

SPENCER, HERBERT (1873): THE PRINCIPLES OF PSYCHOLOGY.

When, in 1855, the First Edition of The Principles of Psychology was issued, it had to encounter a public opinion almost universally adverse. The Doctrine of Evolution everywhere implied in it, was at that time ridiculed in the world at large, and frowned upon even in the scientific world.

The great change of attitude towards the Doctrine of Evolution in general, which has taken place during the last ten years, has made the Doctrine of Mental Evolution seem less unacceptable ...

PREFACE,

The General Synthesis, setting out with an abstract statement of the relation subsisting between every living organism and the external world, and arguing that all vital actions whatever, mental and bodily, must be expressible in terms of this relation; proceeds to formulate, in such terms, the successive phases of progressing Life, considered apart from our conventional classifications of them.

And the Special Synthesis, after exhibiting that gradual differentiation of the psychical from the physical life which accompanies the evolution of Life in general, goes on to develop, in its application to psychical life in particular, the doctrine which the previous part sets forth: describing the nature and genesis of the different modes of Intelligence, in terms of the relation which obtains between inner and outer phenomena.

PART I – THE DATA OF PSYCHOLOGY.

CHAPTER I. - THE NERVOUS SYSTEM.

§ 1.

The lowest animal and the highest animal present no contrast more striking than that between the small self-mobility of the one and the great self-mobility of the other.

Contrasts of this kind exist within each great division of the animal kingdom, as well as in the animal kingdom taken as a whole. The sub-kingdom Annulosa shows us an immense difference between the slow crawling of worms and quick flight of insects.

This self-mobility which by its greater amount generally distinguishes higher animals from lower, and, indeed, enters largely into our conceptions of higher and lower, is displayed in several ways. We see it in the changes of attitude that are made without moving the body from place to place.

We see it in the transference of the body as a whole through space: considering this transference apart from external resistances overcome. And we see it in the over coming of resistances—both those of media and those due to gravity. All these, however, are manifestations of one ability—the ability to generate a force which either shows itself as momentum or would generate momentum but for a counterbalancing force. And it is in this general form that we are here concerned with this ability. We have to contemplate the inferior animals as being generators of very small quantities of actual or potential motion, and the higher animals as being generators of relatively-immense quantities of actual or potential motion.

§ 2.

Above all it is self-evident that along with locomotive activity there must exist those contractile organs which are the immediate movers of the limbs and consequently of the body; and hence the direct connection between absence of muscular fibres and extremely-small self-mobility, and the direct connection between development of the muscles and much self-mobility—connections so direct as to make it at first sight seem that the genesis of motion varies as the muscular development.

Remotely dependent, however, as the genesis of motion is on digestive, vascular, respiratory, and other structures; and immediately dependent as it is on contractile structures; its most important dependence remains to be named. For all of these appliances taken together can do nothing of themselves. The muscles are but instruments, which remain passive until their power is evoked by the structure which uses them; and the quantity of motion they then give out varies according to the demand made by this exciting and controlling structure. In other words, the initiator or primary generator of motion is the Nervous System.

Where there is extremely little power of generating motion, as among the Protozoa and the inferior Celenterata, there is no nervous system: Where activity begins to show itself a nervous system begins to be visible. And where the power of self-movement is great, the nervous system is comparatively well developed. Though the muscular system also becomes larger and better organized; yet the quantity of motion produced is fundamentally related to the degree of nervous development.

§ 4.

But after all modifying causes have been allowed for, there remain substantially intact the fundamental relations set forth—namely, that wherever much motion is evolved, a relatively-large nervous system exists; that wherever the motion evolved though not great in quantity is heterogeneous in kind, a relatively-large nervous system exists; and that wherever the evolved motion is both great in quantity and heterogeneous in kind, the largest nervous systems exist.

§ 7.

It is with deliberate intention that I have set out with this unfamiliar and, as many will think, somewhat strange presentation of the facts. My reasons for doing so are several.

One of them is that we are here primarily concerned with psychological phenomena as phenomena of Evolution; and, under their objective aspect, these, reduced to their lowest terms, are incidents in the continuous re-distribution of Matter and Motion. Hence the first question respecting the nervous system as studied from our point of view is—what are the leading facts it presents as expressed in terms of Matter and Motion ?

Another reason is that, apart from any doctrine of Evolution, true conclusions respecting psychical phenomena must be based on the facts exhibited throughout organic nature ...

CHAPTER II. - THE STRUCTURE OF THE NERVOUS SYSTEM.

§ 8.

An outline of nervous structure must precede a detailed account of it; and the essential facts to be indicated in an outline may be brought most clearly into view by comparing with one another the nervous systems possessed by different types, and by different grades of the same type.

We will limit our comparisons to the three superior sub-kingdoms of animals.

CHAPTER III. - THE FUNCTIONS OF THE NERVOUS SYSTEM.

§ 17.

The proposition with which the first chapter ended was that nervous evolution varies partly as the quantity of motion generated in the organism, and partly as the complexity of this motion. Here the initial inquiry must be, how the nervous system serves as at once the agent by which motions are liberated and the agent by which motions are co-ordinated.

Three things have to be explained —1. What are the causes which on appropriate occasions determine the nervous system to set up motion? 2. By what process does it liberate the insensible motion locked up in cerebral tissues, and cause its transformation into sensible motion; 3. How does it adjust sensible motions into those combinations, simultaneous and successive, needful for efficient action on the external world?

These questions cover the whole of its functions; or, at any rate, all those of its functions with which we are directly concerned. We have to interpret its passive function as a receiver of disturbances that set it going; its active function as a liberator of motion; and its active function as a distributor or apportioner of the motion liberated.

§ 18.

Physiology is an objective science; and is limited to such data as can be reached by observations made on sensible objects. It cannot, therefore, properly appropriate subjective data; or data wholly inaccessible to external observations. Without questioning the truth of the assumed correlation between the changes which, physically considered, are disturbances of nerves, and those which, psychically considered, are feelings; it may be safely affirmed that Physiology, which is an interpretation of the physical processes that go on in organisms, in terms known to physical science, ceases to be Physiology when it imports into its interpretations a psychical factor—a factor which no physical research whatever can disclose, or identify, or get the remotest glimpse of.

The relations between nerve actions and mental states form a distinct subject, to be dealt with presently. Here we are treating of nerve-actions on their physiological side, and must ignore their psychological side.

Doing this, we have no alternative but to formulate them in terms of motion. And having recognized the primary division to be that between the liberation of motions and the co-ordination of motions, we find that this last division must be sub-divided, It includes, first, the co-ordination of the motions received with one another ; and, second, the co-ordination of the motions expended with the motions received, and with one another.

CHAPTER V. - NERVOUS STIMULATION AND NERVOUS DISCHARGE.

§ 87.

Were Life uniform in its rate—were terrestrial conditions such that actions of all kinds could be performed as readily at one time as at another, repair and waste of all organs, including nervous organs, would have to keep an approximately-even pace, one with the other. But the alternation of day and night entails an alternation of greater and less facility for actions; and there has resulted, in organisms an adapted alternation in the relative rates of waste and repair.

CHAPTER VI - AESTHO-PHYSIOLOGY.

§ 41.

Throughout the foregoing chapters nervous phenomena have been formulated in terms of Matter and Motion. If from time to time the phrases used have tacitly referred to another aspect of nervous phenomena, the tacit references have formed no parts of the propositions set down; but have been due to lack of fit words—words free from unfit associations. As already said, the nervous system can be known only as a structure that undergoes and initiates either visible changes, or changes that are representable in terms furnished by the visible world. And thus far we have limited ourselves to generalizing the phenomena which it thus presents to us objectively.

Now, however, we turn to a totally-distinct aspect of our subject. There lies before us a class of facts absolutely without any perceptible or conceivable community of nature with the facts that have occupied us. The truths here to be set down are truths of which the very elements are unknown to physical science. Objective observation and analysis fail us; and subjective observation and analysis must supplement them.

In other words, we have to treat of nervous phenomena as phenomena of consciousness. The changes which, regarded as modes of the Non-Ego, have been expressed in terms of motion, have now, regarded as modes of the Ego, to be expressed in terms of feeling. Having contemplated these changes on their outsides, we have to contemplate them from their insides. To speak with exactness, indeed, it cannot be said that we have so to contemplate these changes; for this expression implies that these changes can be simultaneously witnessed by more than one, which is not true. Rigorously limiting the proposition to that which is alone possible, it amounts to this :—I have to describe the laws of relation between the states of feeling occurring in my own consciousness, and the physical affections of that nervous system which I conclude I possess; and the reader has to observe whether in himself there exist parallel relations between such known states of consciousness and such supposed nervous affections.

This will perhaps be thought a needlessly roundabout, if not a sceptical, statement; but it is in fact not roundabout enough. It does not bring sufficiently into view the remotely-inferential character of the belief that feeling and nervous action are correlated.

1. Each individual is absolutely incapable of knowing any feelings but his own. That there exist other sensations and emotions, is a conclusion implying, in the first place, the reasonings through which he identifies certain objects as bodies of like nature with his own body; and implying, in the second place, the farther reasonings which convince him that along with the external actions of these bodies, there go internal states of consciousness like those accompanying such external actions of his own body.

2. This conclusion that there exist beings like himself, and that under like conditions they experience like feelings, even supposing it entirely true (and it is not entirely true, for many facts unite to prove that under like conditions both the quantities and the qualities of sensations and emotions in different individuals differ considerably), by no means implies that what he knows under its subjective aspect as feeling, is, under its objective aspect, nervous action. The average observer has no direct evidence that these other like beings have nervous systems, any more than that he has himself a nervous system; and he has no direct evidence in the one case any more than in the other, that nervous excitations are the causes of feelings. Experimental physiologists and pathologists only have proofs; and even their proofs are mostly indirect. The experiments which yield them are usually made on beings of another and much inferior order. The contractions of muscles and arteries, caused by irritating nerve-trunks in frogs, the convulsive movements, and sometimes the sounds, made by birds and mammals whose nerve-centres are variously injured—these are the phenomena from which it is inferred that the human nervous system is the seat of the human feelings, and that these feelings are the correlatives of its excitations: the only important verifications of the inference being those obtained during surgical operations where nerve-trunks are cut through, and those furnished by post mortem examinations of morbid nervous structures in the bodies of those who when alive displayed abnormal excesses or defects of feeling.

3. And then, having learnt at second hand, through the remotely-inferential interpretation of verbal signs, that in now one and now another of the bodies he recognizes as like his own there has been found a nervous system, and that the stimulations of this produce those manifestations which in himself accompany feelings, the reader imagines a nervous system contained in his own body, and concludes that his sensations and emotions are due to the disturbances which the outer world sets up at its periphery, and arouses by indirect processes in its centres. Such, stated as briefly as possible, is the long and involved series of steps by which alone the connection between nervous action and feeling can be established.

Nevertheless, the evidence of this connection is so large in amount, presents such a congruity under so great a variety of circumstances, and is so continually confirmed by the correct anticipations to which it leads, that we can entertain nothing more than a theoretical doubt of its truth. Here accepting the belief, alike popular and scientific, that all the human beings known objectively have feelings like those which each knows subjectively; and accepting also the belief, originating with science but now diffused through the general mind, that feelings are the concomitants of nervous changes; we will proceed to consider the relation between feelings and nervous changes under its leading aspects.

§ 42.

And first let us observe that the circumstances conducive to the one are identical with the circumstances conducive to the other. The conditions which we before found essential to the production of nervous action, we shall now find essential to the production of feeling.

§ 47.

Are these correlations between nervous actions and the concomitant feelings quantitative? Is there such connection between a physical change in the nervous system and the psychical change accompanying it, that we may regard the one as an equivalent of the other, in the same sense as we regard so much heat as the equivalent of so much motion? The reader will perhaps expect an affirmative answer; but if an affirmative answer is to be given, it must be given in a greatly-qualified form.

On remembering that many nervous actions are always unconscious; on also remembering that various objective states of the nervous system which have associated subjective states early in life, cease to have them later in life; and on remembering, further, that at the same period of life a change set up in an afferent nerve may cause an appreciable feeling, or may not cause it, according as the attention is free or occupied; we shall see that the connection between feelings and nervous changes is conditioned in a very complex way, and that if they are quantitatively related it can be only within the narrow limits implied by the complex conditions. If between a purely voluntary act and a purely automatic act there are gradations—if, at the one extreme, feeling is a conspicuous accompaniment, and, at the other extreme, ceases to be an accompaniment; then, clearly, in the intermediate phases the amount of feeling must bear a varying ratio to the amount of nervous change which the act implies.

More conspicuously still do we see the variability of this relation, when we compare the feelings called efforts with the discharges and muscular strains produced by them under different conditions. If the psychical force known as effort were transformable into a constant quantity of physical force, then, in any two cases, equal efforts should produce equal contractions. But they do not. Great exertion in a child fails to evolve from its motor organs the dynamic effect which a small exertion evolves from those of a man. Any one who is fatigued finds that an intenser feeling of strain is requisite to generate a given degree of muscular tension, than when he is fresh. And those prostrated by illness show us that immense expenditures of feeling are needed to perform acts which, during health, need scarcely appreciable expenditures of feeling.

Doubtless these differences are partly due to differences in the muscles; which, when undeveloped or when wasted, are excited to smaller amounts of tension by equal amounts of discharge. But we must regard them as partly due to the imperfect development, or the worn state, of the intermediate motor centres and efferent nerves, in which a given feeling excites a smaller molecular disturbance than when they are finished in structure and in complete repair—a conclusion enforced by the familiar experience that purely nervous acts, as those of thought, require unusual efforts when the brain is tried.

This variability of the quantitative relation between nervous actions and psychical states, is equally seen when we limit our comparisons to those nervous actions and psychical states which occur in the same individual under the same bodily conditions.

In brief, then, the quantitative correlation of feeling and nervous change, holds true only within narrow limits. We have good reason to conclude that at the particular place in a superior nervous centre where, in some mysterious way, an objective change or nervous action causes a subjective change or feeling, there exists a quantitative equivalence between the two: the amount of sensation is proportionate to the amount of molecular transformation that takes place in the vesicular substance affected. But there is no fixed, or even approximate, quantitative relation between this amount of molecular transformation in the sentient centre, and the peripheral disturbance originally causing it, or the disturbance of the motor apparatus which it may eventually cause.

§ 48.

The feelings called sensations have alone been considered thus far; leaving out of view the feelings distinguished as emotions. Much less definite as they are, and not capable of being made at will the objects of observation and experiment, the emotions are more difficult to deal with. But having discerned certain general laws to which the simpler feelings conform, we may now ask whether, so far as we can see, they are conformed to by the more complex feelings. We shall find that they are.

Cultivated people, mostly leading lives that exercise their brains too much and their muscles too little, and placed in social conditions that commonly bring the strongest excitements towards the close of the day, are subject to an abnormal periodicity. But those whose lives conform best to the laws of health, exhibit early in the day a general joyousness and emotional vivacity greater than they do towards its close, when approaching sleepiness is shown by a flagging interest in the things and actions around.

CHAPTER VII. - THE SCOPE OF PSYCHOLOGY.

§ 52.

We may now enter on our special topic. Thus far we have been occupied with the data of Psychology, and not with Psychology properly so-called. Here leaving the foundations we pass to the superstructure.

Not a few readers will be surprised by the assertion that none of the truths we have been contemplating are psychological truths. Since the anatomy and physiology of the nervous system have occupied so much attention, and since it has been growing manifest that there is a fundamental connection between nervous changes and psychical states, there has arisen a confusion between the phenomena which underlie Psychology and the phenomena of Psychology itself.

In reality, all the facts ascertained by those who have made nerve-structure and nerve-function their studies, are facts of a simpler order than those rightly termed psychological; though they are facts entering into the composition of psychological facts.

Most will admit without hesitation that the first five chapters of this part consist of propositions which are exclusively morphological and physiological. In them the structure of the nervous system, its functions, the conditions to its action, &c., have been dealt with purely as physical phenomena—phenomena as purely physical as the absorption implications may have arisen from the use of words that carry with them indirect meanings, the direct meanings of all the propositions set down have nowhere implied consciousness or feeling; and, ignoring consciousness or feeling, they have left out that which is tacitly or avowedly contained in every proposition of Psychology.

Dealing as the last chapter does with the connections between nervous changes and feelings, it necessarily becomes, by including a psychical element, a part of psychical science. To this the rejoinder is that, though it can scarcely be excluded absolutely from the body of this science, yet it does not strictly fall within that body. AEstho-physiology has a position that is entirely unique. It belongs neither to the objective world nor the subjective world; but taking a term from each, occupies itself with the correlation of the two. It may with as much propriety be included in the domain of physical science as in the domain of psychical science; and must be left where it stands, as the link between them.

§ 53.

Now so long as we state facts of which all the terms lie within the organism, our facts are morphological or physiological and in no degree psychological. Even though the relation with which we are dealing is that between a nervous change and a feeling, it is still not a psychological relation so long as the feeling is regarded merely as connected with the nervous change, and not as connected with some existence lying outside the organism. As certainly as the man who demonstrates by dissection the articulations of the bones, and the man who, by a sphygmograph, delineates the varying motions of the heart, are respectively studying morphology and physiology; so certainly is the man who examines nervous structure and experiments on nervous function, a student of these same sciences, if he considers the inner correlations only and does not simultaneously consider the answering outer correlations.

For that which distinguishes Psychology from the sciences on which it rests, is, that each of its propositions takes account both of the connected internal phenomena and of the connected external phenomena to which they refer. In a physiological proposition an inner relation is the essential subject of thought; but in a psychological proposition an outer relation is joined with it as a co-essential subject of thought.

A relation in the environment rises into co-ordinate importance with a relation in the organism. The thing contemplated is now a totally different thing. It is not the connection between the internal phenomena, nor is it the connection between the external phenomena; but it is the connection between these two connections. A psychological proposition is necessarily compounded of two propositions, of which one concerns the subject and the other concerns the object; and cannot be expressed without the four terms which these two propositions imply.

The distinction may be best explained by symbols. Suppose that A and B are two related manifestations in the environment—say, the colour and taste of a fruit; then, so long as we contemplate their relation by itself, or as associated with other external phenomena, we are occupied with a portion of physical science. Now suppose that a and b are the sensations produced in the organism by this peculiar light which the fruit reflects, and by the chemical action of its juice on the palate; then, so long as we study the action of the light on the retina and optic centres, and consider how the juicy sets up in other centres a nervous change known as sweetness, we are occupied with facts belonging to the sciences of Physiology and Atstho-physiology. But we pass into the domain of Psychology the moment we inquire how there comes to exist within the organism a relation between a and b that in some way or other corresponds to the relation between A and B. Psychology is exclusively concerned with this connection between (A B) and (a b)—has to investigate its nature, its origin, its meaning, &c.

A moment's introspection will now make it clear to the reader, that he cannot frame any psychological conception without thus looking at internal co-existences and sequences in their adjustments to external co-existences and sequences. If he studies the simplest act of perception, as that of localizing a touch in some part of his skin, the indispensable terms of his inquiry are:—on the one hand a thing (1) and a position (2), both of which he regards as objective; and on the other hand a sensation (3), and a state of consciousness constituting his apprehension of position (4), both of which he regards as subjective.

Again, to cite an example from the opposite extreme, if he takes for his problem one of his involved sentiments, as that of justice, he cannot represent to himself this sentiment, or give any meaning to its name, without calling to mind actions and relations supposed to exist in the environment: neither this nor any other emotion can be aroused in consciousness even vaguely, without positing something beyond consciousness to which it refers. And when, instead of studying Psychology subjectively, he studies it objectively in the acts of other beings, he similarly finds himself incapable of stirring a step without thinking of inner correlations in their references to outer correlations.

§ 54.

It is contended by some that Psychology is a part of Biology, and should be merged in it; and those who hold this view will possibly answer the above argument by saying that in many cases the non-psychological part of Biology also takes into account phenomena in the environment, and even definite connections among these phenomena. The life of every organism is a continuous adaptation of its inner actions to outer actions; and a complete interpretation of the inner actions involves recognition of the outer actions. The annual production of leaves, flowers, and seeds by plants, is adjusted to the annual changes of the seasons; and there is in animals an adjustment between external changes in temperature and abundance, and internal production of ova. Moreover, there are many special relations of structure and function in plants and animals, that have reference to special relations of structure and function in surrounding plants and animals: instance those arrangements of the sexual organs that fit particular phnograms for being fertilized by the particular insects that visit them.

But true as is this conception of Life (and having based the Principles of Biology on it I am not likely to question or to undervalue it), I nevertheless hold the distinction above drawn to be substantially valid. For through out Biology proper, the environment and its correlated phenomena are either but tacitly recognized, or, if overtly and definitely recognized, are so but occasionally; while the organism and its correlated phenomena practically monopolize the attention. But in Psychology, the correlated phenomena of the environment are at every step avowedly and distinctly recognized; and are as essential to every psychological idea as are the correlated phenomena of the organism.

In brief, then, the propositions of Biology, when they imply the environment at all, imply almost exclusively its few general and constant phenomena, which, because of their generality and constancy, may be left out of consideration; whereas the propositions of Psychology refer to its multitudinous, special, and ever-varying phenomena, which, because of their speciality and changeability, can not be left out of consideration.

§ 55.

The admission that Psychology is not demarcated from Biology by a sharp line, will perhaps be construed into the admission that it cannot rightly be regarded as a distinct science. But those who so construe the admission, misconceive the natures of the relations among the sciences. They assume that there exist objectively those clear separations which the needs of classification lead us to make subjectively.

Whereas the fact is, that beyond the divisions between the three fundamental orders of the sciences, Abstract, Abstract-concrete, and Concrete, there exist objectively no clear separations at all: there are only different groups of phenomena broadly contrasted but shading off one into another.

To those who accept the doctrine of Evolution, this scarcely needs saying ; for Evolution being & universal process, one and continuous throughout all forms of existence, there can be no break—no change from one group of concrete phenomena to another without a bridge of intermediate phenomena.

Astronomy and Geology are regarded as distinct. But Geology is nothing more than a chapter continuing in detail one part of a history that was once wholly astronomic; and even now, many of its leading facts belong as much to the older part of the history as to the younger.

Thus the distinction between Biology and Psychology has the same justification as the distinctions between the concrete sciences below them. Theoretically, all the concrete sciences are adjoining tracts of one science, which has for its subject-matter, the continuous transformation which the Universe undergoes.

Practically, however, they are distinguishable as successively more specialized parts of the total science—parts further specialized by the introduction of additional factors. The Astronomy of the Solar System is a specialized part of that general Astronomy which includes our whole Sidereal System; and becomes specialized by taking into account the revolutions and rotations of planeta and satellites. Geology (or rather Geogeny let us call it, that we may include all those mineralogical and meteorological changes which the word Geology, as now used, recognizes but tacitly) is a specialized part of this special Astronomy; and becomes specialized by joining with the effects of the Earth's molar motions, the effects of continuous decrease in its internal molecular motion, and the effects of the molecular motion radiated from the Sun. Biology is a specialized part of Geogeny, dealing with peculiar aggregates of peculiar chemical compounds formed of the Earth's superficial elements—agegregates which, while exposed to these same general forces molar and molecular, also exert certain general actions and reactions on one another. And Psychology is a specialized part of Biology, limited in its application to the higher division of these peculiar aggregates, and occupying itself exclusively with those special actions and reactions which they display, from instant to instant, in their converse with the special objects, animate and inanimate, amid which they move.

§ 56.

A far more radical distinction remains to be drawn. While, under its objective aspect, Psychology is to be classed as one of the concrete sciences which successively decrease in scope as they increase in speciality; under its subjective aspect, Psychology is a totally unique science, independent of, and antithetically opposed to, all other sciences whatever.

The thoughts and feelings which constitute a consciousness, and are absolutely inaccessible to any but the possessor of that consciousness, form an existence that has no place among the existences with which the rest of the sciences deal. Though accumulated observations and experiments have led us by a very indirect series of inferences (§ 41) to the belief that mind and nervous action are the subjective and objective faces of the same thing, we remain utterly incapable of seeing, and even of imagining, how the two are related.

Mind still continues to us a something without any kinship to other things; and from the science which discovers by introspection the laws of this something, there is no passage by transitional steps to the sciences which discover the laws of these other things.

To those who see that the essential conceptions on which Psychology in general proceeds, are furnished by subjective Psychology—to those who see that such words as feelings, ideas, memories, volitions, have acquired their several meanings through self-analysis, and that the distinctions we make between sensations and emotions, or between automatic acts and voluntary acts, can be established only by comparisons among, and classifications of, our mental states; it will be manifest that objective Psychology can have no existence as such, without borrowing its data from subjective Psychology. And thus perceiving that, until it acknowledges its indebtedness to subjective Psychology, objective Psychology cannot legitimately use any terms that imply consciousness, but must limit itself to nervous coordinations considered as physical only; they will see that even objective Psychology contains an element which differentiates it from the rest of the special concrete sciences more than any of these are differentiated from one another.

The claims of Psychology to rank as a distinct science, are thus not smaller but greater than those of any other science. If its phenomena are contemplated objectively, merely as nervo-muscular adjustments by which the higher organisms from moment to moment adapt their actions to environing co-existences and sequences, its degree of speciality, even then, entitles it to a separate place. The moment the element of feeling, or consciousness, is used to interpret nervo-muscular adjustments as thus exhibited in the living beings around, objective Psychology acquires an additional, and quite exceptional, distinction. And it is further distinguished in being linked by this common element of consciousness, to the totally-independent science of subjective Psychology—the two forming together a double science which, as a whole, is quite *sui generis*.

§ 57.

We will next pass to Objective Psychology; of which three divisions may conveniently be made.

In the first, or General Synthesis, we will trace throughout the animal kingdom, the progress in these perpetual adjustments of special inner actions to special outer actions, which accompanies increasing evolution of the nervous system—omitting, so far as may be, the element of consciousness.

In the second, or Special Synthesis, we will consider this same progress more closely, with the view of delineating and formulating it in terms that imply consciousness.

And in the third, or Physical Synthesis, an endeavour will be made to show how, by an ultimate principle of nervous action, this progress is explicable as part of Evolution in general.

PART II. - THE INDUCTIONS OF PSYCHOLOGY.

CHAPTER I – THE SUBSTANCE OF MIND.

§ 58.

To write a chapter for the purpose of showing that nothing is known, or can be known, of the subject which the title of the chapter indicates, will be thought strange. It is, however, in this case needful—needful because, in the absence of explanation, much that has gone before, and much that will come hereafter, maybe misinterpreted; and needful also because we have to distinguish between that absolute ignorance and that partial knowledge which may be asserted according as we give one or other meaning to the terms used.

For if by the phrase “substance of Mind,” is to be understood Mind as qualitatively differentiated in each portion that is separable by introspection but seems homogeneous and undecomposable; then we do know something about the substance of Mind, and may eventually know more. Assuming an underlying something, it is possible in some cases to see, and in the rest to conceive, how these multitudinous modifications of it arise. But if the phrase is taken to mean the underlying something of which these distinguishable portions are formed, or of which they are modifications; then we know nothing about it, and never can know anything about it. It is not enough to say that such knowledge is beyond the grasp of human intelligence as it now exists; for no amount of that which we call intelligence, however transcendent, can grasp such knowledge.

These two propositions will need a good deal of elucidation. It will be most convenient to deal first with the last of them.

§ 59.

To meet all imaginable possibilities, let us set out with the doctrine of Hume, that impressions and ideas are the only things known to exist, and that Mind is merely a name for the sum of them. In this case, the expression “substance of Mind” can have no meaning, unless as applied to each or any impression or idea individually. Whence it follows that there are as many different substances of Mind as there are different impressions and ideas; and this amounts to the conclusion that there is no substance of Mind in the sense implied; or, at any rate, that we have no evidence of its existence. A fortiori, the substance of Mind cannot be known.

Contrariwise, let us yield to the necessity of regarding impressions and ideas as forms or modes of a continually existing something. Failing in every effort to break the series of impressions and ideas in two, we are prevented from thinking of them as separate existences. While each particular impression or idea can be absent, that which holds impressions and ideas together is never absent; and its unceasing presence necessitates, or indeed constitutes, the notion of continuous existence or reality. Existence means nothing more than persistence; and hence in Mind that which persists in spite of all changes, and maintains the unity of the aggregate in defiance of all attempts to divide it, is that of which existence in the full sense of the word must be predicated—that which we must postulate as the substance of Mind in contradistinction to the varying forms it assumes. But if so, the impossibility of knowing the substance of Mind is manifest. By the definition, it is that which undergoes the modification producing a state of Mind.

Consequently, if every state of Mind is some modification of this substance of Mind, there can be no state of mind in which the unmodified substance of Mind is present.

Knowing implies something acted upon and something acting upon it. To see that this is undeniable we have but to glance at the three intelligible propositions which can alone be framed respecting the ultimate character of cognition. Suppose the thing presented in consciousness persists unchanged; then, as in the absence of change there is no consciousness, there can be no knowledge. Suppose there follows something which has no determinate relation whatever to its antecedent ; then, the change being wholly indeterminate, there is no knowledge, since knowledge is the establishment in thought of determinate relations. Suppose lastly, that the succeeding something has a determinate relation to that which precedes it; then the implication is that the two are linked (if they are not, any other thing may equally well follow) ; and to think of a special thing (existing) as linked with a special thing (about to exist) is to think of the second as having a speciality resulting from the co-operation of the first and something else. So that be the thing contemplated in the act of cognition a symbolized activity existing beyond the Mind, or be it a past state of Mind itself, that which contemplates it is distinct from it. Hence were it possible for the substance of Mind to be present in any state of Mind, there would still have to be answered the question—What is it which then contemplates it and knows it? That which in the act of knowing is affected by the thing known, must itself be the substance of Mind. The substance of Mind escapes into some new form in recognizing some form under which it has just existed. Hence could the unmodified substance of Mind be presented in consciousness, it would still be unknowable; since, until there had arisen something different from it, the elements of cognition would not exist; and as this something different would necessarily be some state of Mind, we should have the substance of Mind known in a state of Mind, which is a contradiction. In brief, a thing cannot at the same instant be both subject and object of thought; and yet the substance of Mind must be this before it can be known.

Again, to know anything is to distinguish it as such or such—to class it as of this or that order. An object is said to be but little known, when it is alien to objects of which we have had experience; and it is said to be well known, when there is great community of attributes between it and objects of which we have had experience. Hence, by implication, an object is completely known when this recognized community is complete; and completely unknown when there is no recognized community at all.

Manifestly, then, the smallest conceivable degree of knowledge implies at least two things between which some community is recognized. But if so, how can we know the substance of Mind? To know the substance of Mind is to be conscious of some community between it and some other substance. If, with the Idealist, we say that there exists no other substance ; then, necessarily, as there is nothing with which the substance of Mind can be even compared, much less assimilated, it remains unknown. While, if we hold with the Realist that Being is fundamentally divisible into that which is present to us as Mind, and that which, lying outside of it, is not Mind ; then, as the proposition itself asserts a difference and not a likeness, it is equally clear that Mind remains unclassable and therefore unknowable.

§ 60.

From this absolute ignorance of the substance of Mind, considered as the something of which all particular states of Mind are modifications, let us now turn to that partial knowledge of these particular states, as qualitatively characterized, which lies within our possible grasp.

How is it possible for feelings so different in quality as those of heat, of taste, of colour, of tone, &c., to arise in nervous centres closely allied to one another in composition and structure?

And how, in the course of evolution, can there have been gradually differentiated these widely-unlike orders, and genera, and species, of feelings?

Possible answers are at once supplied if we assume that diverse feelings are produced, by diverse modes, and degrees, and complexities, of integration of the alleged ultimate unit of consciousness.

§ 61.

The nature of Mind as thus conceived, will be elucidated by comparing it with the nature of Matter; and the fact that a parallelism exists between that which chemists have established respecting Matter and that which we here suppose respecting Mind, will help to justify the Conception. Multitudinous substances that seem to be homogeneous and simple, prove to be really heterogeneous and compound; and many that appear wholly unrelated are shown by analysis to be near akin.

Moreover, there is reason to suspect that the so-called simple substances are themselves compound; and that there is but one ultimate form of Matter, out of which the successively more complex forms of Matter are built up. By the different grouping of units, and by the combination of the unlike groups each with its own kind and each with other kinds, it is supposed that there have been produced the kinds of matter we call elementary ; just as, by farther compositions similarly carried on, these produce further varieties and complexities. And this supposition the phenomena of Multitudinous tropism go far to justify, by showing us that the same mass of molecules assumes quite different properties when the mode of aggregation is changed.

We shall perceive that such homogeneous units of feeling may, by integration in diverse ways, give origin to different though relatively-simple feelings; by combination of which with one another more complex and more unlike feelings may arise ; and so on continuously.

We shall suspect that there may be here a further correspondence between a known cause of physical heterogeneity and the supposed cause of psychical heterogeneity.

§ 62.

Even could we succeed in proving that Mind consists of homogeneous units of feeling of the nature specified, we should be unable to say what Mind is; just as we should be unable to say what Matter is, could we succeed in decomposing it into those ultimate homogeneous units of which it is not improbably composed. In the one case, as in the other, the ultimate unit must remain, for the reasons as signed at the outset, absolutely unknown.

The reduction of all the more complex forms to the simplest form, leaves us with nothing but this simplest form as the term out of which to frame thought; and thought cannot be framed out of one term only.

§ 63.

Here, indeed, we arrive at the barrier which needs to be perpetually pointed out; alike to those who seek materialistic explanations of mental phenomena, and to those who are alarmed lest such explanations may be found. The last class prove by their fear, almost as much as the first prove by their hope, that they believe Mind may possibly be interpreted in terms of Matter; whereas many whom they vituperate as materialists, are profoundly convinced that there is not the remotest possibility of so interpreting them.

For those who, not deterred by foregone conclusions, have pushed their analyses to the uttermost, see very clearly that the concept we form to ourselves of Matter, is but the symbol of some form of Power absolutely and for ever unknown to us; and a symbol which we cannot suppose to be like the reality without involving ourselves in contradictions (First Principles, § 16). They also see that the representation of all objective activities in terms of Motion, is but a representation of them and not a knowledge of them; and that we are immediately brought to alternative absurdities if we assume the Power manifested to us as Motion, to be in itself that which we conceive as Motion (First Principles, § 17). When with these conclusions that Matter and Motion as we think them are but symbolic of unknowable forms of existence, we join the conclusion lately reached that Mind also is unknowable, and that the simplest form under which we can think of its substance is but a symbol of something that can never be rendered into thought; we see that the whole question is at last nothing more than the question whether these symbols should be expressed in terms of those or those in terms of these—a question scarcely worth deciding ; since either answer leaves us as completely outside of the reality as we were at first.

Nevertheless, it may be as well to say here, once for all, that were we compelled to choose between the alternatives of translating mental phenomena into physical phenomena, or of translating physical phenomena into mental phenomena, the latter alternative would seem the more acceptable of the two.

Clearly, if units of external force are regarded as absolutely unknown and unknowable, then to translate units of feeling into them is to translate the known into the unknown, which is absurd. And if they are what they are supposed to be by those who identify them with their symbols, then the difficulty of translating units of feeling into them is insurmountable: if Force as it objectively exists is absolutely alien in nature from that which exists subjectively as Feeling, then the transformation of Force into Feeling is unthinkable. Either way, therefore, it is impossible to interpret inner existence in terms of outer existence.

Our only course is constantly to recognize our symbols as symbols only; and to rest content with that duality of them which our constitution necessitates. The Unknowable as manifested to us within the limits of consciousness in the shape of Feeling, being no less inscrutable than The Unknowable as manifested beyond the limits of consciousness in other shapes, we approach no nearer to understanding the last by rendering it into the first. The conditioned form undershapes, we approach no nearer to understanding the last by rendering it into the first. The conditioned form under which Being is presented in the Subject, cannot, any more than the conditioned form under which Being is presented in the Object, be the Unconditioned Being common to the two.

CHAPTER II, - THE COMPOSITION OF MIND.

§ 65.

Each feeling, as we here define it, is any portion of consciousness which occupies a place sufficiently large to give it a perceivable individuality; which has its individuality marked off from adjacent portions of consciousness by qualitative contrasts; and which, when introspectively contemplated, appears to be homogeneous. These are the essentials.

Obviously if, under introspection, a state of consciousness is decomposable into unlike parts that exist either simultaneously or successively, it is not one feeling but two or more. Obviously if it is indistinguishable from an adjacent portion of consciousness, it forms one with that portion—is not an individual feeling but part of one. And obviously if it does not occupy in consciousness an appreciable area, or an appreciable duration, it cannot be known as a feeling.

A relation between feelings is, on the contrary, characterized by occupying no appreciable part of consciousness. Take away the terms it unites, and it disappears along with them; having no independent place—no individuality of its own.

§ 66

Limiting our attention to seemingly-homogeneous feelings as primarily experienced, they may be divided into the feelings which are centrally initiated and the feelings which are peripherally initiated—emotions and sensations. These have widely unlike characters. Towards the close of this volume evidence will be found that while the sensations are relatively simple, the emotions, though seeming to be simple are extremely compound; and that a marked contrast of character between them hence results.

We are thus obliged to carry with us a classification based on structure and a classification based on function. The division into centrally-initiated feelings, called emotions, and peripherally-initiated feelings, called sensations; and the subdivision of these last into sensations that arise on the exterior of the body and sensations that arise in its interior; respectively refer to differences among the parts in action.

§ 70.

A farther trait in the composition of Mind, dependent on these correlated traits, may next be set down. We have seen that tracts of consciousness formed of feelings produced by external disturbances, are mostly distinguished by predominance of the relational element, involving clearness of mutual limitation and strength of cohesion among the component feelings; and we have seen that, contrariwise, the feelings produced by internal disturbances, peripheral and central, are mostly distinguished by comparative want of the relational element, involving proportionate defect of mutual limitation and cohesion.

We have now to observe that the tracts of consciousness thus broadly contrasted, are, by consequence, broadly contrasted in the respect that, in the one case, the component feelings can unite into coherent and well-defined clusters, while, in the other case, they cannot so unite.

The state of consciousness produced by an object seen, is composed of sharply-outlined lights, shades, and colours, and the co-existent feelings and relations entering into one of these groups form an indissoluble whole. To a considerable degree, successive visual feelings cling together in defined groups.

The clustering of auditory feelings, comparatively feeble among those occurring simultaneously, is comparatively strong among those occurring successively. Hence the consolidated groups of sounds which we know in consciousness as words. Hence the chains of notes which we remember as musical phrases.

The clustering of tactual feelings in relations of co-existence, though by no means so decided as the clustering of co-existent visual feelings, either in the extent or complexity of the clusters or the firmness with which their components are united, is nevertheless considerable. "When the hand is laid on some small object, as a key, a number of impressions may be distinguished as separate though near one another; but while their mutual relations are so far fixed that approximate limits within which they exist are known, they do not constitute anything like such a fixed and defined group as those given by vision of the key. This imperfect clustering in co-existence is accompanied by imperfect clustering in sequence.

How, in muscular acts, complete clustering and unconsciousness go together, is seen in the fact that consciousness impedes clustered muscular acts. After having many times gone through the series of compound movements required, it is possible to walk across the room in the dark and lay hold of the handle of the door—so long, that is, as the movements are gone through unthinkingly. If they are consciously made, failure is almost certain.

Of the further class of feelings initiated within the body, including appetites, pains, &c., it is scarcely needful to say that there is among them no formation of coherent groups. Their great indefiniteness of limitation and accompanying want of cohesion, forbid unions of them, either simultaneous or successive.

§ 71.

We come now to more complex manifestations of these general contrasts. In tracts of consciousness where the relational element predominates, and where the clustering of feelings is consequently decided, the clusters themselves enter into relations one with another. Grouped feelings, together with the relations uniting them, are fused into wholes which, comporting themselves as single feelings do, combine with other such consolidated groups in definite relations; and even groups of groups, similarly fused, become in like manner limited by, and coherent with, other groups of groups. Conversely, in tracts of consciousness where the relations are few and vague, nothing of the kind takes place.

It is among the visual feelings, above all others multitudinous, definite, and coherent in their relations, that this compound clustering is carried to the greatest extent.

Along with the ability to form that complex consciousness of lights, shades, and colours, joined in relative positions, which constitute a man as present to sight, there goes the ability to form a consciousness of two men in a definite and coherent relation of position—there goes the ability to form a consciousness of a crowd of such men; nay, two or more such crowds may be mentally combined. The aggregate of definitely-related visual feelings known as a house, itself aggregates with others such to form the consciousness of a street, and the streets to form the consciousness of a town. Though the compound clustering of visual feelings in sequence is not so distinct or so strong, it is still very marked. Numerous complicated images produced by objects seen in succession, hang together in consciousness with considerable tenacity.

There is little, if any, clustering of clusters among the simultaneous auditory feelings. But among the successive auditory feelings there are definite and coherent combinations of groups with groups.

The fused set of sounds we call a word, unites with many others such into a sentence. In some minds these clusters of clusters of successive sounds again cluster very definitely and coherently: many successive sentences are, as we say, accurately remembered. And similarly, musical phrases will cling together into a long and elaborate melody.

§ 72.

One more kindred trait of composition must be set down. Thus far we have observed only the degrees of mutual limitation, of cohesion, and of complex combining power, among feelings within each order. It remains to observe the extent to which feelings of one order enter into relations with those of another, and the consequent amounts of their mutual limitations and of their combining powers.

Feelings of different orders do not limit one another as clearly as feelings of the same order do. The clustered colours produced by an object at which we look are but little interfered with by a sound: the sound does not put any appreciable boundary to them in consciousness, but serves merely to diminish their dominance in consciousness.

Neither the combined noises which make up conversation at table, nor the impressions received through the eyes from the dishes on the table, are excluded from the mind by the accompanying tactual feelings and tastes and smells, as much as colours are excluded by colours, sounds by sounds, tastes by tastes, or one tactual feeling by another. Of sensations arising within the body, and still more of emotions, it may be said that, unless intense, they disturb but slightly the sensations otherwise arising.

It would but slightly the sensations almost seem as though a sensation of colour, a sensation of sound, and a pleasurable emotion produced by the sound, admit of being superposed in consciousness with but little mutual obscuration.

It is a correlative truth that feelings of different orders cohere with one another less strongly than do feelings of the same order. The impressions which make up the visual consciousness of an object, hang together more firmly than the group of them does with the group of sounds making up the name of the object. The notes composing a melody have a stronger tendency to drag one another into consciousness than any one, or all of them, have to drag into consciousness the sights along with which they occurred: these last may or may not cohere with them; but the following of one note by the next is often difficult to prevent.

Similarly, though there is considerable cohesion between the visual sensations produced by an orange and the taste or smell of the orange, yet it is quite usual to have a visual consciousness of an orange without its taste or its smell arising in consciousness; while it is scarcely possible to have before the mind one of its apparent characters unaccompanied by other apparent characters.

§ 78.

On this law of composition depends the orderly structure of Mind. In its absence there could be nothing but a perpetual kaleidoscopic change of feelings—an ever transforming present without past or future. It is because of this tendency which vivid feelings have severally to cohere with the faint forms of all preceding feelings like themselves, that there arise what we call ideas.

A vivid feeling does not by itself constitute a unit of that aggregate of ideas entitled knowledge. Nor does a single faint feeling constitute such a unit. But an idea, or unit of knowledge, results when a vivid feeling is assimilated to, or coheres with, one or more of the faint feelings left by such vivid feelings previously experienced. From moment to moment the feelings that constitute consciousness segregate—each becoming fused with the whole series of others like itself that have gone before it; and what we call knowing each feeling as such or such, is our name for this act of segregation.

The process so carried on does not stop with the union of each feeling, as it occurs, with the faint forms of all preceding like feelings. Clusters of feelings are simultaneously joined with the faint forms of preceding like clusters. An idea of an object or act is composed of groups of similar and similarly-related feelings that have arisen in consciousness from time to time, and have formed a consolidated series of which the members have partially or completely lost their Individualities.

This union of present clustered feelings with past clustered feelings is carried to a much greater degree of complexity. Groups of groups coalesce with kindred groups of groups that preceded them; and in the higher types of Mind, tracts of consciousness of an excessively composite character are produced after the same manner.

Finally, by a further segregation, are formed that consolidated abstract of relations of co-existence which we know as Space, and that consolidated abstract of relations of sequence which we know as Time. This process, here briefly indicated merely to show its congruity with the general process of composition, cannot be explained at length: the elucidation must come hereafter.

§ 74.

And now having roughly sketched the composition of Mind—having, to preserve clearness of outline, omitted details and passed over minor qualifications; let me go on to indicate the essential truth which it is chief purpose of this chapter to bring into view—the truth that the method of composition remains the same throughout the entire fabric of Mind, from the formation of its simplest feelings up to the formation of those immense and complex aggregates of feelings which characterize its highest developments.

Consider now, under its most general form, the process of composition of Mind described in foregoing sections. It is no other than this same process carried out on higher and higher platforms, with increasing extent and complication. As we have lately seen, the feelings called sensations cannot of themselves constitute Mind, even when great numbers of various kinds are present together. Mind is constituted only when each sensation is assimilated to the faint forms of antecedent like sensations.

§ 75.

How clearly the evolution of Mind, as thus traced through ascending stages of composition, conforms to the laws of Evolution in general, will be seen as soon as it is said. We'll glance at the correspondence under each of its leading aspects.

Evolution is primarily a progressing integration ; and throughout this chapter, as well as the last, progressing integration has thrust itself upon us as the fundamental fact in mental evolution.

We came upon it quite unexpectedly in the conclusion that a sensation is an integrated series of nervous shocks or units of feeling; and in the farther conclusion that by integration of two or more such series, compound sensations are formed. We have lately seen that by an integration of successive like sensations, there arises the knowledge of a sensation as such or such; and that each sensation as it occurs, while thus integrated with its like, also unites into an aggregate with other sensations that limit it in space or time. And we have similarly seen that the integrated clusters resulting, enter into higher integrations of both these kinds; and so on to the end.

The significance of these facts will be appreciated when it is remembered that the tracts of consciousness in which integration is undecided, are tracts of consciousness hardly included in what we commonly think of as Mind; and that the tracts of consciousness presenting the attributes of Mind in the highest degree, are those in which the integration is carried furthest.

With equal clearness does Mind display the further trait of Evolution—increase of definiteness. Both the centrally initiated feelings and the internal peripherally-initiated feelings, which play so secondary a part in what we understand as Mind, we found to be very vague—very imperfectly limited by one another. Contrariwise, it was shown that the mutual limitations are decided among those peripherally initiated feelings which, arising on the outer surface, enter largely into our intellectual operations; and that the visual feelings, which enter by far the most largely into our intellectual operations, are not only by far the sharpest in their mutual limitations, but form aggregates that are much more definitely circumscribed than any others, and aggregates between which there exist relations much more definite than those entered into by other aggregates.

Thus the conformity is complete. Mind rises to what are universally recognized as its higher developments, in proportion as it manifests the traits characterizing Evolution in general (First Principles, §§ 98 — 145).

CHAPTER III. - THE RELATIVITY OF FEELINGS.

§ 78.

The general truth, familiar to all students of Psychology, which it is the object of this chapter to present under its many aspects, is that though internal feeling habitually depends on external agent, yet there is no likeness between them either in kind or degree. The connexion between objective cause and subjective effect is conditioned in ways extremely complex and variable—ways which we will proceed to consider seriatim.

We shall find that each set of conditions so modifies the connexion between objective cause and subjective effect as to determine the qualitative character of the effect. In other words, the same agent produces feelings of quite unlike natures according to the circumstances under which it acts.

We shall further see that, besides this qualitative unlikeness, there is a quantitative unlikeness. Between the outer force and the inner feeling it excites, there is no such correlation as that which the physicist calls equivalence—nay, the two do not even maintain an unvarying proportion. Equal amounts of the same force arouse different amounts of the same feeling, if the circumstances differ. Only while all the conditions remain constant is there something like a constant ratio between the physical antecedent and the psychical consequent.

§ 80.

This apparently hasty generalization is justified by the generalization to which we come next; namely, that within the same species the relation between objective cause and subjective effect varies both qualitatively and quantitatively with the constitution—varies, that is, with the individual structure.

§ 81.

Whatever there may seem of excess in this statement will disappear when we remember that even in the same individual the quantity, if not the quality, of the feeling excited by an external agent constant in kind and degree, varies according to the constitutional state.

In certain conditions of nervous irritability, sounds of ordinary strength seem intolerably loud; daylight becomes unbearable from the excess of visual feeling it causes; and even the skin becomes unduly sensitive: there is what is called hyper-aesthesia.

Contrariwise, there are deviations from health characterized by an anaesthesia allied to that artificially caused—a state of comparative indifference to amounts of external stimuli which commonly arouse much feeling.

Thus, besides seeing that the subjective effect produced by each objective cause varies with the structure of the species, and varies with the structure of the individual of the species, we see that it varies with the constitutional state of the individual—often in a marked degree. Very possibly the ratio is never twice the same; but always differs infinitesimally, if not appreciably.

§ 82.

We find, then, that the same external agent acting on different peripheral organs, generates states of consciousness which have in many cases no likenesses of kind whatever, and have in other cases immense unlikenesses of degree.

§ 84.

Yet another general fact remains. The relative motions of subject and object, modify, both qualitatively and quantitatively, the relations between incident forces and evoked feelings.

The instance of qualitative modification most easily observed, is that produced in the pitch of a sound by the movement of the sounding body towards, or away from, the auditor. If, as an express train passes through a railwaystation, the whistle happens to be going, the tone heard by each person in the station, changes from a higher to a lower at the moment the engine goes by him.

§ 85.

Thus far we have limited our attention to the feelings excited by external things acting on the organism. We must not, however, pass over the feelings which accompany actions of the organism on external things. Though here the relation between subjective and objective changes does not obviously vary qualitatively, it varies very much quantitatively.

§ 86.

For present purposes we may fitly limit ourselves to the relativity of those peripherally - initiated feelings directly traceable to environing agencies. Their relativities we find to be of manifold kinds. The quality and the quantity of the sensation produced by a given amount of a given external force, vary not only with the structure of the organism, specific and individual, as well as the structure of the part affected, but also with the age, the constitutional state, the state of the part as modified by temperature, circulation, and previous use, and even with the relative motion of subject and object.

Thus we may count up nine different causes which affect qualitatively or quantitatively or both, the relation between the exciting physical agent and the produced psychical modification. These different causes co-operate in ever-changing proportions.

And when we remember that any change in any one of them results in some alteration in the kind or degree of feeling aroused, we become strongly impressed with the truth that subjective consciousness, determined as it is wholly by subjective nature, state, and circumstances, is no measure of objective existence.

Indeed, the primitive belief that redness exists as such out of the mind, and that sound possesses apart from ourselves that quality which it has to our perception, is thus rendered as hard for the psychologist to entertain as its opposite is hard to entertain for the uncultivated.

There follows irresistibly the conclusion that the same holds of tastes and smells—that a bitter flavour implies in the substance yielding it nothing like what we call bitterness, and that there is no intrinsic sweetness in the exhaled matter which we distinguish as a sweet odour; but that, in these cases as in the others, the objective action which sets up the subjective state, no more resembles it than the pressure which moves the trigger of a gun resembles the explosion which follows.

§ 88.

But now let us not overlook an all-important implication very generally overlooked, and the overlooking of which leads to elaborate systems of erroneous inferences of very remarkable, not to say astonishing, kinds.

All the foregoing arguments, and all arguments of kindred natures, set out by assuming objective existence. Not a step can be taken towards the truth that our states of consciousness are the only things we can know, without tacitly or avowedly postulating an unknown something beyond consciousness. The proposition that whatever we feel has an existence which is relative to ourselves only, cannot be proved, nay cannot even be intelligibly expressed, without asserting, directly or by implication, an external existence which is not relative to ourselves.

When it is argued that what we are conscious of as sound has no objective reality as such, since its antecedent is also the antecedent to what we are conscious of as jar, and that the two consequent, being unlike one another, cannot be respectively like their common antecedent; the validity of the argument depends wholly on the existence of the common antecedent as something that has remained unchanged while consciousness has been changing.

If, after finding that the same tepid water may feel warm to one hand and cold to the other, it is inferred that warmth is relative to our own nature and our own state; the inference is valid only supposing the activity to which these different sensations are referred, is an activity out of ourselves which has not been modified by our own activities.

One of two things must be asserted :—Either the antecedents of each feeling, or state of consciousness, exist only as previous feelings or states of consciousness; or else they, or some of them, exist apart from, or independently of, consciousness.

If the first is asserted, then the proof that what ever we feel exists relatively to ourselves only, becomes doubly meaningless. To say that a sensation of sound and a sensation of jar cannot be respectively like their common antecedent because they are not like one another, is an empty proposition ; since the two feelings of sound and jar never have a common antecedent in consciousness. The combination of feelings that is followed by the feeling of jar, is never the same as the combination of feelings that is followed by the feeling of sound; and hence, not having a common antecedent, it cannot be argued that they are unlike it. Moreover, if by antecedent is meant constant or uniform antecedent (and any other meaning is suicidal) then the proposition that the antecedent of sound exists only in consciousness, is absolutely irreconcilable with the fact that the feeling of sound often abruptly breaks in upon the series of feelings otherwise determined, where no antecedent of the specified kind has occurred.

The other alternative, there fore, that the active antecedent of each primary feeling exists independently of consciousness, is the only thinkable one. It is the one implicitly asserted in the very proposition that feelings are relative to our own natures ; and it is taken for granted in every step of every argument by which this proposition is proved.

Thus we come once more by another route to the conclusion already twice reached. I, the first part of First Principles, when treating of the relativity of knowledge, it was shown that the existence of a non-relative is unavoidably asserted in every chain of reasoning by which relativity is proved.

In the second part of First Principles, when dealing with the Data of Philosophy, it was shown that the co-existence of subject and object is a deliverance of consciousness which, taking precedence of all analytic examination, but subsequently verified by analytic examination, is a truth transcending all others in certainty.

And here again, the validity of the conclusion that whatever we feel exists as we feel it only in ourselves, we find to depend entirely upon the postulate that feelings have antecedents out of ourselves.

CHAPTER IV. - THE RELATIVITY OF RELATIONS BETWEEN FEELINGS.

§ 89.

The mildest criticism on this title will probably be that it is an awkward combination of words; and an out spoken critic will very likely condemn it either as non sensical or as meaningless. Nevertheless it has a definite meaning not properly expressible by any other title.

Mind we found to be composed of feelings and the relations between feelings. In the last chapter, it was shown that the kinds and amounts of feelings are determined by the nature of the subject—exist, as we know them, only in consciousness, and have no resemblance to the agents beyond consciousness which cause them. And it is the purpose of this chapter to show that in like manner the forms and degrees of relations between feelings are determined by the nature of the subject—exist, as we know them, only in consciousness, and no more resemble the connexions between outer agents than the feelings they unite resemble these outer agents.

§ 90.

No great effort of imagination is required to see that the consciousness of space of three dimensions, constituted of trebly-compounded relations of Co-existence, is a consciousness that varies qualitatively according to the structure of the species. It needs but to call to mind how greatly our conception of space is modified when we are in a dark place of which we know not the bounds, to perceive that those inferior creatures which have no eyes, and cannot, as we do in the dark, supplement present tactual experiences by remembered visual experiences, must have conceptions of space quite unlike in quality to our own, which are abstracted in so large a degree from visual experiences.

That compound relations of Co-existence as conceived by different species, vary quantitatively with the structures of the species, seems, to say the least, very probable.

Animals having great locomotive powers are not likely to have the same conceptions of given spaces as animals whose locomotive powers are very small. To a creature so constructed that its experiences of the larger spaces around have been gained by long and quick bounds, distances can scarcely present the aspects they do to a creature which traverses them by slow and many steps.

We are thus driven to the conclusion that what we conceive as space-relations, cannot be, either in their natures or degrees, like those connexions among external things to which they are due. They change both qualitatively and quantitatively with the structure, the size, the state, and the position, of the percipient.

And when we see that what is, objectively considered, the same connexion between things, may, as a space-relation in consciousness, be single or double—when we remember that, according as we are near or far off, it may be too large to be simultaneously perceived or too small to be perceived at all; it becomes impossible to suppose any identity between this objective connexion and some one of the multitudinous subjective relations answering to it.

CHAPTER V. - THE REVIVABILITY OF FEELINGS.

§ 96.

As was pointed out in the second chapter of this part, Feelings admit of a double classification. On grounds of structure they are divisible into the centrally--initiated and the peripherally-initiated; which last are re-divisible into those which are peripherally initiated by external actions and those which are peripherally initiated by internal actions. And on grounds of function they are divisible by a line crossing these transversely, into those primary or vivid feelings produced by direct excitations, and those secondary or faint feelings produced by indirect excitations. The one class, known as sensations, are sometimes called presentative feelings; and the other class, known as ideas (though this word is more commonly applied to clusters of them), are sometimes called re-presentative feelings.

Here we have to inquire how, when vivid forms of feelings have been experienced, it happens that faint forms of feelings like them afterwards arise. We have to inquire what determines this revivability—what conditions they are which render the revivals more or less distinct.*

Since feelings are rarely, or indeed never, revived singly—since the things we remember are, as the word implies, put together out of feelings standing in certain relations; it results that in the illustrations to be given we shall have to deal more with clusters of revived feelings than with individual revived feelings. But what is alleged of the first always holds of the last.

§ 97.

Speaking generally, feelings are revivable in proportion as they are relational. The peripherally-initiated feelings of external origin are more representable than those of internal origin; and both of these can be represented with greater facility than the centrally-initiated feelings.

When we come to those peripherally-initiated feelings to which ordinary states of the viscera give rise, we find the degree of revivability very small. It is difficult to call into consciousness the feeling of hunger. To think of the circumstances along with which hunger occurs is easy; but after a hearty meal it is next to impossible to represent any degree of that craving for food which existed before the meal. Similarly with thirst.

Of the centrally-initiated feelings or emotions, the like is true in a qualified sense. As before pointed out, there is not between actual and ideal emotions the same sharp division as between actual and ideal feelings of other kinds. Emotions are excited, not by physical agencies themselves but by certain complex relations among them.

Hence, only by representations of such complex relations are idea emotions aroused, When so aroused, however, they may rise to any degree of vividness, until they become actual emotions. But the fact which we have here to note as conforming to the principle enunciated, is that an emotion cannot be at once revived in the same way that a feeling of light or sound can. It is impossible to bring instantly into consciousness the passion of anger, or that of joy, in however faint a form. Representation of either can be achieved only by imagining, and dwelling upon, some circumstances calculated to produce it; and this takes an appreciable time.

§ 98.

The revivability of past feelings varies inversely as the vividness of present feelings. This antagonism holds to a certain degree between past and present feelings in general; but it holds to a much greater degree between past and present feelings belonging to the same order.

CHAPTER VI. - WE REVIVABILITY OF RELATIONS BETWEEN FEELINGS.

§ 104.

Mind being composed of feelings and relations between feelings, and every mental act involving both kinds of components, it happens that, in exemplifying the revivability of feelings as modified by various conditions, there has been exemplified also the revivability of relations between feelings.

§ 105.

Relations in general are more revivable than feelings in general. Whether it be a compound relation of Co-existence, or a compound relation of Sequence, or a compound relation of Difference, we shall find that the relation is more distinctly representable, and more enduring in memory, than are its terms.

CHAPTER VI. - THE ASSOCIABILITY OF FEELINGS.

§ 111.

In preceding chapters, a good deal has been said by implication about the phenomena usually treated under the head of Association. When tracing out the composition of Mind, we saw that feelings cohere in unlike degrees in different tracts of consciousness; and what were there described as cohesions may be otherwise described as associations. More recently, too, in the chapter on the Revivability of Feelings, much was tacitly asserted respecting the Associability of Feelings; since, other things equal, revivability varies as associability.

§ 112.

We divided feelings into the central, commonly called emotions, and the peripheral, commonly called sensations; which last we re-divided into those internally initiated, which we may conveniently call ento-peripheral, and those externally initiated, or epi-peripheral. Of these three great groups of feelings the first are extremely unrelational; the second are somewhat more relational; and the third are relational in a comparatively high degree. Beginning with the central or least relational feelings, which have no limitations in space and are but vaguely bounded in time, we found that, passing through the ento-peripheral to the epi-peripheral, we come to feelings more and more definitely limited by one another in space, or time, or both: the sharpest limitations being among the feelings that are epi-peripheral in the highest degree. And along with this increasing definiteness of mutual limitation we saw that there goes an increasing tendency to mutual cohesion.

This, then, represents the order of associability of the feelings. The relational are the mutually-limited, which are the mutually-coherent, which are the associable. Feelings of the central or of the ento-peripheral kinds which have been experienced together or in succession, either do not recall one another into consciousness at all or do it but feebly after many repetitions; while feelings of the epi-peripheral kind which occur together or in succession but a few times, become linked in such a way that the vivid or the faint form of one arouses the faint forms of the rest. Indeed among the auditory and visual feelings, single presentations in serial or simultaneous groups cause such connexions, that one member of a group being afterwards presented or represented, representations of the other members follow it, often with few or no omissions.

Manifestly, associability and revivability go together; since, on the one hand, we know feelings to be associable only by the proved ability of one to revive another, and since, on the other hand, the revival of any feeling is effected only through the intermediation of some feeling or feelings with which it is associated. Hence the conditions that favour revivability are those which favour associability. These, both psychological and physiological, having been enumerated in the last chapter, may be passed over.

CHAPTER VIII. - THE ASSOCIABILITY OF RELATIONS BETWEEN FEELINGS.

§ 117.

When considering the composition of Mind, we saw that relations as well as feelings cohere with one another in consciousness; and what was there described as cohesion of relations is otherwise describable as association of relations.

Again, in the last chapter but one, different classes of relations were observed to be revivable in different degrees, which implies that, other things equal, they are associable in different degrees. Moreover, we saw how the revivability of relations varies in degree according to the fulfilment of sundry conditions, psychical and physical; whence it follows that their associability similarly varies.

Though these truths need not be again contemplated in detail from our present point of view, there are one or two leading aspects of them which we must glance at before passing on to the general law remaining to be set forth.

§ 118.

That the most relational of relations are the most associable is a truism; for the relations which enter into relation with one another most easily are the relations most easily associable with one another.

We sleep in a strange bedroom, and getting up in the dark to reach the water-bottle, recall at once the position of the washing-stand. We read a book, and without having specially observed the fact, remember that a passage we want to find lies near the bottom of a left-hand page. So quickly do these relations of co-existent positions connect with one another, that those of many things seen at the same instant can be simultaneously reproduced in thought.

§ 119.

Before seeking the ultimate law of association of relations, let us observe how relations, like feelings, aggregate with their respective classes and subclasses.

Equally, the observation of a difference between two impressions, whether simultaneous or successive, implies its assimilation to Differences in general. While in the order of its terms the relation can be known at all only as a relation of co-existence or sequence, its terms can be known at all as standing in relation, only by distinguishing between them in consciousness; and the act of distinguishing between them is the act of classing their relation along with relations of Difference.

Thus it is with Time as with Space, that each place in it associates itself with places at the same distance from the place we at present occupy; and as we turn our attention now to one part of the past and now to another, the relations of sequent positions which constitute our consciousness of that part become clear, while all others lapse into vagueness.

§ 120.

Every relation then, like every feeling, on being presented to consciousness, associates itself with like predecessors. Knowing a relation, as well as knowing a feeling, is the assimilation of it to its past kindred; and knowing it completely is the assimilation of it to past kindred exactly like it. But since within each great class the relations pass one into another insensibly, there is always, in consequence of the imperfection of our perceptions, a certain range within which the classing is doubtful—a certain cluster of relations nearly like the one perceived, which become nascent in consciousness in the act of assimilation. Along with the perceived position in Space or Time the contiguous positions arise in consciousness.

Hence results the so-called Law of Association by Contiguity. When we analyze it, Contiguity resolves itself into likeness of relation in Time or in Space or in both.

Thus, the fundamental law of association of relations, like the fundamental law of association of feelings, is that each, at the moment of presentation, aggregates with its like in association are two aspects of the same act. And the implication is that besides this law of association there is no other; but that all further phenomena of association are incidental.

§ 121.

The congruity between this conclusion and the facts of nervous structure and function is evident.

Changes in nerve-vesicles are the objective correlatives of what we know subjectively as feelings; and the discharges through fibres that connect nerve-vesicles are the objective correlatives of what we know subjectively as relations between feelings. It follows that just as the association of a feeling with its class, order, genus, and species, group within group, answers to the localization of the nervous change within some great mass of nerve-vesicles, within some part of that mass, within some part of that part, &c.; so the association of a relation with its class, order, genus, and species, answers to the localization of the nervous discharge within some great aggregate of nerve-fibres, within some division of that aggregate, within some bundle of that division.

CHAPTER IX. - PLEASURES AND PAINS.

There is, however, one other side of mental phenomena as inductively generalized, which cannot be omitted without leaving this outline incomplete. Thus far we have spoken of Feelings as central or peripheral, as strong or weak, as vague or definite, as coherent or incoherent, as real or ideal ; and where we have considered them as differing in quality, the differences named have been such as do not connote anything more than a state of indifference in the subject of them—a passive receptivity. But there are certain common characters in virtue of which Feelings otherwise quite unlike, range themselves together either under the head of pleasurable or under the head of painful.

To treat fully of consciousness under this further aspect, would carry us still more widely out of our course; for the phenomena of Pleasure and Pain are perhaps the most obscure and involved which Psychology includes.

§ 123.

Pleasures and Pains are concomitants of certain states, local or general—certain actions, I was about to say, but since pains of one class accompany what we distinguish as inactions (though these can never be absolute while the life, general or local, continues) it is better to use the word states. Not that all living states, either of the whole organism or of any organ, are accompanied by pleasures or pains; for many of them, as those of the viscera during the normal discharge of their functions, yield to consciousness no feelings of any kind; and there are also feelings yielded by higher organs that are neither pleasureable nor painful, as an ordinary sensation of touch. But while certain states cause no feelings, and other states cause indifferent feelings, the feelings distinguished as pleasurable and painful manifestly result from states of some kind; and the question is—What are the states which yield Pains and what are the states which yield Pleasures ?

§ 126.

Mankind shows us in many conspicuous ways, the failures of adjustment that follow changes of enviring conditions—not so much the changes which migrations involve, though these too are to be taken into account, but the changes caused by the growth of large societies.

Pre-historic men, like men as we find them still in many parts of the Earth, had feelings congruous with the wandering predatory life, only incipiently social, which they had to lead. Inadequate supply of wild food compelled some of their descendants to become pastoral and agricultural; and these multiplied into populous tribes and eventually into settled communities. They were thereby cut off from activities like those of the men whose characters they inherited, and were forced into activities to which their inherited characters furnished no incentives. Throughout the course of civilization this has been, and continues in large measure to be, the source of discordances between inclinations and requirements.

On the one hand, there still survive those feelings, quite proper to our remote ancestors, which find their gratification in the destructive activities of the chase and in warfare—feelings which, anti-social as is the conduct they prompt, in directly cause numerous miseries. On the other hand, persistent and monotonous labour has been rendered by the pressure of population a necessity; and though to civilized men work is by no means so repugnant as to savages, and to a few is even a source of pleasure, yet the re-adjustment has at present gone by no means so far that pleasure is habitually found in the amount of work habitually required.

Further, it is to be observed that many of the industrial activities which the struggle for existence has thrust on the members of modern societies, are in-door activities—activities not only unresponded to by the feelings inherited from aboriginal men, but in direct conflict with those more remotely inherited and deeply organized feelings which prompt a varied life in the open air.

PART III – GENERAL SYNTHESIS.

CHAPTER I. - LIFE AND MIND AS CORRESPONDENCE.

§ 129.

If the doctrine of Evolution is true, the inevitable implication is that Mind can be understood only by observing how Mind is evolved.

If creatures of the most elevated kinds have reached those highly integrated, very definite, and extremely heterogeneous organizations they possess, through modifications upon modifications accumulated during an immeasurable past—if the developed nervous systems of such creatures have gained their complex structures and functions little by little; then, necessarily, the involved forms of consciousness which are the correlatives of these complex structures and functions must have arisen by degrees. And as it is impossible truly to comprehend the organization of the body in general, or of the nervous system in particular, without tracing its successive stages of complication; so it must be impossible to comprehend mental organization without similarly tracing its stages.

Here, then, we commence the study of Mind as objectively manifested in its ascending gradations through the various types of sentient beings.

§ 180.

From what point are we likely to obtain the widest view of this evolution? How shall we guide ourselves towards a conception general enough to include the entire range of mental manifestations, up from creatures that yield but the faintest traces of feeling to creatures having intellects and emotions like our own.

The phenomena which those of Mind resemble in the greatest degree are those of bodily life. While these classes of phenomena are intimately related to one another, they are related to other classes of phenomena in comparatively remote ways. Our question, therefore, becomes—What is it that mental life and bodily life have in common? And this amounts to the question—What distinguishes Life in general ?

§ 131.

Thus, in looking for a conception of mental evolution sufficiently large to take in all the facts, we are led back to the definition of Life reached at the outset of the Principles of Biology.

We saw that Life is adequately conceived only when we think of it as "the definite combination of heterogeneous changes, both simultaneous and successive, in correspondence with external co-existences and sequences." Afterwards this definition was found to be reducible to the briefer definition— "The continuous adjustment of internal relations to external relations;" and though, by leaving out the characteristic of heterogeneity, this definition is rendered some what too wide, so that it includes a few non-vital phenomena which simulate vitality, yet practically no error is likely to result from its use.

That Life consists in the maintenance of inner actions corresponding with outer actions, was confirmed on further observing how the degree of Life varies as the degree of correspondence. It was pointed out that, beginning with the low life of plants and of rudimentary animals, the progress to life of higher and higher kinds essentially consists in a continual improvement of the adaptation between organic processes and processes which environ the organism. We observed how along with complexity of organization there goes an increase in the number, in the range, in the speciality, in the complexity, of the adjustments of inner relations to outer relations. And in tracing up the increase we found ourselves passing without break from the phenomena of bodily life to the phenomena of mental life.

CHAPTER II. - THE CORRESPONDENCE AS DIRECT AND HOMOGENEOUS.

§ 183.

The lowest life is found in environments of unusual simplicity. Most environments present both co-existences and sequences; but there are some which, for a short time, present co-existences only; and in these, during this short time, occur the least-developed organic forms. Of those classed with the vegetal kingdom, may be instanced the Yeast-plant, and the *Protococcus nivalis* or red snow alga. Of those held to be of animal nature, the *Gregarina* and the *Hydatid* may be taken as samples.

The life of each of these organisms consists, almost wholly, of a few contemporaneous processes adjusted to the co-existent properties of the medium which surrounds it.

Evidently, however, the two orders of changes, answering in this case to the two all essential functions of assimilation and reproduction, exist under their simplest forms in correspondence with the simplest relations in the environment; and ending as they do with that new state of the environment soon arising, the life is as short as it is incomplex.

CHAPTER IV. - THE CORRESPONDENCE AS EXTENDING IN SPACE.

§ 189.

On ascending from the lowest types of life, in which the adjustment of inner relations to outer relations is thus limited, one marked manifestation of the heightening correspondence, is the increasing distance at which co-existences and sequences in the environment produce adapted changes in the organism. This progress accompanies the development of the senses of smell, sight, hearing, &c., and the subsequent development of the intellect.

There is reason to believe that the susceptibilities to odours, colours, and sounds, arise by degrees out of that irritability which animal tissue, in its lowest forms, possesses. 'The saying of Democritus that all the senses are modifications of touch, modern science goes far to confirm.

Smelling obviously implies the contact of dispersed particles with a specially-modified part of the organism—implies that these particles are so carried by a current of air or water as to impinge on this modified part. Hearing results when we feel the vibrations of the air lying in contact with our bodies.

Not only do the conclusions of physicists support this doctrine which Democritus taught; but the conclusions of biologists do the like. The organs of the special senses are every one of them developed from the dermal system—are modifications of that same tissue in which the tactual sense in general is seated. Nor is this all. It is a remarkable fact that the eye and the ear are, in their types of structure, morphologically identical with the vibrissae, or most perfect organs of touch. (Principles of Biology, § 295.)

The hypothesis of Evolution implies that the senses in general have a yet deeper basis in those primordial properties of organic matter which distinguish it from inorganic matter. And many facts point to the conclusion that sensibility of all kinds takes its rise out of those fundamental processes of nutrition and waste—integration and disintegration—in which Life, in its primitive form, consists.

§ 140.

The ability to discriminate between organic and inorganic matter, appears to be possessed in some degree even by the simplest animals. Rhizopods do not absorb indiscriminately all fragments of available size; nor do the tentacles of polypes commonly behave in the same way when touched by inorganic bodies as when touched by organic bodies.

CHAPTER VI. - THE CORRESPONDENCE AS INCREASING IN SPECIALITY.

§ 151.

Otherwise considered, the evolution of life is an advance in the Speciality of the correspondence between inner and outer relations.

Just as we saw that in so far as mechanical phenomena are concerned, the extension of the correspondence goes on part passu in Space and in Time, but that the extension of the correspondence in Time afterwards takes in many other orders of phenomena; so, though at first the increase of the correspondence in Speciality is inseparable from its extension in Space and Time, yet it presently comes to include innumerable correspondences not comprehended under either of these.

Objectively, the development of the correspondence is essentially one; but the limitations of our intellects prevent us from grasping it as one; and it is an inconvenience accompanying the presentation of it in parts, that the divisions overlap one another.

The first specialization of the correspondence occurs on passing from those simplest organisms whose environments are homogeneous both in Space and Time, to those whose environments are homogeneous in Space but heterogeneous in Time.

The next step of the same nature—the step which distinguishes, so far as it can be distinguished, the animal kingdom from the vegetal one—takes place when, relatively to the needs of the organism, the environment is heterogeneous both in Time and Space.

To the lowest living things, the integrable matter is everywhere present under uniformly available conditions. To plants in general, it is everywhere present, but not under uniformly available conditions. To animals in general, it is neither everywhere present nor present under uniformly available conditions—it exists in particular bodies irregularly dispersed, which can be obtained only by particular actions.

§ 152.

The fundamental attribute of matter is resistance. The fundamental sense is a faculty of responding to resistance. And while in the environment, associated with this attribute of resistance, are other attributes severally distinctive of certain classes of bodies; in the organism, there arise faculties of responding to these other attributes—faculties which enable the organism to adjust its internal relations to a greater variety of external relations—faculties, therefore, which increase the speciality of the correspondence.

Eventually there is reached speciality alike in space, time, and object—the action of the organism is adjusted to the changes of a particular thing in a particular spot at a particular period. A large proportion of human actions, even among the uncivilized, are of this nature. The going to certain places, at certain seasons, to gather certain natural productions then fit for use; the endeavour to intercept an animal that is making for a retreat, by getting there before it; these, and numerous daily procedures, will serve as examples.

§ 154.

Under this, as under previous aspects, an advance of the correspondence is clearly displayed in the course of human progress. The growth of classifications implies the establishment of more numerous distinctions among surrounding things, and a conforming of the conduct to their respective properties. Agriculture, as it develops, brings knowledge of the serial changes undergone by various plants and animals; while special materials, times, modes, places, are adopted for the production of each. Improvements in the Arts have involved an incalculable multiplication of special processes adapted to produce special changes in special objects. Our whole social life, alike in the manufactory, in the shop, on the highway, in the kitchen, displays throughout, the performance of particular actions towards particular things in particular places at particular times.

Above all in exact science, or rather in the actions guided by exact science, civilization presents us with a new and vast series of correspondences far exceeding in speciality those that came before them. For this which we call exact science is in reality quantitative prevision, as distinguished from that qualitative prevision constituting ordinary knowledge. The progress of intelligence has given the ability to say both that such and such things are related in co-existence or sequence, and that the relation between them involves such and such amounts of space, time, force, temperature, &c., &c. It has become possible to predict, not simply that under given conditions two things will always be found together, but to predict how much of the one will be found with so much of the other. It has become possible to predict, not simply that this phenomenon will occur after that, but to predict the exact time at which it will occur, or the exact distance in space at which it will occur, or both.

§ 155.

This increase in the speciality of the correspondence, like its extension in Space and Time, is both in itself a higher life, and contributes to greater length of life. Inability to distinguish between surrounding bodies of different natures, must be attended by fatal errors in the conduct pursued towards them; while, conversely, the greater the power to recognize the multitudinous distinctions among such bodies, the greater must be the number of special adjustments that can be made to them, and the more frequent will be the self-preservation. The proposition is in essence a truism.

It is almost a truism, too, to say that in proportion to the numerousness of the objects that can be distinguished, and in proportion to the variety of co-existences and sequences that can be severally responded to, must be the number and rapidity and heterogeneity of the changes going on within the organism—must be the amount of vitality.

CHAPTER VIII. - THE CORRESPONDENCE AS INCREASING IN COMPLEXITY.

§ 159.

As we saw that the extensions of the correspondence in Space and in Time, are partly reciprocal and partly not so—as we saw that increase of the correspondence in Speciality, while to some degree comprised under the extensions in Space and Time, includes very much beside; so we shall see that while, throughout a certain range of cases, growing Complexity is the same thing as growing Speciality, yet neither includes all that the other does. Much of the early advance in Speciality does not imply advance in Complexity; and the higher forms of the advance in Complexity cannot without straining be comprehended under advance in Speciality.

§ 160.

Wherever we find nothing but a greater ability to discriminate between varieties of the same simple phenomenon, there is increased speciality of correspondence with out increased complexity. It is thus with the progress from an eye that appreciates a difference between light and darkness, to one that appreciates degrees of difference between them, and afterwards to one that appreciates differences of colour and degrees of colour.

Though the stimulus responded to is more special, it is not more complex. In each case a single undecomposable sensation is followed by certain muscular actions; and though these muscular actions are more intricate in the higher creatures than in the lower, yet the relation between antecedents and consequents is very nearly, if not quite, of the same order. But where the stimulus responded to consists, not of a single sensation but of several, or where the response is not one action but a group of actions, the increase in speciality of correspondence results from an increase in its complexity.

§ 161.

But, as already hinted, we eventually rise to an order of correspondences in which the speciality and the complexity are no longer co-ordinate. A further advance in speciality is achieved by a more than proportionate advance in complexity.

What constitutes this excess of complexity? It is constituted by the addition of generalities to specialities. Each of these higher correspondences displaying what we call rationality, implies an adjustment of inner relations not simply to the particular outer relations perceived, but to sundry general relations not then perceived, but established by previous experience.

And as we advance to correspondences of still greater complexity, we see that their leading characteristic is the increasing number of generalizations recognized, and involved in the process of adjustment.

§ 162.

There seems no place fitter than this, for drawing attention to the important fact that an approximately-constant ratio is maintained between the ϕ mpressibilities and the activities of the organism, in so far as their complexity is concerned. In the lowest animal types we see a touch followed by a withdrawal of the part touched—a single stimulus followed by a single motion. Gradually as we ascend, abilities to receive increasingly-complicated impressions, and to perform increasingly-complicated actions present themselves. And the truth here to be observed is, that the heterogeneity of the stimuli which can be appreciated is in general proportionate to the heterogeneity of the changes which can be displayed.

Note, first, that survival of the fittest ensures this connexion. As every advance consists in the adjustment of some further internal relation to some farther external relation; and as the ability to recognize the external relation is useless unless there is an ability to modify the conduct appropriately; it is clear that for the better preservation of life, the passive and active elements of the correspondence must progress together.

Everywhere it must on the average happen that each additional differentiation of the perceptions, opening the way for an additional differentiation of the actions, fails to benefit the species, and therefore fails to be established in the species, unless there goes along with it an additional differentiation of the actions.

But this intimate connexion between the directive and executive faculties, is even still more clearly to be traced in certain other phenomena of civilization. This mutual dependence of the regulative and operative powers, which Anaxagoras had a glimpse of when he uttered his hyperbolic saying that animals would have been men had they had hands, is remarkably and conclusively exemplified in the reciprocity of aid between the Sciences and the Arts.

It needs but a little analysis to show that under their psychological aspects, Sciences and Arts represent what in their lowest forms we call sensory and motor processes.

How this increase of the correspondence in complexity which we have followed up through the higher animals to Man, has been continuing during civilization, has just been shown: the advance of the Sciences and the Arts abundantly exemplified it. One note-worthy fact, however, remains to be named. Human evolution, considered under this aspect, is not adequately represented objectively by the developing Sciences and the Arts. It must be looked at also on its subjective side as developing faculty. 'While there has been advance in the complexity of the cognitions and operations that have been age by age attained to, there has been advance in the ability to receive complex cognitions and perform complex operations,

For scientific and artistic progress is due not simply to the accumulation of knowledge and of appliances: the impressibilities and the activities have themselves grown to higher complications. There is evidence from various quarters that the minds of the inferior human races cannot respond to relations of even moderate complexity; much less to those highly-complex relations with which advanced science deals.

One of the reasons assigned in the United States for not educating negro children along with white children, has been that after a certain age they "do not correspondingly advance in learning—their intellects being apparently incapable of being cultured beyond a particular point." And this statement, which might else be suspected of bias, agrees with that made respecting the same race in Africa by Sir Samuel Baker, who says ;—"In childhood I believe the negro to be in advance, in intellectual quickness, of the white child of a similar age, but the mind does not expand—it promises fruit but does not ripen."

So, too, of the Andaman children we read that they "catch up words readily and repeat them, but seem incapable of connecting words with corresponding ideas."

In all these cases, as also in the minor cases continually occurring among ourselves of inability to understand reasonings passing a certain degree of abstruseness, the interpretation is that the intellect has not reached a complexity equal to the complexity of the relations to be perceived.

Not only with purely intellectual cognitions does this hold; it holds also with what we distinguish as moral cognitions. In the Australian language there are no words answering to justice, sin, guilt. Among most of the lower races, acts of generosity or mercy are incomprehensible. That is to say, the more involved relations of human actions in their social bearings are not cognizable. We must therefore conclude that the complex manifestations, intellectual and moral, which distinguish the large-brained European from the small-brained savage, have been step by step made possible by successive complications of faculty.

CHAPTER IX, - THE CO-ORDINATION OF CORRESPONDENCES.

§ 166.

Funny to comprehend the increase of the correspondence between the organism and its environment, in speciality, in generality, and in complexity, it is requisite to contemplate the facts under yet another aspect. We must look at the general conditions by fulfillment of which these more elaborate adjustments of inner to outer relations are made possible. The performance of a compound action in response to a compound impression, implies something more than a susceptibility to each of the several elements constituting the compound impression, and a power to effect each of the several motions constituting the compound action. It implies that the constituent sensations and contractions shall be combined after a particular manner—shall be co-ordinated; and the perfection of the correspondence will vary as the perfection of the coordination.

The impression which indicates dangerousness and that which indicates position, must together control the motor changes; and the control must consist in so ordering their respective amounts that the resulting motion may carry the organism away from the source of danger. When distance as well as direction becomes cognizable, and when the colour and shape of the object are distinguished as well as its mass, the stimulus is composed of a much greater number of elements, united after a special manner; and the more rapid, skilful, and varied the consequent actions become, the more elaborate and more perfect are the implied combinations of motor changes. While just as a wrong combination of motor changes involves a fall or other failure of action; so, a wrong combination of the separate stimuli entails a mistaken perception.

Space need not be occupied in tracing up these simple kinds of co-ordination. It is obvious that throughout the series of increasingly-compound perceptions, including even the recognitions of localities by identification of surrounding objects, the constituents of each perception co-operate after a particular manner; and that, as especially seen in this case of localities, it is only in virtue of a definite relationship among them that a definite perception is possible. No less obvious is it that the increasingly-complex actions by which higher creatures achieve their ends, succeed only in as far as the muscular contractions implied are fitly regulated in their order, their amounts, and their modes of conjunction.

§ 167.

Advancing from these cases in which the directive stimuli, though heterogenous, are made up of elements that are simultaneously present to the senses, to the cases in which some of their elements are present to the senses and some not; we meet with a sensory co-ordination of a new and higher order.

And where the responding motions, no longer occurring as an inseparable group, are divided by intervals that vary according to circumstances, we see a parallel progress in motor co-ordination. A creature which when pursued runs to its burrow, supplies us with an instance of the one; while an instance of the other occurs in any process which, like the building of a nest, is effected by instalments variously interrupted by other procedures.

From the stage in which a single past impression unites with many present ones to compose a special stimulus, and in which the action completed at intervals is tolerably homogeneous in character, the advance is towards a union of many past impressions with present ones, and towards a kind of action increasingly heterogeneous in its instalments, as well as in the manner of their succession.

In men's daily transactions, the complex sights, sounds, and muscular sensations, serving for immediate guidance, are co-ordinated with recollections of the persons, places, things, events, to which those transactions refer; and one who mistakes the hour at which certain business is to be done with certain people at a certain office, shows us how a failure arises from imperfect coordination of the past and present impressions constituting the directive stimulus.

But the all-essential thing is the definiteness with which the combination is adapted to the combination of external circumstances—the goodness of the co-ordination.

§ 168.

A still higher species of co-ordination growing imperceptibly out of the last, and vaguely seen even in the illustrations just given, involves not simply the union of past with present specialities, but the union of generalities with both.

The perception received yesterday when the barometer stood at "Fair," together with the perception received to-day, when it stands at "Change," bring no conclusion unless joined to the generalization that a fall of the mercurial column commonly indicates rain. Nay, before a true inference can be drawn for to-morrow's guidance, these data must be joined with the further generalization, that only when the air is charged with water to a certain degree is rain indicated by a falling barometer.

In other cases, as in that of a physician prescribing for his patient, many remembered observations of bygone symptoms, many observations of existing ones, and many general truths serving to interpret the changes that have taken place, must enter into that directive process which terminates in an appropriate course of treatment.

It will further elucidate both this doctrine of co-ordination and the general doctrine of correspondence, if we consider how, for the perfect adjustment of inner to outer relations, there must exist in the first, elements and changes symbolizing all the essential elements and changes in the last. Undeveloped life is led by associations among some of the superficial attributes of things. Developed life is led by associations among those fundamental attributes on which the actions of the things depend.

Whenever a group of inner relations, or cognition, is completely conformed to a group of outer relations, or phenomenon, by a rational process—whenever there is what we call an understanding of the phenomenon—the composition of the phenomenon is, in a sense, paralleled by the composition of the cognition.

CHAPTER X. - THE INTEGRATION OF CORRESPONDENCES,

§ 169.

There is one more point of view from which the phenomena of Life must be contemplated. We have to note how, out of co-ordination, there grows up integration. Compound impressions, as well as the compound motions guided by them, continually approach in their apparent characters to simple impressions and simple motions. The co-ordinated elements of any stimulus or of any act ever tend towards union; and eventually become distinguishable from one another only by analysis. Further, the connexion between stimulus and act also becomes constantly closer; so that at last they seem two sides of the same change.

Only by virtue of this law do the higher kinds of correspondence become possible. In its absence, complex impressions could not generate complex actions with the needful rapidity; nor would there be time for that immense multiplicity of adjustments which developed life displays.

If the two organic changes which constitute sensation and motion, did not, in superior creatures, follow with greater rapidity than the withdrawal of a snail into its shell follows the touch of its horn, all those correspondences with the environment which imply any quickness of adaptation would be impracticable.

If the period that elapses between the gaze of a young child at a stranger and the fit of crying that follows (a period during which the component visual impressions are being co-ordinated), were habitually paralleled in the perceptions of adults—if compound cognitions were not formed, and the appropriate operations produced by them, in periods incomparably briefer, human life would cease.

The necessity for this progressive integration will be most clearly understood if, regarding sensations as symbols and perception as the interpretation of groups of symbols, we observe what takes place with verbal symbols and the meanings they convey.

But on what condition only does this more elaborate language become serviceable? or, to confine the attention to one division of it—What is required before composite written signs can supplant simple written signs?

It is required that the constituent elements of each composite sign shall be so efficiently coordinated, so rapidly united in the act of perception, so integrated, as to become practically one.

Had the letters that make up every word to be separately identified, as the child identifies them when learning to read, the system would be of little or no use.

Able, though it might be, to express with precision all verbal articulations, it could never compete with the limited system of simple signs, did it remain thus cumbrous in its application. Similarly with the primordial language of perception. If the several colours, size, shape, motion, direction, and distance, of an object, had to be successively identified by the creature perceiving it—if the object had to be spelled out in this deliberate fashion; the method of recognition by combined sensations would yield in utility to the method of recognition by a single sensation. Universal in its powers, it would yet be too slow of use to satisfy the requirements.

§ 170.

So, too, is it with peculiarities of handwriting. The motions of the fingers having by years of practice been coordinated in a particular manner, cannot be otherwise coordinated without a degree of labour to which few are equal. Though, by moving them slowly and with attention, the fingers may be made to produce differently-formed letters; yet, on the attention being relaxed and the usual speed resumed, the letters re-acquire their old characters. Similarly in all handicrafts, chains of perpetually-repeated muscular actions, however complex, eventually approximate in rapidity and ease to simple motions; and, at the same time, cease to be capable of modified adjustment—tend more and more to produce one another automatically—grow inseparable—become integrated.

Similar integrations go on between cognitions and the operations guided by them. In the child learning to walk, or to lay hold of a neighbouring object, or to pronounce a word, there is a deliberate and conscious modification of the motions in obedience to the sensations. But in after-years the various muscular adjustments by which, from minute emotions in obedience to the sensations. But in after-years the various muscular adjustments by which, from minute to minute, the intentions are fulfilled, follow the will instantaneously and without oversight of the intellect,

Even where the impressions and motions are both extremely complex, the law may be traced; witness the feats of a skilful billiard-player. In one of his strokes we see the relative positions of the three balls to one another, to the cushions, and to the pockets, all united into a complex visual impression co-ordinated with the greatest nicety ; we see the direction of the cue, its adjustment to the ball, the strength of its impact, and the quality of its impact, all accurately modified to suit the requirements ; and we see that by long habit the compound impression has been so united with the compound action, that the one follows the other almost mechanically. No reasoning or calculation is required; or, indeed, is permissible. For it is notorious that in games of skill, any lengthened consideration or active interference on the part of the higher faculties, almost inevitably causes a failure. The direct guidance that has been established between the constituent sensations and constituent motions, must be allowed free play; and sticcess becomes sure in proportion as, by constant co-ordination, the combined changes become practically one change.

In all which we may perceive how that automatic character shown in the simple correspondences of inferior creatures, is gradually assumed by more complex correspondences—how that integration which the reflex and purely instinctive correspondences perfectly exemplify, is partially exemplified by all higher correspondences.

§ 171.

Not only to the constituents of immediate perception, to the elements of composite motion, and to the combination of the two, does this law apply; it applies also to the highest processes of cognition. The most advanced conceptions of science display it equally with the achievements of manipulatory skill. For making a generalization is, in reality, integrating the various separate cognitions which the generalization includes—uniting them into a single cognition.

After there has been a mental accumulation of facts presenting a certain community of nature (remembered first as isolated facts and after further experience colligated as facts having some resemblance), there suddenly, on the occurrence perhaps of some typical example, arises a cognition of the relation of co-existence or sequence common to the whole group: the particular facts, before loosely aggregated, all at once crystallize into a general fact—are integrated.

The mode in which this result is brought about, is the same in these highest cases as in the lowest cases. Continuous repetition of experiences in which any two sensations are always joined, any two muscular contractions constantly performed together, or any perception uniformly followed by a special motion, results in the greater or less integration of the component changes; and, similarly, continuous repetition of those more complex experiences which, though superficially unlike, one and all present the same fundamental relation of co-existence or sequence, ultimately establishes a union in thought between the elements of this relation, and still-multiplying experiences go on consolidating the union.

It will be obvious without details, that the same thing holds respecting the generalization of generalizations. The integration of correspondences is traceable from the simplest up to the most elaborate of the intellectual processes. And in the last, as in the first, the effect is to simplify the directive and executive actions, and so to make practicable those adjustments that would else fail from the too slow succession of the processes they involved.

For as the perception of a complex object would commonly be useless if the percipient had to spell out the constituent sensations; so, any series of compound experiences which, embodied in a generalization, afford valuable guidance, would be of little or no service if every member of the series had to be separately recollected before the guiding cognition could be formed.

§ 172.

This gradual union of the elements of any internal change by which the organism adapts its acts to an external co-existence or sequence, has been, in common with previous traits of advancing correspondence, abundantly displayed in the course of human evolution. Progress in integration has been a necessary accompaniment of progress in speciality and complexity, since without it highly special and complex correspondences cannot be achieved ; and hence in proportion as civilization has displayed the last it must have displayed the first. The one having been illustrated in detail it is therefore needless to illustrate the other. Similarly, greater length and degree of Life, involved as they are by greater complexity and speciality of correspondence, have accompanied that greater integration which has rendered these possible.

CHAPTER XI. - THE CORRESPONDENCES IN THEIR TOTALITY.

§ 173.

Thus then we find illustrated in all ways the truth enunciated at the outset, that the connexions among vital actions directly or indirectly correspond with the connexions among actions in the environment. That method by which we sought out the fundamental fact on which to base a Synthetic Psychology, is justified by its results. On comparing the phenomena of mental life with the most nearly allied phenomena—those of bodily life—and inquiring what is common to both groups, a generalization was disclosed which proves on examination to express the essential character of all mental actions. Regarded under every variety of aspect, intelligence is found to consist in the establishment of correspondences between relations in the organism and relations in the environment; and the entire development of intelligence may be formulated as the progress of such correspondences in Space, in Time, in Speciality, in Generality, in Complexity.

As hinted more than once, these several modes in which the advance of the correspondence displays itself, are but so many different aspects of one mode. The vast array of phenomena which, for convenience' sake, we have considered under distinct heads, form in reality one general, continuous, and inseparable evolution.

On the one hand, such greater complexity of the correspondence as is shown by discriminating between objects which have many attributes in common, amounts to advance-in its speciality ; and, on the other hand, advance in speciality is that without which greater complexity of correspondence cannot be reached. While, by the correspondence to higher generalities, the way is opened for more complex and more special correspondences; it is by accumulated experiences of such more complex and more special correspondences that the correspondence to still higher generalities is made possible.

So that from the lowest to the highest forms of life, the increasing adjustment of inner to outer relations is one indivisible progression.

Without dwelling on the fact that the primordial tissue displays the several forms of irritability in which the senses originate, and that the organs of sense, like all other organs, arise by differentiation of this primordial tissue—without dwelling on the fact that the impressions received by these senses form the raw materials of intelligence, which arises by combination of them and must therefore conform to their law of development—without dwelling on the fact that intelligence advances part passu with the advance of the nervous system, and that the nervous system has the same law of development as the other systems—without dwelling on these facts, it is sufficiently manifest that as the progress of organization and the progress of correspondence between the organism and its environment, are but different aspects of the evolution of Life in general, they cannot fail to harmonize.

In this organization of experiences which constitutes evolving Intelligence, there must be that same continuity, that same sub-division of function, that same mutual dependence, and that same ever advancing consensus, which characterize the physical organization.

§ 174.

That Intelligence has neither distinct grades nor is constituted of faculties that are truly independent, but that its highest manifestations are the effects of a complication that has arisen by insensible steps out of the simplest elements, is a conclusion equally thrust upon us when we turn from the characteristics of the organism to the characteristics of the environment. Every act of Intelligence being, in essence, an adjustment of inner to outer relations, it results that as, in the advance of this adjustment, the outer relations increase in number, in complexity, in heterogeneity, by degrees that cannot be marked, there can be no precise demarkations between the successive phases of Intelligence.

Evidently then, the classifications current in our philosophies of the Mind can be but superficially true. Instinct, Reason, Perception, Conception, Memory, Imagination, Will, &c., must be either conventional groupings of the correspondences, or divisions among the operations which are instrumental in effecting the correspondences. However widely contrasted they may seem, these various modes of Intelligence cannot be anything else than either particular ways in which the adjustment of inner to outer relations is achieved, or particular parts of the process of adjustment.

§ 175.

Here a new region of inquiry opens before us. Having found that all the phenomena of Psychology come within this formula which unites them with those of Physiology, we have now to see what distinguishes the one group from the other. We decided that we should “best fulfil the requirements of clear exposition by first exhibiting mental evolution as it may be most generally conceived, and subsequently specializing the conception” (§ 180).

That which distinguishes the science of psychical life from the science of physical life, we found to be the distinct cognizance which it takes of phenomena outside the organism as well as of phenomena inside the organism. We saw that, passing beyond the question with which Physics deals—What is the connexion between two phenomena A and B in the environment? and passing beyond the question with which Physiology deals—What is the connexion between two changes a and b in the organism? the question with which Psychology deals is—What is the connexion between these two connexions? How is the relation a to b in the organism adjusted to the relation A to B in the environment?

While admitting, or rather asserting, that Biology at large tacitly recognizes phenomena in the environment as implied by phenomena in the organism, I pointed out that the recognition is but tacit, and that the great mass of biological inquiries are carried on without reference to it; whereas in Psychology the recognition of environing actions and relations is avowed and all-essential—is repeated from moment to moment—is a necessary component of every proposition.

In so far as it deals at all with the adjustments of inner actions to outer actions, Physiology limits itself to the few in which the outer actions are those of agents in actual contact with the organism—food, aerated medium, and things which produce certain effects by touch (as insects which fertilize flowers); thus leaving to Psychology all other adjustments of inner to outer actions. So that, practically, the spheres of the two are as clearly divided as the organism is divided from its environment by its limiting membrane.

§ 176.

The presentation of Intelligence as an adjustment of inner to outer relations that gradually extends in Space and Time, that becomes increasingly special and complex, and that has its elements ever more precisely co-ordinated and more completely integrated, leaves us with a conception which obviously requires further development.

The various degrees and modes of Intelligence known as Instinct, Memory, Reason, Emotion, Will, and the rest, must be translated in terms of this conception. If, as above alleged, the several grades of Mind and its component faculties, are phases of the correspondence and factors in the correspondence, they can be interpreted as such; and to complete the argument it is needful that they should be so interpreted.

PART IV. - SPECIAL SYNTHESIS.

CHAPTER I. - THE NATURE OF INTELLIGENCE.

§ 177.

The two great classes of vital actions called Physiology and Psychology are broadly distinguished in this, that while the one includes both simultaneous and successive changes the other includes successive changes only. The phenomena forming the subject-matter of Physiology present themselves as an immense number of different series bound up together. Those forming the subject-matter of Psychology present themselves as but a single series. A glance at the many continuous actions constituting the life of the body at large, shows that they are synchronous—that digestion, circulation, respiration, excretion, secretion, &c., in all their many sub-divisions, are going on at one time in mutual dependence. And the briefest introspection makes it clear that the actions constituting thought occur, not together, but one after another.

So that only by gradual differentiation have the actions constituting psychical life become specially successive, instead of simultaneous and successive; and the distinction is not even now complete.

CHAPTER II. - THE LAW OF INTELLIGENCE.

§ 182.

All Life, whether physical or psychical, being the combination of changes in correspondence with external coexistences and sequences, it results that if the changes constituting psychical life occur in succession, the law of their succession must be the law of their correspondence.

An adequate statement of this law is by no means easy to find. Did the phenomena in the environment form, like the phenomena of consciousness, a succession, there would be no difficulty. The entire fact would be expressed by saying that the internal succession parallels the external succession. But the environment contains many successions of phenomena, going on simultaneously.

Farther, there are found in it a great variety of phenomena which are not successive at all, but co-existent.

Again, it is unlimited, and the phenomena it includes are not only innumerable, but insensibly pass into a relative non-existence as the distance from the organism increases.

Once more, the environment, relatively considered, is ever varying as the organism moves from place to place.

How then can the succession of psychical changes be in any way formulated? How is it possible to express the law of a single series of internal phenomena in terms of its correspondence with an infinity of external phenomena, both serial and non-serial, mixed in the most heterogeneous manner, and presented to the moving organism in fortuitous combinations never twice alike?

Were it not that the inner relations must correspond with the outer ones; and that therefore the order of states of consciousness must be in some way expressible in terms of the external order; we might despair of finding any general law of psychical changes. Even as it is, we may be certain that no general law can apply to extended portions of the series of changes. Mainly dependent as these must be, on the assemblages of things by which the organism is environed, and on the new assemblages perpetually disclosed by its movements, they can be no more formulated than these assemblages can be formulated. Evidently, it is in the immediately-connected changes, and small groups of changes, rather than in the longer concatenations of changes, that a law is to be sought.

§ 183.

A correspondence between the internal order and the external order, implies that the relation between any two states of consciousness corresponds with the relation between the two things producing them. How corresponds?

The two states of consciousness occur in succession; and all successions are alike in so far as they are simply successions. In what, then, can the correspondence consist? In this, that the persistence of the connexion between the states of consciousness is proportionate to the persistence of the connexion between the agencies to which they answer.

The relations between external objects, attributes, acts, are of all grades, from the necessary to the fortuitous. The relations between the answering states of consciousness must similarly be of all grades, from the necessary to the fortuitous.

§ 184.

The acts of animals exhibit countless failures of the internal order to parallel the external order. In the moth which flies at a candle-flame, there exists no relation of psychical states answering to the relation between light and heat in the environment.

Externally there co-exists with particular appearances, a destructive activity; but internally, the state of consciousness roused by these appearances is not followed by any state of consciousness representing a destructive activity: and a risk of being killed is the consequence.

A child's perception of some brightly-coloured berry does not excite an idea of pain, or of the word "poison," but more probably some idea of a pleasant taste; and should injurious chemical properties co-exist with these attractive visible ones, the child's life may be endangered.

But in all cases of this kind what is the implication? Do we not speak of the injuries suffered as resulting from lack of sagacity? Or as evincing ignorance? And is it not a corollary that, as non-conformity of the inner to the outer order is want of intelligence, conformity of the inner to the outer order is that in which intelligence consists?

Among the Australian savages, who mostly meet with violent deaths, it is the belief that any one who dies without apparent cause has been killed by an unseen foe; and a stranger who happens to be found near at hand is liable to be sacrificed as the supposed assassin. Here, though the mental connexion between death and enmity very generally agrees with the connexion in the environment, it by no means uniformly does so.

The earlier chemists, by a large number of experiences respecting the combinations of acids and bases, were led to think of substances that neutralized bases as substances having sour tastes; but this relation of ideas, though very generally in harmony with external relations, is not always so.

What, now, do we say of cases like these, in which the inner order does not completely answer to the outer order? We say that they imply a low degree of intellect, or a limited experience, or a but partial enlightenment. And the disappearance of these discrepancies between thoughts and facts we speak of as an advance in intelligence.

§ 185.

"But how does this conception include co-existences?" it may be asked. 'In so far as the environment presents motions and changes, there is no difficulty in understanding the law of intelligence to be, that the strength of the tendency which the antecedent of any psychical change has to be followed by its consequent, is proportionate to the persistence of the union between the external things they symbolize. But when this union is not between successive things but between simultaneous things—not a union in Time but a union in Space, it is less easy to see how the parallelism between the inner and the outer order can result from fulfilment of this law. The connexion between two states of consciousness occurring in succession, can very well represent the connexion between two external phenomena occurring in succession. But if it can do this, it cannot also represent the connexion between two external phenomena not occurring in succession."

Where, as in most cases, there are not two co-existent phenomena but a group, this same law implies cohesion of many different states of consciousness, which similarly produce and re-produce one another in all orders; and such an irregularly-varied presentation and re-presentation of combined properties is just what we know takes place.

Even more apparent becomes the conformity of the facts to the law on remembering, that among the clustered states of consciousness those which answer to invariably-coexistent phenomena, as resistance and extension, continue reproducing each other during the whole perception, forming, as it were, the basis of it; whereas the several other states of consciousness answering to the special qualities of the object (qualities not invariably co-existing with resistance and extension) do not remain thus persistent, but appear, and disappear, and reappear in consciousness, with degrees of frequency varying according to the constancy of the answering qualities.

§ 186.

A fact seemingly incongruous with the generalization is, that a great proportion of mental changes arise in a way which is in one sense fortuitous. Noises heard through the open window traverse consciousness in a totally-irregular manner. When walking along the streets, the passing people and vehicles produce internal changes of which the succession is indeterminate. External objects, attributes, acts, being infinitely varied in their combinations, every observer is subject to changing assemblages of impressions between which no law of connexion can be traced. Hence, to a large part of the successive changes that constitute intelligence, the formula above given must be inapplicable.

This difficulty will disappear on consideration. The alleged law of intelligence is that the strength of the tendency which the antecedent of any psychical change has to call up its consequent, is proportionate to the persistence of the union between the external things they symbolize. Thus far, we have considered this law with reference to those connexions in consciousness which correspond to established or habitual connexions in the environment.

Here the connexions in the environment to which the connexions in consciousness correspond, are accidental ones.

A fortuitous relation in the environment is paralleled by a fortuitous relation in thought. Two adjacent mental impressions answer to two phenomena that are by chance adjacent in Space or Time. Thus far the law manifestly applies as before: the internal order conforms to the external order.

§ 187.

CHAPTER III. - THE GROWTH OF INTELLIGENCE.

§ 188.

Three ways in which progress shows itself maybe distinguished. There is, first—increase in the accuracy with which the inner tendencies are proportioned to the outer persistences. There is, second—increase in the number of cases, unlike as to kind but like as to grade of complexity, in which there are inner tendencies answering to outer persistences. And there is, third—increase in the complexity of the coherent states of consciousness, answering to coherent complexities in the environment.

The organism is placed amid innumerable relations of all orders. It begins by imperfectly adjusting its actions to a few of the simplest of these. To adjust its actions more exactly to these few simplest, is one form of advance. To adjust its actions to a greater variety of these simplest, is a further form of advance.

To adjust its actions to successive grades of the more complicated, is yet another form of advance. And to whatever stage it reaches there are still the same three kinds of improvement open to it—a perfecting of the correspondences already achieved ; an achievement of other correspondences of the same order; and an achievement of correspondences of a higher order: all of them implying greater fulfilment of the law of intelligence.

But now, what are the requisites to this progress? Is the genesis of Intelligence explicable on any one general principle applying at once to all these modes of advance? If so, what is this general principle ?

§ 189.

In the environment there exist relations of all orders of persistence, from the absolute to the fortuitous. Consequently, in a creature displaying a developed correspondence, there must exist all grades of strength in the connexions between states of consciousness. As a high intelligence is only thus possible, it is manifestly a condition to intelligence in general that the antecedents and consequents of psychical changes shall admit of all degrees of cohesion. And the question to be answered is :—How are their various degrees of cohesion adjusted?

Concerning their adjustments there are two possible hypotheses, of which all other hypotheses can be but modifications. On the one hand, it may be asserted that the strength of the tendency which each state of consciousness has to follow any other, is fixed beforehand by a Creator—that there is a “pre-established harmony” between the inner and outer relations. On the other hand, it may be asserted that the strength of the tendency which each state of consciousness has to follow any other, depends on the frequency with which the two have been connected in experience—that the harmony between the inner and outer relations arises from the fact that the outer relations produce the inner relations,. Let us briefly examine these two hypotheses.

For the first the reason given, like the reason given for the special-creation hypothesis at large, is that certain of the phenomena cannot otherwise be explained. This super natural genesis of the adjustment is alleged because no natural genesis has been assigned. The hypothesis has not a single fact to rest on.

A further criticism is, that those who espouse this theory dare not apply it beyond a narrow range of cases, It is only where the connexions between psychical states are absolute—as in the so-called forms of thought and in the congenital instincts—that they fall back on “pre-established harmony.”

But they should either go the entire length with Leibnitz, or not go with him at all.

If they assume that the adjustment of inner relations to outer relations has been in some cases fixed beforehand, they ought in consistency to assume that it has been in all cases fixed beforehand.

If, answering to each absolutely-persistent connexion of phenomena in the environment, there has been provided some absolutely-persistent connexion between states of consciousness; why, where the outer connexion is almost absolutely persistent, and the inner connexion proportionately persistent, must we not suppose a special provision here also ? why must we not suppose special provisions for all the infinitely-varied degrees of persistence.

The unqualified adoption of the hypothesis is, however, declined, for obvious reasons. It would involve the assertion of a rigorous necessity in all thought and action—an assertion which those who favour this hypothesis are, more than any others, disinclined to make. It would raise the awkward question why at birth there is not as great a power of thinking, and of thinking correctly, as at any subsequent period.

Contrariwise, for the second hypothesis the evidence is overwhelming. The multitudinous facts commonly cited to illustrate the doctrine of association of ideas, support it. It is in harmony with the general truth that from the ignorance of the infant the ascent is by slow steps to the knowledge of the adult.

Exemplification of it is furnished by the fact that men who, from being differently circumstanced, have had different experiences, reach different generalizations; and by the fact that a wrong conception will become as firmly established as a right one, if the external relation to which it answers has been as often repeated.

The only orders of psychical sequences not obviously included by this general law, are those classed as reflex and instinctive—those which are apparently established before any experience has been had. But it is possible that, rightly interpreted, the law covers these also. Though reflex and instinctive sequences are not determined by the experiences of the individual organism manifesting them; yet the experiences of the race of organisms forming its ancestry may have determined them.

Among the families of a civilized society, the changes of occupation and habit from generation to generation and the intermarriage of families having different occupations and habits, greatly confuse the evidence of psychical heredity. But it needs only to contrast national characters to see that mental peculiarities caused by habit become hereditary. We know that there are warlike, peaceful, nomadic, maritime, hunting, commercial, races—races that are independent or slavish, active or slothful; we know that many maritime, hunting, commercial, races—races that are independent or slavish, active or slothful; we know that many of these, if not all, have a common origin; and hence it is inferable that these varieties of disposition, which have evident relations to modes of life, have been gradually produced in the course of generations. The tendencies to certain combinations of psychical changes have become organic.

In brief, the case stands thus:—It is agreed that all psychical relations save the absolutely indissoluble are determined by experiences, Their various strengths are admitted, other things equal, to be proportionate to the multiplication of experiences. It is an unavoidable corollary that an infinity of experiences will produce a psychical relation that is indissoluble. Though such infinity of experiences cannot be received by a single individual, yet it may be received by the succession of individuals forming a race. And if there is a transmission of induced tendencies in the nervous system, it is inferable that all psychical relations whatever, from the necessary to the fortuitous, result from the experiences of the corresponding external relations; and are so brought into harmony with them.

Hence the growth of intelligence at large depends on the law, that when any two psychical states occur in immediate succession, an effect is produced such that if the first subsequently recurs there is a certain tendency for the second to follow it.

§ 190.

By this law, if it is the true one, must be interpretable all the phenomena, from their lowest to their highest grades.

A manifest corollary from the law is that the psychical relations in any organism, will correspond best to those physical relations it comes most in contact with. The environment in general is infinite. The environment of each order of creature is practically more or less limited. And each order of creature has an environment which, besides being limited, is practically more or less special. The law implies, then, that the psychical relations displayed by each order of creature, will be those which recur the oftenest within the range of its experience. And we know the fact to be that they are so.

CHAPTER IV. - REFLEX ACTION.

§ 192.

Reflex action being the lowest form of psychical life, is, by implication, most nearly related to physical life: in it we see the incipient differentiation of the two.

So that while as belonging to the order of vital changes which, in their higher complications, we dignify as psychical, it may be convenient to classify it as psychical; yet it must be admitted that in position it is transitional.

Again, in well-organized creatures, the physical life is itself regulated by reflex actions.

CHAPTER VI. - INSTINCT.

§ 194.

Not using the word as the vulgar do, to designate all other kinds of intelligence than the human, but restricting it to its proper signification, Instinct may be described as—compound reflex action.

I say described rather than defined, since no clear line of demarkation can be drawn between it and simple reflex action.

CHAPTER VII. - REASON.

§ 208.

That the commonly-assumed hiatus between Reason and Instinct has no existence, is implied both in the argument of the last few chapters and in that more general argument elaborated in the preceding part. The General Synthesis, by showing that all intelligent action whatever is the effecting of correspondences between internal changes and external co-existences and sequences, and by showing that this continuous adjustment of inner to outer relations progresses in Space, in Time, in Speciality, in Generality, and in Complexity, through insensible gradations; implied that the highest forms of psychical activity arise little by little out of the lowest, and cannot be definitely separated from them. Not only does the recently-enunciated doctrine, that the growth of intelligence is throughout determined by the repetition of experiences, involve the continuity of Reason with Instinct; but this continuity is involved in the previously-enunciated doctrine.

The impossibility of establishing any line of demarkation between the two may be clearly demonstrated. If every instinctive action is an adjustment of inner relations to outer relations, and if every rational action is also an adjustment of inner relations to outer relations; then, any alleged distinction can have no other basis than some difference in the characters of the relations to which the adjustments are made.

It must be that while, in Instinct the correspondence is between inner and outer relations that are very simple or general; in Reason, the correspondence is between inner and outer relations that are complex, or special, or abstract, or infrequent. But the complexity, speciality, abstractness, and infrequency of relations, are entirely matters of degree.

§ 205.

A further interpretation here becomes possible. We have seen that rational action arises out of instinctive action when this grows too complex to be perfectly automatic. We have now to observe that, at the same time, there arises that kind of reasoning which does not directly lead to action—that reasoning through which the great mass of surrounding co-existences and sequences are known.

Thus, the experience-hypothesis furnishes an adequate solution. The genesis of instinct, the development of memory and reason out of it, and the consolidation of rational actions and inferences into instinctive ones, are alike explicable on the single principle, that the cohesion between psychical states is proportionate to the frequency with which the relation between the answering external phenomena has been repeated in experience.

§ 206.

But does the experience-hypothesis also explain the evolution of the higher forms of rationality out of the lower? It does. Beginning with reasoning from particulars to particulars—familarly exhibited by children and by domestic animals—the progress to inductive and deductive reasoning is similarly unbroken, as well as similarly determined. And by the accumulation of experiences is also determined the advance from narrow generalizations to generalizations successively wider and wider.

Were it not for the prevalent anxiety to establish some absolute distinction between animal intelligence and human intelligence, it would be needless to assign proof of this.

Every one must also admit that the steps by which these simplest inferences of the infant pass into those inferences of high complexity drawn in adult life, are so gradual that it is impossible to mark the successive steps: no one can name that day in any human life when the alleged division between special and general conclusions was crossed. Hence, every one is bound to admit that as the Rationality of an infant is no higher than that of a dog, if so high; and as, from the rationality of the infant to that of the man the progress is through gradations which are infinitesimal; there is also a series of infinitesimal gradations through which brute rationality may pass into human rationality. Farther, it must be admitted that as the assimilation of experiences of successively-increasing complexity, suffices for the unfolding of reason in the individual human being; so must it suffice for the evolution of reason in general.

Equally clear is the argument from the history of civilization, or from the comparison of existing races of men. That there is an immense difference in abstractness between the reasonings of the aboriginal races who peopled Britain, and the reasonings of the Bacons and Newtons who have descended from them, is a triteremark. That the Papuan cannot draw inferences approaching in complexity to those daily drawn by European savants, is no less a platitude. Yet no one alleges an absolute distinction between our faculties and those of our remote ancestors, or between the faculties of civilized men and those of savages. Fortunately, there are records showing that the advance towards conceptions of great complication and high generality, has taken place by slow steps—by natural growth.

If, then, we have proof that in the course of civilization there has been an advance from rational cognitions of a low order of generality to those of a high order of generality, brought about solely by the accumulation of experiences; if this advance is as great as that from the higher forms of brute rationality to the lower forms of human rationality (which no one who compares the generalizations of a Hottentot with those of La Place can deny); it is a legitimate conclusion that the accumulation of experiences suffices to account for the evolution of all rationality out of its simplest forms.

Those who contend that knowledge results wholly from the experiences of the individual, ignoring as they do the mental evolution which accompanies the autogenous development of the nervous system, fall into an error as great as if they were to ascribe all bodily growth and structure to exercise, forgetting the innate tendency to assume the adult form.

Were the infant born with a full-sized and completely constructed brain, their position would be less untenable. But, as the case stands, the gradually-increasing intelligence displayed throughout childhood and youth, is more attributable to the completion of the cerebral organization, "than to the individual experiences—a truth proved by the fact that in adult life there is sometimes displayed a high endowment of some faculty which, during education, was never brought into play.

Doubtless, experiences received by the individual furnish the concrete materials for all thought. Doubtless, the organized and semi-organized arrangements existing among the cerebral nerves, can give no knowledge until there has been a presentation of the external relations to which they correspond. And doubtless, the child's daily observations and reasonings aid the formation of those involved nervous connexions that are in process of spontaneous evolution; just as its daily gambols aid the development of its limbs. But saying this is quite a different thing from saying that its intelligence is wholly produced by its experiences. That is an utterly inadmissible doctrine—a doctrine which makes the presence of a brain meaningless—a doctrine which makes idiotcy unaccountable.

In the sense, then, that there exist in the nervous system certain pre-established relations answering to relations in the environment, there is truth in the doctrine of "forms of intuition"—not the truth which its defenders suppose, but a parallel truth. Corresponding to absolute external relations, there are established in the structure of the nervous system absolute internal relations—relations that are potentially present before birth in the shape of definite nervous connexions; that are antecedent to, and independent of, individual experiences; and that are automatically disclosed along with the first cognitions. And, as here understood, it is not only these fundamental relations which are thus pre-determined; but also hosts of other relations of a more or less constant kind, which are congenitally represented by more or less complete nervous connexions.

But these pre-determined internal relations, though independent of the experiences of the individual, are not independent of experiences in general: they have been determined by the experiences of preceding organisms.

The corollary here drawn from the general argument is, that the human brain is an organized register of infinitely numerous experiences received during the evolution of life, or rather, during the evolution of that series of organisms - through which the human organism has been reached.

The effects of the most uniform and frequent of these experiences have been successively bequeathed, principal and interest; and have slowly amounted to that high intelligence which lies latent in the brain of the infant—which the infant in after life exercises and perhaps strengthens or further complicates—and which, with minute additions, it bequeaths to future generations. And thus it happens that the European inherits from twenty to thirty cubic inches more brain than the Papuan. Thus it happens that faculties, as of music, which scarcely exist in some inferior human races, become congenital in superior ones. Thus it happens that out of savages unable to count up to the number of their fingers, and speaking a language containing only nouns and verbs, arise at length our Newtons and Shakspeares.

CHAPTER VIII. — THE FEELINGS.

§ 209.

Some approach towards a right comprehension of the matter, will be gained by recalling certain leading conclusions set down among the Inductions of Psychology. We saw that Mind is composed of feelings and the relations between feelings. We saw that the feelings are primarily divisible into the centrally-initiated and the peripherally initiated; which last are re-divisible into those which are initiated at the outer surface of the body and those which are initiated within the body. On comparing these three great orders of feelings, we found that whereas the epiperipheral are relational to a very great extent, the entoperipheral, and still more the central, have but small aptitudes for entering into relations. Hence, by implication, it was shown that the relational element of Mind is in no case absent. But the relational element of Mind is the intellectual element. Obviously, then, no kind of feeling, sensational or emotional, can be wholly freed from the intellectual element.

If all mental phenomena are incidents of the correspondence between the organism and its environment; and if this correspondence passes insensibly from its lowest to its highest forms; then, we may be certain, a priori, that no orders of Feelings can be completely disentangled from other phenomena of consciousness. We may infer that they must arise gradually out of the lower forms of psychical action, by steps such as lead to the higher forms of psychical action already traced out; and that they must constitute another aspect of these. This is just what we shall find.

§ 210.

Before proceeding to the synthetic interpretation, it may be well to remark that even in our ordinary experiences, the impossibility of dissociating the psychical states classed as intellectual from those seemingly most unlike psychical states classed as emotional, may be discerned.

CHAPTER IX. - THE WILL.

§ 217.

All who have followed the argument thus far, will see that the development of what we call Will, is but another aspect of the general process whose other aspects have been delineated in the last three chapters. Memory, Reason, and Feeling, simultaneously arise as the automatic actions become complex, infrequent, and hesitating; and Will, arising at the same time, is necessitated by the same conditions. As the advance from the simple and indissolubly-coherent psychological changes, to the psychological changes that are involved and dissolubly coherent, is in itself the commencement of Memory, Reason, and Feeling; so, too, is it in itself the commencement of Will. On passing from compound reflex actions to those actions so highly compounded as to be imperfectly reflex—on passing from the organically – determined psychological changes which take place with extreme rapidity, to the psychological changes which, not being organically determined, take place with some deliberation, and therefore consciously ; we pass to a kind of mental action which is one of Memory, Reason, Feeling, or Will, according to the side of it we look at.

Of this we may be certain, even in anticipation of any special synthesis, For since all modes of consciousness can be nothing else than incidents of the correspondence between the organism and its environment; they must all be different sides of, or different phases of, the co-ordinated groups of changes whereby internal relations are adjusted to external relations.

Between the reception of certain impressions and the performance of certain appropriate motions, there is some inner connexion. If the inner connexion is organized, the action is of the reflex order, either simple or compound; and none of the phenomena of consciousness proper, exist. If the inner connexion is not organized, then the psychological changes which come between the impressions and motions are conscious ones: the entire action must have all the essential elements of a conscious action—must simultaneously exhibit Memory, Reason, Feeling, and Will; for there can be no conscious adjustment of an inner to an outer relation without all these being involved.

Between an involuntary movement of the leg and a voluntary one, the difference is that whereas the involuntary one occurs without previous consciousness of the movement to be made, the voluntary one occurs only after it has been represented in consciousness; and as the representation of it is nothing else than a weak form of the psychological state accompanying the movement, it is nothing else than a nascent excitation of the nerves concerned, preceding their actual excitation. Involuntary movement implies that the psychological states accompanying the impression and the action, are so coherent that the one follows the other instantly; while voluntary movement implies that they are so imperfectly coherent, that the psychological state accompanying the action does not follow instantly—is partially aroused before it is fully aroused; and so occupies consciousness for an appreciable time. Thus the cessation of automatic action and the dawn of volition are one and the same thing.

That Will comes into existence through the increasing complexity and imperfect coherence of automatic actions, is clearly implied by the converse fact, that when actions which were once incoherent and voluntary are very frequently repeated, they become coherent and involuntary. Just as any set of psychological changes originally displaying Memory, Reason, and Feeling, cease to be conscious, rational, and emotional, as fast as by repetition they grow closely organized ; so do they at the same time pass beyond the sphere of volition. Memory, Reason, Feeling, and Will, simultaneously disappear in proportion as psychological changes become automatic,

§ 219.

Long before reaching this point, most readers must have perceived that the doctrines developed in the last two parts of this work are at variance with the current tenets respecting the freedom of the Will. That every one is at liberty to do what he desires to do (supposing there are no external hindrances), all admit; though people of confused ideas commonly suppose this to be the thing denied. But that every one is at liberty to desire or not to desire, which is the real proposition involved in the dogma of free will, is negated as much by the analysis of consciousness as by the contents of the preceding chapters.

From the universal law that, other things equal, the cohesion of psychical states is proportionate to the frequency with which they have followed one another in experience, it is an inevitable corollary that all actions whatever must be determined by those psychical connexions which experience has generated—either in the life of the individual, or in that general antecedent life of which the accumulated results are organized in his constitution.

Considered as an internal perception, the illusion consists in supposing that at each moment the ego is something more than the aggregate of feelings and ideas, actual and nascent, which then exists. A man who, after being subject to an impulse consisting of a group of psychical

states, real and ideal, performs a certain action, usually asserts that he determined to perform the action; and by speaking of his conscious self as having been something separate from the group of psychical states constituting the impulse, is led into the error of supposing that it was not the impulse alone which determined the action. But the entire group of psychical states which constituted the antecedent of the action, also constituted himself at that moment—constituted his psychical self, that is, as distinguished from his physical self.. It is alike true that he determined the action and that the aggregate of his feelings and ideas determined it; since, during its existence, this aggregate constituted his then state of consciousness, that is, himself.

Hither the ego which is supposed to determine or will the action, is present in consciousness or it is not. If it is not present in consciousness, it is something of which we are unconscious—something, therefore, of whose existence we neither have nor can have any evidence. If it is present in consciousness, then, as it is ever present, it can be at each moment nothing else than the state of consciousness, simple or compound, passing at that moment. It follows, inevitably, that when an impression received from without, makes nascent certain appropriate motor changes, and various of the feelings and ideas which must accompany and follow them; and when, under the stimulus of this composite psychical state, the nascent motor changes pass in actual motor changes; this composite psychical state which excites the action, is at the same time the ego which is said to will the action.

Naturally enough, then, the subject of such psychical changes says that he wills the action; since, psychically considered, he is at that moment nothing more than the composite state of consciousness by which the action is excited. But to say that the performance of the action is, therefore, the result of his free will, is to say that he determines the cohesions of the psychical states which arouse the action; and as these psychical states constitute himself at that moment, this is to say that these psychical states determine their own cohesions, which is absurd.

§ 220.

To reduce the general question to its simplest form :—Psychical changes either conform to law or they do not. If they do not conform to law, this work, in common with all works on the subject, is sheer nonsense: no science of Psychology is possible. If they do conform to law, there cannot be any such thing as free will.

I will only further say that freedom of the will, did it exist, would be at variance with the beneficent necessity displayed in the evolution of the correspondence between the organism and its environment.

As it is, we see that the continuous adjustment of the vital activities to activities in the environment must become more accurate and exhaustive. The life must become higher and the happiness greater—must do so because the inner relations are determined by the outer relations. But were the inner relations partly determined by some other agency, the harmony at any moment existing would be disturbed, and the advance to a higher harmony impeded. There would be a retardation of that grand progress which is bearing Humanity onwards to a higher intelligence and a nobler character.

CHAPTER IX. - A FURTHER INTERPRETATION NEEDED.

§ 221.

We are now prepared for dealing with the remaining problem presented by objective Psychology. Though not conspicuous, the hiatus between the interpretation we have reached and a complete interpretation, is a deep one; and one which, when first looked into, appears impassable. For there has still to be answered the inquiry—how is mental evolution to be affiliated on Evolution at large, regarded as a process of physical transformation ?

Specifically stated, the problem is to interpret mental evolution in terms of the re-distribution of Matter and Motion. Though under its subjective aspect, Mind is known only as an aggregate of states of consciousness, which cannot be conceived as forms of Matter and Motion, and do not therefore necessarily conform to the same laws of re-distribution ; yet under its objective aspect, Mind is known as an aggregate of activities manifested by an organism—is the correlative, therefore, of certain material transformations, which must come within the general process of material evolution, if that process is truly universal.

§ 222.

Here, then, the structure and functions of the nervous system, considered as resulting from intercourse between the organism and its environment, form our subject-matter. We have to identify the physical process by which an external relation that habitually affects an organism, produces in the organism an adjusted internal relation.

In other words, regarding psychical changes as the subjective faces of what on their objective faces are nervous actions, the inquiry before us is—from what general law of the re-distribution of Matter and Motion does it result, that when a wave of molecular transformation passes through a nervous structure, there is wrought in the structure a modification such that, other things equal, a subsequent like wave passes through this structure with greater facility than its predecessor ? And—not to evade a still deeper question which immediately follows—is the establishment of nervous communication itself explicable on this same general principle? Are we enabled by it to understand not only how nerve becomes more permeable, but how nerve is formed?

CHAPTER X. - RESULTS.

268.

A not unsatisfactory fulfilment of the anticipation with which we set out has, I think, been reached. In the General Synthesis mental development, traced up from its beginnings, was represented as a correspondence between inner and outer actions, that extends in Space and in Time, while it increases in Speciality, in Generality, and in Complexity. The Special Synthesis carried further this interpretation of mental development, by showing how the advancing correspondence, when translated into the more familiar terms of Reflex Action, Instinct, Memory, Reason, Feeling, and Will, is comprehensible as a continuous process naturally caused. And in the Physical Synthesis just concluded, this continuous process naturally caused has been interpreted as a cumulative result of physical actions that conform to known physical principles.

Nerve being supposed to have the molecular structure and properties which, at the beginning of this work, we found such numerous reasons for assigning to it; we have inferred from established laws of motion, that the molecular change wrought in it by every discharge it conveys, leaves it in a state for conveying a subsequent like discharge with less resistance. This, being the universal law of nervous action, explains the universal law of intelligence.

§ 269.

“Thus, then, we are brought face to face with unmistakable materialism,” will exclaim many a reader. “Thus, then, it is positively asserted that Mind is a growth, and that it grows after the same general method as does the meanest fungus or the most degraded worm. Thus, then, we must infer that the profoundest intuitions of the discoverer and the sublimest inspirations of the poet—the most abstract conceptions of the mathematician as well as the noblest emotions of self-sacrificing sympathy—are but properties of certain matters arranged in particular ways.”

That you cannot get out of the undeveloped child, thoughts and feelings like those you get out of the undeveloped child, thoughts and feelings like those you get out of the developed man; that the idiot, with brain permanently arrested in its growth, remains permanently incapable of any but the simplest mental actions; are propositions not denied by the most in temperate reviler of physiological psychology.

But one who recognizes such facts and propositions, is just as much chargeable with materialism as one who puts together facts and propositions like those which constitute the foregoing exposition. Whoever grants that from the rudimentary consciousness implied by the vacant stare of the infant, up to the quickly-apprehensive, far-seeing, and variously feeling consciousness of the adult, the transition is through slow steps of mental progress that accompany slow steps of bodily progress, tacitly asserts the same relation of Mind and Matter which is asserted by one who traces out the evolution of the nervous system and the accompanying evolution of intelligence, from the lowest to the highest forms of life.

But, as said here and before, the supposed implication is not the true implication. Let me once more point out what the true implication is. By way of preparation, however, we will first observe how the above apostrophe might be met by those to whom it would be fitly addressed.

§ 270.

"Your reproaches seem to me strangely inconsistent with your avowed beliefs and sentiments," might say the materialist to his opponent. "You profess the profoundest reverence for the Creative Power, from which you hold the Universe to have proceeded. Yet of the visible and tangible part of the Universe, you speak in a way that would be appropriate were its origin diabolical; and you taunt me because I recognize in that which you treat with so much scorn, powers no less marvellous than those manifested in the human mind."

§ 272.

In the closing paragraphs of First Principles, and again in the earlier parts of the present work, the position taken was, that the truth is not expressible either by Materialism or by Spiritualism, however modified and however refined. Let me now, for the last time, set forth the ultimate implications of the argument running through this volume, as well as through preceding volumes.

§ 273.

And this brings us to the true conclusion implied throughout the foregoing pages—the conclusion that it is one and the same Ultimate Reality which is manifested to us subjectively and objectively. For while the nature of that which is manifested under either form proves to be inscrutable, the order of its manifestations throughout all mental phenomena proves to be the same as the order of its manifestations throughout all material phenomena.

The Law of Evolution holds of the inner world as it does of the outer world. On tracing up from its low and vague beginnings the intelligence which becomes so marvellous in the highest beings, we find that under whatever aspect contemplated, it presents a progressive transformation of like nature with the progressive transformation we trace in the Universe as a whole, no less than in each of its parts. If we study the development of the nervous system, we see it advancing in integration, in complexity, in definiteness. If we turn to its functions, we find these similarly show an ever increasing inter-dependence, an augmentation in number and heterogeneity, and a greater precision. If we examine the relations of these functions to the actions going on in the world around, we see that the correspondence between them progresses in range and amount, becomes continually more complex and more special, and advances through differentiations and integrations like those everywhere going on. And when we observe the correlative states of consciousness, we discover that these, too, beginning as simple, vague, and incoherent, become increasingly numerous in their kinds, are united into aggregates which are larger, more multitudinous, and more multiform, and eventually assume those finished shapes we see in scientific generalizations, where definitely-quantitative elements are co-ordinated in definitely-quantitative relations.

Such are the results of a synthesis which we shall presently find verified by analysis. These are the conclusions to which Objective Psychology has brought us; and these are the conclusions to which we shall find ourselves led by that Subjective Psychology to which we now pass.