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ANALYTIC PSYCHOLOGY

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ANALYTIC PSYCHOLOGY.

CHAPTER V.

NOETIC SYNTHESIS.

§ 1. Noetic Synthesis as Distinguished from Association.

By *noetic synthesis* I mean that union of presentational elements which is involved in their reference to a single object; or, in other words, in their combination as specifying constituents of the same thought. It is by noetic synthesis that those complex psychical units come into being which we call percepts, ideas, and concepts. All these words imply something which is perceived or conceived, or of which we have an idea; and it is this objective reference which constitutes each of them a unit in mental process. This kind of synthesis has a twofold application, according as the elements unified are themselves anoetic or noetic. As an example of the first case, we may take our recognition of persons by means of peculiarities in their appearance which we are unable to analyse, so that, if any alteration took place, although we should notice the difference, we should not be able to detect wherein it consisted. Similarly, we may be able to identify a musical note as having a certain *timbre*, without being able to distinguish the overtones which give it its peculiar quality. But the second application of noetic synthesis is most important for the detailed explanation of mental process. It is to be

found wherever the objective reference is to a whole consisting of parts each of which may constitute a distinct object. In the developed consciousness the whole mind is more or less perfectly organised into a system of noetic units, in which partial apprehensions are subordinated to more comprehensive apprehensions, and these in their turn to others still more comprehensive. The percept of a particular thing in space has subordinated to it the percepts or ideas of the constituent parts of the thing and of its various sensible qualities. So the idea of the thing as it occurs in a train of thought embraces under it not merely the ideas answering to the subordinate percepts, but also the ideas of the special relations which give it its interest and significance as part of the train. This mental organisation may be compared to that of a complex society, such as an army; the part played by the apprehension of the whole in connecting the apprehensions of the parts is comparable to the function of the officer who gives unity and combined action to the group placed under his control. The unity of the army depends on the commander-in-chief; the unity of the various divisions depends on the generals of division; the unity of the regiment depends on the colonel; that of the company on the captain. It would obviously be an absurdity to attempt to account for the organisation of an army merely by the contiguous adhesion of the soldiers *inter se*, apart from the descending scale of subordination to officers. But it is an absurdity of an exactly analogous nature, though much greater in degree, to attempt to account for the systematic unity of the human mind by mere association. We have already paved the way for the application of this analogy, and for the exposition of noetic synthesis in general. In chapter iii. of book i. we discussed the connection between our cognisance of form of combination and our cognisance of the parts combined. We there showed that our cognisance of the form of combination characteristic of a whole is a mode of

consciousness distinct from our cognisance of its constituents. In chapter iv. we showed that the apprehension of a whole could take place independently of the apprehension of its component details. This we called *implicit apprehension*. We also pointed out that the implicit apprehension of a whole might be combined with the successive apprehension of each of its components, so as to control the order of their emergence, and to exclude the intrusion of irrelevant objects. This we called *schematic apprehension*, and we found that it constitutes the essence of whatever can be properly termed a train of thought. If the reader carefully attends to these distinctions he will have no difficulty in clearly separating the conception of noetic synthesis from that of association. Association comes into play only in so far as co-ordinate elements tend to suggest each other, because they have been previously combined in a certain order. In any given stage of a train of thought the next step is partly determined by the controlling influence of the central idea of the topic with which the whole series is concerned, and partly by the special idea which has last emerged. In so far as it is determined by the special idea which has last emerged, the principle of association is operative; in so far as it is determined by the central idea of the whole topic, noetic synthesis is operative. Association also manifests itself in the casual accompaniments of irrelevant imagery which appear in the course of the process, and in the casual suggestions which give rise to sudden transitions to other topics which may be wholly disconnected with the pre-existing train. It is mere association, for, instance, which would lead a man in a conversation about peace and war to begin to talk about Peace the murderer. But the antithesis between noetic synthesis and contiguous adhesion is brought out in the clearest light by the passage of attentive into automatic process. In proportion as automatism supervenes association becomes substituted for thought-control, and in the

final stage completely supplants it. Thus, when we are walking without attending to our movements, our progress is wholly determined by the association between a certain group of sensations experienced at a given moment and a corresponding motor impulse. In learning to read, a child has at the outset to attend carefully to the connection between written characters and the sounds for which they stand. The idea of this connection dominates the whole process of learning. But the educated adult finds that the sight of the characters immediately suggests the sound as if it were part and parcel of the visual impression, so that he can give his whole attention to the subject-matter of a book or letter without in the least considering the connection between visual and auditory signs. Association has been so strengthened by repetition that it has become capable of fulfilling by itself the function of attention.

We shall now proceed to a systematic examination of noetic synthesis as it appears at different levels of mental life, in simple perception, complex perception, image or idea, and conception. At the same time we shall consider carefully its connection with associative process.

§ 2. Simple Perception.

By *simple perception* is meant the immediate identification and distinction of an object presented to the senses, whether this be a simple sensible quality, like red or blue, or a complex thing, having a multiplicity of parts and of sensible qualities, each of which is capable of being separately identified. The nature of simple perception as thus defined has already been touched upon in discussing so-called association by similarity. We then pointed out that to perceive a thing at all implies our perceiving it as such or such,—in the words of Spencer, " we identify it as a particular thing or range it

with certain kindred things". We also pointed out that this does not commonly involve the ideal recall, either of other appearances of the same thing, or of other appearances of like things. If I look at a horse I immediately know it for a horse, without summoning up mental images of other horses. Ordinary introspection is quite sufficient to bear out this statement. But if it needed further corroboration, this would be supplied by the existence of simple perception where the power of ideal recall is absent. On meeting a man, I may feel convinced that I have met him before, without being able to recall when or where. In certain cases of aphasia the power of remembering words is wanting, though the words may be distinguished and identified when they are heard, so that the patient can write from dictation and understand what is said to him. To take an instance at random a man who has lost memory of substantives, "on being shown a tumbler glass shakes his head and says it is for beer but cannot remember its name; he knows it is not called a basin, a mug, or a jug, and recognises the word 'glass' directly it is named; but the next minute he has forgotten it, and cannot repeat it".[1] Charcot reports a case in which the power of recalling visual imagery was almost entirely lost, though visual perception was by no means proportionately affected. As Dr. Ward points out, the patient could sort wools, although he could not mentally image colours. To this pathological evidence we may add the appearance of simple perception in stages of psychical life in which mental images cannot be supposed to exist. The lower animals, such as fishes, can identify their prey or their mate; there is no evidence to show that they can think about these objects when they are not sensibly present. Indeed, it has been supposed that percepts may be innate. Such instances as that of the chicken picking up grains on its emerging from

[1] F. Bateman, M.D., on *Aphasia*, p. 103.

the shell are apt to suggest this view. But both the facts and the inference are doubtful.

What is the precise character of this peculiar mode of consciousness which we call simple perception? It might be supposed that it consists merely in the bare reference of a specific experience to a specific object, and that it does not involve the relation of the apprehension of a whole to the apprehension of its parts. Closer consideration will, however, lead us to take a different view. Whatever is perceived is recognised as such or such; and however vague and rudimentary the recognition may be, it implies a reference to something beyond the given object. The object comes before consciousness as an instance, or example, or particular appearance *of* something which may have *other* instances, or examples, or particular appearances. The precise mode of consciousness involved is perhaps best indicated by reference to a special phase of it in which its nature is manifest with peculiar clearness. After having noted a succession of similar objects, such as sheep passing through a gap in a hedge, I exclaim: "There's another!" or simply, "Another one!" Now, the only perceptual or ideal image which exists in my consciousness at the time will in all probability be that of the object which provokes my exclamation. But the word "other" implies a reference beyond this particular object; a reference to what, for psychological purposes, we may regard as a whole, of which the presented particular is a constituent part. This whole is an object of implicit apprehension, and in all human perception, at least, some such implicit apprehension appears to be involved. All identification implies distinction, and in simple perception the distinction can only exist in this form.

How is simple perception connected with *association?* Association of ideas cannot be regarded as among its preconditions, for ideas do not precede but follow perception, and

even presuppose a considerable measure of perceptual complexity. Percepts, as we have seen, may exist without the corresponding ideas; and it is equally true that ideas may exist without the corresponding percepts. The spontaneous remembrance of spoken or written words may be conjoined with word-blindness and word-deafness. The patient for whom spoken language is merely a confused murmur, may none the less be able to express his thoughts with considerable freedom. Similarly, in a remarkable case of psychical blindness, reported by Wilbrand, a lady who could perfectly well with closed eyes summon up before her mental view the images of objects and of their relative position, was thoroughly confused and bewildered by her inability to identify the same objects when actually present, so that she could not find her way without a guide. If, then, association plays any part in simple perception, it must be association between the residua of impressions, as distinguished from percepts. But here the grand difficulty emerges, that impressions as such do not appear to be revived at all, except in certain rare and curious cases. The most obvious way of parrying this objection is to put forward a theory such as that of Bain, according to which the residua of previous like impressions immediately blend with the new one and are merged in it. We may even dismiss the supposed plurality of numerically distinct residua, and simply refer identification to the re-excitement of a previous disposition. On this last view, of course there will be no room for association or reproduction, but we may consider it along with the theory based on the attraction of similars, because the same criticism applies to both. The main point of this criticism has already been indicated (pp. 279-281). It is that frequent repetition of like impressions fails to lead to identification. We here add two further examples in order to clinch our case. The first I quote from Mr. Edridge-Green. "The plane-tree is one of the commonest trees in London;

most of the avenues contain large numbers of them, and nearly all the trees in the quadrangle of St. Bartholomew's Hospital are plane-trees; and yet I have taken a leaf and shown it to numbers of students and other persons, and asked them if they knew what it was. They have all said, 'No; I have never seen anything like it before'. And one, who prided himself on his botanical knowledge, even went so far as to say, 'I am positive I have not, because I always notice everything, and should certainly have remembered if I had'. *Next* day he remarked to me, 'It's very strange my not having noticed it before; but I saw numbers of trees with leaves like the one you showed me yesterday on my way home'. . . . I was taking a walk with a relation who was very much interested in superficial botany, and anxious to know the names of the different trees and plants. So I went up an avenue (where nearly every second tree is a plane-tree), and pointed out the various trees and shrubs, mentioning their names, of course taking no notice of the plane-trees. I then turned into a side-avenue of a similar character, and, having reached the centre of it, stopped in front of a plane-tree, and asked, 'Have you ever seen a similar tree to that before?' and received the answer I expected. 'No; I think that must be a very rare tree. I don't remember ever having seen one like it before.' We were in sight of two or three dozen at the time, and the great surprise expressed at finding every other tree a plane was amusing."[1]

The following is an instance from my own experience. I was about to try a series of experiments with the view of ascertaining how far and under what conditions it is possible to discriminate the components of a compound smell or taste. For this purpose a number of spices, such as cinnamon, clove, nutmeg, etc., were used. By way of

[1] Edridge-Green on *Memory*, pp. 119, 120, 121.

preliminary I tested my power to identify the several smells separately, rather as a matter of form than from any doubt of my ability to do so. To my amazement I found that in a large proportion of cases I utterly failed to recognise quite familiar odours. Nor was the failure due to inability to recall names. In point of fact, I knew beforehand the names of the spices which were to be used; but when the right name occurred to me, I did not know it was the right name. My helpless bewilderment pointed distinctly to a deficiency in perceptual discernment. To realise the importance of such facts as these, we must note that the repetition of impressions is not merely of itself insufficient to give rise to identification, but that it fails to do so even when interest is aroused. I could not identify the smell of a familiar spice, even though I had an intense desire to do so. This shows not only that the preacquired disposition need not in point of fact generate perceptual consciousness, but that it is incapable of doing so. It is not enough that the residua of previous impressions should be re-excited. Their re-excitement must bring with it a peculiar modification resulting in a new growth, both mental and physiological. On the physiological side we may take this to imply the establishment of a connection between "lower level" impressional nervous arrangements, and "higher level" perceptual nervous arrangements. However this may be, it is clear that the acquirement of a new kind of percept presupposes more than the repetition of impression. It presupposes interest; it arises only when psychical activity is set in a certain direction. Of course it is a ὕστερον πρότερον to say that we feel interest in an object before it is perceived. What is meant is, that we feel an interest in some kind of whole, of which the object forms part, and that the interest requires for its fuller gratification further distinction and analysis.

If this account of the matter be correct, it does not neces-

sarily follow that association plays no part in the development of simple perception. It may enter into the gradual process of differentiation of a preformed disposition, which ultimately issues in perceptual consciousness. A possible mode in which this may take place is indicated by a general condition of distinction and identification, first formulated, I believe, by Lotze, and since very clearly expounded by Stumpf and James. This condition, as stated by James, is that "any total impression made on the mind must be unanalysable whose elements are never experienced apart".[1] . . . "If all cold things were wet and all wet things cold, if all hard things pricked our skin and no other things did so; is it likely that we should discriminate between coldness and wetness, and hardness and pungency respectively?"[2] "The converging of the eyeballs and the accommodation for near objects are, for each distance of the object (in the common use of the eyes), inseparably linked, and neither can (without a sort of artificial training . . .) be felt by itself."[3] "The contraction of the diaphragm and the expansion of the lungs, the shortening of certain muscles and the rotation of certain joints, are examples"[4] of an analogous kind. "The assafœtida in 'Worcestershire sauce' is not obvious to any one who has not tasted assafœtida *per se*. In a 'cold' colour an artist would never be able to analyse out the pervasive presence of *blue*, unless he had previously made acquaintance with the colour blue by itself."[5] Let us now consider the mode in which this principle may be supposed to operate. How is it that the recurrence of the like impression in dissimilar contexts leads to identification? Obviously, the presented content and its corresponding disposition must in some way undergo a modification which is one of the conditions of the genesis of the percept. How does this modification take

[1] *Psychology*, vol. i., p. 502. [2] *Ibid.* [3] *Ibid.*
[4] *Ibid.* [5] *Ibid.*, p. 504.

place? It is conceivable that the differentiation arises merely from the excitement of the same disposition, *D*, in conjunction with varying psychical concomitants. But it seems probable that besides this the associative principle also comes into play. *D* becomes associated with different, and usually conflicting dispositions *X*, *Y*, *Z*, so that whenever the corresponding impression arises in consciousness its nature is modified by preacquired reproductive tendencies. We need not suppose that these tendencies actually take effect in the distinct revival of previously experienced impressions. It is enough to assume that they give rise to increased complexity in the disposition *D*, and in the answering sensations. We shall adduce a little later on examples of this effect of association. In so far as the variable associations acquired by *D* are mutually conflicting, they will tend more or less to counteract each other, so that the central process immediately connected with *D* will suffer a kind of mechanical detachment from its impressional setting, and acquire a certain salience in consciousness. In some such way we may suppose association, even at the level of purely sentient process, to play a part in the transition from anoetic to noetic consciousness.

§ 3. Possibility of Impressional Revival and Association.

It must be admitted that this suggestion is somewhat speculative and precarious, but there is, I think, a presumption in its favour. It does not presuppose the existence of ideas, and it does not regard ideas as "traces, copies, or residues of sensations".[1] What it does assume is the possibility of impressional revival and association. To judge from Dr. Ward's article in *Mind*, above referred to, he would entirely deny this possibility. But it is clear that in so doing he would

[1] Dr. Ward in *Mind*, N.S., No. 12, p. 531.

overstate his case. There are not wanting instances which are hard to interpret without assuming impressional revival. Instances of purely impressional association are rarer and more doubtful. I would call association purely impressional when one impression reinstates another without the intervention of ideas. But cases are not very rare in which an idea reinstates an impression, or in which a percept reinstates another percept.

Some persons can summon up mentally so vivid a presentment of colour that the negative image follows, as if the colour had actually been before their eyes. J. Müller vouches for this fact, and A. Binet, in his *Psychologie du Raisonnement*, reports a number of cases. It is difficult to suppose that such after-images can arise otherwise than through a previous excitement of impressional centres. In dreams we have a sequence not merely of ideas, but also of percepts more or less connected in the way of association. Similarly, in the hypnotic state, it is possible to suggest hallucinations and to determine the mode and time of their occurrence by preformed association. Purely impressional association is probably involved in certain curious instances of hypermnesia, in which delirium or the use of drugs seems to revive the residua of a series of experiences which could never have been recalled under normal conditions. The well-known case recorded by Coleridge is perhaps the most remarkable, though it is by no means isolated. "In a Roman Catholic town in Germany a young woman who could neither read nor write was seized with a fever, and . . . was heard talking Latin, Greek and Hebrew. Whole sheets of her ravings were written out, and found to consist of sentences intelligible in themselves, but having slight connection with each other. . . . At last the mystery was unveiled by a physician, who . . . discovered that at the age of nine she had been charitably taken by an old Protestant pastor, a great Hebrew scholar, in whose

house she lived till his death. On further inquiry, it appeared to have been the old man's custom for years . . . to read to himself with a loud voice out of his books. The books were ransacked, and . . . many of the passages taken down at the young woman's bedside were identified."[1] What is especially deserving of notice in this case is the extreme difficulty of supposing that the associative recall took the form of a sequence of ideas. We have good reason for affirming that the woman had no ideas of the sounds which she uttered. Ideas are the counterpart of percepts, but how should the necessary percepts be formed simply by overhearing the strange sentences? The discrimination, identification, and complex synthesis of sound would have required minute and careful study, together with an exceptional mental endowment. All this we have to suppose in a young girl who is said to have been a "simple creature," and who "could neither read nor write". Is there any explanation admissible except that the fever rendered the impressional centres more unstable and excitable, and that in consequence the revival took the form of a series of actual sensations? We seem here to have an instance of purely impressional association. Professor J. Baumann mentions a case of very similar nature as having recently occurred. A man who had taken an overdose of morphia recited passages out of Homer. He was quite ignorant of ancient Greek, and the explanation turned out to be that, as a boy, he had overheard students committing passages to memory.

There is also abundant evidence to show that even under normal, or approximately normal, conditions impressional revival may take place. It is difficult to explain such experiences in the way of mental vision as those communicated to Francis Galton by Mr. Henslow, without assuming more

[1] Coleridge, *Biographia Literaria*, p 55.

than mere ideation.[1] Dr. Wigan refers to an English painter who explains his mode of work in this way: "When a sitter came I looked at him attentively for half an hour, sketching from time to time on the canvas. I wanted no more. I put away my canvas and took another sitter. When I wished to resume my first portrait, *I took the man and set him in the chair*, where I saw him as distinctly as if he had been before me in my own proper person—I may almost say more vividly. I looked from time to time at the imaginary figure, then worked with my pencil, then referred to the countenance, and so on, just as I should have done had the sitter been there—*when I looked at the chair I saw the man.* Gradually I began to lose the distinction between the imaginary figure and the real person; and sometimes disputed with sitters that they had been with me the day before. At last I was sure of it; and then—all is confusion. . . . I lost my senses, and was thirty years in an asylum."[2] Finally, I may mention an experience of my own which greatly impressed me. Under the influence of a large dose of haschisch I found myself totally unable to distinguish between what I actually did and saw, and what I merely thought about. The value of this experience lies in the fact that I was throughout able to observe my own mental state.

All this evidence in favour of impressional revival does not in the least countenance the theory that ideas are merely faint revivals of impressions. On the contrary, it tends strongly in the opposite direction. It shows that a revived impression is itself an impression, and not an idea. This is well brought out by the testimony of some of Galton's correspondents. "There are some who visualise

[1] Galton, *Human Faculty and its Development*, p. 161, ff.

[2] Wigan, *A New View of Insanity*, p. 125, quoted by Taine on *Intelligence*, pp. 45-46.

well, and who also are seers of visions, who declare that the vision is not a vivid visualisation, but altogether a different phenomenon. . . . The following is a good instance of this condition. A friend writes: 'I find it difficult to define the difference between a waking vision and a mental image, although the difference is very apparent to myself. I think I can do it best in this way. If you go into a theatre and look at a scene—say of a forest by moonlight—at the back part of the stage you see every object distinctly and sufficiently illuminated (being thus unlike a mere act of memory), but it is nevertheless vague and shadowy, and you might have difficulty in telling afterwards all the objects you have seen. This resembles a mental image in point of clearness. The waking vision is like what one sees in the open street in broad daylight, when every object is distinctly impressed on the memory. The two kinds of imagery differ also as regards voluntariness, the image being entirely subservient to the will, the visions entirely independent of it. They differ also in point of suddenness, the images being formed comparatively slowly as memory recalls each detail, and fading slowly as the mental effort to retain them is relaxed, the visions appearing and vanishing in an instant. The waking visions seem quite close, filling as it were the whole head, while the mental image seems farther away in some far-off recess of the mind.'"[1] It is evident that the uncontrollable nature of these visions makes them unfit for use in a train of thought, and the same holds good of Mr. Henslow's analogous experiences. But if the case against the identification of impressional revival and association, with ideal association and revival, is rather corroborated than weakened by this evidence, it remains true that impressions may be revived as well as ideas, and there is some reason to suppose that they may even be associated with each

[1] Galton, *Human Faculty and its Development*, pp. 164-65.

other. There is at least a presumptive possibility that the process which we find operative in an exaggerated form in the exceptional instances above quoted will not be wholly inoperative under ordinary conditions. It is legitimate to take account of the possibility that the quality of a sensation may, by contiguous association, become modified in some such way as the quality of a fundamental note is modified by its upper tone. This suggestion will receive a more definite form presently, when we come to discuss complex perception.

§ 4. Grades of Simple Perception.

The noetic synthesis involved in simple perception has many different gradations, varying with the fineness of the distinctions which are recognised. The shepherd who can separately distinguish and identify each individual sheep in his flock is greatly superior in this respect to the ordinary person who can scarcely notice any difference between one sheep and another, even with the fullest opportunities for comparison. Many idiots require a long training before they can identify colours or shapes with anything like ordinary accuracy; and the colour discrimination of the artist is as much superior to that of most ordinary persons as the idiot's is inferior. Mr. Edridge-Green quotes a case of a professional man of great ability who "is unable to recognise his best friends (until they speak). He has got into an omnibus and sat opposite his mother, and thought to himself that he seemed to know her face. . . . He has to judge in other ways, as by their speech, peculiarities, etc. But he is able to draw, and the sketches (which of course are not very complicated) are very fair representations of the objects intended, and from which they are copied very carefully. But on a minute examination of the drawings there was found to be no *individuality of form;* the curves and lines were the simplest possible, and looked as if they might have

been executed with the aid of a ruler and compasses, which, in fact, many of them were."[1] A close pathological parallel to this perceptual deficiency is found in a case of psychical blindness reported by Groenouw. His patient could recognise a statue of Mercury, as such, but not as the one which he had himself carved; he could draw *a* sofa, but not *the* particular sofa in his own room. In most instances of psychical blindness there is not merely a failure to identify, but a wrong identification.

So far we have considered the bare fact of immediate identification, disregarding whatever complexity may exist in the object identified. In complex perception the object is composed of distinct constituents, each of which may be separately perceived. At the same time it forms for the percipient consciousness a unity of such a nature that the perception of the part involves the perception of the whole, as such. The percepts of the partial constituents are percepts of the whole from different points of view. Thus I may immediately identify an object in the dark by means of touch, or I may recognise it in the light by visual perception. The distinction between simple and complex perception is rather logical than real; it seems impossible to adduce an instance in which an object is simply identified without any discernment of its different parts or aspects. It would seem that an animal identified its prey at least from two points of view: (1) in the moment of anticipation, (2) in the moment of fruition. In the first moment it sees, smells or touches something eatable; in the second moment there emerges the distinctive feeling of actually eating this something. Of course it would be absurd to look for any case of absolutely simple perception in the more developed consciousness.

It should be noted that in the absence of ideas the noetic

[1] *Memory*, pp. 75-76.

synthesis involved both in simple and complex, perception operates as a principle determining the serial order of mental process, only in so far as it determines bodily movement. Thus in the case of the animal and its prey the initial perception of the object determines a sequence leading to the following perception, through the medium of appropriate movements. So the squirrel's recognition of a nut is a noetic synthesis determining the successive experiences involved in the gathering of a store of nuts.

§ 5. Complex Perception.

We must now carefully examine the nature of the complex percept, as such. For this purpose it is sufficient to take as a typical instance our ordinary apprehension of a sensible thing such as an orange. This involves three kinds of complexity: (1) The thing identified has a definite configuration in space, and therefore contains a plurality of locally distinguishable parts; (2) it has a plurality of qualities, perceptible by means of different senses; (3) it passes through a number of changes in time. Now, there are two modes in which we may attempt to explain perceptual complexity in its threefold form. With the first we have become familiarised in psychological text-books. According to this view the complex percept is constituted by the associative cohesion of its component percepts The association is supposed to be of so intimate a kind that any one of these component percepts revives the ideas of the rest in a compact mass. No one has enunciated this theory with so much clearness, or followed out its consequences with so much logical rigour, as Mr. Herbert Spencer. He argues that complex perception is a complex inference. "The structural, tangible, gustable, ponderable and other sensible characters ascribed to an orange, are not included in the visual impression received from the orange; but, as all admit, are in-

ferred from that impression, yet these various inferred characters are included in the concept—an orange. When I reach out my hand towards this reddish-yellow something, under the belief that it is juicy, and will slake thirst, I have already, in judging it to be an orange, conceived it as having various attributes besides the observed attributes; every one of which I know to exist, only by the same process that I know the juiciness to exist. The act of classing, then, involves a whole group of inferences; of which the particular inference avowedly drawn is only one. And had some other been drawn, as that the taste was sweet, what is now distinguished as the inference would have been one of the data; that is, one of the attributes involved in the judgment—this is an orange. Should it be said that these various unspecified attributes are not inferred in the act of classing, but that the entire thought implied is—All reddish-yellow spherical, polished, pitted bodies of a certain size are juicy; the untruth of the position will be seen on remembering what takes place if a mock-orange made up of painted stone is laid hold of. The *unexpected* weight and hardness instantly lead to a change of classification; it is at once perceived that the body is not an orange. And this fact proves that something else than juiciness had been inferred; had been wrongly inferred; and had involved a wrong classification."[1] Mr. Spencer's reasoning here appears to me to be irresistible. If complex perception is constituted by a group of associative revivals, then every part or attribute of the perceived complex, which is logically presupposed in identifying it, must be reproduced.

Mr. Spencer admits that this result appears "incredible, both as asserting what self-analysis gives no evidence of, and as implying a mental activity inconceivably great".[2] But he seems to think that all difficulties are dispelled by the magic

[1] *Principles of Psychology*, vol. ii., pp. 119-120; *cf.* also pp. 149-151.
[2] *Ibid.*, p. 149.

phrase organic classification". The imposing assemblage of distinct acts of identification elude introspection and retrospection because they take place unconsciously. But here, it would seem, Mr. Spencer fails to observe the necessities of the case. The essence of the theory is that the complex percept is actually built up by the mere juxtaposition of the component percepts. The relation between the percept of the whole and the percepts of its parts is expressible as a numerical equation. If, then, the component percepts are unconscious, their sum must be unconscious also. But it is not so. On the contrary, it is a mode of attentive consciousness; therefore its constituents must be modes of attentive consciousness also. If we suppose them to be unconscious, then their numerical sum must also be unconscious, just as stones remain stones even when they are heaped together. Of course a plurality of conditions may give rise to a consequence different in nature from the conditions themselves, but when this is so the consequence cannot be regarded as merely identical with the conditions themselves taken collectively. Mr. Spencer's reasoning must therefore be regarded as a *reductio ad absurdum* of the theory from which it starts. The percept of the whole is not the sum of the percepts of the parts. Complex perception, as it ordinarily takes place, is possible only through schematic apprehension. If one part of the complex whole be given, we have such a prenotion or schematic anticipation of the remainder as enables us to mentally inquire for it, and, if circumstances permit, to seek for it in detail by actually touching, tasting, seeing, etc., or to call up the corresponding ideas in succession.[1] This mental

[1] The reader is requested to remember that my standpoint in this account of perception is analytic. The ultimate aim of psychology is to give an expcsition in genetic order not involving reference to elements in consciousness later in development: but this cannot be satisfactorily attempted without a preliminary analysis of our actual developed consciousness. In the present work, which I have for this reason called

prospectiveness constitutes the possibility and controls the order of a series of actual percepts or ideal revivals, but it does not, at the outset, already contain these ideas and percepts. It is not their sum, but their noetic synthesis.

This will become clearer if we examine more closely by the aid of introspection what takes place in the apprehension of a more or less familiar sensible thing. What we commonly call "things" are in the first place characterised by a determinate configuration, which marks them off from their surroundings by definite lines and surfaces of demarcation. They have also a definite magnitude and a definite distance from the percipient. Besides this, we apprehend them as having insides as well as outsides. Now, it is obvious that the full shape of an object is never directly presented to the eye, and not often presented to the touch. In looking at a thing, such as an apple or a book, I only see that aspect of it which is turned towards the eye; the other side is invisible. But when I perceive an apple, as such, I certainly identify it as having spherical shape. On the bridge of Clare College in

Analytic Psychology, my primary aim is to break up the complexity of developed human consciousness into its components, and to show their interconnection. In a future work I intend to take up the genetic treatment, under the title *Genetic Psychology*. There is not, I think, in my present account of perception, any confusion between the perceptual and more developed attitudes of consciousness. The primary thought-synthesis, which forms the essence of perception, must of course have a larger significance for beings capable of mental imagery, than for beings who are incapable of it. It must have a still larger significance for beings capable of conception in the proper sense. In a creature who has no mental imagery, the perceptual attitude will serve to systematise the movements of its sense-organs and of its limbs in relation to perceived objects. In a creature with mental imagery, it may also serve to guide and systematise ideal revivals, supplementing and expanding the primary discernment. For the conceptual consciousness, perception may expand itself into a conscious classification of the various parts and aspects of an object. But in all cases the perception itself, in its simple initial phase, is distinct from the further processes for which it furnishes the primary clue.

Cambridge there are a number of stone balls. The unsuspecting stranger is sometimes challenged to count these correctly; he proceeds to his task and counts fourteen. It comes upon him as a shock of surprise that there are only thirteen and three-quarters, a bit being chipped out from the unseen side of one of them. Evidently he has identified each of the balls as having a spherical shape. Now, what takes place in identification of this kind? Is it true that the percipient mentally visualises the part of the object which he does not see? Certainly my own experience does not bear out this assumption. I identify an apple as soon as I see it; but in so doing I do not usually have a mental image of the appearance of its unseen side. I may if I choose attempt to call up such an image, but to do so costs an effort, and an effort which, in my case, is never wholly successful. Moreover, in making it, my attention is diverted from that part of the whole which is actually within the field of view. Mr. Galton refers to the power of visualising at the same moment all round the image of a solid body as an exceptional gift possessed only by a favoured few. "Many can do so nearly, but not altogether round (the image) of a terrestrial globe. An eminent mineralogist assures me that he is able to imagine simultaneously all the sides of a crystal with which he is familiar."[1] The obvious conclusion from introspective data is that in perceiving the shape of an ordinary sensible object we apprehend the whole without apprehending all the parts.

This conclusion is corroborated when we consider that in visual perception the shape which we actually recognise is represented by the visual appearance, not merely partially, but for the most part inaccurately. This applies primarily to perceived magnitude. If we attend to the visual appearance rather than to the object, we find that it varies in size accord-

[1] *Human Faculty*, p. 98.

ing to our distance from the thing seen. At great distances this variation is forced upon our notice. Looking down from a high tower on men walking in the streets of a town, we remark with a kind of surprise how small they look. But for comparatively short distances the variation passes unnoticed unless we expressly measure the visual angle. The reason is that the visual magnitude, as such, is habitually disregarded, serving only as a sign of the real magnitude. But this real magnitude, in its distinction from apparent magnitude, is neither actually seen nor mentally visualised. Nor is it represented by an ideally revived tactual or motor complex. There is no trace of such a complex in consciousness.

The variation of the visual magnitude according to distance involves a corresponding variation in the apparent shape of things as we see them from different points of view. For shape is conditioned by the relative magnitude of the different parts of a spatial whole. But this relative magnitude, and consequently the shape of a thing, varies according to the perspective. The shape of a familiar thing as we immediately perceive it is not the same as any of these visual appearances or of all of them taken collectively. What we recognise is the configuration which accounts for them all and enables us to anticipate them in serial order. But this true shape which we directly recognise, is not represented in consciousness by any corresponding image, visual or tactile.

We cannot here attempt to decide between the conflicting theories by which psychologists explain the visual percept of distance or depth. But on any theory whatever which has any claim to the attention of modern psychology, this percept involves a complex synthesis, and only part of the constituents synthesised are present in perceptual consciousness. The rest are "suggested" by a multitude of signs such as the experience connected with convergence and divergence of the eyes, accommodation of the lens, distribution of light and

shade, aerial perspective, known magnitude of the object, and so forth. Psychologists differ as to what it is precisely that is suggested by these signs. Some suppose that it is a train of tactual and motor experiences. Others lay equal stress on suggested visual experiences. But, on any view, much is suggested which is not represented by mental imagery. If in perceiving the distance of an object from me, I recall a series of tactual and motor percepts, involved in actually moving towards the object, it is certain that such "recall" does not consist in the ideal reproduction of the links of the perceptual train. The tactual-motor series is apprehended as a whole without discrimination of its parts.

We apprehend things as having insides as well as outsides. We do not usually represent to ourselves these insides either in the way of visual, tactual, or motor imagery. If we expressly make the attempt to do so, we picture cross-sections of the object taken in various directions. But in this process we are only making explicit what is already implicitly apprehended. We are enabled to make these ideal cross-sections only because we have already recognised the object as having a certain definite volume. This is the noetic synthesis which guides our ideal analysis.

The synthesis of the data of different senses in the perception of a single object is a topic on which associationists specially love to dwell. But introspective analysis easily shows that it cannot be accounted for by association of ideas. Consider first the relation of tactual to visual extension. When I glance at an apple, and recognise it as such, I may, if I am so disposed, mentally recall a series of images corresponding to the experiences which would arise if I explored the surface of the object with my hand. But it certainly is not necessary that I should do so. In most cases I do nothing of the kind. When the thing perceived only appears for a moment and then disappears, there is no time for any such

process. Yet it cannot be truly said that what I recognise is merely the visual appearance, as such: for, as we have just shown, visual appearance, as such, is not recognised except in so far as it is taken to correspond with the real shape and size of the thing. The real shape and size, as such, are not apprehended as either specifically visual or specifically tactual. The varying visual presentations of the object and its presentation to touch, are modes in which the real extension appears. This real extension logically includes the synthesis of the various optical percepts with each other and with the tactual. Its complex totality is apprehended in any particular perception only in a schematic way. To ideally resolve it into its constituents requires time and effort. As a noetic synthesis, it systematises our procedure when we observe and explore the object in detail by a series of muscular movements, or when we ideally analyse it. When I see a familiar thing, I feel that if I wish to examine it I shall know what to look for and how to find it. I have a prenotion or presentiment of the whole before I resolve it into its components. The complex percept is constituted by this prenotion. The case seems somewhat different when the object is touched without being seen. When this is so, there is a strong disposition to supplement the tactual percept by the visual picture. But a long series of observations on this point has fully convinced me that the visualisation, though frequent and natural, is by no means universal. In touching an object in the dark I can often, by a previous volition, exclude the revival of visual imagery. I know in the moment of contact that I can if I choose realise what the thing looks like; but I refrain from doing so. This knowledge that "I can if I choose" is noetic synthesis; and so is the anticipation which sometimes occurs that the image is going to emerge even against my will. The connection of smell and hearing with the other senses is of similar nature. When I hear a bell, and know it to be a bell, I may or may

not picture it. The smell of a rose may or may not recall the specific representation of its shape and colour. What actually happens varies greatly with different persons and in different circumstances.

But if association of ideas forms no essential part of the ordinary perception of things, it remains possible that what we have called impressional association may be present. In other words, the visual appearance may, by its preformed connection with tactual experience, be modified in a peculiar way, so as to be the vehicle of percepts for which it would otherwise be incompetent. There is something to be said in favour of this view. We say that a thing looks "hard" or "soft," "smooth" or "rough," "cold" or "hot," "sharp" or "blunt". Do these distinctions simply express differences in the optical experience itself, as such? The evidence seems to exclude such a supposition. Ice looks cold, because we have felt it to be cold. If it had always been warm to the touch, it might have looked warm. Yet its cold look is not a suggested *idea;* it is something which is presented as if included in the visual appearance as an integral part of it. It belongs to the impression in such a way that any attempt to separate it destroys its specific character. We are tempted to regard it as a modification of visual experience imparted to it by previous association with experiences involved in contact. This is perhaps still more obviously implied in the "wet" or "dry" appearance of things to the eye. To take another instance, it sometimes happens that in a mountainous country the condition of the atmosphere makes the scenery appear dreamy and unsubstantial. The illusory impression persists in spite of the full conviction that the objects seen are very substantial indeed. However far we may succeed in ideally recalling their true nature, they continue to preserve their unreal and dreamlike appearance to the eye. Sound furnishes a good illustration of these acquired modalities of sensation. Thus we speak of cracking, crash-

ing; bursting, splitting, grinding, rushing noises. Doubtless in each of these cases there is something specific in the auditory impression itself apart from association; but this does not seem sufficient to explain the distinctive peculiarities of the impressional experience. There seems to be more in the impression than is actually heard: this added element nevertheless qualifies the noise itself, much as overtones qualify a musical note.

This peculiar kind of impressional association seems to be recognised by Dr. Ward in his *Encyclopædia* article; at any rate, he gives a very good illustration of it. "The sight of a suit of polished armour instantly reinstates and steadily maintains all that we retain of former sensations of its hardness and smoothness and coldness:"[1] he points out that this mode of mental combination is widely different from that which is properly entitled "association of ideas," such as is exemplified when the sight of the armour "calls up ideas now of tournaments, now of crusades, and so through all the changing imagery of romance".[2] On the other hand, he seems to draw no line of demarcation between the noetic synthesis involved in perception, and the increased complexity of impression which may arise from preformed association. He seems to refer to both indiscriminately, when he speaks of "the manner in which the constituent elements in a perception are combined". He proposes to give the name Complication to the peculiar mode of synthesis characteristic of a percept. I adopt this suggestion so far as concerns impressional complexity. But I am inclined to regard such amalgamation as a special case of the working of the associative principle, whereas Dr. Ward confines the application of the term *association* to ideas exclusively. My reasons are: (1) That so far as association is operative in determining an ideal

[1] *Encycl. Brit.*, 9th ed., No. xx., p. 57.
[2] *Ibid.*

train, it manifests itself as essentially analogous in nature to the principle on which complication depends; (2) That a criticism of the associationist point of view can only be made thoroughly effective if we give the widest possible range to their principle of explanation.

It may be contended that both perceptual synthesis and complication are initially association of ideas, and that they took their present form through the influence of habit. As far as regards perceptual synthesis we have to urge against this view the comparatively late development of ideas. Even the shortest ideal train presupposes the existence of a noetic synthesis which determines and controls the succession of its parts. As Dr. Ward says: "Ideas as such are from the first complex, and do not begin to appear in consciousness apart from the impressions which they are said to reproduce, till these impressions . . . have been more or less firmly synthesised into percepts or intuitions".[1] It is true that complex perceptual synthesis conditions from the outset an orderly sequence of experiences, but this sequence is initially a sequence of percepts, determined by appropriate movements. So far as regards complication, the case is perhaps not quite so clear. It may, however, be fairly urged: (1) That the actual nature of the impressional complexity is not accounted for by supposing it to originate in association of ideas. Through habit a series of ideal revivals may come to take place automatically. We have a conspicuous illustration of this in a train of words which express thought without being themselves attended to; but in this case there is no complication in the restricted sense of the term. The word remains an experience distinct from the thought which it expresses, and can easily be recognised as such by introspection. In order to lead to complication, on the contrary, the idea would have

[1] *Encycl. Brit.*, 9th ed., No. xx., p. 57.

to lose its separate existence entirely, and be amalgamated with the impression. (2) That in being so amalgamated, it would cease to be an idea, and become an impression by mere repetition. Evidence of the possibility of such a transformation under such conditions is not forthcoming. (3) That the assumption seems unnecessary. Impressional association is of itself enough to account for the result; and we have already given reasons for regarding such association as possible, at least in the manner and degree required. It is best to regard complication as a precondition of complex perception, and complex perception as a precondition of ideal revival. To go further into this question here would lead us too far in the discussion of genetic problems which are reserved for another treatise.

§ 6. Grades of Perceptual Complexity.

The different grades of complexity of perceptual synthesis may be illustrated by a comparison of normal human beings with idiots. With the normal child all the senses concur towards the same end. With idiots, on the contrary, a single sense, or at the most two, are brought into play by an impression. This impression remains isolated. It does not produce a cognition in which the data of different senses are synthesised. Some idiots are almost exclusively confined to visual perception, others to auditory. In the case of blind or deaf persons, the sense which does not exist cannot be awakened: it is otherwise with the idiot. With him the organ exists, but perception is defective and badly organised, so that it cannot be excited without assistance. Thus in the training of idiots it is necessary to develop the senses, or rather the perceptive centres, exclusively; to make use of those which fulfil their function in order to develop those which do not; to force these last to develop themselves by making their exercise a condition of the attainment of pleasure and of the satisfaction

of desire. In this way, by a long and tedious course of training, it becomes possible to raise the idiot more or less near to the level of ordinary perceptual consciousness. This perceptual consciousness is a common possession of the human race under normal conditions, because the predisposition to it is transmitted by heredity, and its development is provided for by the elementary and universal conditions of human life. Animals, on the contrary, and especially the lower animals, have much simpler percepts. Fishes which can see may none the less identify their prey merely by smell, without the aid of vision.

§ 7. How does a Sense-Impression Suggest a Percept?

We have seen that complex perception does not consist in a given impression reviving a cluster of faint images of previous impressions. None the less it does involve a mental transition which may be properly called a *suggestion* or reproduction. What is primarily given is a certain impressional experience having a specific character, and this suggests the percept of an object having a correspondingly specific character. Now, this connection between the sense-experience and the percept is not of course ultimately dependent on association. It follows from the very nature and genesis of the percept as a correlation of sensory data that these data should be capable of bringing it into consciousness. Nevertheless, the associative principle must co-operate from the outset in the perceptual process. It comes into play in so far as the transition from a given sensory experience to a corresponding percept is strengthened by repetition. Thus, if a similar impressional experience is connected with two different kinds of objects, the resulting percept will, *ceteris paribus*, be that of the object which is most familiar. We may take as an example the fact that a human face does not appear hollow in the pseudoscope.

As Professor James says, "to couple faces and hollowness violates all our habits of association".[1] The general possibility of the transition from sense-impression to percept depends upon the existence of the percept as something distinct from the sense-presentations to which it serves as a rallying point and centre of connection. But, in the case of this or that special transition, the strength of the suggestive tendency is conditioned by association, *viz.*, by repetition in previous experience. The part played by association becomes more prominent in proportion as the percept is more determinate and specific. Thus my apprehension of a thing simply as a solid body depends on a general form of noetic synthesis, probably preconditioned by inherited brain structure; but my apprehension of it as a chair, or a table, or an apple, or an orange, depends in a much larger measure on the repetition of special experiences. Association serves to particularise general modes of noetic synthesis.

§ 8. Noetic Synthesis and the Train of Ideas.

In general, ideal revival involves a higher level of noetic consciousness than even complex perception. The existence of an inward train of mental imagery presupposes an interest independent of the actual presentation of the corresponding object to the senses. It presupposes the direction of mental activity to some end which cannot be attained, or cannot be so well attained, by immediate bodily action on the occurrence of the appropriate external occasion. This end constitutes the unity of the train of ideas. It involves reference to an object which becomes progressively specified as the successive links of the series emerge. Even when the ideal series consists simply in the mental representation of the various qualities and aspects of a particular object of perception, the ideal

[1] *Psychology*, vol. ii., pp. 87-88.

revival has a motive which transcends the interest of direct perception. It may be that, as in the case of the apples and oranges which we have discoursed about above, the analysis is prompted by psychological curiosity. It may be that we wish to fix the character of the object in our memory, or to mentally compare it in detail with other objects, or to decide on its fitness for a special use we propose to make of it. I may see a fork, identify it at once, and in consequence apply it to its appropriate purpose. On the other hand, I may find that I have lost my corkscrew, and it may occur to me that perhaps the fork may do instead; I may then mentally picture it in its supposed application, and ideally anticipate the probable result. In the end, I may refrain from the use of the fork, and perhaps try a penknife or knock off the head of the bottle. The comparison of the relative fitness of these different means, in view of the proposed end, further complicates the ideal series. Throughout it is the reference to the proposed end which at once gives unity to the series and constitutes its *raison d'être.* From the genetic point of view it is probably in such revivals as this that the life of ideas emerges from the life of percepts. A more advanced form of mental train is found in the memory-series which ideally represents a sequence of past experiences in their original order. Here the noetic synthesis involves the more or less definite apprehension of a period of time as a whole, and the successive steps represent in detail the successive moments as they followed each other in the past. Time-consciousness of this kind is very much in advance of anything which is necessarily involved even in complex perception. There is yet another way in which ideal synthesis transcends perceptual synthesis. Not merely the series as a whole, but its component parts, involve a more comprehensive objective reference. This is obvious in the case of the higher processes of thought, where the links of the ideal series are

represented by general terms ; *e.g.*, the train of thought which I am now following is very far indeed from being a mere literal translation into ideal imagery of a series of percepts. But the same holds good, in some degree, even in more concrete revivals. Ideas are always, in some measure, more generalised than percepts. In a memory-train it is true that we may refer each object as it emerges to a particular place and time ; but this reference to "there" and "then" is distinct in nature from the perceptual "here" and "now". It is, so to speak, a general and abstract "there" and "then" ; it is determined by the relations of the several parts of the time-series to each other, and it presupposes that apprehension of the series as a whole which determines the order and connection of the parts. The "thereness" and "thenness" as thus determined may even be considered in abstraction from the nature of particular objects, and so become the subject-matter of mathematical science. Again, inasmuch as successive ideas interest and engage attention only in so far as they contribute to realise an ideal end, and so serve to work out a train of thought, the determinate particularity of percepts would in their case be an irrelevant encumbrance. It seems also, in point of fact, unattainable for the vast majority of mankind. Apart from exceptional effort to attain vivid and detailed reproduction, mental imagery is usually indistinct and blurred as compared with the corresponding percepts. Taken in isolation, an image answers rather to the common features of a multiplicity of varying percepts than to any special one of them in particular. The particularity of a percept arises from the determinate nature of the impressions which condition it. In the case of the idea these impressions are absent. The ideal apprehension is not, therefore, particularised in this way, but in quite a different way. The thought-reference in this case is restricted and limited by the relation of the terms of the ideal series to

each other and to the whole. Every image is in some degree a generic image.

The varying degrees of noetic synthesis within the sphere of ideal and conceptual consciousness broadly correspond to the degree of intelligence of the individual, either in general, or in certain special directions. The more developed it is, the less conspicuous by comparison is the part played by mere association. A person of disciplined intelligence in narrating an occurrence brings together the really relevant points as parts of a systematic whole, discarding whatever is superfluous. A country yokel seems unable to proceed otherwise than by casual associations of proximity in time and space. The important items are for him so embedded in a flood of irrelevant details that it is difficult to disentangle from his chaotic narrative the essential circumstances. In other words, there is present in the one case a mental synthesis which is absent in the other. In the one case the vivid, distinct, and persistent apprehension of the train of events as a whole, so controls and guides the ideal train as to prevent divergence into cross series which would interrupt and tangle the narrative. In the other no such mental clue is definitely and steadily operative. Hence each casual association due to coincidence in place and time is liable to lead to digressions. Nor are such differences merely a matter of education. Given two persons with equal opportunities and equal industry, and it may happen that there are levels of noetic synthesis easily attainable by the one and utterly out of the reach of the other. There are some persons whom we could not by the wildest stretch of imagination suppose capable of understanding the binomial theorem, or of appreciating literary style, or of conceiving a moral ideal, or of making an architectural plan of any complexity. And yet such people may have excellent memories, and may have exceptional perceptive endowments. How far the possible

advancement of intelligence is from depending on the amount of material furnished for mental elaboration by the senses is well seen in the case of Helen Keller. Her intellectual grasp in the most varied departments of knowledge is markedly superior to that of most children of the same age, and yet she has been from infancy limited to the sense of touch.

A few special illustrations will serve to place in a more definite light the nature of noetic synthesis. Take first what phrenologists call "Locality," or the power of combining the relative position of places in a systematic whole. This is a power that I myself possess in a very small measure. I can therefore sympathise with the helplessness of the Damaras, as described by Mr. Galton. "A Damara never *generalises;* he has no one name for a river, but a different name for nearly every reach of it; thus the Swakop is a Namaqua name; there is no Damara word for it. A Damara who knew the road perfectly from A to B, and again from B to C, would have no idea of a straight cut from A to C; he has no map of the country in his mind, but an infinity of local details. He recollects every stump or stone, and the more puerile the object the more strongly does he seem to recollect it. Thus, if you say, 'I intend to sleep by the side of the great hill where the river-bed runs close under its foot,' he would never recognise the place by the description, but if you said, 'under the tree, a little way on the other side of the place where the black and white ox lowed when the red ox was in front of him, and Koniati dropped his assegai,' etc., etc., every savage in the party would understand the exact locality. The Damaras pick out their way step by step; they never dream of taking a course and keeping to it. All their observations are directed to spoors, sticks, and stones, and they perpetually look down on the ground, and not round about them."[1]

[1] F. Galton, *The Narrative of an Explorer in Tropical South Africa*, pp. 176-177.

We find the opposite extreme in savages who live by the chase, such as the North American Indians or the Australian aborigines, who seem almost incapable of losing their way. Another test of this sense of locality is the power of finding one's way about in a building. Personally I suffer considerable inconvenience in a large hotel, as I become ashamed of having continually to ask waiters where my rooms are. Even when I do become able to find my way about, it is only in a sort of hand-to-mouth fashion. I do not really apprehend the relative positions of places; when I see and recognise a certain object I remember that I have either to pass it or to turn, and thus I find my way, so to speak, like the Damaras, "step by step".

Another good illustration of noetic synthesis is furnished by the differences in the apprehension of number which we find in different individuals. Zerah Colburn, "on being asked the square root of 106929, answered 327, before the original number could be written down. He was then required to find the cube root of 268336125, and with equal facility and promptness he replied 645."[1] "On being requested to give the factors" of "171395 . . . he named 5 × 34279, 7 × 24485, 59 × 2905, 83 × 2065, 35 × 4897, 295 × 581, and 413 × 415."[2] He identified prime numbers as soon as they were proposed. "On being interrogated as to the method by which he obtained these results, the boy constantly declared that he did not know *how* the answers came into his mind." He was not "able to perform on paper a simple sum in multiplication or division".[3] Now, whatever may have been the exact procedure of Colburn, one thing is evident. The large numbers with which he dealt in such a marvellous way must have had the same kind of

[1] Dr. Carpenter, *Mental Physiology*, p. 233. [2] *Ibid.*
[3] *Ibid.*, p. 234.

transparence for him as simple numbers such as 9, 6, 12, or 3. The figures given him represented from the outset in his mind a systematic synthesis of all the various processes which the constitution of the number admitted of. He had only to translate into explicit apprehension the knowledge which he consciously possessed as an implicit apprehension. His mental attitude towards the number 106929, when he was asked to give its square root, was in its initial stage comparable to what mine would be if I were asked to give the square root of 25. We find an instructive contrast to this case of extraordinary mental endowment in the exactly opposite condition common in idiots. As a rule, the utmost in the way of arithmetic that idiots are capable of learning is addition, and occasionally subtraction.

Certain idiots have a good auditory memory, which enables them to add up without any real insight into the nature of number. Thus they say, 2 and 2, 4; 4 and 2, 6, etc. It is the same with multiplication by 2, 3, and 5. But if instead of following the order of addition or multiplication with which they are familiar, the numbers are inverted, they are no longer able to proceed.[1]

As another illustration of noetic synthesis we may take the apprehension of grammatical form. The analysis of language into distinct parts of speech, and the grouping of these parts of speech in appropriate order and with appropriate inflections, into sentences, involve a general apprehension of syntactic form guiding and controlling the serial succession of words and ideas. In certain diseases of language this synthetic apprehension becomes seriously impaired. Inflections and connecting particles are omitted; the order of words becomes chaotic, and it is only with great difficulty that the meaning can be divined. Dr.

[1] J. Voisin, *L'Idiotie*, p. 213.

Broadbent describes a case of this kind. The patient was evidently unable to "propositionise". Though names were more or less remembered, there was loss of the faculty of constructing a sentence. Thus the patient corrected "the statement that he awoke up from sleep paralysed and speechless, somewhat as follows: 'No—evening, evening—put down my cigar—smoking, smoking not quarter of an hour—all at once'—indicating by gestures the loss of power in the limbs, and adding—'Couldn't speak'. Again, wishing to inform me that he had heard from a brother in America, to whom a friend had written respecting his attack, he came up to me, fumbling in his pocket for a letter (not the one from his brother, as he told me on inquiry), and saying 'Brother — brother —'Merica — letter — New York—two brothers in America'."[1] In a case quoted by Kussmaul from Gogol, a young man on being asked to give the history of his own illness, replied: "Ich habe 1869 als Kutscher gewesen und als Kutsche habe welche mir als ich diene haben es mir meine Pferde als Kutscher bei dem der Diener gewesen. Und ich musste es runter auf meine Kutscher und haben sie meine Eisen und haben sie Pferde auf mein Fuss und meine und da haben sie das Eisen auf meine Kopf und das Blut ist fort."[2]

As an example of a remarkably high level of noetic synthesis, we may quote without comment from Mozart's own account of his method of composition. "My subject enlarges itself, becomes methodised and defined, and the whole, though it be long, *stands almost complete and finished in my mind*, so that I can survey it, like a fine picture or a beautiful statue, at a glance. Nor do I hear in my imagination the parts *successively*, but I hear them, as it were, all at once (*gleich alles zusammen*). . . . When I proceed to write down

[1] *Brain*, vol. i., p. 486.
[2] Kussmaul, *Störungen der Sprache*, p. 199.

my ideas, I take out of the bag of my memory, if I may use that phrase, what has previously been collected into it in the way I have mentioned. For this reason, the committing to paper is done quickly enough; for everything is, as I said before, already finished."[1]

§ 9. Mutual Implication of Synthesis and Analysis.

The advance of noetic synthesis in complexity necessarily involves a corresponding analysis. In order that the parts of a whole, as such, may be combined, they must be distinguished. When a person first hears a foreign language, it is for him a confused jumble of sounds, in which he fails to distinguish the separate words and sentences. His condition is comparable to extreme phases of that form of aphasia which is called "word-deafness". In process of time he gradually learns to divide the components of the language and to identify each separately. In so doing, he performs both an analysis and a synthesis, each of which is impossible without the other. He analyses in so far as he distinguishes the separate words and sentences from the stream of sound in which they occur; on the other hand he at the same time, and by the same process, combines and identifies as a whole the sounds which enter into the composition of the units of speech which he learns to distinguish. So the ability to give an orderly and clear account of an occurrence, without being led off by casual associations into irrelevant details, obviously involves analysis as well as synthesis. Insight into the essential interconnection of the events narrated, at the same time involves a sharp distinction of these events from each other, and from their superfluous accompaniments.

There is yet another way in which analysis may involve

[1] Holmes's *Life of Mozart*, pp. 317-318.

synthesis and *vice versâ*. In distinguishing a component of one whole, we usually connect it with another. Thus, in the above instance, to distinguish a word as a component of a spoken discourse is *ipso facto* to identify it with other similar words. So in general, to discriminate a thing from the context in which it appears is to refer it to some other context in which it has appeared, or may appear. In this way different modes of noetic synthesis, so to speak, intersect each other, and are interwoven in a complex system. If we conjoin this kind of union with that involved in the relation of higher to lower syntheses, we obtain something like an adequate conception of the systematic unity which characterises a developed mind as a whole.

§ 10. Noetic Synthesis and Apperception.

The above exposition naturally suggests a problem of fundamental importance. How does noetic synthesis arise? By what process do we pass from a lower grade of it to a higher grade of it? The answer to these questions, so far as it falls within the scope of the present volume, will be discussed in the chapter on Apperception. In order to define apperception, we must combine the conception of retentiveness with that of noetic synthesis. When we consider a noetic synthesis not merely as involved in this or that conscious process, but as a mode of mental grouping which persists as a disposition when it has ceased to operate in actual consciousness, we have the idea of an apperceptive system. It is through the gradual growth and differentiation of such systems that new phases of noetic synthesis arise. Of especial importance in this connection is the effect of the development of one system on the development of another, as conditioned by that intersection of different modes of noetic synthesis referred to in § 7. The process which I have called Conflict

is also an indispensable factor. Before attacking this problem at close quarters, it will be necessary to consider two topics: (1) That aspect of association, and especially of association as controlled by noetic synthesis, which appears in its most developed forms in the mental transitions which constitute reasoning and constructive imagination. This subject will engage us in chap. vi. on Relative Suggestion. (2) The connection of cognitive grouping with conation, which will be treated of in chap. vii.

§ 11. Final Remarks.

It may be said that at present the psychological world is divided into two camps; on the one side are the champions of Association, on the other the champions of Apperception. In the present chapter I have definitely sided with the second party. I cannot find in association, in the widest sense of the word, the sole ultimate form of cognitive combination. What I termed noetic synthesis undoubtedly has a rough correspondence with what Wundt calls apperception. There is, however, an important distinction. Noetic synthesis owes, in my view, its peculiarity to the introduction of a distinct kind of mental factor, the apprehension of the whole which determines the order and connection of the apprehension of the parts. This apprehension of the whole is a content of consciousness which operates in a certain assignable way. Such a conception is widely different from that of the reaction of consciousness upon its own content, which seems to form the essence of Wundt's "apperception". I venture to think that my position is not open to the objections brought by such critics as Münsterberg against that of Wundt. The main point of Münsterberg's contention I take to be as follows. In order to define and investigate a process, we must be able to assign the special and definite terms between which it takes place, the special and definite factors which enter into it.

Now Wundt's "consciousness" or "disposition of consciousness" cannot be regarded as such a special and definite factor; therefore his whole procedure must be involved in vagueness and a kind of mystery. This objection does not extend to the conception of noetic synthesis; for the schematic apprehension of a whole is as much a distinct content of consciousness and a distinct factor in mental process, as is the sensation of red or blue. Another aspect of Münsterberg's contention is the alleged difficulty or impossibility of assigning a clearly intelligible physiological correlate of apperception. This cannot, I think, be fairly urged against the conception of noetic synthesis. Higher and lower levels of noetic synthesis correspond to higher and lower levels of neural synthesis. We have already to hand an impressive pictorial expression and illustration in that progressively higher and more complex combination of movements which is traced by such writers as Dr. Hughlings Jackson to a progressively higher representation of the motor impulse of the brain. We have only to suppose the brain to be organised through and through on the same plan, and we have at once a physiological counterpart of the systematic organisation of the mind as above described.

CHAPTER VI.

RELATIVE SUGGESTION.

1. UNCONSCIOUS INFERENCE.

SOME of our most distinguished modern psychologists have shown a strong disposition to recognise in the elementary processes of perception and association the rudimentary presence of those mental operations which, in their higher form, we call reasoning and constructive imagination. Helmholtz, in particular, has emphasised the inferential or ratiocinative nature of those judgments of size, shape, and distance which form essential constituents of our visual perception of space. In such perceptions we have, according to him, an analogue of the syllogism. The major premiss is the cumulative result of a series of experiences which in their particularity have vanished from memory. The new sense-impression which emerges in the present perception forms the minor, to which the rule registered by previous observation is applied. This psychical process he holds to be operative from the lowest to the highest stages in the development of our mental life.[1] James criticises this view as follows: "If, every time a present sign suggests an absent reality to our mind, we make an inference; and if every time we make an inference we reason; then perception is indubitably reasoning. Only one sees no room in it for any unconscious part. Both associates, the present sign and the contiguous things which it suggests,

[1] *Die Thatsachen in der Wahrnehmung*, pp. 26-27.

are above-board, and no intermediary ideas are required."[1] "Our rapid judgment of size, shape, distance, and the like, are best explained as processes of simple cerebral association. Certain sense-impressions directly stimulate brain-tracts, of whose activity ready-made conscious percepts are the immediate psychic counterparts."[2] Now, it may be admitted that this criticism is justified as against any attempt to find a formal parallel between the process of perception and a logical schema such as that of the syllogism. The absence of the major premiss is sufficient to vitiate the supposed analogy. But the major premiss is absent, as such; it is certainly not present for consciousness; and the assumption of Von Hartmann that it has an unconscious existence is at any rate devoid of all psychological justification, however we may regard it from a metaphysical point of view. It does not, however, follow that the perceptual processes which Helmholtz has in view are fully and accurately characterised as "simple cerebral associations". What is questionable in this formula is the word "simple". If this means that the working of association in perceptual process is merely reproductive, the statement of James covers a fallacy. Psychologists in genera show a tendency to ignore the constructive aspect of mental process in its lower phases. They recognise mental productiveness only in complex and advanced stages of development. Thus in Bain's *Senses and Intellect*, out of the 306 pages devoted to the intellect, only the last 42 deal directly with what he calls "Constructive Association". Throughout the whole of the preceding 264 pages he has in view "the literal resuscitation, revival, or reinstatement of former actions, images, emotions, and trains of thought". This procedure appears to be founded on a false view of the nature both of association and of construction.

[1] *Psychology*, vol. ii., pp. 111-112.
[2] *Ibid.*, vol. i., p. 169.

§ 2. MENTAL PRODUCTIVENESS IN GENERAL (1).

The ultimate root of Professor Bain's fallacy has been laid bare by Mr. Bradley. It lies in the tacit assumption that association is a link between particulars, as such. On this view, when the sight of a particular piece of sugar suggests sweet taste, what happens is as follows. In the past we have experienced a particular sweet taste in connection with the particular visual appearances of particular bits of sugar. When now I see a new bit of sugar, the association which revives the sweetness is that between the preceding particular past experiences, as such. Hence it is assumed by Bain that the piece now seen must first reproduce the particular visual appearance of past pieces before it can resuscitate the sweetness; and also that the sweetness actually revived is a particular sweetness which has been previously experienced. It is obvious that in this process there is absolutely no room for mental construction. The process is essentially one of literal resuscitation. If there is any novelty in the new product it is the result of accident due to obliviscence, etc. But the process as described is a sheer impossibility and absurdity. The only particular which is actually operative is the given particular. It is this special piece of sugar as seen by me at this special moment which recalls the sweet taste. The past particular experiences of other particular bits of sugar no longer exist, and therefore cannot operate. If, *per impossibile*, they did exist and operate, they would not account for the actual result. What is suggested is not past particular experiences of sweetness, but the idea of a new particular sweetness connected with the present bit of sugar. *This* sugar suggests *this* sweetness. The special conditions included in the word "this" enter into and modify process and result. If the sugar seen is beyond my reach, then the sweetness suggested is a sweetness beyond my reach, although in all my

past experiences the sugar may have been easily attainable. If it be a bigger piece of sugar than I have before had experience of, I anticipate a more extended enjoyment of its sweetness.[1] To take another example: Mr. Lloyd Morgan tells a story of a little boy who, "after gazing intently at a spirited picture of a storm at sea with a ship being struck by lightning, asked, 'Mother, why doesn't it rumble?'" Now, what kind of a rumble was in this case actually suggested to the boy? Was it anything in the nature of a literal reproduction of any thunderclap which he had ever heard? If he had heard an actual peal of thunder at the moment, this would not have fitted itself in as a natural complement of the painted scene. If his mother had told him that painted lightning could only be accompanied by painted thunder, the answer would in all probability have appeared to him a satisfactory one. But the point of it would have lain in the modification of the process of reproduction by the special features of the datum from which it starts—special features which, as such, have never been associated with the idea suggested. In this case the idea suggested is an absurdity, but this does not affect the general principle.

As against the particularism of the associationists, Mr. Bradley lays down the axiom that "Association marries only Universals". In other words, the connection which is operative in the process of revival is not between atomic particulars as such, but between general elements of content which they have in common. This principle is inseparably correlated with another, which requires to be specially emphasised in view of our present topic. We can only understand mental construction when we bear in mind that any

[1] See F. H. Bradley's *Principles of Logic*, bk. ii., pt. ii., chap. i. Readers who are not already familiar with this chapter are particularly requested to consult it if the above condensed statement does not appear to them perfectly transparent and evident, and also important.

actual reproduction is the work of the present psychological datum. The special features of this give a special embodiment to the preformed general connection. Before inquiring into the manifold modes in which this can take place, we must investigate some other associationist fallacies, with a view of bringing into yet clearer light the essential nature of mental construction.

The fundamental fallacy of the associationists, as exposed by Mr. Bradley, lies in their bias towards psychological atomism. Behind this tendency there lies an obstinate disposition to explain the nature and existence of a whole exclusively by reference to the nature and existence of the parts which are combined in it. From this point of view the parts must be supposed to pre-exist before they are combined, and to pre-exist in such a way that they need only to be in some undefined manner externally brought together or associated in order to constitute the whole which contains them. Thus, in psychology, if we push this mode of explanation to its logical limit, we shall find it necessary to assume implicitly or explicitly a plurality of separate and independent existences; which, being shuffled sufficiently, give rise to all mental combination and composition.

From this primary fallacy there flow three derivative errors, which go far to vitiate the associationist doctrine of the productive aspect of mental process. The first of these is the exclusive emphasis which it lays on mere combination. The novelty of a mental construction is made to consist entirely in the meeting of elements which have not been conjoined before. Thus Bain says: "The new combinations grow out of elements already possessed by the mind, and brought to view according to the laws already laid down".[1] These laws are the laws of "literal resuscitation, revival, or reinstatement".[2] As against this view we advance the counter-pro-

[1] Bain's *Senses and Intellect*, 4th ed., p. 606. [2] *Ibid.*, p. 605

position that every new synthesis results from the further determination of a psychical whole which in some way already pre-exists. The new synthesis consists in the distinction and definition of the parts and relations within this prior whole. To regard it purely and exclusively as a synthesis involves no less an error than to regard it purely and exclusively as an analysis. It is like the shuffling of a pack of cards; the various combinations which take place presuppose the general and relatively indeterminate combination, in virtue of which the cards constitute a pack at all.

In the second place, there is a complete failure on the part of the associationists to recognise the apprehension of a *form* of combination as a distinct psychical element. The presented whole is for them simply the sum of its presented components. If the atomistic bias in psychology were followed up with full logical rigour, it would lead to the conclusion that if each one of a number of different persons had cognisance of an isolated part of a building, they would collectively cognise the building as a whole. Against any view pointing in this direction, we urge the result which we have already at great length explained and defended: the presentation of a form of synthesis is as distinct from the presentation of the elements combined considered apart from their union, as the presentation of red is distinct from the presentation of green.

Finally, the associationist has a strong disposition to regard mental elements as entering into new combinations, without themselves undergoing transformation in the process. This never is and never can be true. Elements which enter into a new whole, receive new qualifications from their relations within this whole; and they must often suffer considerable preliminary modification, in order to make them capable of entering into these relations. The whist-player needs not be told that in every fresh deal the several cards become qualified by their relations within the new whole. To fit in

to the design and plan of a building the stones must be hewn into shape.

§ 3. Mental Productiveness in General (2).

These illustrations are, of course, mere illustrative metaphors, not examples. Abundant exemplification will be found throughout the remainder of this chapter. But our special topic is not mental construction in the widest sense, but rather constructive suggestion as a productive aspect of associative revival. We shall here, therefore, give preliminary exemplification in a case where the part played by association is comparatively inconspicuous, because the elements combined appear to be supplied from without by sense-perception, not reproduced from within by association.

The following is a case of the sort, as stated from the associationist point of view: "Suppose," says Mill, "that a phenomenon consists of parts, and that these parts are only capable of being observed separately, and as it were piecemeal. When the observations have been made, there is a convenience (amounting for many purposes to a necessity) in obtaining a representation of the phenomenon as a whole by combining, or as we may say piecing, these detached fragments together. A navigator sailing in the midst of the ocean discovers land: he cannot at first, or by any one observation, determine whether it is a continent or an island; but he coasts along it, and after a few days finds himself to have sailed completely round it; he then pronounces it an island. . . Did he infer anything that had not been observed from something else that had? Certainly not. . . . That the land in question is an island is not an inference from the partial facts which the navigator saw in the course of his circumnavigation; it is the facts themselves." [1]

[1] *Logic*, 9th ed., vol. i., p. 338

In this statement there is an exclusive emphasis on mere combination; the process is a piecing together of detached fragments. The whole which results is described as a mere external juxtaposition of what had previously been given piecemeal. "That the land in question is an island . . . is the facts themselves; it is a summary of those facts."[1] Further, there is no indication that the detached fragments in any way alter their character in becoming components of the complex fact. They are taken together instead of being taken separately; but their juxtaposition makes no difference to them. They acquire no new relations: for nothing is inferred "that had not been observed from something else that had". Now, all these assumptions are uncritical and erroneous. In the first place, the parts to be put together are not initially apprehended in pure isolation from each other. The navigator starts by considering them under a certain point of view; if he does not think of them as part of an island, he at least thinks of them as part of a coast-line. The process of piecing them together is only possible because it is also a process whereby this relatively vague and indeterminate unity which is implied in his initial point of view receives progressive determination in detail. It follows from this that the whole which results cannot accurately be described as a mere summary or external juxtaposition of the partial observations. It is the specific determination of a certain kind of whole which has been present to the navigator's mind from the outset. The form of combination involved can be represented when the special features given in each particular observation are obliterated: as when the coast-line is laid down on a map. This becomes still more evident when we consider the third point. It is untrue that nothing is inferred, or at least made inferable,

[1] *Logic*, 9th ed., vol. i., p. 338.

which had not been inferred before. The union of the "fragments" in a presented whole brings to light innumerable new relations before unseen. When the coast-line is known to be that of an island, we know that by starting from any part of it and walking inland in a given direction we shall reach the sea; further, when the outline of the coast as a whole has once been fixed, the relation of any part on it to any other part or parts whatever, and of each to all collectively, has been implicitly determined. Nothing but analytic attention is needed to ascertain these new relations which are involved in the form of the whole. Of course this analysis is also a synthesis. In selecting special points of the spatial whole, and considering them in relation to each other, we construct new combinations, and each of these involves new inferences. In determining the relation of *A* to *B*, and *B* to *C*, we determine the relation of *A* to *C*. Thus the discovery of the shape of the coast-line which the circumnavigator makes involves a concentrated infinity of inferences. We shall revert later to the relation of inference to mental construction.

What has been said of the circumnavigator's discovery holds good, *mutatis mutandis*, of the example which formed the main bone of contention between Mill and Whewell,—Kepler's discovery of the orbit of Mars. Kepler started with the presumption that the planet described some regular curve in its course: the nature of this curve became defined through successive observations of the special positions which the planet successively occupied. In one point, however, this example differs from that of the island. It clearly involves not merely construction, but constructive reproduction. The path of the planet between the observed points had to be mentally supplied by Kepler, in accordance with analogy. A process of this kind is what I propose to call *Relative Suggestion*, a term adapted from Thomas Brown. It may manifest itself in

the most multiform way. In the next section we shall distinguish some of its principal modes. We shall then proceed to show how it pervades primitive phases of mental life. We shall afterwards make special reference to the part it plays in artistic construction and in inference, formal and informal.

§ 4. Types and Examples of Relative Suggestion.

"Association marries only Universals." It depends on a general connection, but its specific working in each case is conditioned by the specific and relatively new nature of the present psychological datum in which the process of reproduction has its starting point. The most general formula for it is: *If the presented content b has formed part of a presented whole bc, then the presented content β, when it recurs, will tend to call up a whole βγ formally corresponding to bc.* But the simplicity of this ultimate principle may be complicated in endless ways. The β which corresponds to b may be a simple modification of b, as a lighter grey is a modification of a darker grey; or again, it may involve the relation of b to a new context, and it may happen that the constituents of this new context have associations of their own, which contribute to determine the productive-reproductive process. The following types and specimens are not put forward as by any means exhausting the varieties of Relative Suggestion. They are only intended to indicate the general nature of the possible variations.

(1) We may first consider a class of cases which approaches most nearly to the process of construction without constructive suggestion which we have examined in the last section. A B, and C have severally associates of their own; but they are for the first time brought into combination, so as to form the whole ABC. Their associates are thereby brought into corresponding combination, so as to form a new whole. What

is especially to be noted in such instances is that the associated presentations suffer transformation by being brought into their new connection. A good example is supplied by the use of language. Each word suggests its appropriate meaning, and new combinations of words suggest new combinations of meaning. But the meaning of the several words fluctuates with the context. Except in the case of terms scientifically defined, words have no rigid and unalterable signification. This is, perhaps, most obvious in the case of metaphorical extensions of meaning. Consider the variations in the import of the word "home" in the following sentences: "I am going home"—this may mean something different according as I say it on my death-bed or to a friend in the street; "He drove his weapon home"; "Cromwell drove home his argument against the Pope with English cannon"; "The business of the philosopher is to make himself intellectually at home in the universe"; "A home team"; "A house is not a home"; "Heaven is our home"; "Home-keeping youth have ever homely wits"; "A homely face". This is of course an illustration taken at random; innumerable other words are equally variable. There is a certain common element pervading their manifold occasional meanings; but this common element is an abstraction. In each concrete application of the term its import is specified by the connection in which it occurs; so that even a strikingly novel use of it may be instantly intelligible. Let W stand for the word, and M for its meaning; we have a series M_1 M_2 M_3, etc., of special significations: W is not of itself associated with any of these to the exclusion of the others, and it frequently calls up a modification of M, with which it has never been associated at all. The special modification of M which emerges on any particular occasion is dependent on context and circumstances, which we may denote by C. C of course may vary indefinitely, yielding a series C_1 C_2 C_3, etc. Thus if $W + C_1$ calls up M_1,

$W + C_2$ will call up M_2, and $\frac{W + C_1}{M_1} = \frac{W + C_2}{M_2}$. ' Of course these formulæ are meant only as a device to make the general conception clear; it is not implied that it can be worked out with anything approaching to mathematical precision.

(2) The second group of instances is that in which a certain kind of series is given, and we mentally supply, in accordance with the law of the series, terms in it which are not given. There is an interesting allusion to this mode of Relative Suggestion in Hume. "Suppose a person to have enjoyed his sight for thirty years, and to have become perfectly well acquainted with colours of all kinds, excepting one particular shade of blue, for instance, which it has never been his fortune to meet with. Let all the different shades of that colour, except that single one, be placed before him, descending gradually from the deepest to the lightest; 'tis plain, that he will perceive a blank, where that shade is wanting, and will be sensible that there is a greater distance in that place betwixt the contiguous colours, than in any other. Now I ask, whether 'tis possible for him, from his own imagination, to supply this deficiency, and raise up to himself the idea of that particular shade, tho' it had never been conveyed to him by his senses? I believe there are few but will be of opinion that he can; and this may serve as a proof that the simple ideas are not always derived from the correspondent impressions, tho' the instance is so particular and singular, that 'tis scarce worth our observing."[1] The general problem which Hume is here discussing, is whether the mind can make to itself a new simple idea. This question may fairly be regarded as out of date, and does not concern us here. If we rigorously press the notion of simplicity, a simple idea is a presented content which has absolutely nothing in common with any other presented content. The mind cannot make such an

[1] Hume's *Human Nature*, ed. Green and Grose, vol. i., pp. 315-316.

idea, because such an idea is an intrinsic impossibility. But the special question concerning the filling in of the absent terms of a series, such as that of the gradations in the depth of a colour, is the very question which we are here raising, and we cannot do better than begin by considering Hume's example.

It is plain, as Hume says, that the person in the case which he supposes "will perceive a blank"[1] where the shade is wanting. Now this in itself involves relative suggestion, whether he actually succeeds in recalling the right shade or not. The idea of something qualified by quite specific and definite relations within the series is called up. The case is analogous to that in which on seeing a person we try to recall his name, and fail. There is a reproductive process which is not completed. In the next place, it must be noted that for our purpose the question whether the person has had actual experience of this particular shade of colour before, is irrelevant. By hypothesis, it is not the associations which it has acquired in our previous experience of it, which now recall it. What is really operative is the form of the series. Represent this series by $B_1\ B_2\ B_3\ B_4\ B_6$. B_4 and B_6 suggest B_5, not because they have been previously associated with B_5, but because $B_3 : B_4 :: B_4 : B_5$, and $B_4 : B_3 :: B_6 : B_5$. Besides this, when B_5 is recalled, it is not just the same in nature as when it previously appeared in a different context. In being transplanted, it becomes transmuted. It now appears as a gradation in a series of gradations, and the attributes which belong to it as part of this series may be more important and interesting than any which it previously possessed. The process of suggestion may of course be greatly facilitated by prior experience of B_5; but on the other hand it may not. All depends upon the attention we have paid to it and the fre-

[1] Of course we suppose the threshold of "differential sensibility" to be exceeded.

quency of its repetition. It may be that in past experience it has acquired no associations which of themselves would suffice to revive it, and yet it may be revivable as part of the colour series. In this case previous experience would count as quite a subordinate factor in the result. The question of fact remains: Are we able thus to supply a missing gradation of colour depth? Personally, I find that I do so with pains and difficulty, and with only an imperfect result. But my general power of imaging colours is deficient. A good colour visualiser would, I presume, find no such difficulty. It seems to be a suitable problem for statistical experiment. I find that my power of filling in intermediate gradations is much greater for degrees of loudness in sound, or of muscular effort. It approaches something like accuracy for geometrical images. Given a series of lines, varying in length according to a certain easily discernible ratio, and I can mentally continue the series, or fill in links where it is discontinuous, with what appears to me to be approximate correctness. Similarly with a series of curves of different degrees of curvature. Of course the essential point is that we can make the attempt, and that the result follows from our sense of proportion, and not from any irrelevant association. So far as this is the case, we are mentally productive, though we may be in error. There are, however, cases in which full accuracy is possible. Thus we can continue a simple numerical series, such as 3, 5, 7, 9; or 1, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, with facility and accuracy by mere relative suggestion, until the terms become so large that they require to be calculated according to a formal rule of operation. The continuance of such a series is not analogous to the repetition of the letters of the alphabet. In repeating the alphabet, we depend wholly on association between the preceding and the succeeding letters. In continuing the numerical series, the clue which guides us is the general nature of the serial transition.

(3) In another and very important type of relative suggestion, the mental production consists in supplying terms in one series corresponding to terms in a parallel series. It is exemplified in all reduction or enlargement of the scale of a whole, while the proportion of its parts is maintained. This is an operation which we are constantly performing. It is the mental construction which precedes and makes possible all graphic representation on paper of large objects; all plans of the disposition of a battle, and so forth. In general our mental representations of space-relations are in miniature. Reduction of scale of another kind is to be found in the child's dealings with its doll. The diminutive waxen baby must have all its belongings diminished in a corresponding ratio. A very clear instance of this third class of relative suggestions is supplied by the singing or mental repetition of a tune in a different key from that in which it has been previously heard. The absolute pitch of the note is determined by the keynote, which may vary. The identity of the tune is preserved by correspondence in the transitions between the notes. In these instances, which might be indefinitely multiplied, the terms of the one series for which a parallel is supplied in the other need not be actually presented. The preformed associative connection specialises itself in the new material without any distinct reference to its previous embodiment. This is not so in another set of instances which come under the present heading. As typical of these, we may take the work of the painter or draughtsman. In passing from actual scenery to the coloured picture, and from the coloured picture to its reproduction in black and white, there is a "transposition of values" delicately adjusted, so that the values may as far as possible preserve their relation to each other. We may consider specially the representation of gradations of colour depth by corresponding gradations of grey. Ruskin, in his *Elements of Drawing*, after giving the beginner directions for

forming by a mechanical method black and white series corresponding to certain colour series, proceeds to point out that the special correspondences thus brought to light are useless in actual practice. "For it would never be possible for you to gradate your scales so truly as to make them perfectly accurate and serviceable; and even if you could, unless you had about ten thousand scales, and were able to change them faster then ever juggler changed cards, you could not in a day measure the tints on so much as one side of a frost-bitten apple: but when once you fully understand the principle, and see how all colours contain as it were a certain quantity of darkness, or power of dark relief from white—some more, some less; and how this pitch or power of each may be represented by equivalent values of grey, you will soon be able to arrive shrewdly at an approximation by a glance of the eye, without any measuring scale at all."[1]

(4) All the above examples may be regarded as conditioned by the transference of a pre-existing form of combination to new matter. In other instances the converse aspect of the case is more conspicuous. The striking point is that pre-existing matter is brought into a new combination. Thus, to take a simple case, we may have carefully considered the pictures in a collection in the way of comparing their æsthetic merits: but we may never have thought of counting them. The counting of them involves a general transformation of the given material. Certain aspects of it are now ignored as irrelevant, and other aspects, previously ignored, are brought into prominence. A work of art becomes a unit in a numerical series. At the same time the preformed associations are still operative in the new process. The counting is possible because we have already considered the pictures in their æsthetic relations. The important point is that the

[1] *Elements of Drawing*, pp. 43-44.

working of these associations is transformed by the new point of view; they suggest numerical rather than æsthetic relations.

(5) There is another group, more or less cognate with the last, in which one point of view does not merely supplant another, but blends with it, and co-operates with it in controlling the course of relative suggestion. Poetic composition is a good example. Here, as Bain notes, there are a number of distinct conditions to be satisfied. In all literary composition, "besides conveying a meaning, certain grammatical forms have to be observed; likewise, there are rhetorical properties or rules of good taste; a certain melody or cadence is sought to be imparted; and, in poetic composition, the other qualities have to be attained under the restrictions of metre and rhyme".[1] It must be added to this that both sound and sense must yield a unity of æsthetic effect. This is the most comprehensive form of combination, which includes the others as its parts, and realises itself by means of them.

Each of these conditions of verbal combination is a form which is being continually transferred to new matter. Thus each taken singly, apart from its relation to the others, would give rise to trains of relative suggestion. The forms of construction by which relationships are indicated, including the distinction of the parts of speech, inflection, and syntactical rules, constitute a comprehensive thought-schema, which pervades and controls the whole connection of our ideas, so far as they find expression in language. In every moment of our intellectual life we are filling in this schema with new material; in every moment we are constructing sentences and, *eo ipso*, corresponding ideal combinations, which are built up in accordance with formal analogy, not through previous association between the actual words which enter into their

[1] *Senses and Intellect*, 4th ed., p. 610.

composition. Similarly, metrical form is a constant source of relative suggestion. In verse composition words do not suggest each other merely because they have been previously combined, but because a metrical relation is to be fulfilled. Now, when grammatical forms and metrical forms are to be combined so as to produce unity of æsthetic effect in a given subject-matter, the course of suggestion is simultaneously controlled by all these conditions.

Bain gives a different and, as it seems to me, a quite untenable account of the matter. He represents the whole process as one of trial and error. "It is not enough that I can combine one form of words sufficient to express a certain meaning; I must be able from my verbal resources, recovered from the past, to construct several forms all equally good as regards meaning, so that I may be able to choose the one that satisfies the other conditions as well. In fact, the mind must possess, not one way of bringing out a certain effect, but a plurality of ways; and, out of this plurality, we fix upon the form that yields some second effect also desired. If a third effect is wanted, there must be a power of altering the combination already made without losing the previous effects, and for this end we must be able to command a choice of equivalent phrases in the room of those that are discordant as regards the new end."[1] The whole conception of constructive combination, as consisting in trial and error, and in selection from a throng of suggested ideas which crowd in upon the mind merely owing to their conjunction in previous experience, is vicious. The process of suggestion itself must be selective. As Brentano remarks: "If we compare the number of all possible combinations of tones in their manifold variety as regards pitch and intensity and timbre, with the number of tone-combinations which yield an æsthetic effect, we shall see that

[1] *Senses and Intellect*, 4th ed., p. 610.

mere abundance and liveliness of imagery is inadequate to explain the facility with which a Mozart or a Schubert composes music".[1] Such words as *inspiration* would have no kind of meaning if Bain were right. A process of patient and laborious sifting and rejecting is exactly the characteristic which is conspicuous by its absence in the mental construction of the man of genius. Pope says: "I lisped in numbers, for the numbers came," and yet no man spent more time and pains than Pope in polishing and correcting his work. But if the working of his mind had been such as Dr. Bain describes, he never would have written anything worth correcting or polishing. The notion that Shakespeare first of all tried to express his meaning, and then sought for metre, and then for a satisfactory cadence, and then for unity of æsthetic effect; and that under each of these heads he went through a laborious process of sifting and selection; and that finally by these means the *Venus and Adonis* and the *Midsummer Night's Dream* came into being, is a transparent absurdity if ever there was one. It would have taken him a century to write ten lines, and then he would not have succeeded on this plan. The nearest approach, perhaps, to the mental attitude Bain describes is that of the school-boy who is beginning to do Latin verse and has no turn for it. One insuperable difficulty in the way of the view I am here opposing is that it destroys the unity of the process. This unity depends on the unity of æsthetic effect which is aimed at. The æsthetic effect is conjointly conditioned by metre, cadence, meaning, and grammatical structure, and it must be lost if these clues are followed in isolation from each other. Perhaps this is the reason why Dr. Bain omitted to notice unity of æsthetic effect at all as one of the conditions to be fulfilled. But, if this be neglected, a poem or any other work of art is *Hamlet* with the Prince of Denmark missed out.

[1] *Das Genie*, p. 26.

Of course I do not deny that there is much trial and error in most trains of relative suggestion. The exigencies of exposition have perhaps led me to represent the operation of this principle in a diagrammatic way, which may lead to misunderstanding. β does not always call up a γ corresponding to c, precisely as β corresponds to b. This is only the ideal case of relative suggestion. In general it is truer to say that β tends to call up γ, and that, in fact, it for the most part does so more or less imperfectly. So far as this imperfection extends intellectual ends can only be attained by a process of repeated trial and failure. But, as Von Hartmann says: "Even in those cases where experience shows a repeated rejection of revived ideas, it should not be forgotten that all these rejected ideas are by no means absolutely fortuitous in respect of the particular object, but always tend to this goal, although they may not hit the nail upon the head".[1] Thus, in any process of mental construction, the efficacy of relative suggestion is in inverse proportion to the amount of tentative groping. Its perfection depends partly on the familiarity attained in previous practice, with the special kind of relation involved, and partly on the degree of mental excitement in respect to the subject-matter at the moment. The facility of genius consists in the right idea arising at the right time, without previous effort, hesitation, or failure. Where the transitions are so immediate they take place without being specially attended to, and so may be called automatic. This is a large part of what is meant by the "inspiration" of genius. Of course when the transitions dependent on relative suggestion are thus automatic, the constructive process as a whole may, and in the case of a work of genius must, be the extreme opposite of automatic. Mozart is a favourite example of the automatism of genius, but the process of composition

[1] *Philosophy of the Unconscious*, vol. i., chap. vii., p. 302.

with Mozart involved a consciousness more intense, vivid, and concentrated than is easily conceivable by ordinary mortals.

(6) The last set of instances to which I shall draw attention differ widely in nature from the preceding; none the less they can be brought under the same principle. I refer to inferences through a middle term. Of course I have nothing to do with these inferences in their logical aspect. I am only concerned with the process of suggestion through which the mental construction on which they depend takes place. It will be well to begin with an example. Suppose that in a pedestrian excursion I have lost my way. It happens that I catch sight of some landmark which is known to me to be situated at a certain definite position and distance from my destination. I then know where I am, what course to take, and how far I have to go to reach my journey's end. Now, here there has been a preformed association between the landmark which guides me and the place which I wish to reach. The landmark, therefore, recalls the place as in a certain relation to itself. This relation is one of position and distance, because my mind is initially occupied with the spatial relations of the objects in the region surrounding me. Nor is this all. My mind is preoccupied from the outset with my present position; and when I see the landmark I think of it in relation to this. Hence, when the sight of the landmark suggests the relative position of the place I wish to reach, the course of suggestion is so conditioned by my mental attitude that the resulting ideal whole is one in which my present position, the landmark, and my destination are combined in definite relations to each other. Of course, such trains of suggestion may have a different order according to circumstances. In the present instance the middle term is given, and the third term is suggested. In other cases the middle term itself may not be given, but mentally recalled. The formula for this second class of instances, which is substantially similar to the first,

may be stated as follows: A, B, and C are all by their nature constituents belonging to a spatial, quantitative, or other kind of whole or series, W. A has been apprehended in a certain relation to B within this whole, and recalls B so as to present it in this relation. C also has been apprehended in a certain relation to B, and so tends to recall A in this relation. A and C are now both apprehended as having some relation within the same formal system. They conjointly call up a B; but this B is not the same as each of them would recall separately. It is qualified by its joint relation to A and C, and it is apprehended as a link of connection between them, so that the three constitute a specific kind of whole, W_1, within the original whole, W. On the emergence of this new combination the relation between A and C itself becomes transformed. As constitutive of W_1, it receives a specification which did not initially belong to it when it was merely apprehended as some relation within the relatively indeterminate W. Thus in apprehending two quantities as equal to the same quantity, we apprehend them as equal to each other.

In the web of our concrete psychical life, these various modes of relative suggestion are intimately interwoven with each other in the most complicated way; and our attempt to disentangle them involves artificial abstraction. There is, however, considerable simplification in the case of sense-perception and the comparatively simple processes connected with it. Here the most prominent and important form of construction is the third to which we have alluded; in which a form of connection remaining relatively the same, variation in one of the terms suggests corresponding variation in the others.

It may be questioned whether there are any clear instances of absolutely simple, as opposed to relative, suggestion. Perhaps the nearest approach to it is to be found in the mere repetition of what has been learned by rote. Thus, in repeat-

ing the alphabet, it would seem that we merely reproduce it without any kind of modification due to relative suggestion But even in this case it would be rash to say that such modification is absolutely excluded. We may repeat the alphabet in various ways, with different rates of rapidity, with different degrees of distinctness, loudness and emphasis, and with differences of rhythmic grouping. Other things being equal, the mode in which we go on with our repetition will be conditioned by the mode in which we start. But this is a rudimentary stage of relative suggestion. An analogous case in which the relativity is sharply and distinctly marked, is the singing of the same tune in different keys. The absolute pitch of the note is determined by the keynote, which may vary. The identity of the tune is preserved by correspondence in the relations of the notes.

§ 5. Relative Suggestion in Perceptual Process.

The Suggestion with which we are concerned under this head, is that by which the transition from a given sense-impression or impressions to the corresponding percepts, takes place. Our aim is to show that this process is constructive, and not merely reproductive, or, in other words, that it involves free adaptation to varying conditions which have not been adequately provided for in advance by specially preformed particular associations. Consider first our apprehension of the position of objects by means of touch. The position of objects is fixed by us in relation to the varying position of the tactile surface with which they come in contact. But the number and complexity of such variations is immense. Consider the single case of the finger-tips. These, as Lotze notes, are capable of being put into the most varied relative positions by means of the finger-joints, each of which by itself and apart from the others can move its tip through a

semicircle. "This marvellous system of susceptible surfaces is finally extended freely into all directions of space by the bendings and extensions of the wrist and elbow, and the still more unlimited mobility of the upper arm."[1] Now, the question is whether each several variation of this kind has been provided for by a particular association, which has become by repetition or otherwise so firmly fixed that it operates with automatic rapidity, ease, and precision. Is it not a much more probable explanation, that we have here a constructive process, depending on relative suggestion, and analogous to that which pervades higher phases of our mental life? Before the reader decides this question negatively or doubtfully, he is invited to consider each and all of the cases which are brought forward in this section. He will then, I hope, come to the conclusion that the explanation here advocated is, if not the only possible one, at least distinctly preferable to that which relies on simple suggestion. Another illustration drawn from tactual and motor experience is furnished by the indirect contact on which all use of implements depends. This is a topic on which Lotze loves to dwell, and we refer to him for a fuller discussion of it than can be given here. If we grasp a rod at one end, or balance it on the finger-tip, we at once perceive the length or height. So "if a ball is suspended by a thread from our hand, . . . and if we set it in circular motion, so that the thread exerts pressure with varying degrees of tension and velocity on different parts of the hand's surface in a regular sequence, we now imagine that we are directly aware of the length of the interval at which the ball is revolving, as well as of the radius of its rotating circle, and of the velocity and weight with which it moves in the circumference of this circle".[2] So, if with the finger we firmly press upwards on the bottom of a hollow vessel, we become aware of any contact

[1] Lotze, *Microcosmus*, Engl. trans., vol. i., pp. 586-587.
[2] *Ibid.*, p. 588.

with the vessel, of the distance and direction of the impact, and of the hardness and elasticity of the material. The blind man's stick, the surgeon's probe, the pen of the clerk, and the brush of the painter, are only of use because the delicate variations of pressure and resistance at the point of contact with the hand, reveal from moment to moment the nature of the material they operate on, and of their action on this material, as well as the slight bendings which they themselves undergo. Any one who has realised the infinite complexity, delicacy, and variety of these and similar suggestions, will scarcely be persuaded that each fine particular variation has its own equally particular preformed association. The only explanation which can cover the facts without the most violent straining, is that which assumes a constructive process. General principles of combination particularise themselves according to the particular occasion.

Turning from touch to sight, we may first draw attention to our judgment of the proper or local colour of a body throughout the changes which it undergoes under changing illuminations. This is a point on which Helmholtz has laid special emphasis. Unfortunately, however, he has extended its scope beyond due limits, and has included under it phenomena which ought rather to be referred to physiological contrast. But when every allowance for such contrast is made, it remains true that a vast variety of transient changes in the colour of objects which the artist would have to note and imitate in order to give a true representation of them, are commonly ignored, as such, by the ordinary percipient, and unconsciously interpreted as appearances of the real and abiding colours of the objects seen. We abstract this colour from its variations, so that, as Delbœuf observes, "when we see the object reflected by a mahogany table, we see it in what we call its true colours and not suffused with the brown tints of the table".[1]

[1] *La Psychologie comme science naturelle*, p. 61 (quoted by Lewes).

Every painter represents a white object in shadow by means of grey pigment, and, if he has correctly imitated nature, it appears pure white. To realise the full complexity of the case, we must remember how many factors are involved in determining the light-sensation produced by an object. Besides local colour, there is the colour reflected on to it by other objects, the intensity of the illumination, which in full moonlight is 150,000 times less than in sunlight, the colour of illumination, — which differs, for instance, in daylight and in candlelight,—the light and dark produced by local colour, and the light and dark produced by illumination. What we call shadows are really lighted by complex reflected lights, which may be tinted in the most various ways. All these delicate, complex, and shifting variations are for the most part unnoted by the ordinary observer; and yet they contribute in the most subtle way to determine his perception of objects. Although he fails to note them himself, he may readily recognise that a picture which ignores them is a bad imitation of nature. It is needless to point out how difficult it is to refer to simple association all this fine adjustment, this fine allowance for evanescent changes, and abstraction of the permanent fact from the accidental appearance.[1]

Perhaps, however, the most remarkable examples of constructive process in perception are those supplied by the perceptions of depth, distance, and solidity. The perception of distance has its starting-point in sensory impressions which are not themselves distinguished and identified.

[1] Ruskin says: "Having once come to conclusions touching the signification of certain colours, we always suppose that we *see* what we only know, and have hardly any consciousness of the real aspect of the signs we have learned to interpret. Very few people have any idea that sunlighted grass is yellow" (*Elements of Drawing*, p. 7). The previous process of "coming to conclusions" is mythological; but the description of our present mental attitude is perfectly correct.

These sensory data are of the most various kind. The binocular perception of the distance of the object which is directly fixated, depends very largely upon the motor experience accompanying the varying convergence of the two eyes. The amount and direction of change in the motor series carries with it a corresponding amount and direction of change in the distance perceived. The point fixated at any moment forms a centre around which other distances are grouped. The perception of these, in so far as change of the fixation-point does not come into operation, is, in binocular vision, predominantly determined by the combination of the dissimilar perspectives presented to the two eyes. The delicacy and fineness of the distance discrimination which is thus effected, must be carefully noted. Spurious banknotes, as Helmholtz observes, are detected by putting a suspected one in a stereoscope along with a genuine specimen of the same kind,—so that it is seen whether all the marks of the combined image appear on the same plane. Now, add to this delicacy of discrimination its enormous complexity; a single glance without appreciable movement of the eye will group innumerable points in their relative distances from the observer and from each other. Only the desire to support a preconceived theory could lead any one to attempt to explain this by separate association between each particular distance and each particular difference in the relative position of the images in the retinas of the two eyes. What takes place is construction according to a general principle of co-variation. Variation in the retinal experience carries with it a variation in the distance-perception corresponding to it in kind and degree.

The conditions of distance-perception so far taken in account come into play only in the binocular apprehension of relatively near objects In the apprehension of remote objects we depend mainly on the distribution of light and shade, on the indistinctness of boundary lines and faintness of colouring

which accompany increased distance, and on the known magnitude of the objects. These are the means of which the artist avails himself to suggest distance and solid shape. The subtle effect of the distribution of shading may be seen in the incessant changes in the details of a mountain front under changing light. The relation of magnitude and distance constitutes a peculiarly striking case of proportional variation. When, under artificial conditions, the magnitude of the retinal image is kept unaltered, while the convergence of the eyes increases, the object appears proportionately smaller; and, conversely, the inclination of the optical axes being unchanged, increase or diminution of the retinal image yields a corresponding increase or diminution in the apparent size. Similarly, when the actual magnitude of an object is known by previous experience, the extent of the retinal image measures its distance, and *vice versâ*. In monocular vision the conditions are the same as for vision of distant objects, except that there is added the varying adjustment of the lens.

We must note that these factors do not work in isolation, but often co-operate in the most delicate relation to each other. This consideration alone counts strongly against explanation by simple suggestion.

Consider, in conclusion, the way in which we identify shapes under the endless variations and points of view from which we see them. With change in the point of view, the retinal image changes. This is true even of such a simple figure as a rectangular cross. Yet the figure is instantly identified as the same amid the variety of its sense-appearances. Moreover, in the case of superficial figures there is another condition on which the identification depends—the kind of surface to which it is referred. The retinal image which will give the perception of a rectangular cross on a flat surface will not do so on a spherical surface.

The point which we desire to make plain is that the same

constructive process which pervades the higher phases of our mental life, also pervades those lower phases which are classed as sense-perceptions. In these it obviously does not consist merely in the bringing together of elements which have not been brought together before. On the contrary, its most prominent feature is the change which the new combination produces in the elements combined.

One question remains yet to be decided. Can perceptual construction properly be regarded as unconscious inference? All depends on our definition of the term *inference.* If we define it as a mental construction issuing in a judgment or belief, then undoubtedly inference is involved in sense-perception. But it will be generally admitted that this definition is too wide. We may try to amend it by saying that inference is a mental construction which both has its point of departure in a judgment and issues in a judgment. On this view we should have to refuse the title to merely perceptual process, however constructive it may be. But the proposed definition, though not likely to mislead in practice, scarcely seems to touch the essence of inference. This involves a clear distinction of reason and consequent, and the apprehension of their connection. Now, we must here avoid a very plausible error. The premisses of an inference are not to be identified with the steps of the psychological process which lead up to it. The premisses are, strictly speaking, not premisses at all, except in so far as their relation to the conclusion is discerned. But this is possible only in so far as mental construction is already completed. What ultimately compels the inference is the special nature of the whole which is presented as the result of the constructive process. It is the nature of this whole which determines the relation of its parts. We do not infer that A, being to the right of B, is also to the right of C, because B is to the right of C, until A, B, and C appear to the mind as arranged in a definite spatial order. Nothing short of this

justifies the inference. It follows from this that no merely psychological analysis, and no statement of general laws of thought, can yield the specific formulæ of actual inference. These in each case depend upon the nature of the subject matter. Turning now to the special question under consideration, it seems conceivable that sense-perception might be properly called an inference, although as a psychological process it has its starting-point in sensation and not in judgment. If, as the outcome of the process, the sense-experiences ceased to be merely sense-experiences, and became distinguished and identified, and if they were apprehended in their necessary connection with the resulting percept, the perception might rightly be called an inference. But in point of fact this is not so. The percipient does not analyse and identify the sense-impressions which form the psychological data of perception. Hence they remain data only from a psychological, and not from a logical, point of view. It has been the tardy and difficult task of modern psychology, physiology, and physics to discriminate as perceptual data such experiences as those connected with the convergence of the eyes with the binocular combination of dissimilar perspectives, and so forth. The percipient, as such, entirely ignores them.

§ 6. Relative Suggestion in Automatic Movement.

In movement we may distinguish two kinds of automatism. Some motor processes may, in a comparative sense, be regarded as purely automatic, inasmuch as they go on while the attention is directed to disparate topics. Walking is the most obvious illustration. Bicycling, when it has been thoroughly learned, is another. The bicyclist may spin along while he is all the time attending to the scenery or to the talk of his companion. It is highly improbable that all the varying adaptations required for this process have been severally and separately provided for in the process of learning, and each so

fixed by repetition as to be readily available at need. It is difficult to see how all the changes in the nature of the ground, and all the possible deviations from equilibrium which are met by an automatic response, can be thus anticipated in detail. Other movements may be described as relatively automatic. They are automatic parts of a process which, as a whole, involves concentrated attention. Attention is engrossed by a series of fluctuating conditions and by the nature of the end to be attained. But the adaptation of movements to the perceived conditions takes place in a more or less automatic way. In so far as this is the case the question, "How am I to react?" does not arise. "How," says Von Hartmann, "does the dog calculate the curve of the morsel which it catches so cleverly at any distance and at any angle?" Of course there is no calculation on the part of the dog. But there must be something which, for the purpose, is equivalent to the calculation. Mere reproduction, due to merely particular association, is not enough. The dog's reaction must take place according to a general principle which becomes specialised in its application to the fluctuating conditions. *Mutatis mutandis* the same may be said of all kinds of motor dexterity. Consider, for instance, the importance which Ruskin attaches to the accurate performance by the beginner of one or two quite limited and special exercises in drawing. "Show the camel's-hair, and the colour in it, that no bending nor blotting are of any use to escape your will: that the touch and the shade *shall* finally be right, if it costs you a year's toil; and from that hour of corrective conviction, said camel's-hair will bend itself to your wishes."[1]

§ 7. Informal Inference.

We have seen that the perceptual process does not, properly speaking, involve an inference. For this ideas, as

[1] *Elements of Drawing*, pp. 136-37.

distinguished from percepts, are needed. Nevertheless, inferences may connect themselves so closely with a percept that they seem almost to be integral parts of it. This was in the mind of Helmholtz when he described perception as "*unbewusstes Denken*". When the import of a complex percept is translated into mental imagery, there is often an inference. Thus, if we touch an object and then call up mentally the image of the visual appearance which corresponds to the tactual, we have gone through a mental construction issuing in a judgment and starting with a judgment. Moreover, in the presented result, our belief in the tangible configuration of the thing, and our belief in its visible configuration, may remain distinct, and the one may be apprehended as the ground of the other. Thus all the conditions of a true inference may be fulfilled. The same holds good when the visual appearance is given, and we ideally represent the tactual in accordance with it. In such instances the process is essentially constructive, for the revived visual image shares the variation of the tactual datum, and *vice versâ*. Each adapts itself, so to speak, to the bends and folds of the other.

Again, we may start from the perceived shape of an object seen from a certain point of view, and then ideally envisage the series of varying appearances which the same object would present from different points of view. With sufficient power of geometrical imagery we may mentally deduce all these and review them one after the other. Nor is it necessary that the perspectives which we thus ideally construct should all have been previously perceived. By the mental application of cross sections in certain directions we may, as Helmholtz observes, derive from the original percept mental views of the object which we have never had in actual perception.

Such inferences as these are informal. By this I mean that the form of combination which connects their terms comes

before us only as it is embedded in the detail of the particular case. It is not generalised and explicitly expressed in an abstract formula. In order to attain such general formulation of the universal principle which underlies an inference, systematic comparison of particular cases is necessary. We shall have a word to say presently on the nature of formal inference, after having first considered a mode of mental construction which even in its highest phases frequently dispenses with abstract formulæ—the play of constructive imagination.

Nearly all the practical inferences of ordinary life are of the informal kind. When in practical life I infer that *A* is to the right of *B*, because *B* is to the right of *C*, *A B* and *C* are quite specific objects. The algebraic generality which attaches to them in my description of the process as a type of inference is absent from the mind of the person who makes it. So the ordinary reasonings which in books on logic are for the most part chosen as examples of syllogistic form are in ordinary life performed without any recognition of a major premiss. Mill has illustrated this in dealing with what he chooses to call "Reasoning from Particulars to Particulars"; and Spencer has urged the same point with great clearness and cogency. We may here quote one of Mill's examples: "An old warrior, on a rapid glance at the outlines of the ground, is able at once to give the necessary orders for a skilful arrangement of his troops; though if he has received little theoretical instruction, and has seldom been called upon to answer to other people for his conduct, he may never have had in his mind a single general theorem respecting the relation between ground and array. But his experience of encampments, in circumstances more or less similar, has left a number of vivid, unexpressed, ungeneralised analogies in his mind, the most appropriate of which, instantly suggesting tself, determines him to a judicious arrangement."[1]

[1] *Logic*, 9th ed., vol. i., p. 216.

§ 8. The Play of Imagination.

The play of imagination is treated by Bain under the head Emotional Constructiveness. The title is appropriate. We may say that in the play of imagination the mental craving connected with some mood or emotion calls up and co-ordinates ideas which harmonise with it, and which gratify it in so far as it can be gratified merely by receiving definite form and outline, apart from any change in the world of actuality or in our beliefs concerning it. Bain very aptly gives as an example of emotional construction the day-dream of the crockery-seller in the *Arabian Nights*. His formal analysis of this case is, however, not quite satisfactory. He says: "The owner of the crockery-basket had amassed pictures of happiness and grandeur which required only to be cast into a consecutive order to make his epic".[1] Here we have the old fallacy that mental production consists merely in putting together ready-made material. Of course, as Bain's own account of the matter is sufficient to show, there is more than this involved, The images brought into consecutive order, so as to gratify the ruling emotion, are profoundly modified in the process. The buying and selling, with which the crockery-seller's reverie started, were not business transactions such as he had ever had experience of, nor were they remoulded in his mind by a conscious process of addition and subtraction. They became spontaneously transformed so as to fit into their places in the consecutive order.

The most important kind of emotional construction is the æsthetic. Æsthetic emotion is marked by a peculiarity—that it can be satisfied purely by the play of imagination. Its embodiment in actual works of art only serves as an aid to emotional construction. Closely connected with this peculiarity is another. Æsthetic satisfaction is a satisfaction

[1] *Senses and Intellect*, 4th ed., p. 641.

derived from the form of combination of the parts of a whole. The pleasantness of the several elements is, indeed, a contributory factor of the highest importance; but it has æsthetic value only in so far as each several source of enjoyment has its action intensified by this relation to the whole of which it is part. In combinations of this kind the part played by relative suggestion is very prominent. We have already discussed poetic composition. For painting, we may refer to any art critic who has the power of reflective analysis. The following quotation from Hamerton will sufficiently serve for present illustration: "The lightness and darkness of each object, being relative, must be translated synthetically—that is, with continual reference to the rest of the picture. When this is not done the parts may be separately true, yet false when considered with reference to the whole."[1] "Whether you will or not, in painting on any one part of your picture you are really painting upon, that is, changing the colour of, the whole canvas at once."[2] "Synthesis in form does not merely *arrange* given forms, but runs into, and modifies, every line in the forms themselves. A great inventive artist never in a picture draws anything exactly as it is, but compels it into such shapes as he wants in that place, having reference all the time to all the other shapes either already put, or to be put, in all the other parts of the picture."[3]

In all artistic construction the form of combination which controls relative suggestion is only apprehended as it is embodied in a special way in a special material. The artist, as distinguished from the art critic, never attempts to describe his ideas in abstract terms. There is, however, one way in which the creative artist, as such, mentally disengages the ideal plan of synthesis which guides the flow of his ideas

[1] *Thoughts about Art*, p. 179.
Ibid., p. 180.
[3] *Ibid.*, pp. 180-81.

from the special matter in which he desires to incorporate it. This happens when he transfers it from one kind of material to another kind. This process, which forms a sort of meeting-point between scientific and artistic method, we shall now proceed to examine.

§ 9. Relative Suggestion as Related to Suggestion by Formal Similarity.

Identity, or correspondence in form of combination, is a very potent factor in determining suggestion by similarity. A portrait or a picture suggests its original more because the relation of its parts is analogous to the relation of the parts in the original than because of any resemblance in the parts themselves taken severally. All metaphor depends upon suggestion of this kind. When Tennyson says, "A doubtful throne is ice in summer seas," the transition in his mind was not mediated by any material identity between ice and a throne, or between a disputed succession and summer seas. So, too, when Ruskin compares a society undifferentiated by diversity of individual character to one "in which every soul would be as the syllable of a stammerer instead of the word of a speaker,"[1] the mental suggestion is a formal one. When Hobbes says that mental imagery is obscured by sense-impressions, as the light of the sun obscureth the light of the stars, and that the vivacity of the mental imagery in dreams is comparable with the appearance of the stars at night when the sun has set, the suggestion depends on the correspondence of relations. It has been said that the result of a well-conducted discussion is to give one a binocular apprehension of the debated topic by a combination of dissimilar perspectives. For a comparatively superficial and one-sided view there is substituted a kind of stereoscopic view. There could not be a better example of suggestion by formal similarity.

[1] *Elements of Drawing*, p. 166.

Now, the nature and operation of relative suggestion is most conspicuous when it is preceded and conditioned by formal suggestions of the kind described. When a metaphor first flashes upon the poet's mind, the mental transition is due to suggestion by formal similarity. But he may subsequently proceed to work out in detail the formal analogy so as to discover new correspondences. In doing so, he exemplifies the process of relative suggestion. Browning, in the *Ring and the Book*, starts with a comparison between the way in which he, by the help of his imagination, fashions antiquarian material into a poem, with the way in which a workman fashions a ring, by first mingling the gold with an alloy. This is suggestion by formal similarity. But when, at the end of the poem, he refers to his own ring as lying outside Mrs. Browning's ring of verse, and so serving to link England to Italy, the transition in the poet's mind is from the general analogy to a special correspondence. But the process is most strikingly illustrated by continuous allegory. Bunyan, in the *Pilgrim's Progress*, starting from the general analogy between an actual pilgrimage and the spiritual pilgrimage of the Christian, works out the formal correspondence in elaborate detail. In so doing he constructs a narrative full of dramatic incidents, which is interesting quite apart from its allegorical significance. And yet the train of ideas is throughout controlled by the initial analogy. A does not simply suggest B; it suggests a β of such a special kind that $\frac{A}{B} = \frac{\alpha}{\beta}$. In other words, the connection of things and events in the actual narrative A B C D, etc., shapes itself so as to correspond to its spiritual counterpart α β γ δ, etc. Spenser's *Faerie Queene* is full of similar allegories. Take, for instance, the representation of Care as a blacksmith, who "to small purpose yron wedges made,"[1] and whose bellows were Sighes. In this case

[1] Bk. iv., canto v.

the reality, in the person of Sir Scudamore, is placed side by side in the same room with its allegorical representation.

What is distinctive of the above instances of relative suggestion is the controlling influence of a definite model. The mind fashions a new determinate whole according to the pattern supplied by another equally determinate whole. The formal scheme embodied in one kind of material is transferred to another kind of material, so that the old relations are as far as possible preserved, but new terms are found to satisfy them. Processes of the kind described are not confined to the æsthetic play of the mind. They also fulfil an important function in its scientific work. A geometrician, having hit on the idea of a fourth dimension, corresponding in its relation to the third with that of the third to the second, and with that of the second to the first, works out in detail the correspondence of relations. Thus, on the analogy of the rule by which we represent the third dimension on a flat surface, he may endeavour to draw a correspondent representation of the fourth. The first germ of the law of gravitation probably lay in the suggested analogy between terrestrial gravity and solar attraction. But it is just in a case like this that the direct working of relative suggestion proves inadequate for further progress. Suppose that Newton initially hit on the comparison of the relation of the falling apple to the earth with that of the moon to the earth;[1] then relative suggestion would lead him to anticipate that the identical relation would express itself in a specifically different way under specifically different conditions. But the anticipation would be indeterminate. It would not of itself enable him to fix in exact detail the special variations. For this, something else is required. He could not proceed to verify the analogy without explicitly formal inference. Thus, it required

[1] The apple story may very well be a myth.

an express calculation to determine how the effect of the earth's attraction would be modified by the moon's primary motion of translation.

§ 10. Formal Inference.

Newton was enabled to write his *Principia* because he already possessed, or had the power of discovering, general quantitative formulæ expressing in abstract terms the universal modes according to which the operation of gravity varies according to various conditions of mass, distance, and so forth. By the deliberate application of these formulæ he ascertained how it ought to work in the case of the moon and the earth, and found his results congruent with known facts. This is one of the instances in which the use of abstract formulæ is greatest and most conspicuous. It is so because it not only formulates a general relation, but also formulates with quantitative precision the general laws according to which its application varies under varying circumstances. When, on the other hand, we consider such general formulæ as constitute the major premisses of the specimens of syllogistic reasoning which are commonly given in books on logic, the value of the abstract formulation is much less clear. In point of fact, we can for ordinary purposes usually dispense with a major premiss altogether. When it is introduced its chief utility is that it enables us to criticise our own procedure by examining our assumptions. We go back from the abstract formula to collect and compare particular cases, with the view of justifying, rejecting, or limiting it.

We cannot, of course, at this point investigate the origin of these abstract formulæ. Suffice it to say that they depend on express comparison and on the use of language.

CHAPTER VII.

CONATION AND COGNITIVE SYNTHESIS.

§ 1. CONATION AND COGNITION DEVELOPED COINCIDENTLY.

IN the present chapter we recur to a point which has been deliberately disregarded in our account of the special conditions that determine the grouping and sequence of presentations. This point is the essentially active nature of mental process. As we have seen in the chapters on Activity and on Attention, the stream of consciousness has always a current. Conscious process is in every moment directed towards some end, whether this end be distinctly or vaguely recognised by the conscious subject, or not recognised at all. The physiological correlate of this conative aspect of mental process was identified by us with the tendency of a neural system to recover a relatively stable condition when its equilibrium is disturbed by external stimulus or by exciting conditions within the brain itself. It follows from this that the laws of mental grouping which we have laid down in the preceding chapters cannot be considered by themselves except by a convenient abstraction; they are merely modes in which conscious striving seeks satisfaction. To regard them as containing by themselves the explanation of the grouping and sequence of presentations is like the attempt to explain the course of a vessel merely by reference to the arrangement of the sails, without taking into account the existence and direction of the wind. We have said that such laws as those of

association are only modes in which mental striving tends to realise itself. They therefore presuppose the conative aspect of consciousness, and do not operate apart from it. But the direction of mental activity is frequently efficacious in determining the flow of ideas without the aid of association. It is not true that the transitions of the mind from one topic to another are uniformly introduced by links of suggestion. Dispositions corresponding to strong inclinations often emerge spontaneously into consciousness. When we are engaged on an interesting problem, and the train of our ideas is broken by the intrusion of other claims on our time and attention, our minds naturally revert to the original topic so soon as the interruption is over. We spontaneously occupy ourselves with the prior train of ideas on the cessation of the mental activity which had temporarily displaced it. So, when we awake in the morning, or in the darkness of the night, our thoughts naturally fasten on some subject of special interest to us, independently of any association of ideas. Such facts as these are of themselves sufficient to show the inadequacy of the laws of the interaction of presentations to explain the actual course of conscious process. But what we are here more immediately concerned with is the way in which a conation works by means of these laws, so as to revive and combine such cognitive elements as are relevant to it, and to exclude those which are irrelevant.

It is the essence of conation to seek its own satisfaction. But this is only possible in so far as it acquires a definite and determinate character. The more blind an impulse is, the more helpless it is. The new-born infant feels the craving of hunger and manifests it by diffused movements and by cries. Its craving is psychically indeterminate, inasmuch as it has no cognisance of the special object which would satisfy it, or of the means of attaining this object. Hence the felt want cannot work out its own satisfaction. The mother or the nurse must

do for the child what it cannot do for itself. It is at the outset even unable to find the breast, and it knows nothing of the action of sucking, until this follows in a reflex way on the contact of its lips with the nipple. On the other hand, in proportion as blind craving gives place to open-eyed desire, the infant becomes more and more capable of fulfilling its own wants. Throughout this process the original conation is the factor which is primarily operative. It tends to define itself, and the gradual acquisition of knowledge through experience is but another expression for the process whereby the originally blind craving becomes more distinct and differentiated. To this growing distinctness and differentiation correspond more and more special and complex combinations of movements. Thus the vague craving for food becomes the desire to suck. The infant which could not at first find the nipple, of itself points to the bottle. Further development brings preference for this or that kind of food, the use of knife and fork, and the earning of money to buy nourishment.

We must here guard against a serious error. It must not be supposed that conscious needs produce those cognitive combinations which lead to their satisfaction, as a spider spins its web. The grouping of cognitions is no mere external machinery which intervenes between the felt want and its gratification. On the contrary, it is the way in which the conation itself grows and develops. In becoming less blind it *ipso facto* becomes more complex and differentiated. The vague craving of the new-born infant becomes a specific desire to suck the breast of its nurse; and in the long run it becomes transformed into the desire to earn a living. As a mental tendency becomes progressively more complex, each constituent part of it which emerges in the process is itself a conation. To desire the end is *eo ipso* to desire the means. From this point of view we gain an insight into the development of our psychical life as a

whole. It is not only true that each constituent of a complex conation is itself of the nature of conation; it constantly happens that such partial constituents assume an independent character, so that they come to constitute separate tendencies finding their satisfaction independently of the original end. They may even become more important, persistent, and engrossing than the conation out of which they grew.

The general principle from which we start is that when the primary element of a complex tendency becomes inoperative, the remainder still retains and manifests its conative character. This is exemplified in the endeavour to procure satisfaction for an organic need when the organic need is not itself actually felt. Thus we may attempt to obtain food in order to provide against anticipated hunger, as well as to relieve actual hunger. In this case the bodily craving is non-existent. The idea of it is present, but for the most part this involves a very faint, if any, revival of the uneasiness of actual hunger. What remain and operate are the acquired tendencies which have grouped themselves round the primitive impulse. It is the complex conation constituted by these residual tendencies which is called into play by the idea of approaching hunger. The satisfaction of this desire does not lie in actual eating, as in the case of actual hunger, but in the production of certain arrangements which will ensure food when it is required.

Other instances belong to that large class of cases which is commonly, though inaccurately, described as involving a "transference of desire from the end to the means". The partial conation acquires an independence of such a nature that the result which it tends to bring about, and in which it finds satisfaction, is disconnected from the immediate conditions which gratify the primary tendency. It is difficult to attach a definite and tenable meaning to the word "transference" in the ordinary formula. The transference is said to take place through association; thus avarice is explained as a trans-

ference by association of the desire for the objects which money can buy to the money itself. Now, it is obvious that the idea of money must become firmly associated with the idea of the objects which it can procure, and with the desire for such objects. But what is meant by saying that the desires for the articles thus procurable are transferred to the idea of the money? When we abstract from the nature of the objects to which they are directed the desires wholly lose their distinctive character. What remains is merely conation in the abstract, and I fail to see how this can be regarded as a possible constituent of an associated complex. The original connection between the thought of an object and the desire for it is not one of association; and if the association does not exist, how can it be transferred? It is also manifest that in any case the word "transference" cannot be literally interpreted in its ordinary acceptation. When I transfer a thing from myself to another, I cease to possess it myself; but it is not true that when the means comes to be desired for its own sake the original end ceases to be an object of desire.

Our position is free from these difficulties. For us the desire of the end includes from the outset, as a constituent part of itself, the desire of the means. Indeed, from a strictly psychological point of view, the means, so soon as it is recognised as such, becomes an integral part of the end. Our problem is to trace the conditions through which a conation, forming initially merley part of a more complex tendency, comes to assume an independent character. These conditions are of two kinds, which we may call formal and material. Among the first we may begin by naming the intervention of a special difficulty interfering with the ordinary course of habitual action. The opening of a door is not ordinarily a result which is keenly desired for its own sake; as a rule it takes place in an automatic way. But if, on trying the handle

of a familiar door by which we are accustomed to go out and in, we find that it does not yield to our pressure, there immediately arises an intense desire to effect our purpose. Mere success in opening the door becomes itself an object of keen interest, which may be out of all proportion to our interest in the ensuing consequences. We resent the interruption of the ordinary course of things, the interference with an habitual process. The attraction of the forbidden is to a large extent explicable in the same way. It is felt with especial strength when the forbidden act has been in the past regarded as a matter of course. In these cases a tendency which is usually subordinate suddenly asserts its independence in consequence of a special and exceptional circumstance. But permanent independence may be accounted for in a manner substantially the same. A mode of mental activity which repeats itself with undisturbed uniformity on the recurrence of uniform conditions, will never manifest itself as a separate impulse. Its existence will be merged in that of the whole tendency of which it forms a part. We have just seen that it may disengage itself and appear as a separate conation when it encounters some exceptional difficulty. We have now to add that when the process involves constant readjustment to new circumstances, instead of taking place in an automatic or approximately automatic way, it becomes a permanently independent tendency. In so far as this condition is fulfilled, it is never merely an undistinguished constituent of a more complex conation, and it may come to operate in detachment from the primary impulse in which it took its rise. The essence of the matter is that any process, in proportion as it has become fixed by repetition, tends to complete itself when it is partially revived. This tendency is of itself a conation. It is separately felt as such when and so far as the special conditions of its partial revival vary in a way which is not thoroughly familiar, and so call for a readaptation, by relative suggestion or otherwise,

which cannot take place in an automatic manner. Now, it is evident that readjustment to relatively novel conditions will be greater and more frequent the greater is the systematic complexity of the process itself; and that, conversely, the more frequent and elaborate are the readjustments required, the more complex will the process become.

We may, then, regard the systematic complexity of a tendency as a very important formal condition favouring its independent operation. We shall see in the next section that disinterested curiosity or love of knowledge emerges, according to this principle, from the more primitive strivings which aim at the satisfaction of practical needs. We may here adduce as a special instance the interest which a chess-player takes in solving problems or playing over games, apart from any ulterior end such as that of defeating an opponent. The complexity and difficulty of the process of following out chess complications constitute its charm. As another example we may refer to the hold which a business involving skill and sustained attention often gains upon a man who at first perhaps only takes it up with a view to earning a livelihood. The excitement of his calling may come to be more essential to his happiness than the wealth it brings him. The formal condition, then, under which a previously subordinate conation acquires more or less complete independence, is the need for that kind of readjustment which we have already assigned as the distinctive mark of attentive as distinguished from automatic process. Such readjustment is called for when a preformed mental connection, in realising itself in consciousness, leads up to conflicting alternatives, or to logical contradiction, or to conflict between idea and actual perception, or when in any way it has to be modified to meet variations to which we are not fully habituated.

The material conditions are those which lie in the particular nature of this or that conation. A special mode of activity

which at first arises as part of a more complex conation may open out new sources of satisfaction, either for other acquired tendencies or for tendencies ingrained in the inherited psycho-physical organisation. A process which is primarily directed to the realisation of a certain end may in fact be found conducive to other ends. A child may at first desire to possess property of its own, mainly, or only, as a means of enjoying the objects possessed; but it will find a new source of gratification in the increased sense of power and importance which its possessions confer; it will, for instance, find itself respected and envied by its playmates on account of them. The growth of the love of money for its own sake is an excellent example. Apart from exceptional cases of inborn miserliness, money is at first desired for the sake of spending it, and so obtaining by its means various gratifications. But, as Thomas Brown says, "the mystery of this strange passion arises only when the enjoyments which it could command are sacrificed to the mere possession of the means of commanding them".[1] Brown himself furnishes the most essential part of the explanation, at least in ordinary cases. A permanent sense of power bound up with the possession of money is preferred to the fugitive enjoyment of spending it; and, on the negative side, there is a stronger aversion to the loss of this power than to the sacrifice of this or that particular gratification. "Before the boy lays out his penny in the purchase of an apple or an orange, it appears valuable to him chiefly as the mode of obtaining the apple or orange. But the fruit, agreeable as it may have been while it lasted, is soon devoured, its value with respect to him has wholly ceased, and the penny he knows is still in existence, and would have been still his own if the fruit had not been purchased. He thinks of the penny, therefore, as existing now, and existing without

[1] *Philosophy of the Human Mind*, vol. iii., p. 403.

anything which he can oppose to it as equivalent, and the feeling of regret arises—the wish that he had not made the purchase, and that the penny, as still existing, and equally capable as before of procuring some new enjoyment, had continued in his pocket."[1] It may be said that in this process the means does not come to be desired for its own sake, but only for the sake of an end different from that to which it is at first directed. This is true, of course, if we distinguish between money and purchasing power; but the essential point is that the power of purchase, as such, is at first merely desired as a means, and afterwards comes to be desired as an end, because of the immediate gratification which it affords, and the corresponding painful restriction which the want of it occasions. This gratification is a pleasure accompanying free ideal activity.[2] When we possess the means of commanding desirable or avoiding undesirable things, we can without let or hindrance imagine ourselves obtaining the one or escaping the other. The sense of impotence, on the other hand, is a check on the flow of ideas, restricting inward freedom, and so producing in many minds greater discomfort than the sacrifice

[1] *Philosophy of the Human Mind*, vol. iii., p. 405.

[2] "In the chain of islands which stretch away from the south-eastern end of New Guinea, one finds an interesting metamorphosis of the stone axe. The stone axe was very precious among these people, to whom the art of working in metals is still unknown. A large fine axe would have very considerable value, and the exhibition of it would be a symbol of wealth, and, consequently, of power. The desire to be recognised as wealthy has resulted in the development of a stone axe of which the stone is very large, often remarkably thin and beautifully polished, and is hafted to an unwieldy handle which may be carved and decorated with shell-money and other ornaments. The value of such an ornament seems to depend upon the amount of work required to produce it; its inutility enhances the reputation of the wealth of its possessor; thus we appear to arrive at certain primitive conceptions. Work done gives ownership to property. One form of wealth is the possession of unnecessary or useless property; the exhibition of this gives power to the owner" (A. C. Haddon, *Evolution in Art*, pp. 78-79).

of particular enjoyments which can only be gained by spending. To such persons the loss of wealth is a curtailment of existence—a kind of mutilation of their conscious being. Of course, the whole secret of avarice is far from being contained in this explanation. The mere process of accumulating money has in many instances an irresistible charm of its own. This is to a large extent explicable by what we have called the formal conditions of the independent growth of a desire. The process of accumulating and saving is an engrossing one; it calls into play the complex and persistent exercise of mental activity, and this of itself is sufficient to constitute an impulse which demands gratification for its own sake. To this we may add that there may be in some men an inborn tendency to hoarding, comparable with the instinctive impulse of certain animals, such as the raven.

Another good instance of an activity which is at first subordinated to the attainment of an ulterior end, but in practice turns out to have a specific value of its own, is that of hunting. This, to begin with, was a means of obtaining food. Now it is followed in civilised life chiefly as an amusement. The physical exercise and the display of skill in overcoming difficulties have a charm of their own. Hence they become an object of desire for their own sake, and the killing of the hunted animal is only pursued as a means which makes possible the pleasures of the chase. Of course, the mere enjoyment of overcoming difficulties by skill is accounted for by formal conditions. But the pleasant organic sensations which constitute a large portion of the attraction cannot be brought under this head.

Side by side with the evolution of relatively new desires there is found the inverse process of the gradual decay of impulses initially intense and engrossing. The general principle of this decay is that a conation, in attaining its end, ceases to exist. In some instances ten-

dencies which at the outset played an important part in mental life pass into automatic processes, which only appear as independent conations when some exceptional circumstance occurs to interrupt their normal course. The mental attitude of the child in learning to walk is one of conscious endeavour. When he has become habituated to the act he performs it without attending to his movements, his mind being fixed on the attainment of other ends. Organic cravings, such as hunger and thirst, can never in this way wholly fall outside the sphere of attentive consciousness, since they are bound up with regularly recurrent bodily needs, which cannot be fully satisfied as soon as they emerge. But it is none the less true that in proportion as the methods of appeasing them have become speedy, facile, and uniform, they play a less conspicuous part in conscious life. They occupy quite subordinate positions in the consciousness of a person to whom a regular recurrence of sufficient meals is a matter of course. If a civilised man in good circumstances thinks much about his dinner, what he has in view is rather the special pleasures of the palate than the mere gratification of hunger. This enfeeblement of conation with the increased facility of its satisfaction would, apart from the working of other conditions, lead to a state of comparative mental stagnation such as we find in animals. It is counteracted, as we have seen, by the gradual differentiation of relatively simple tendencies. The relatively blind impulse in satisfying itself must define itself, and in becoming defined it becomes transformed, so that what was adequate to satisfy it in its simpler phase proves inadequate in its more complex phase.

Apart from the perpetual germination of one conation out of another, the characteristic features of the mental life of human beings would be inexplicable. When Pope said that "Man never *is* but always *to be* blest," he touched on the very essence of human consciousness as distinguished from that of

the lower animals. Hobbes expresses the same fact in another way when he asserts that "there is no satisfaction but in proceeding". The peculiar feature of the life of animals which prevents progressive development is the existence of instincts which do for them what the human being must do for himself. Their inherited organisation is such that they perform the movements adapted to supply their needs on the mere occurrence of an appropriate external stimulus. These motor reactions may in some degree be improved in accuracy and fitness by experience, but the amount of acquired definiteness and precision is so small as to be negligible when we institute a comparison with the human being. In man, a blind craving has to grope its way from darkness into light in order to become effective; in the animal, the means of its satisfaction are provided ready-made by nature at the outset.

If we turn to the physiological aspect of conation it seems possible to find a general formula for the independent development of a mental tendency. Conation has its physiological correlate in the tendency of a neural system to recover relative stability when its equilibrium is disturbed. Now, suppose a complex system A, which includes as partial components p, q, r. Initially, disturbance of equilibrium and tendency to its recovery affect this system as a whole. So long and so far as this is the case, the activity of the partial systems p, q, r, will be merged in that of the whole to which they belong. But so soon and so far as any one of the partial systems suffers a disturbing excitement which primarily affects it alone, independently of the others, its correlate in consciousness is a separate and independent conation.

§ 2. Practical and Theoretical Conation.

In the beginning of mental life practical needs are paramount. Purely intellectual curiosity disengages itself from these only by a process of gradual evolution. A practical

need is one which demands for its ultimate satisfaction an actual change produced in the environment, or in the relation of the organism to the environment, or at least in the consciousness of power to produce such change. Theoretical needs, on the contrary, require for their ultimate satisfaction only an extension of knowledge and removal of doubt without alteration in the things known. This does not imply that theoretical satisfaction can always be obtained purely by the flow of ideas. Of course it constantly calls for observation and experiment. The essential point is that observation and experiment, inasmuch as they are only intended to appease intellectual curiosity, are means to an end: and that the ultimate end consists in the unimpeded flow of ideas previously obstructed by the competition of conflicting alternatives.

We have now to consider how theoretical conation, which is solely directed to the attainment of an unobstructed course for trains of thought, emerges into independence from the complex of practical tendencies which are initially directed to the maintenance of the life and physical well-being of the individual. One obvious characteristic of these most primitive impulses is that their satisfaction, so far as it is not externally provided for, directly depends on bodily movement. Thus the first stages in the definition and differentiation of such tendencies coincide with the growing definition and differentiation of motor process. The cognitive development, in and through which the conation becomes more determinate, serves only to guide the bodily activity. The ideas and perceptions which arise are ideas and perceptions of the conditions of direct action upon the environment or change in the spatial relation of the organism to the environment by means of the muscles. Thus the systematic co-ordination of presentations has its almost exact counterpart in the systematic co-ordination of motor processes. The diffused mobility which is the outward expression of hunger in the new-born infant develops into the

definite action of suction, and this is succeeded by the more complex processes of mastication, of prehension, of lifting the food to the mouth, of the use of knife and fork, etc. Corresponding to the growing complexity and co-ordination of movement, there is an increasing complexity and co-ordination in the grouping of cognitive elements by which movement is guided; and this, again, constitutes a growing complexity and co-ordination of the primitive impulse with which the whole process starts. The entire mental development of the child in its early phases finds in like manner an adequate expression or translation in terms of bodily movement. The education of the senses has its external counterpart in the growing complexity and definiteness of the motor adaptations of the sense-organs, and of the other movements by which we are enabled to obtain impressions in a systematic order by changing the position of bodies in space, or our own position in relation to them. As a type of the whole process, we may take the exploration of boundaries by the eye or hand. The primary craving with which the education of the senses begins, so far as it does not involve such special practical needs as that for food, may be described as a general craving for stimulation or excitement. This is seen in the fascination which a bright light has for the very young child. But this conation is, in the first instance, in the highest degree indeterminate. It assumes definite direction and becomes specialised in definite channels through the guidance afforded by the contours of things in space, and the edges which divide one colour from another. Of course, as experience advances and the brain grows, new tendencies emerge through the awakening of congenital dispositions ingrained in the nervous organisation. But these innate dispositions manifest themselves at first as mere vague cravings, and become differentiated only by a gradual development. In this gradual education of the senses there is a stage in which purely

theoretical curiosity seems to play a part. The child appears to explore objects with hand and eye, merely to find out what they are like. It shows the same bias in a more advanced stage when it breaks its toys in order to find out what is inside them. But perhaps the real question in the mind of the child is rather, "What can I do with this?" than "What is this?" In any case the practical impulse comes first and remains throughout inseparably blended with the theoretical.

Among the specific tendencies which seem to have their source in the inherited organisation are those which lie at the root of the special emotions. The child, for example, early manifests anger and fear. Anger initially expresses and satisfies itself by a peculiar form of violent motor discharge. Even at the outset it takes the form of an effort to overcome resistance by main force. The young child who has acquired no definite mode of wreaking its passion, shows it by vague kicking and struggling, by movements which antagonise each other, and which encounter resistance in external objects. The development of cognitive consciousness simply serves to restrict this diffused mobility within more definite channels. The child in a later stage throws his plaything violently to the ground, or pushes it away, or breaks it, or, in the case of a person who thwarts his will, he kicks, pushes, or strikes. Even the adult may find some satisfaction for his irritation in destroying furniture, and he nearly always has a strong disposition to break, crush, tear, or rend something. Inasmuch as his anger has become enlightened and defined, his destructive impulse will become more specially directed against the object by which his desires are crossed or thwarted. But when the conditions deny him this satisfaction, it is well known that the angry man is very apt to wreak his anger on inoffensive things or persons, thus approximating to the condition of the child. Though the tendency to overcome resistance by violent exertion of bodily

force seems always to play some part in anger, yet with the advance of intellectual development it gives place more and more to an ideal satisfaction; it becomes enough to know, or sometimes even to imagine, that the opposing forces have been crushed by our agency. This is of course a direct consequence of the growing importance of the life of ideas as compared with that of perception. But even in the ideal satisfaction of anger the impulse to destroy or break down opposition may be satisfied to some extent by wreaking it on other objects than those which immediately awaken resentment. The relief afforded by swearing comes under this head. It is a breaking down of the ideal barriers which social convention or religious sentiment sets up. As anger is primarily expressed in movements which seek to meet and crush opposition, so fear is primarily expressed in movements which tend to evade or escape it. The process whereby these movements of shrinking or withdrawal pass into definite and complex actions by which we escape or evade special kinds of threatened injury, is quite parallel to that which we have illustrated in the case of anger. In both instances we have two initially blind tendencies gradually differentiating themselves, and so becoming transformed with the growth of experience.

We have next to consider the transition from those practical conations which find their full expression and satisfaction in bodily activity and its proximate consequences, to those which require for their realisation prolonged trains of thought. This transition takes place if and so far as the result aimed at depends on an intervening series of events which cannot be directly influenced by our actions. Here it is obvious that prevision of a causal series issuing in the desired end is a necessary condition of its attainment. We must be able ideally to construct the sequence of occurrences which will follow on our initiative. In so far as continued interference on our part is required as a contributory factor, we must

endeavour to foresee where, when, and how it is to be brought to bear. Sometimes a pre-arrangement of external conditions is a necessary preliminary. This renders the ideal construction more complicated, because we have not merely to anticipate the modes in which things or persons will comport themselves when the train of occurrences which we set in motion affects them, but also how we can modify them beforehand, so that they may be affected by it in a certain way. For instance, the commercial speculator has to control his buying and selling by prevision of the rise and fall of prices; and he sometimes endeavours directly to influence the state of the market beforehand by his own agency.

In this way complex and sustained intellectual activity may arise in the service of practical ends. This ideal process, as it becomes more extensive and involves more adaptation to varying conditions, takes on more and more the character of an independent conation. Successful ingenuity of itself gives satisfaction both as a coherent train of ideas and in its coincidence with fact, when it comes to be verified by trial. On the other hand, difficulties which defy solution give pain merely because they impede the flow of mental construction, apart from the obstruction they offer to the attainment of practical results. So, too, the disappointment of expectation when a contrivance turns out a failure, may be a source of dissatisfaction merely because of the collision between the preformed connection of ideas and the actual course of events.

With the growing complexity of the life of ideas, there will also arise discrepancy, incoherence, and indeterminateness of ideal relations, giving birth to problems which have no immediate practical interest. In so far as these problems arrest the free course of thought, and so engross attention for their own sake, a purely theoretical activity ensues. But so long as the mind is mainly absorbed in practical pursuits, it is not likely that purely theoretical questions of the kind will

occupy attention otherwise than in an occasional and transient way. Plato was on the right track when he referred the origin of philosophy to the emergence of apparent contradictions and difficulties in the common-sense view of the world. But this explanation is not complete. The practical man, who knows enough for his purpose, shows a marked tendency to thrust aside speculative difficulties, or to treat them as a mere amusement for an idle hour. Even the student of physical science is apt to be content with his fundamental conceptions, and to treat the philosophical criticism, which reveals their essential incoherency, as mere trifling.

It is obvious that we must introduce supplementary conditions, if we are to give a full explanation of the origin of the mental attitude of the man of science or of the philosopher. The conditions so far assigned are not adequate. They show how, in the pursuit of practical ends, sources of satisfaction and dissatisfaction arise which are not themselves practical. But they do not show why these theoretical interests should so sever themselves from the practical as to become dominant; they do not account for cases in which men may be said rather to live for the sake of thinking than to think for the sake of living. Such predominance of theoretical interests only becomes possible in a state of society in which part of the population are more or less freed from the necessity of living by their own exertions. The pursuit of science and philosophy for their own sake presupposes leisure. But at this point we are confronted with a difficulty. If the growth of theoretical interest depends on the growing complexity of systems of ideas, and if this in its turn depends on the existence of practical needs, which require for their satisfaction the exercise of intellectual ingenuity, how can theoretical curiosity ever become strongly developed in persons who live a life of leisure? If the leisure comes to them after prolonged exertion of a practical kind, their mental striving will already

have become set in a practical direction, and they will therefore form very unpromising material for the shaping of disinterested scientific discoverers. There is, however, a condition of paramount importance which overcomes this difficulty, and supplies an adequate solution for our problem. I refer to the influence of the social factor. Society supplies the needs of the individual in a two-fold manner. In the first place, each man depends upon the co-operation of others for the satisfaction of his practical needs, for the maintenance of his existence and of his material well-being. Without the aid of others he cannot mould and adapt his material environment to his own use. Perhaps the child's interest in the persons who surround him, and his desire to communicate with them, are at the outset mainly of this practical character. But at a very early stage in the development of the individual, the desire for sympathy and mutual understanding becomes itself a primary end. The mental life of man in society is as immediately dependent on interchange of ideas with his fellow-men as it is on the use of his senses. The first strong development of pure curiosity arises in connection with social relations. It consists in the felt need to know what those around us are doing or thinking. The greater part of all ordinary conversation, both among the civilised and the uncivilised, illustrates this primary social impulse. Even the interest of human beings in nature, apart from their immediate practical needs, was at the outset an interest in personified natural objects. Another aspect of this desire for communion with our fellows, and of aversion for that mutilation of mental existence which social isolation involves, is found in what may be broadly termed the tendency to imitation,—the tendency to assimilate ourselves to the society in which we live, so that we may understand and sympathise with it, and it may understand and sympathise with us. But this *rapport* with our social environment can only be acquired by possessing ourselves of the ideas which

are current in it. We must be able to talk about the topics which others talk of. Nor do we merely desire to understand what they say. We require that they shall be interested in us. For this purpose, it is useful to know what they do not know but desire to learn. Hence arises the impulse to acquire knowledge which may prove of interest to others, and by this means to secure for ourselves a recognised and respected place in the social organisation. In this social tendency is found an initial motive for the pursuit of knowledge apart from reference to practical utility. Of course it is only at the beginning that it is of predominant importance; yet perhaps it is never wholly absent. Even the most disinterested student of science has probably always more or less before him the idea of the appreciation of his work by others, though these may be only a select few.

To realise the full importance of the social factor, we must take into account the continuity of human progress from one generation to another. The intellectual acquisitions of the past are transmitted as a legacy, by way of oral tradition or written record, to the present. Thus the impulse to place ourselves in an attitude of sympathetic understanding with our fellow-men is largely an impulse which seeks sympathetic understanding of the work of our ancestors, and which endeavours as far as possible to establish a claim on the interests and gratitude of our successors. This linking together of successive generations, through the permanent inheritance which one leaves to another, makes possible the gradual accumulation of knowledge. What in one age is a difficult and laborious discovery becomes in the next an idea in current circulation, so that it is acquired by the individual as a matter of course, and at the expense of comparatively little time or effort. But this of itself involves increase in the range and intensity of theoretical interests; the desire to know grows by what it feeds on.

This brings us back to the fundamental position that all mental process, as such, is conation, and that the more complex and systematic it is, the more it asserts itself as independent conation. The development of immediate theoretical interest apart from collateral motives depends in part on the systematic complexity of the knowledge already attained. The more extensive a system of ideas is, the larger is the part it plays in the mental life, and the more completely does it disengage itself as an independent tendency. A boy may begin to study Greek at first because he is expected to do so by his parents and schoolmaster,—because it is a means of winning their approval,—because the people he is to associate with are the kind of people who understand Greek,—or even because he will be flogged if he does not. But by the time he has gone through a classical course at a university, he will in all probability have acquired at least some degree of interest in verse-making, in textual emendations, and so forth, independently of extraneous motives. Of course very much depends upon congenital aptitude. This is by no means the least important condition which we have to consider. The essential point, so far as regards the present discussion, is that congenital aptitude is also congenital proclivity. To have a special turn for a certain line of study is, *ceteris paribus*, to have a special disposition to pursue it. This disposition can only be called into play under appropriate conditions; but when it is so it often manifests itself in a very striking manner. This is best seen in the case of men of genius. Pascal's father refrained from teaching his son mathematics until he had been fully grounded in classics. But the boy happened to inquire one day what geometry was: he was told that it investigated the properties of lines and figures. He straightway began to investigate the properties of lines and figures for himself; and in so doing discovered and demonstrated many of the propositions of Euclid. Malebranche again, casually taking up a

volume of Descartes, was thrown by it into a state of intense bodily and mental excitement, which formed the starting-point of his philosophical work. Similar instances could be easily accumulated. Perhaps there is no man of genius whose biography would fail to yield striking illustration. We also frequently meet with instances of a similar kind in which the congenital aptitude falls short of what is generally known as genius. In one such instance known to myself, a youth, after drifting through life in such a way as to impress his friends with his want of any special bias or special capacity, and after having determined on entering the army, simply because he was bound to do something, and nothing else had greater attraction for him, had his whole career permanently revolutionised by a casual conversation with his coach about Herbert Spencer's philosophy. Since then philosophy has been the leading interest of his life.

Perhaps it may be as well to remind the reader that, though mental process as it advances in complexity becomes less and less capable of adequate expression in terms of motor process, yet some motor process is always involved in it. Even the most purely theoretical trains of thought cannot be carried on without the movements by which attention fixes and detains the particular images, which successively emerge into consciousness. Thus, even those who regard motor expression as the distinctive character of conation, must admit that thinking, being a motor activity, has a good title to be brought under this head.

§ 3. Miscellaneous Illustrations.

The general position that cognitive synthesis is merely the way in which active tendencies define and differentiate them-

selves, is of so much importance that some additional elucidation may not be out of place.[1]

The special emotions perhaps supply the most conspicuous examples. The ideas and combinations of ideas which arise in a mind under the influence of vehement passion, are all such as in some manner harmonise with the dominant tendency. They explain it, justify it, or gratify it. Defoe describes in a very vivid and natural manner the state of Crusoe's mind after seeing the print of a man's naked foot on the shore: "I came home to my fortification, not feeling, as we say, the ground I went on, but terrified to the last degree; looking behind me at every two or three steps, mistaking every bush and tree, and fancying every stump at a distance to be a man. Nor is it possible to describe how many various shapes my affrighted imagination represented things to me in, how many wild ideas were found every moment in my fancy, and what strange unaccountable whimsies came into my thoughts by the way." On the other hand, after discovering the remains of a cannibal feast, his emotional attitude becomes transformed from fear to violent indignation, and this change is accompanied by a corresponding transformation in the general current of his ideas: "But my invention now ran quite another way; for, night and day, I could think of nothing but how I might destroy some of these monsters in their cruel, bloody entertainment, and, if possible, save the victim they should bring

[1] In this connection, I desire to recommend a book by André Godferneaux, entitled *Le Sentiment et la Pensée* (F. Alcan, 1894). The author greatly exaggerates the exactness of the correspondence between conation and motor process, and he seems disposed to regard cognitive synthesis rather as a web which conative tendencies spin, than as the definition of these tendencies themselves. But in the main I can appeal to his book as containing a corroboration of the doctrine advocated in the present work. My own view is at bottom essentially similar to that of Spinoza, when he says that ideas are not dumb pictures on a tablet, but specific modes of the primary *conatus* which constitutes our being.

hither to destroy". In Crusoe's case, the first inrush of fear and anger arose in connection with definite objects; but they not unfrequently occur merely through general organic conditions without any particular occasion. When this happens, the emotion finds or makes objects for itself without any definite cue to start from. If illness or want of sleep has thrown a man into an irritable mood, then circumstances, which might otherwise have appeared indifferent or even agreeable, are apt to provoke his resentment. He puts a wrong construction on the behaviour of others, and sees everything through a distorted medium. To use a slang expression, he has got out of bed on the wrong side. This influence of organic conditions in determining emotion, and with it the train of ideas, is best seen in those moods of depression and elation which, in some persons, follow each other with an almost rhythmic regularity. In the state of elation the step is elastic, the speech fluent, and in general bodily movements are prompt and rapid. In the state of depression there is a tendency to walk slowly or to keep still; speech is comparatively slow and hesitating, and movement in general is sluggish and vacillating. These external features have their counterpart in the accompanying psychical condition. In the elated mood the flow of ideas is easy and rapid. If difficulties occur, they only provoke an energetic effort to overcome or evade them, and if they are recognised as insuperable, we pass with comparative ease to some other line of activity. Now this felt power and freedom which characterises the state of elation, tends, like other conative states, to define itself in appropriate ideas and combinations of ideas. In such a mood we naturally take a roseate view of things; of our own prospects of success, of what others think about us, and so forth. The opposite holds good in depression. Here the movement of ideas is comparatively slow and difficult. It is as if the channels of thought were clogged and obstructed.

The links of the ideal chain succeed each other with appreciable delay and effort, and we have often to go back and make a new start. The general sense of mental impotence, characteristic of depression, finds its definition in an unfavourable view of our own position and prospects. Difficulties which, in a state of elation, would have seemed comparatively trifling, or would have only served to call forth a development of our resources for overcoming them, appear now as impassable barriers which prevent us even from imagining success. Our thoughts fasten themselves on the hostile and disagreeable side of things, disregarding or feebly resenting the bright side.

These moods of depression and elation, due to organic conditions, may of course arise in various ways. The elation may be produced by taking too much wine in the evening, and the depression may be the well-known sequel in the morning. But on both the bodily and mental sides the most pronounced forms of these states are found in certain types of insanity—in melancholia, and in that mental exaltation which is generally connected with some degree of mania or intellectual incoherence. Simple melancholia is in the main an intense exaggeration of ordinary depression. The patient has a general sense of fatigue; he shows a strong antipathy to all muscular effort; even the exertion required to put on his clothes may be too much for him; sometimes he obstinately refuses to quit his bed. His voice is feeble and unemphatic; the latent innervation of the muscles is diminished; the neck drops, the head hangs, the face is elongated; vaso-motor action is profoundly affected; the calibre of the arteries is diminished; the pulse is enfeebled, and the constriction of the larger vessels is accompanied by stenosis of the capillaries. This paludism or stagnation of the blood-supply is probably the primary feature of the disease, on which the other symptoms depend. As a consequence of the innutritions thus produced, all the secretions are diminished. The general

clogging of the organic functions involves the brain also; hence the psychical characters of melancholia. Sustained and complex trains of thought become impossible; the flow of ideas becomes a slow and painful effort. There is a sense of mental fatigue corresponding to the sense of bodily fatigue. The patient, for example, on being asked a simple question, may require to reflect for some seconds before answering. Sometimes it may be necessary to repeat the question two or three times. The higher the degree of noetic synthesis involved, the more slow and difficult does the process become. Thus a female patient on being shown a lily and asked to identify it, at first hesitates, and then says "a flower". On being pressed to say what kind of flower, she hesitates once more before pronouncing it to be a lily.[1] The same patient, in order to multiply 8 by 6, wrote the number 6 eight times, and succeeded in the addition after two mistakes.[2] Another characteristic of melancholia is the aboulia which accompanies it. The patient is unable to come to a decision, or at any rate to carry the decision out when it comes to the point. Another feature of such cases is persistent obsession by the same ideas; the mental state of the melancholic patient is monotonous. The difficulty of passing to new ideas involves persistent preoccupation with the old. Now, just as in ordinary depression, so in the asthenia of melancholia the ideas on which the mind fastens are such as to explain and justify its own experience of impotence and oppression by hostile forces. The conative state defines itself in the cognitive. Thus, in a case described by the same author, a woman harped continually on having twice deceived her husband years ago, on her disbelief that she had really been forgiven by him, on an attempt which she had made to produce abortion when she was *enceinte*, on the death of a relation, on the weakness of her son's eyes, and her anticipation

[1] Dumas, *Les États intellectuels dans la Mélancolie*, p. 72.

[2] *Ibid.*, p. 74.

that he will become blind. Within this narrow circle her thoughts seemed to confine themselves without finding any outlet; reasoning and remonstrance served simply to make her pass from one of this narrow group of depressing topics to another, but utterly failed to give her any new or brighter view of things.[1]

Some writers on mental pathology make much of the distinction between depression arising primarily from general organic disturbance, and that which in the first instance is, as they say, "intellectual" in its origin. The distinction is no doubt an important one; but to a psychologist it appears to be very badly expressed. It seems a strange perversion of language to say that depression occasioned, *e.g.*, by the loss of a fortune, is due in the first instance to an idea, and that emotional change is a secondary consequence. The loss of a fortune is, in itself, a very strong emotional shock. The cognitive apprehension of the loss and the emotional disturbance are one and the same event. The distinction is really between depression which begins with an emotional disturbance referring to a specific object, and due to special circumstances in the personal history of the individual, and one which begins with general depression and is not traceable to any special circumstance in the experience of the individual. Where the occasion is special, some degree of general depression follows, having its source and support in general organic disturbance. This vague impression will tend to define itself, like that which arises without special external occasion. An important difference between the two cases is that the depression with specific origin is already partially defined, and this partial definition forms a nucleus around which other defining ideas crystallise. It also happens in normal life that states of general depression may either originate spontaneously or be traceable to some definite motives.

The pathological state of exaltation with its accompanying ideas of grandeur and its sanguine self-complacency, arises in connection with an impairment of noetic synthesis. Its bodily expression is contrasted with that of melancholia inasmuch as it is characterised by an apparent increase of motor activity. But the increase is only apparent as compared with the normal state. There is present a restless mobility, but the systematic co-ordination of motor process is impaired and tends gradually

[1] Dumas, *Les États intellectuels dans la Mélancolie*, p. 16 ff.

to disappear. The patient becomes less and less capable of delicate motor adjustment, and more and more the prey of vehement and disconnected impulses. His mental state is exactly correspondent to this. The flow of ideas is abnormally varied and rapid, but it is also abnormally incoherent. Its ease and rapidity are due to the fact that it is not restricted within definite channels by the sustained pursuit of definite ends. The play of association proceeds with ease and rapidity because the central control due to noetic synthesis is impaired or absent. Action is due to momentary impulse, not the result of deliberation. The patient cannot persist in the same occupation; "he cannot stay at home, or mind his own business; he pays visits without a motive, he gesticulates, he perorates, he shows himself indiscreet, over-expansive, and injudiciously generous; he forms a thousand projects, which he imparts to every one whom he meets."[1] Now, though the state here described is in reality one in which mental power is seriously impaired, yet the patient himself is conscious mainly of increased freedom and facility. This defines itself on the intellectual side by his sanguine view of things, his anticipations of triumph and success on all sides, and his increased sense of his own importance. Perhaps, however, the chief lesson taught by such instances is to be found in the coincidence of cognitive inco-ordination, and conative inco-ordination. Disconnected impulse takes the place of the sustained pursuit of ends, and the play of association displaces noetic synthesis. These are only two ways of describing the same concrete fact.

Mental pathology throughout its whole range supplies abundant illustration of the inseparable unity of conative and cognitive process. This side of the question has been worked out by M. Godferneaux in an interesting way, and we may refer the reader to his book for further detail.

[1] Godferneaux, *Le Sentiment et la Pensée*, p. 2.

CHAPTER VIII.

APPERCEPTION.

§ 1. Explanation of the Term.

Under the term *apperception* are included all such processes as understanding, interpreting, identifying, subsuming, etc. It is used to indicate one feature which these processes have in common. In all of them a presentation acquires a certain significance for thought by connecting itself with some mental preformation as this has been organised in the course of previous experience. Hence apperception has been defined by Steinthal as "the union of two mental groups in so far as it gives rise to a cognition". As this definition implies, both groups may give and receive significance on equal terms. This depends entirely on the degree of organisation which each has already acquired. If one of them, *A*, has a relatively high degree of that systematic unity, which noetic synthesis gives, and the other, *B*, more nearly approaches the condition of a mere anoetic manifold, then *A* may be said, in a special sense, to be appercipient, and *B* to be apperceived. Some admirable illustrations of this are given, for another purpose, by Dr. Stirling: "When, one morning, the day broke, and all unexpectedly before their eyes a ship stood, what it was was evident at a glance to Crusoe. . . . But how was it with Friday? As younger and uncivilised, his eyes were presumably better than those of his master. That is, Friday saw the ship really the best of the two; and yet he could hardly be

said to see it at all. . . . In short, what to Crusoe was *an* object, was to Friday only a dark and amorphous blur, a perplexing, confusing, frightening mass of details, which would not collapse and become single and simple to him."[1] "Has it never happened to the reader to lie in a strange bedroom, and to puzzle himself in the morning about some distant object which he was conscious he had known perfectly well the night before, but which he could not put together for the life of him now? It is an object on a shelf, peeping out of a cupboard (say): *what* is it? What a strange-looking object it is! A formless detail of many perceptive [anoetic] particulars, an incomprehensible plurality of parts; but what is it? Ah! a candlestick, a family Bible, a bandbox, a general's battered hat, etc. The moment you recollect what you had recognised it to be, the moment the notion attaches itself, all is plain; and yet you are not a bit nearer, and see (*qua* seeing) not a bit clearer than before."[2] Instances in which the two mental groups mutually communicate significance to each other on equal terms are abundant in the higher processes of thought. Thus, the discovery of gravitation took place through a confluence of the mental system representing what was known of terrestrial gravity, and the system representing what was known of the motion of the heavenly bodies. A simpler example is supplied by the process of comparison, in which the idea of each of the objects observed apperceives the idea of the other. These mutual apperceptions usually form part of a wider process. The apperception of each group by the other subserves the apperception of both of them by a more comprehensive system. It is not, however, necessary that this should be the case. Each of the groups may, in one respect, be regarded as more comprehensive, and, therefore, as appercipient, and in another respect as more special, and,

[1] *Text-book to Kant*, p. 54. [2] *Ibid*, pp. 54-55.

therefore, as apperceived. In the example quoted, the system representing terrestrial gravity was more special, inasmuch as it referred to a comparatively limited portion of the physical world. It was more general, inasmuch as it referred to a mode of the interaction of bodies conceivably applicable to the whole material world.

It will be seen from this account that the process of apperception substantially coincides with that of attention. The difference lies in the point of view. The attention-process, as we saw (bk. ii., ch. ii., p. 185 ff.), is characterised by systematic unity and relative novelty. Under the head *apperception* we are especially concerned with the relation of the new to the old, in so far as it gives rise to modifications of the old. We consider the whole process as one by which the mind grows. As Mr. Shand remarks, attention has a "cumulative effect on its own process". Each act of attention leaves behind it "a kind of deposit . . . which is taken up and utilised by succeeding acts," and "ever grows with the growth of our attentive experience".[1] Now this cumulative effect of attention on its own process is precisely what is meant by apperception. In the doctrine of apperception we consider how attention becomes progressively modified by retention, how the products of past process determine and are determined by succeeding changes. From this point of view apperception may be defined as *the process by which a mental system appropriates a new element, or otherwise receives a fresh determination.* When an unsuccessful attempt is made to identify, classify, interpret, etc., there is a failure to appropriate new elements; but this very failure is itself a fresh determination of the apperceptive system. The word *appropriate* is used in order to indicate that the system makes the new element its own. The need for the apperceptive process and the stimulus

[1] *Mind*, N.S., No. 12, p. 463.

to it lies in the initially foreign and alien nature of the new element, and the consequent antithesis between its disturbing novelty and the internal self-development of the system. The end of the process is to annul this antithesis. The new element appropriated by the appercipient system is not to be confused with the whole mental group which is apperceived. The two coincide only in cases of subsumption of the particular under the general. But these cases constitute only a special class of apperceptions. For the most part, the appropriated element is only a part or aspect of the apperceived system. This is well seen in those metaphors which control the growth of language, and constitute what is called the inner speech-form. "I apprehend" means originally "I grasp," *i.e.*, "lay hold on with my hands". The first person who said "I apprehend your meaning," merely said "I grasp or lay hold on your meaning as with hands". Now when this metaphor first occurred, it was an apperceptive process taking place between the mental group representing understanding and the mental group representing prehension. But neither of these groups became mebodied in the other; the result was rather that they came to interpenetrate each other at a certain point, in respect of the common relation which both involved,—a relation which would never have become a distinct content of either, apart from the apperceptive process.

In almost every moment of waking life an apperceptive process is taking place. Whenever an object is attended to, the presentation of it is apperceived. Those aspects of the presentation which are congruent with the appercipient system acquire special significance. Others remain outside the sphere of the attention-process. The physician will at a glance detect in a patient symptoms which have escaped the anxious scrutiny of friends and relatives. The reason for this certainly does not lie in the greater intensity of his interest. He is able to note what they fail to note, because in his mind an

apperceptive system has been organised, which they do not possess.

An important distinction between attention and apperception is that, whereas attention is an attitude of consciousness towards a presented object, apperception is merely a process of interaction between presentations or dispositions. The apprehension of an object is to be regarded as a result of this process. Thus we may freely follow Herbartian terminology in speaking of ideas apperceiving each other, without falling into the Herbartian paradox according to which they observe or take cognisance of each other. As vital process comprehends in a higher synthesis physical and chemical changes, so the systematic activity which we call *apperception* comprehends in a higher synthesis the elementary process of simple suggestion, relative suggestion, conflict, etc. Apperceptive activity involves a systematic combination of these elementary processes. Indeed, its main value is that it enables us to knit together in their natural unity the separate threads of psychological theory, and to include in a single view the various aspects and elements of mental process which would otherwise only be treated of in distinct chapters.

In the whole of the succeeding discussion the reader is requested to bear in mind the result of our last chapter. Apperception is conative process. A mental group or system is a grouped or systematised tendency, and the union of such groups or systems is the confluence of different modes of mental activity. It is needful to say this, because the familiar Herbartian treatment of apperception is apt to suggest a notion that the presentations concerned in it are distinct and independent agents, instead of being special modifications of the general current of conscious life.

§ 2. Mental Systems.

The kind of combination signified by the term *systems* essentially involves noetic synthesis. A system is systematic

in so far as its constituents are partial apprehensions of one and the same whole, so that their relation to each other is conditioned by their relation to the central idea of this whole. The whole itself is nearly always presented in the way of implicit or schematic apprehension. To say nothing of other difficulties, the narrowness of consciousness forbids that it should, at any given moment, be presented in the fulness of its details. Hence a mental system, even when it enters into conscious process, always remains to a very large extent beneath the threshold of consciousness. Yet, owing to its organisation, the unconscious dispositions emerge into consciousness as they are required, under the central control of noetic synthesis. "Thus," to take an illustration from Hume, "should we mention the word triangle, and form the idea [image] of a particular equilateral one to correspond to it, and should we afterwards assert *that the three angles of a triangle are equal to each other*, the other individuals of a scalenum and isosceles, which we overlooked at first, immediately crowd in upon us, and make us perceive the falsehood of this proposition, though it be true with relation to that idea which we had formed."[1] It should be added that the more fully and familiarly we are acquainted with the meaning of the word *triangle*, the less likely we are to make the initial mistake referred to by Hume, because the noetic synthesis not merely tends to call into consciousness the constituents of the system which it unifies, according as they are required for the purposes of thought, or, what is the same thing, of apperceptive process; it also represents the system as a whole, more or less perfectly. In one way or the other, the central idea discharges a vicarious function; it stands for the whole system, much as the constituted authorities in a society may represent the whole society. The official representatives of the society in the

[1] *Treatise on Human Nature*, bk. i., part i., sect. vii.

discharge of their function, may or may not find it needful to enforce their authority; and this holds good also in the psychological analogue.

In general, the analogy between mental and social organisations is a fruitful and instructive one; it has been well worked out by M. Paulhan: "Undoubtedly the ultimate element of the social organism is the individual man—but between the individual and the whole, there are various smaller organisations, various systems of a less complex composition, which severally play their distinctive parts in the life of the whole. These minor groups are, in the strict sense, elements of society, each having its specific tendencies, opinions, desires, passions, which combine or conflict, and so give to the whole in which they are united, an aspect of unity or of incoherence, according to the nature of their mutual relations. In psychology we find secondary combinations of an analogous kind—syntheses of simpler elements, entering in their turn into the composition of higher syntheses, and into the general life of the mind."[1] The same man belongs at once to his political party, to his church, to his family, to his club, to his trade or profession, and so forth. He is thus connected with a multiplicity of separate social groups, each having its own distinctive aim and function, and its own appropriate mode of organisation. To each of these distinct social relations, there corresponds in his own mind a distinct group of psychical elements. These are subordinate components of his general mental organisation, just as the various minor social systems are subordinate components of the general organisation of society. Similar mental groups tend to grow up in connection with each of the special aspects of his experience. To understand the meaning of a word, to identify or classify a perceived object, to plan a consistent

[1] *L'Activité Mentale,*

course of action—are all mental processes which involve the existence of groups of ideas, having severally a certain systematic unity.

The analogy between mental and social organisation may be carried further. In so far as a man actually participates in the special activity of any one of the social systems to which he belongs, he is, for the time being, debarred from taking part in the special activity of the other co-ordinate systems, as well as from asserting his own independence. Brutus, in his office of magistrate, ceases to be a father. In like manner, mental elements, which share in the activity of one mental system, are for the time disabled from acting either in any other systematic combination or independently. When we are engrossed in writing or speaking about some serious topic, it does not occur to us, unless we are inveterate punsters, to play upon the words we use. When we are interested in a game of billiards, the idea of the billiard balls does not set us thinking about the trade in ivory and African slavery.

On the dissolution of a mental system, whether brought about by pathological conditions or otherwise, its several components begin in their isolation to display the tendencies which their combination had suppressed. Mental anarchy in this respect resembles social anarchy. When a social organisation is broken up, its component groups or its component individuals do severally what is right in their own eyes. So, too, when a mental organisation is dissolved, its elements become free to act independently. Aphasic patients, for whom language has ceased to be an instrument of thought, sometimes show a strong tendency to string words together in a connection determined merely by alliteration, assonance, etc. In certain phases of the hypnotic trance, and in some other pathological states, mental systems act in abnormal isolation from each other, giving rise to beliefs and conduct which would be impossible to the subject in his normal condition.

Similar results may be brought about in manifold ways. The inverse happens when a number of groups, which have previously existed in relative detachment from each other, become combined in systematic unity. The action of each becomes limited by their union, as the liberty of individuals is restricted by their combination in an organised society. Thus, Darwin's passion for miscellaneous collecting became restricted in its range when it was subordinated to a great scientific purpose.

§ 3. Apperception and Assimilation.

Most writers, who treat of apperception on Herbartian lines, distinguish between two forms of the process. In some cases, they say, what takes place is mere fusion of a given presentation with the revived residuum of a past presentation of identical quality. In others, either the apperceived or the appercipient group, or both, become modified by their combination. Now no such distinction is admissible from our point of view. Apperception, for us, involves the activity of an apperceptive system as a whole; but no conditions can bring into play such a system, unless they tend to change its constitution, or in some way to make a difference to it. Wherever attention is present, some kind or degree of systematic readjustment is involved. Where attention is not present, there is no apperception, but mere assimilation. There is no apperception because there is no noetic synthesis. Assimilation there must always be, inasmuch as the existence of a given experience coincides with the re-excitement of some preformed disposition. Thus, in automatic actions, the impressions which guide us are all assimilated, but not apperceived. Whenever through habitual exercise, an organised group of psychical dispositions has become so preconformed to a special class of familiar experiences, that it assimilates

them with a certain degree of ease and rapidity, apperception becomes needless. There is the less need for it the more perfect is the mental preadjustment. Unless there is some difficulty to be overcome, mere assimilation, association, and relative suggestion can of themselves fulfil the office of apperception. Where there is nothing for it to do, its intervention would, in most cases, be a hindrance instead of a help, because the act of attending would occupy more time than the assimilative and associative process occupies by itself. For the most part, the perceptions of size, shape, and distance depend on processes of relative suggestion which are independent of apperception, except in the early stages of mental development in which we are still learning to apprehend sensible things, by means of sight, touch, and hearing. In the developed mind, the whole process takes place with so unfailing a celerity and facility that there is no occasion and no opportunity for the interposition of attention. If attention does intervene, it is because some feature of the perceived object is obscure or doubtful. Apart from this, ordinary sensible objects excite apperceptive process only in so far as they are connected with some wider interest—only when the product of the perceptual process enters into relation with a more comprehensive mental system, which strives to incorporate it, but which can only do so with comparative slowness and hesitancy.

In general, mere assimilation only involves attention in so far as it constitutes an integral part of a more comprehensive process which is not purely assimilative. We may illustrate this by a case given by Steinthal, which he appears to us to interpret erroneously. "Suppose that we are looking for a key in a bunch of keys or for a letter in a bundle of letters. We take into our hands one letter after another, one key after another, and hold them before our eyes The image of the object we are seeking is thus confronted with the several per-

ceptions as they arise. It apperceives them. All depends on whether the image of the key or letter actually presented blends with the image of the key or letter we are in quest of. If it does so blend, the object is found. If it fails to blend, it is not what we are looking for. In the former case there is positive, in the latter negative, apperception. 'This is not it; this also is not it; nor this; but this is.'"[1] Now here apperception is represented as consisting in mere coalescence, or in mere failure to coalesce. But a little reflection will show that this is an utterly inadequate representation of the process. Suppose that the key is one which we habitually use every morning to open a certain door, and that it habitually occupies its familiar place in a certain pocket; then, so long as things go smoothly, we do not notice the key at all; we simply take it and put it into the lock and open the door, while our mind is preoccupied with other matters. In this, there is no definite attention, and consequently no apperception. But there is a whole group of fusions. The renewed experience of door and key every morning, coincides with the revival of previous similar experiences. Apperception, however, is absent, because it has no function to fulfil. Suppose, now, that some morning we put our hand into our pocket and find no key there; instantly we attend to the key and to our need of it. But the mental picture of the key, if it is formed at all, is, at the outset, not appercipient but apperceived. The apperceptive system is that connected with our delayed and interrupted morning's work. This is the beginning of an apperceptive process which only reaches its completion in the finding of the key. The continuation of the process may, as in Steinthal's example, involve a search among a bunch of keys; there then follows, as he says, a series of negative apperceptions, ending in a positive one. But throughout the successive rejections,

[1] *Psychologie und Sprachwissenschaft*, p. 208.

and in the final identification, the mental picture of the lost key is not by itself the apperceptive system, but only a part of it. The failures to identify, as they follow one another, may make no difference to our mental picture: but they do make a difference to the general purpose and interest of our search. So, when identification does ensue, it is no mere fusion of image and percept which constitutes it; when we say, "This is it," we do not merely mean, "This is the key I pictured," we mean, "This is the key I wanted". Our knowledge of the appearance of the key may receive no extension or modification; what we gain as the result of the apperceptive process is the knowledge that we actually possess the key and the power to use it for our purpose. It is because in this respect it makes a difference to us, that an apperceptive process takes place at all.

Perhaps this will become clearer if we consider apperception from a teleological point of view. It is the process by which a conation fulfils itself. But conation only exists in so far as it is unsatisfied. The sight of food awakens no desire after a full meal. Similarly, apperception does not take place where there is no end to be attained which cannot be attained as well or better without it.

§ 4. Connective Arrangements.

When a mental operation of any complexity takes place as a merely assimilative process, the possibility of it depends upon previous apperceptions. These leave behind them a phycho-physical arrangement which can operate of itself without the intervention of attention. We have partly shown how this is brought about, in discussing the formation of Habit; but our account of the matter is not yet adequate. We have shown how mere association gradually displaces and ultimately supplants noetic synthesis, but there are facts which unmistakably indicate that, at least in some instances,

if not in all, assimilative process cannot be reduced to the mere play of association and relative suggestion. Even when the controlling guidance of a central thought ceases to operate as a unifying principle, it may leave behind it as a substitute a nervous arrangement which fulfils an analogous function independently of consciousness. Attention has been recently called to facts which bear out this statement, in an article by Von Kries.[1] He calls the modifications of the psycho-physical mechanism, which play this quasi-apperceptive part, *connective cerebral arrangements.* His first and most striking example is derived from the use of different systems of musical notation. In reading music, the significance of the symbols, throughout the entire score, is determined by the clef which is prefixed to it. Each note is indicated by a mark on one of five parallel lines, and each line stands for a note two degrees higher than the line below it. But this relation of value is all that is fixed for musical notation in general; all else depends upon the clef. Thus the sign  stands in one clef for *d*, in another for *h*, and so forth. The expert reader first notices the clef, and then proceeds to read without further consideration of it, and without difficulty. Here one and the same sign calls up the ideas of different notes, and this depends on a modification of the psycho-physical mechanism, which is produced by the preceding perception of the clef, and which continues after this transient perception has ceased. This connective arrangement, which controls the process of associative suggestion, cannot be explained away by reducing it to conditions which enter into the series of presentations. Certainly, the thought of the clef does not persist through the entire process of reading. It may be

[1] "Über die Natur gewisser mit den psychischen Vorgängen verknüpfter Gehirnzustände," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, Bd. viii., Heft 1 und 2.

suggested that the immediately precedent combination of symbol and note in each case determines the interpretation of the next symbol. But this view seems to be disposed of when we consider: (1) That the correct system of interpretation persists over comparatively long intervals of time, during which no notes are read, and no clef thought of; (2) That, in many cases, the new note is not mentally connected with the old, but read independently of it.

The question next arises, how far these connective arrangements are involved in assimilative process generally. It is difficult to suppose that the above instance is peculiar and isolated. We should rather expect that, if apperception in this case creates and leaves behind it a surrogate of itself, it will do so in all cases, or at least in all of similar complexity. Many of the further illustrations adduced by Von Kries are not relevant, for they involve apperception. Perhaps the best which he gives is the different psycho-physical attitudes involved in speaking different languages. There is a connective pre-arrangement for English, another for French, another for German. If we can speak a language fluently, the consciousness that we are speaking it is usually absent. When we have to pass from one language to another, it is certainly present at the outset. But a few days in a foreign country is sufficient to lead us to speak the foreign tongue, as a matter of course, without noticing that we are doing so. Thus the same occasions which, under the control of one connective arrangement, would call a certain series of verbal signs, under the influence of another call up an entirely different series.

Other examples of a similar kind will readily occur to the reader; but even apart from cases in which the presence of a connective arrangement can be distinctly proved by special considerations, it is clear that, in general, they fill up a *lacuna* in our explanation of automatic process. They account for the fixed and definite way in which the series of associative

suggestions is circumscribed within precise limits, to the exclusion of diverging and disturbing tendencies. Hence it is best generally to assume that connective arrangement is involved, if not in all merely assimilative processes, at least in the more complex.

§ 5. Serial Evolution of Apperceptive Systems.

An apperceptive process may be the affair of a moment, or it may be prolonged for hours, or even for years; but whether it be brief or protracted, the point of contact between an apperceptive system and that which it apperceives lies in perceptual or mental imagery. In momentary apperception, perhaps a single image may be sufficient. But this is a limiting case, which probably never literally occurs. Consider such a simple instance as that of our meeting an unknown person in the street, and taking notice of him because he is unusually tall. Here it might, at first sight, seem as if the single perception were enough, without any succession of images. But, in fact, it is not ordinarily so. We look hard at the man; we scan his proportions; all this involves a succession of ocular movements with a corresponding series of perceptions. Where an apperceptive process is more prolonged, it clearly always involves what English psychologists are in the habit of calling a mental train. This train may be either ideal or perceptual, or both combined. In the instance just given, it is merely perceptual. In guessing a riddle, it is merely ideal. In all prolonged observation, as distinct from casual attention to perceived objects, it is at once ideal and perceptual.

Now the train of images, through which apperception takes place, is simultaneously determined by both of the factors which enter into the process. It is the evolution of the apperceptive system itself—the successive presentations of the parts and aspects of the whole—which is schematically

apprehended. On the other hand, this evolution is initially conditioned, and is throughout modified, by the new material which is being incorporated into the system. Thus we cannot regard either factor in the process, in any stage of it, as exclusively passive, or as exclusively active. We must here guard against an error into which such men as Herbart and Volkmann have fallen. They divide the whole process into two stages. In the first of these the apperceptive system is said to be passive. Those constituents of it which are contrary in quality to the new presentations are momentarily repressed; but soon the mental preformation reasserts itself against this disturbance. The strength which it derives from its internal organisation enables it to obscure and suppress opposing elements in the apperceived group, and the final outcome is that this group becomes incorporated with it. It is admitted that sometimes the inverse takes place; and that the incorporation involves destructive transformation of the pre-established system. But in any case it seems to be taken for granted that the suppression of antagonising elements is an essential part of the process by which the two mental groups blend into unity. Now there are certainly facts which correspond to the Herbartian description. It often happens that we see what we expect or desire to see, instead of what is present to our eyes, as, *e.g.*, in correcting proofs. We have already discussed cases of this kind under the head Coalescence. Further illustrations, from more complex regions of our mental life, are afforded by the blinding influence of pre-conceived theory, or of hardened prejudice. But the real question is whether coalescence, as such, can be properly regarded as belonging to the essence of apperception. If this were so, then apperception would be, by its very nature, a source of illusion and error. But it seems clear that in so far as one of the interacting groups simply annuls or suppresses elements in the other, it fails to apperceive it, and apperceives

something else instead. In so far as a preconceived theory blinds a man to a fact, he fails to apply his theory to the fact; it is not in this way that the mind develops. The growth of the mental organisation requires that new and old fairly confront each other; and, if need be, evolve themselves in consciousness in relatively distinct series.

Wherever the process is so complex as to involve serial evolution, two lines of suggestion are theoretically present. Where there is apparently only one, it should be regarded as a limiting case, in which the two series coincide. Of course the final outcome of a positive apperception is always the confluence of the two trains in a single one. This confluence may be brought about in different ways. But in general it is the result of relative suggestion. The evolution of one or both systems becomes gradually so modified by its relation to the other that the two become congruent and blend. Ordinary observation, with the view of identifying or classifying an object, or of verifying an hypothesis, clearly exhibits the two-fold mental train and its ultimate simplification. On the one hand, both in scientific and ordinary observation, there is always ideal anticipation based on past experience, side by side with the actual series of perceptions. Each of these trains profoundly modifies the other. The order of the perceptual process, and the direction which it takes at any moment, are throughout determined by our own mental prospectiveness and *lacunæ*, in the perceptual data, are constructively filled in by ideal activity. On the other hand, the series of ideal anticipations has perpetually to adapt and readapt itself to the unforeseen data which emerge as the object is more fully explored. When the whole process goes on within the sphere of ideas, there is no essential difference in the course which it takes. The only distinction is that the *rôle* played in actual observation by sense-perception is now wholly transferred to associative reproduction and relative suggestion.

Sometimes the apperceptive process serves only to bring out the needlessness of ideal reconstruction. Thus a person who for the first time sees a black swan, and whose whole previous experience has led him to expect swans to be white, will gaze at first in wonder, and will need time to reconcile himself to the novelty. But in apperceiving the new experience, he has no need to make a special reconstruction of his general idea of a swan; on the contrary, the process consists in his gradually realising that all the distinctive features of a swan remain unmodified by the difference in colour. Relative suggestion is here not really absent, but its function consists almost entirely in setting in a new light the single feature of colour, in bringing out the looseness of its relation to the group of essentially connected marks distinctive of a swan. In any case, it is absurd to say that the colour difference is simply suppressed or annulled. On the contrary, it becomes in the highest degree salient in consciousness, and the entire issue of the process is to cause it to be regarded in a new way. If, instead of seeing a black swan for the first time, a person is told of the existence of black swans, he may not succeed in perfectly apperceiving the new mental combination. If he does so, it will be by calling to mind experiences of colour variation taking place independently of other variations in plants and animals, or in reminding himself of the conditions which determine colour, and the looseness of their connection with the general plan of structure and function.

A more positive and complex construction is required when a person is, for the first time, called upon to represent the whale as an air-breathing animal, or to realise the idea of Antipodes.

§ 6. Apperception and Fixation.

If we except possible vaso-motor changes in the brain, movements of fixation do not directly affect appercipient

systems as such. They strengthen and detain, or weaken and dismiss, particular percepts or images. Their function is, therefore, limited to the sequent parts of the train, in which an apperceptive system develops itself. Without them this serial evolution would be impossible, because without them a definite sequence of images either could not take place at all, or could not be controlled so as to subserve the purposes of thought. Thus the act of fixation may be compared to the act of prehension by which an animal seizes and retains its prey until it has consumed it. The movement of fixation fastening upon the image or percept, detains and detaches it in the focus of consciousness, so long as is required for that stage of the apperceptive process which it subserves.

It is the peculiarity of that class of images to which the signs of language belong, that they make it possible to introduce into the train of ideas, as separate and successive links, mental systems which would otherwise be merely apperceptive. On this function of verbal signs the development of conceptual thinking is in a very large measure dependent. We shall have to recur to this point in detail in chap. ix.

§ 7. Co-operation and Competition of Apperceptive Systems.

In so far as the mind is a unity, it tends to become affected, as a whole, by changes taking place in any of its component elements. For this reason, an appercipient system tends to excite other systems in a degree varying directly with the intimacy of its connection with them. The apperceptive activity of one group communicates to others a wave of excitation by which they are prepared to become in their turn appercipient. They are by this means rendered alert and ready to act so soon as occasion arises. This process by which a mental group in the exercise of its apperceptive

function prompts others to a similar activity, is what I call *Co-operation.*

On the other hand, every mental group, in the exercise of its apperceptive function, tends to debar all other groups from becoming appercipient, excepting such as are at the moment capable of combining with it the same systematic activity. This follows, in part, from the very nature of an apperceptive system. Elements which are united in the same apperceptive process are *ipso facto* disabled, for the time being, from taking part in any other. Otherwise the word *system* would have no meaning. A mental group cannot, therefore, become appercipient, if some of its essential constituents enter also into the composition of a different group which is in full action at the time. Another ground of competition between mental systems is to be found in the quantitative limitation of the total mental activity in each moment. In proportion as mental energy is engrossed by one group, other groups are enfeebled. If in the course of our thoughts we come upon some topic of extraordinary interest, we often suspend even the automatic movements which depend on conditions disconnected with the main stream of mental process—we cease walking or eating, or let our cigar go out.

The nature of co-operation and of competition may be illustrated by the interaction of co-ordinate groups, which are subordinated in an analogous manner to a single comprehensive system. A system so organised may apperceive in a twofold way according to the nature of the apperceived group. It may assimilate the new element in a general manner without incorporating it in any one of the subordinate groups. On the other hand, the new element may by the same act be incorporated in the total system and in one of the sub-groups. I may see that an object, at a distance, is a bird, without being able to discern what kind of bird it is. In this case the object is apperceived by the class-group, repre-

sented by the term *bird*. But it is not apperceived by any of the minor groups, represented by the terms *thrush*, *blackbird*, etc., except in so far as these necessarily take part in the systematic activity of the whole to which they belong. When the object approaches nearer, I may be able to discern not only that it is a bird, but that it is a thrush. This means that it is apperceived by one of the co-ordinate sub-groups to the exclusion of the others. It is incorporated not only by the total appercipient system, but by a specialised portion of that system. The co-ordinate sub-groups compete with each other, because they can exercise their distinctive functions only in exclusive alternation. They co-operate with each other because they are all integral parts of one system. Each of them, in so far as it shares in the general excitation of the whole in which it is contained, becomes prepared to play its own proper part so soon as occasion arises. Thus, when I see the bird in the distance, the various sub-groups, corresponding to different species of birds, become excited, and the excitation of each sustains and heightens that of the rest. Each is on the alert to exercise its special apperceptive function, to the exclusion of the others.

Examples of the co-operation of mental systems are constantly occurring in ordinary experience. A person of a religious turn of mind is prepared for devotional exercises merely by entering a church. Another with a superstitious bias is predisposed to see ghosts by the mere presence of darkness and solitude. If I meet with a Latin word in reading a Latin book, I am not misled by its accidental likeness to an English word, as I might be, if I came upon it casually and unexpectedly. In a printing establishment, the term *proofs* is likely to receive a different interpretation from that which would be attached to it in a polemical discussion. In such cases the apperceptive activity of a comprehensive system maintains each of its component

sub-groups in a state of readiness to apperceive groups with which they have special affinity. Co-operation is strongest and most effective between groups which are thus interconnected according to an articulate plan as co-ordinate parts of a highly organised whole. But it also takes place between all groups which enter into the composition of the mind in a greater or less degree, according to the greater or less intimacy of their interconnection.

Competition is a trial of strength between competing systems. Co-operation is one of the main conditions on which their comparative strength depends. In so far as an appercipient system transmits a wave of excitation to other systems, it strengthens them even against itself. It follows that, *ceteris paribus*, the power of an ideal group to compete with others increases as the degree in which it co-operates with them diminishes. In some cases co-operation is the predominant condition determining the comparative strength of competing sub-groups, and it affects these sub-groups in an approximately equal degree. When this is so, the reason why one becomes appercipient in preference to the others lies mainly in its greater affinity with the group to be apperceived. But co-operation is by no means the only circumstance on which the power of an apperceptive system depends. In the following section we shall have to consider a number of other conditions determining the comparative readiness, energy, and persistence with which different mental groups exercise their apperceptive function. These conditions, combined with the influence of co-operation, determine, *ceteris paribus*, which of a number of competing groups shall succeed in becoming appercipient. When a plurality of objects, each having exclusive affinity with a different system of ideas, are simultaneously presented to the senses, or suggested by the train of association, that group is apperceived which is congruent with the most powerful system. Similarly, when the same group is capable of

being incorporated by different systems, the strongest of them apperceives it. If they apperceive it in turn, they do so in the order of their relative strength. We have now to indicate the conditions on which this difference in the power of mental systems depends.

§ 8. Conditions Determining the Strength of Apperceptive Systems.

The most fundamental of these is the strength of the practical or theoretical conation which the system serves to define and determine. On this depends the tendency of an interrupted process of apperception to recommence even without external prompting. If such a process has been cut short without reaching its natural termination, the disposition which it leaves behind it corresponds to an unsatisfied striving, and such strivings, as we have seen (bk. ii., ch. vii.), tend to renew themselves in consciousness so soon as they cease to be suppressed by other excitations.

The more special circumstances which favour apperceptive activity may be roughly divided into those which are extrinsic, and those which are inherent in the construction of the apperceptive system itself. Both groups of conditions include special cases of the influence of conation, but they cannot be entirely brought under this head. The extrinsic consist in passing circumstances which from time to time may favour the activity of a system. Among these latter are included: (1) The co-operation of another system; (2) the recency, or (3) the intensity of its own previous action; (4) the influence of organic sensation; (5) its own freshness arising from previous repose. The intrinsic conditions are: (1) The comprehensiveness of the system; (2) its internal organisation; (3) the strength of the cohesion between its parts; (4) the nature of the sensory material which enters predominantly into its composition.

I have already treated of the influence of co-operation, and I shall have more to say concerning it in § 9. Its effect is greatly modified by other conditions. Through it apperceptive groups are stimulated to become appercipient; but they respond to the stimulus only so far as they are excitable, and their excitability depends on other causes.

An apperceptive system is, apart from fatigue, more prompt to apperceive the more recently it has been brought into play. *Ceteris paribus*, the mental group which is appercipient in one moment will also be appercipient in the next. Being already in action, it tends to continue in action. Further, the state of excitation into which a system is thrown by the exercise of its apperceptive functions, tends to persist afterwards. It is only by a gradual process that the system sinks into its previous condition of comparative inertness. When we are absorbed in the consideration of some interesting topic, any circumstance which diverts our attention from it usually occasions only a transient interruption. So soon as the disturbance ceases, our thoughts pursue their former course, as if they had never been arrested in it.

The effect of intensity is ordinarily most conspicuous when it is combined with that of recency. An apperceptive group which has been both recently and intensely excited is apt to assume for some time a tyrannical predominance over competitors otherwise more powerful than itself. We all know how difficult it is to dismiss from our minds, permanently and completely, a subject about which we have been recently very much excited. A game of chess which has roused a keen interest in us, is likely for some hours afterwards to recur to our thoughts, even in the midst of more important occupations. Certain pathological cases furnish very striking instances, in which the effect of intense excitement is greatly exaggerated and prolonged—sometimes permanently. "A lady frightened by robbers takes all men she sees for brigands who mean to

assassinate her; another, having seen her child knocked down by a horse, cannot be persuaded that it is living, by any arguments, or even by the sight of it, although it is quite well."[1]

The influence of the cœnaesthesis on the relative strength of apperceptive systems is of fundamental importance. The ideas connected with the satisfaction of an organic need commonly assume exclusive predominance so soon as the corresponding organic sensation is felt with a certain degree of intensity. The pangs of hunger will ordinarily cut short the most absorbing train of abstract speculation. The influence of varying modifications of the cœnaesthesis is, however, by no means confined to simple cases of this kind. It pervades our whole mental life. Every specific kind of emotion is accompanied by a characteristic mode of organic reaction. The resulting systemic sensations form a most important constituent of the emotion itself, and they become intimately associated with the apperceptive system which is dominant when the emotion is felt. A recurrence of a similar organic state, from whatever cause it may arise, will tend to re-excite the whole mental system with which it has thus become coherent. The most striking illustrations of this point are to be found in the psychological effects of sexual excitement. For an excellent discussion of this topic I refer the reader to M. Paulhan's book, pp. 458-476. The emotion of fear is accompanied and in part occasioned by certain disturbances of the heart's action, of respiration, etc. The occurrence of somewhat similar disturbances in sleep will give rise to terrifying dreams. In waking life they may give rise to anticipations of danger and disaster which would never have been entertained in a state of sound health. In like manner, a low condition of body may colour our whole view of our own

[1] *L'Activité Mentale*, p. 72; M. Paulhan gives many other illustrations.

circumstances, actions and prospects. It may cause us to regard our past life as a failure and our future as full of difficulty. On the other hand, a vigorous state of health favours hopefulness and self-complacency. In early stages of mental evolution, the relative strength of apperceptive systems depends almost entirely on organic sensation. The first differentiation of the mind into distinct systems depends on the existence of distinct practical needs. As mental development advances, other conditions acquire increasing importance.

The comparative freshness of an apperceptive system often renders it more excitable than others which are in other respects more powerful or equally so. Prolonged activity occasions fatigue and necessitates a period of inaction, which affords an opportunity for fresh groups to become appercipient. We all know by familiar experience how much we stand in need of recreative change. The more complete the change, the more effective it is. A system enjoys adequate repose only when it is displaced by others, which do not sub-excite it too strongly by co-operation. Otherwise it is like a man in troubled and unrefreshing sleep. It continues to be indirectly excited, and therefore indirectly fatigued. The recurrent effect of fatigue is noticeable even in the course of what is ordinarily called a continuous train of thought. Transient intermissions of activity, during which the mind momentarily wanders to other topics, become from time to time necessary. Short intervals of comparative repose restore the excitability of the apperceptive system, which then re-assumes its predominance—a predominance due in part to the very intensity and recency of the activity which gives rise to fatigue.

We must now consider the way in which the strength of apperceptive groups is determined by their own internal constitution. The excitability of a system of psychical elements depends very largely on the degree of its inward

organisation. It is more easily stirred to activity, as a whole, the more rapidly and completely the excitation of any one of its components spreads to the rest. Now the rapidity of diffusion within the system varies according to the general plan of combination interconnecting its constituent parts. The more manifold are the relations by which each element is united with all the rest, the more completely, rapidly, and certainly will the whole become implicated in the activity of the part. This condition is best fulfilled by a symmetrical scheme of interconnection, such that co-ordinate sub-groups bear a similar relation to each other, and to the whole, and are themselves composed of minor groups combined according to an analogous plan. We may adduce, as an instance of a system organised in this manner, the philosophy of Hegel as it exists in the mind of the genuine Hegelian. The dialectic process constitutes a general form of relation which permeates the entire system, determining the connection both between its most comprehensive divisions and between its most specific details. Each part of the whole has a formal affinity with every other, and it is, therefore, psychologically coherent with every other. Each is thus a psychological, as well as a logical, centre and rallying-point for the total system. I have adduced this example because it seems to be a specially striking one. But every logical system possesses a similar psychological character in a greater or less degree, in proportion as it approaches more or less perfectly to the logical ideal.

The power of an apperceptive system depends on its comprehensiveness as well as on its organisation. To revert to the previous example, the dominating and pervasive influence of the Hegelian system on the minds of its supporters is not merely due to its inward coherence. Its width and breadth is also to be taken into account. It touches reality at so many points that there is scarcely a single problem, practical or theo-

retical, to which it is not applicable. But comprehensiveness is not necessarily combined with inner articulation. A group of political or religious prejudices, unconnected by any logical principle of union, may derive predominant strength from its mere massiveness. The lack of articulate plan is compensated by the number of the elements which combine to excite and sustain each other. We must also take into account, besides the number and logical interdependence of the components of a system, their mutual cohesion as established by habitual association. This depends upon the frequency with which the system is brought into action.

Finally, we must take into account the comparative excitability of ideas derived from different senses. MM. Charcot and Ballet, following a clue given by Galton, have made us familiar with the classification according to which different persons are ranked as "visuals," "audiles," or "motiles". The visuals are those in whom visual images are most easily and vividly reproducible. The audiles are those in whom presentations of sound are predominant. In the motiles, reproductions of muscular experience have the greatest importance. These distinctions have an important bearing on the present subject. The dominance of a special mode of sensibility gives an advantage in the struggle of competing systems to those in which sensory presentations of the dominant kind play a prominent part. Great engineers are likely to be visuals, great musicians audiles, and so forth.

Before quitting the subject, attention should be called to the truism that apperceptive systems which are non-existent, or practically so, cannot be operative. This is, as we have said, a truism; but it is one which has been frequently and disastrously neglected. The unskilled teacher forces instruction upon the child and is angry or disheartened when he finds no intelligent response, although he never considered the previous question, whether the child already possesses the

mental organ for apprehending the facts or ideas which are thrust upon him. The main principle which psychology lends to the theory of education as its starting-point, is the need that all communication of new knowledge should be a development of previous knowledge. If the apperceptive system necessary for incorporating a new fact or idea does not exist, it must first be evolved before teaching can be successful. It would seem that Socrates has the credit of being the first to insist on this point. Another group of instances of the neglect of this truism is to be found in the unthinking surprise with which the man of culture often regards what to him are the grotesque and absurd views of the ignorant and superstitious, or with which the civilised man regards the beliefs and practices of the savage. In considering the state of the savage mind, the first point to be remembered is that, in it, complex and comprehensive systems of ideas, which are normally present in civilised races, are simply absent; savages can only apperceive with the systems which they actually possess. Since these are mainly connected with their own actions, and with their personal relations, the anthropomorphic interpretation of nature follows as a matter of course. The American Indian, introduced for the first time into a great centre of civilisation, shows little interest, beyond perhaps a vague bewilderment, in most of the objects which would generally be thought likely to absorb his mind in wondering admiration. His attention is most certainly and strongly attracted by anything which can be brought into some sort of connection with his pre-established circle of ideas, and this often takes place through a strange misinterpretation of what is presented to him. An analogous fact is often referred to by travellers, who tell us that it is not easy to interest savages in accounts of civilised peoples, though their attention is strongly aroused by narratives of the ways of living of other savages. Thus the

thoughts of an Australian aborigine will wander, if he is called on to listen to a description of London, but will be riveted by a description of Greenlanders and their mode of existence.

The decay of savage races before the advance of civilisation, is often referred exclusively or predominantly to such causes as the introduction of spirituous liquors, of diseases, of vices, etc. There is a tendency to leave out of account what is probably the most essential factor. This lies in the inability of the savage to apperceive the new experiences which are thrust upon him; to adapt himself to the new social and other conditions in which he is placed. The futility of his old modes of thought and action in relation to the new circumstances, leads to their repression and gradual decay. For a hopeless struggle must lead in the end to disgust and discouragement. Mr. Sproat has drawn attention to a case in which savages were in every respect well treated by their civilised neighbours, and, none the less, underwent moral and intellectual degeneration. "It was only after a considerable time that symptoms of a change, amongst the Indians living nearest to the white settlement, could be noticed. Not having observed the gradual process—my mind being occupied with other matters—I seemed at once to perceive that a few sharp-witted young natives had become what I can only call offensively European, and that the mass of the Indians no longer visited the settlement in their former free independent way, but lived listlessly in the villages, brooding, seemingly, over heavy thoughts. Their gradual shrinking from association with us, when first observed, caused a little alarm, but I found, on inquiry, that it did not arise from ill-will. The fact was, that the curiosity of the savage had been satisfied; his mind was confused and his faculties surprised and stunned by the presence of machinery, steam vessels, and the active labour of the civilised men; he distrusted himself, his old habits and traditions, and shrank away despondent and discouraged. Always suspicious,

it now became the business of the Indian life to scrutinise the actions of the whites, and to speculate apprehensively as to their probable intentions. He began soon to disregard his old pursuits, and tribal practices and ceremonies. By-and-by it was noticed that more than the usual amount of sickness existed among the Indians, and particularly among the Indians who lived nearest to the white settlement. . . . This did not result from ill-usage, nor from the excessive use of ardent spirits, nor from debauchery; but from other causes, among the chief of which, according to my observation, I would name—the effect of a change of food, and the despondency and discouragement produced in the minds of the Indians by the presence of a superior race: the latter being the principal cause."[1]

§ 9. Negative Apperception.

An appercipient system may meet with more or less resistance in the effort to incorporate a new element. This resistance may merely delay the process of assimilation, or it may effectively arrest it. It is convenient to distinguish these two cases, according to their result, as *positive* and *negative* apperception. In positive apperception a mental system actually succeeds in absorbing a new element; in negative apperception the effort to incorporate a new element is defeated. We have now to distinguish between the kind of obstruction which merely delays positive apperception from that which effectively prevents it from taking place. A system can positively apperceive elements which differ from its component sub-groups only in those respects in which they differ from one another. Thus, I recognise an animal as a bird, when it presents a certain general type of structure under special modifications varying from those characteristic of

[1] G. M. Sproat, *Scenes and Studies of Savage Life*, pp. 278-9.

known species of birds, in a manner analogous to that in which these vary from each other. Similarly, change in an individual person or thing does not debar identification so long as the alteration is of a kind and degree with which we are familiar. It may also happen that an altogether unprecedented variation fails to present an effective obstacle to the process of assimilation. I may recognise a black swan as such, although I have never seen or heard of any that were not white. In this and similar cases, we are accustomed to say that the variation is unimportant, or irrelevant. If the unaccustomed variation is important, positive apperception may none the less take place by the aid of relative suggestion. This happens when the exceptional feature admits of special explanation, as in the case of air-breathing animals which live in the sea.

When these conditions are not fulfilled, and when the divergent features which resist union are not obscured or suppressed, the result is the final failure of positive apperception, and this is what we call negative apperception. The positive process is always presupposed; the negation always consists in the defeat of an attempted synthesis. But this is only one aspect of what takes place; if it were all, we might simply refuse to recognise the existence of a negative apperception, on the plea that it is not apperception at all, but a mere failure to apperceive. This would not be correct. We have defined apperception as *the process by which a mental system appropriates a new element or otherwise receives a fresh determination.* Now, when the result is negative, there is, indeed, a failure to appropriate a new element, and so the first part of the definition is inapplicable, but the second is not so; in negative apperception the appercipient systems certainly receive new determination. They become more definite and articulate, inasmuch as the points of incongruity between them emerge with special distinctness into consciousness, in contrast

to those in which they agree. Another kind of determination is found in the fact that an apperceptive process which has definitely ended in a negative way does not take place again under like conditions. The systems implicated in it have recovered permanent equilibrium in relation to each other. The *vital series*, as Avenarius would call it, has reached its natural termination; the conation involved in apperception has attained satisfaction.

It follows from this that negative is a step towards positive apperception. The failure of a group *A* to form a positive combination with another group *B*, leaves it free to acquire other connections within the total mental preformation. Indeed, any further positive connections which it may form must be other than those which have been excluded by the negative result of previous process. The full significance of this point is seen when we consider negative apperception, not in abstract isolation, but as a moment in a more comprehensive activity. Thought may, and often does, move to a positive result by passing through a series of mutually exclusive alternatives, which are rejected in turn until its end is attained. Thus the attempt to identify or classify an object may only reach its final issue after a succession of failures. The total apperceptive system which constitutes our interest in the object, apperceives the mental group representing the special characters of the object, by means of a sequence of subordinate apperceptive processes, in which its own constituent sub-groups come alternately into play. The question, "What is this?" represents the initial stage of the process, corresponding to the excitation of the total system. This system, though it may be very comprehensive, has yet in all cases a specific character which circumscribes the limits of the question. To borrow a term from logic, the answer must fall within a certain "universe of discourse". This means that the possible alternatives are confined within a certain range. "What is this?" in

the mouth of the botanist examining a new specimen, means "What kind of a plant is this?" The question, "What is this?" in its abstract generality, is never actually asked by any one. The further development of the process, by which the question tends to find its answer, consists in a series of attempted identifications. Each of these in turn fails; and, by its failure, makes way for another, until a positive apperception takes place, or, it may be, until all the alternatives are exhausted with a negative result. In most cases the total process cannot reach its end through mere negation, so that exhaustion of alternatives issues, not in equilibrium, but in another condition which we shall presently have to consider, that of *conflict*. In the attempt to identify an object by successive trials, a dominant and persistent appercipient system brings into play its subordinate sub-groups in turn. In other instances the groups which give place to each other in sequence are those which are apperceived. The dominant system strives to appropriate an element which is wanting to it, and, failing to find it in one direction, seeks for it in another. A good example is afforded by the illustration of the lost key referred to, (p. 119). The search among the bunch of keys is a series of negative apperceptions ending in a positive one, if it is successful.

The office fulfilled by negation, so far as we have yet considered it, is that of making way for new apperceptive processes, by the exclusion of previous ones. But this is far from being its whole function. The exclusion of other alternatives not only leads up to a new and different attempt at positive apperception; it is also a condition which directly contributes to bring about a positive issue. Positive apperception may take place in a given way, because no other way presents itself. We may identify an object as *C*, because we cannot identify it as *A* or *B*, although, apart from the exclusion of *A* and *B*, the process would not have a positive

result. It sometimes happens that we recur to an alternative previously rejected because of the failure of others. When this is so, a negative apperception turns out to be only provisionally negative. We have said that an apperceptive process, which has definitely ended in a negative way, does not take place again under like conditions. Here a new condition is added—the exhaustion of alternatives. When we have looked "everywhere" for a missing article, we begin to look again in places which have been previously searched. This renewal of previous attempts is still more likely to take place when, as often happens, the preceding apperception has not had a negative issue, but has simply failed to have any definite issue at all, positive or negative. As negative conditions positive apperception, so positive conditions negative. The two are so correlated that each is meaningless without the other. The appropriation of mental elements by one system precludes their being appropriated by other co-ordinate systems. If we have identified an animal as a mammal, we have excluded the possibility of its being oviparous; and the attempt to apperceive it through the mental system corresponding to what we know of birds, will, therefore, either yield a negative result, or dissolve the preformed connection. This leads to the consideration of apperception in its destructive aspect.

§ 10. Destructive Apperception.

This takes place when one system by appropriating a new element wrests it from its preformed connection with another system. This may occur in two ways, according as it has its origin in a negative or in a positive apperception. If a person whom we have been led to regard as governed by high principles of honour and rectitude is discovered by us in some secret course of roguery, the new positive apperception brings

with it a negative, dissolving the old. The new connection implies the disintegration of pre-established connections; it introduces a negative relation where a positive one has previously existed. Where the point of departure is a negative apperception, the process is somewhat more complicated. The negative by itself is not sufficient apart from the co-operation of a coincident positive apperception. Let us take a case in which a theory is rejected because it is confronted with an irreconcilable fact. The system corresponding to the theory apperceives the fact negatively, and this involves the rejection of the theory. But what does this rejection mean? It means that there is a still wider mental system of which the theory has previously formed a constituent part; and that, henceforth, it ceases to form part of this system. The dissolution of the pre-established connection involves coincidently the negative relation between theory and fact, and a positive relation between fact and the larger whole of which the theory is a special component. The theory may be a doctrine of heredity; the wider whole, to which it belongs, may be the entire range of knowledge concerning living organisms possessed by biology. The dissolution of preformed combinations will then follow from the union of positive and negative apperception. The positive apperception incorporates the new fact with the general body of biological knowledge; the negative excludes it from the ideal group constituting the special theory. Hence arises a negative relation between the special theory and the whole body of biological knowledge.

§ 11. Conflict of Systems.

We have already described the general nature of conflict in its more primitive form (see p. 282). From our present point of view, we may define it as a state of more or less prolonged suspense between positive and negative apperception. By it

the onward movement of the apperceptive process is arrested, and a deadlock ensues. The most general condition on which it depends, is the coincident activity of two or more systems, each of which tends to appropriate the same elements, in such a way that the success of one is the defeat of the others. The most intense and enduring processes of this kind are those in which destructive apperception is threatened. Where positive apperception by one system implies the disintegration of another, and conversely, each resists the apperceptive process, inasmuch as it tends to maintain its own existence against destructive forces. Take as an instance the mental attitude of an astronomer who has discovered aberrations in the path of a planet, which he cannot explain. On the one hand, the recognition of the fact threatens with disintegration the organised system of ideas relating to the movements of the heavenly bodies. On the other hand, a like disintegration is involved in the rejection of the fact—a disintegration of the mental system with which his observations and calculations are bound up. The conflict is the more intense and inevitable, because both systems are intimately united in a more comprehensive one, constituting the entire body of his astronomical knowledge; for this more comprehensive system simultaneously supports and sustains both of its constituents in their mutual struggle.

A plurality of systems may severally tend to enter into positive union with the same system; the absence of conditions sufficing to decide in favour of one to the exclusion of the others is a frequent source of conflict. This is the suspense which arises out of mere indeterminateness, in contrast to the suspense which arises out of positive contradictions. A simple instance of it is supplied by the traveller who finds himself unable to determine which of two roads is the right one. The claims of the one road are counteracted by the counter claims of the other, so that he is

brought, both mentally and bodily, to a standstill. In another class of instances, the onward flow of ideas may be arrested, because alternative modes of apperceiving are, at least for the time being, exhausted. This is the mental attitude in which we say that we have looked "everywhere" for a thing, and cannot imagine where it is. Sometimes the suspense arises from the indefinite multiplicity of alternatives, where there is no condition tending to suggest the right one rather than others. This is illustrated by the kind of perplexity which a conundrum may cause. The impatient mood which precedes "giving it up," is a good example of mental conflict. Finally, the mental deadlock may arise from the non-existence of the apperceptive sub-group, necessary to give a new mental combination its specific place in a wider system. This is the attitude of the student of fossils, who finds a specimen belonging to a kind with which he is unacquainted. The conflict finds its natural issue when, by appeal to books or authorities, he assigns his specimen to a previously known class, or when, definitely recognising it as new, he has analysed and described its relations of affinity or difference with co-ordinate forms. This is an important form of conflict, including, as it does, all cases of bewilderment springing from mere strangeness or unfamiliarity.

There are two ways in which conflict may end. It may either work itself out to its natural termination, so that a new mental combination arises in which the conditions of conflict are no longer present, or it may be merely avoided or evaded. It is not too much to say that this distinction affords a principle of division between different types of intellectual and moral character. Some may squarely meet doubts and difficulties, and strenuously strive to solve them. Others simply resent and shun them ; they are perpetually afraid, so to speak, of wetting their feet. The avoidance of conflict may take place in one of two modes. Either the whole line of

thought is abandoned when it is brought to a standstill, or it proceeds through the mere suppression of one of the antagonist groups, by the superior strength of the other. To return to our previous illustration, a man, on coming to diverging roads without being able to decide which is the right one, may either simply go back for fear of losing himself, or he may make a choice determined by the superior attractiveness of one path to the other.

Under what conditions does evasion take place rather than the following out of a conflict to its issue? This inquiry has two branches. What are the conditions which favour the evasion which consists in withdrawal, and what are those which favour the evasion which depends on the suppression of one of the opposing groups? These two modes of procedure are characteristic of distinct types of mind. The mind which habitually retreats before intellectual difficulties, and fears to lose itself in wandering mazes, is usually of the practical and straightforward type; it follows the path of plain common sense. The mind which overlooks, or forgets, or thrusts aside difficulties and objections, is usually excitable and unstable. Its temper is impetuous, precipitate, or enthusiastic. It is also often characterised by flightiness; the ideas and projects which, at one moment, possess a tyrannical dominance in it, give place rapidly to others of a different nature, which exhibit an equal degree of exclusive intensity. The extreme examples of this form of mental process are to be found in pathological exaltation.

There is a general tendency to withdraw from conflict which arises from the very nature of mental activity in general. Our total mental activity is like a stream, which, when its course is barred in one direction, seeks other channels. This tendency is stronger in proportion as the arrest of mental process is more complete. Thus the inclination of the mind to turn aside from a difficulty, will be greater in proportion as it is more helpless in face of the difficulty. Conflict, in some cases,

may be the centre of a kind of mental fermentation; in itself, it is a mere arrest of activity, but it may be the incentive to a rapid and varied flow of ideas which tend to bring about its removal. In so far as this is not the case, the total mental condition becomes one of dead strain, comparable to a bodily struggle against an immovable obstacle. This attitude of mind cannot, without very powerful motive, be maintained for any length of time. Hence the result is the diversion of thought into other channels. The reluctance of the plain man to encounter the travail of mental conflict is in part explicable on this ground. The difficulties which he shuns, mean for him mere blank perplexity unrelieved by the rapid flow of conjectures, hypotheses, and distinctions. His common sense consists in following mainly the beaten tracks, in which such obstruction rarely presents itself. The dominant apperceptive systems, which enter into his mental organisation, refer to the more common and immediate practical ends of life, and not to remote ideals, theoretical, social, or ethical. Hence he has neither strong enough motives, nor adequate means for dealing with the difficulties connected with these comparatively "abstruse" topics. We say that he has neither means nor *motives*. The motive for facing a difficulty lies always in the strength of the interest involved in its solution, the strength of the conation which it debars from satisfaction, the intensity of the apperceptive activity which it obstructs. In other words, the more powerful is the mental system or systems involved in the total process within which a conflict occurs, the more likely is the conflict to be persistently maintained, or, under special conditions, to be evaded by the repression of one of the conflicting groups. The traveller who is brought to a halt by the difficulty of deciding between two roads, will long continue to debate the question, if important issues depend upon his reaching his destination at a given time. The whole apperceptive system involved in the process

derives its strength from the strength of the practical desire which it embodies and defines. Hence retreat from conflict is precluded. Even if one road is chosen, merely because there is no time to decide, the internal struggle and perplexity continue, until it turns out plainly that the path actually taken is the right or the wrong one. Now, in this instance, it must be noted that the apperceptive system, from which proceeds the impulse and motive to continue the struggle, yields equal support to both the conflicting groups. So far as depends on it, the only interest involved in choosing between the two roads lies in their relation to the end to be attained. So long as it remains indeterminate which of them conducts to this end, both of them are equally interesting in relation to it. Hence, in proportion as this total apperceptive system predominates, the less likely is the conflict to be evaded by repression of one of the conflicting groups. In so far as these derive their strength from it, they are on an equality. But they may not derive their whole strength from the more comprehensive whole, with which they are connected. One road may be smooth and easy, and may conduct through cheerful and attractive scenery; the other may be rugged, arduous and gloomy. Now, the tendency to take the more inviting path will virtually count for nothing, if the ultimate practical interests involved are sufficiently strong. But it may count for much, if they are comparatively weak. Here we find the essential condition which determines whether a difficulty shall be slurred over, or fairly encountered and overcome. All depends on the antithesis between the equal support which the conflicting groups derive from their connection with a more comprehensive system, and the strength which they derive from other circumstances. These circumstances comprise all the conditions enumerated in § 8, as constituting the permanent or transient strength of mental systems. One of the conflicting groups, for instance, may be superior in

extent, in associative cohesion of its parts, or in the degree of its internal organisation. Such conditions as these constitute the blinding influence of long-cherished preconceptions or hardened prejudices. A theory which has been long entertained, and has served as a principle of connection for a multitude of facts, is confronted with a phenomenon which conflicts with it. The fact is a datum which ought to be explicable by the theory. In other words, the idea or perception of it, belongs to the more comprehensive system of which the theory is also part. Unless, then, the fact is ignored or misrepresented, conflict must ensue and persist until either the theory is rejected, or the exception to it is explained. But the fact, if it stands comparatively isolated, is very likely to be ignored. It may, indeed, create trouble at the moment, when it is encountered in actual sense-experience, or when it is insisted on by other students of science. But the habitual cohesion, the complexity, and the internal organisation of the pre-established system, will give it a permanent advantage in the struggle, which will enable it, for the most part, to exclude its opponent from consciousness, or, it may be, to blunt the edge of the difficulty by a hasty explanation, which, if it were scrutinised, would be seen to involve new difficulties, or the same difficulties in a new form. We have here supposed that at least a transient or intermittent conflict actually takes place. But often the evasion is more complete. The efficacy of the preformed system is such that facts inconsistent with it are simply overlooked or transformed by *coalescence* from the very outset. The observer, or experimenter, finds what his preconceived ideas lead him to expect, and fails to notice or actually transmutes into something else what is incongruous with them. A conspicuous illustration of this is found in psychological experiments. Any preconception on the part of the subject of the result which ought to follow, goes far to destroy the value of the result. A simpler case is that of

proof-reading, which we have previously alluded to. Here the habitual spelling of a word prevents the reader from detecting how the word actually is spelt. It is needless to refer to cases in common life. It will be enough to mention ghost-stories and other tales of marvellous experiences, or, better still, the odd omissions and insertions which are found even in the most careful and conscientious accounts by eye-witnesses of slate-writing performances.[1] It will be noticed that the mere fact of an apperceptive system being already in activity tends to exclude from consciousness what conflicts with it, and that the more intense it is, the stronger is this tendency. The system tends to evolve itself in consciousness, and the more rapidly and intensely it does so, the less chance have interfering conditions to come into operation. In this way we can account for the unconscious inconsistencies into which men fall in their mode of thinking and acting. What a man says and believes in the heat of polemical discussion may be very different from what he says and believes in a cool moment. Yet he may never be aware of the discrepancy until he is unpleasantly reminded of it by some one else. Similarly, a person's opinions under the influence of an imposing religious ceremony, may vary considerably from those which he entertains in pursuing a scientific or critical research. It is quite conceivable that a professor of anatomy, who is also a devout Roman Catholic, may pay veneration to what are alleged to be bones of saints, although his scientific knowledge would constrain him to identify them as the bones of animals. In cases of this kind the two systems, which might conflict and do not, are usually disparate and disconnected. They may be equally extensive and excitable, as in the last instance, but they are not so united under a higher noetic synthesis, that the one is unable to operate in detachment from the other.

[1] See Minto's *Logic*, p. 286.

The one, which for the time being preoccupies consciousness, excludes the other by competition. The points in which they conflict may be almost the only points of community between them. Hence the strength with which they compete is altogether out of proportion to the strength with which they co-operate. There is, as indicated above, an "impulsive" or "excitable" type of mind which is peculiarly apt to under-estimate, overlook, or forget difficulties.[1] This mental attitude finds its most appropriate embodiment in precipitate action, which often fails, because of the very eagerness with which it seeks its immediate object. The characteristics of the type are: (1) The explosive intensity of the group of ideas which happens at any given time to occupy the field of consciousness, and the rapidity with which it develops itself; (2) either as cause or consequence, or both cause and consequence, of this, the absence of systematic control exercised by more comprehensive systems over their constituent parts; (3) changeableness or flightiness—the rapid and complete way in which one topic or project supplants another. (3) follows naturally from (1) and (2). The exaltation in the initial stages of mania affords good illustration. The patient is full of all kinds of impossible projects, which he puts forward with confident eagerness and complacency, heedless of obvious obstacles; and when these are presented to him, he meets remonstrance with indignant and violent resentment, as if it could only come from an enemy. What he is incapable of

[1] There are also other types which shirk mental obstacles. "Dreamy" people do so. "Dreamers" are of two kinds, the *indolent* and the *strenuous*. Comte was a *strenuous* dreamer. His own ideals so pre-occupied his consciousness as to pervert his view of the actual social and political conditions under which he lived. He mentally evaded practical difficulties because his interest in his own practical ideal was so strong. The *indolent* dreamer, on the other hand, evades both practical and theoretical obstacles, for an opposite reason,—the feebleness of his theoretical and practical interests.

is prolonged persistence in any train of thought, or in any one pursuit. His mind flies from one project of self-aggrandisement or philanthropy to another, forgetting each in turn. Allowing for the difference in degree, this description evidently applies to many persons who are not classed as insane. Excellent instances of the way in which an excitable and disorderly mind may fall into obvious inconsistencies, without experiencing conflict, are supplied by Professor Lombroso, in his work on *The Female Offender*. One of these may serve to conclude this section: "Madame Goglet, who set fire to her house in order to burn her old husband, said at first that the guilty party was a stranger whom she had fired at without hitting him. Next she asserted that she was not the true Madame Goglet, but a great friend, who exactly resembled her, and had undertaken to nurse the old man in his real wife's place. And finally, when her husband swore to her identity in court, she did not hesitate to affirm that he had become purblind in consequence of a shock."[1]

§ 12. Suggestibility.

The normal working of competition, co-operation, and conflict, may be admirably illustrated by contrasting it with a certain pathological state in which these processes are more or less completely in abeyance. The pathological state to which I refer is called *suggestibility*. It accompanies certain phases of the hypnotic trance, and it is frequent in hysterical patients. In the mind of a suggestible person, apperceptive systems are excited almost wholly by the commands, words, gestures, etc., of another person, and not by their own mutual competition and co-operation. It follows that conflict also is almost absent, except in so far as conflicting groups are simultaneously excited by suggestion. Hence arises the possibility of

[1] P. 181.

all kinds of strange hallucinations and delusions. In proportion as a subject is suggestible, he is incapable of spontaneously finding difficulties or inconsistencies to interfere with his belief, in what would, under normal conditions, appear to him to be the wildest vagaries of imagination. If he is told that he is the Emperor of China, he straightway proceeds to act and speak as if he were so, without any misgiving. A voyage to the moon will present no more difficulty than the most common-place incident. If he is told that he is making such a voyage, or has made it, he will accept the suggested situation as if it were real; he will act and speak as if he actually were in a balloon, leaving the earth beneath him. He will then represent the journey as completed, and will proceed to discuss the difficulty of returning. This difficulty he can appreciate, because it arises from a conflict within the limits of the total system which is already excited by suggestion. But the general impossibility of the situation never strikes him at all. With the exception of the dominant system, the constituent elements of the mind are virtually inoperative. Surrounding objects stimulate the senses, but they fail to call into being any percepts save those which are congruent with the reigning group of ideas. The external stimulus is incapable of suppressing images having their source in suggestion, and of substituting others in their stead. Whatever in the environment is incompatible with, or even irrelevant to, the suggested train of ideas, escapes notice as if it were non-existent. Sensory stimulation, instead of interfering with suggestion, becomes auxiliary to it by giving sensuous vividness and definite localisation in space to suggested images.

Some degree of suggestibility is a frequent accompaniment and manifestation of mental weakness, whether arising from imperfect development or from disorganisation due to disease or to drugs. A young child is more or less

suggestible because its mind is unformed. The mental systems which in the adult resist suggestion are in it as yet too feeble to do so. A drunken man is suggestible because in him apperceptive systems act in abnormal isolation. This is shown by the fact that in his intoxicated state he says and does what in his sober moments he would be incapable of. He becomes powerless to resist temptation, because restraining considerations are inoperative. A healthy condition of mind is characterised by a general excitability of all the mental systems composing the empirical Ego, which enables them to co-operate, compete, and conflict, with a comparative strength simultaneously determined by all the conditions enumerated in § 8.

13. Issue of Conflict.

It belongs to the very nature of persistent conflict to set in motion processes which lead to its own cessation. At the point of conflict the onward flow of mental activity is arrested. The further evolution of the total apperceptive system in this direction is brought to a standstill; hence if the conflict is not evaded, there must result either a state of dead strain leading to stupefaction, or a *regressive* movement of thought, consisting in ideal or perceptual trains, which have for their destination that point in the original process at which conflict emerged. The mental trains thus conditioned and controlled by the conflict may have very various points of departure. What is essential is that they should lead back to the conflicting groups, so as to supplement or otherwise modify one or both of these. It may be that the point of departure is some previous link in the original train, so that this train is partially or wholly repeated, as when we go over a calculation afresh in order to detect a mistake in it. The repetition differs from the original process, inasmuch as it is modified by

the conflict; indeed, it may be said that throughout the course of it the conflict continues to be felt. It takes place with more slowness and hesitancy than at first, and there is a constant tendency to introduce variations into it; in fact the end which the process of repetition aims at, is that of being no mere repetition. This follows from the general principle, that where the course of mental activity is obstructed in one direction, it seeks other channels.

When the conflict is between alternative groups, each of which tends to be positively apperceived by the same system, the starting-point may be supplied by one of these. This happens when, being puzzled to choose between cross-roads, we walk along one of them in order to see in what direction it leads us. It happens also, whenever an attempt is made to decide between alternative hypotheses by developing each in turn to its consequences. The use of the inverse or analytic procedure in geometry is also a case in point. We call these processes regressive, because they find, or tend to find, their termination at the point where the conflict began. Moreover, throughout their whole course the conflict manifests itself in their provisional and tentative character. The mental attitude of the man who walks along a road in order to discover whether it is the right or the wrong one, is utterly different from that of the man who takes the same road without any doubt that it will lead him to his destination. If the road takes an obviously wrong turn, he will have to go back bodily, as well as mentally, to the place from which he started. If the revival of old reminiscences, or other considerations, assure him that he is on the right track, he will not need to go back bodily, but none the less he does so mentally. The free flow of ideas starts afresh from the point where it was suspended. If he finds himself unable to come to a conclusion, then this free flow of ideas continues to be arrested. Finally, the regressive series may have points of departure

independent of the original process. The conflicting groups may be apperceived by systems which were not previously operative, so that new mental trains evolve themselves in consciousness. It is to be noticed that the regress may be perceptual as well as ideal. If I pick up what I suppose to be a piece of chalk in order to write on a blackboard, and find that it does not behave like chalk, I look at it again to see whether it really has the distinctive appearance of chalk or not.

The regressive movement of thought which I have described never occurs except when it is produced and controlled by conflict. It is only when confronted by obstacles to its progress, that the mind returns upon its own traces, or otherwise makes a fresh start. We do not reconsider plans or opinions unless we are driven to do so by some kind of doubt or difficulty. Hence the enormous importance of conflict as a condition of intellectual and practical progress. It is not too much to say that the progressive development of human knowledge and of human ideals has its origin in conflicts which work themselves out to their natural terminations. We cannot here pretend to enumerate exhaustively the manifold modes in which conflict may achieve its own solution. We must be content to mention a few typical examples by way of illustration.

Sometimes the material required for resolving a difficulty, or explaining a contradiction, is already in the possession of the mind, so that it only needs to be brought into consciousness. This is illustrated by the riddle or conundrum. Here the initial apperceptive group consists in the indeterminate thought of some particular case or other, which shall satisfy certain general conditions. This group most often derives its strength and permanence from its connection with some wider whole. We usually attempt to answer a conundrum from some such motives as desire to show off our

cleverness, or to gratify the company in which we happen to be. Otherwise, most men would simply withdraw from the conflict. The perplexity, where perplexity exists, lies in the indefinite number of alternatives, among which we have to make a selection, without any clue to lead us to the single right one. It is like looking for a needle in a bundle of hay. Each case as it arises is found to satisfy one part of the conditions, but not the rest. Positive apperception which removes the conflict takes place only when we stumble upon an alternative which satisfies all the conditions. In other kinds of conflict, and those the most important, the solution presupposes the formation of new mental groups. The means of overcoming the difficulty are not already part of our permanent mental possessions, but have to be constructed in the process itself. Here there is an important distinction between cases in which the new combination involves a new and higher noetic synthesis, and those in which it is merely a co-ordinate sub-group within a higher system. The last class of instances is of course the simpler. One of them has been elaborately analysed by Dr. Theodor Lipps.[1] I here briefly reproduce his results. Suppose that I meet with a plant belonging to a well-known species, which presents on this occasion an exceptional and unfamiliar feature. Perhaps, instead of having thorns as usual, it is thornless. The novel feature strikes me, and brings me to a pause. A regressive movement sets in, and I reconsider the plant. I scan its details closely, to see whether in other respects it really resembles the species to which I have referred it. Finding no important difference, I remain perplexed, and my thought goes back to consider other circumstances, such as climate and soil. I notice that the vegetation around is exceptionally luxurious, indicating a peculiarly rich soil. Now I have learnt to connect varying characters of the soil with corre-

[1] *Grundtatsachen des Seelenlebens*, pp. 416 ff.

sponding variations in the characters of plants. This removes my perplexity. Instead of an identical a, tending to maintain simultaneously in the same relation to itself, two incompatible determinations, P and P_1, there is now an ab_1 demanding P for its self-completion, and an ab_1 demanding P_1 for its self-completion. The single path from a to P and P_1, has divided into two, that which passes through b to P and through b_1 to P_1. It is assumed, of course, that there is no conflict between b and b_1. All that is required for this is that they should be variations of a kind with which we are familiar. Here ab_1, P_1, is the combination which comes into being in the process, and forms a mental sub-group, which may become appercipient when similar experiences arise in the future. We have assumed that the condition b_1 is identified as belonging to a well-known series of variations, b_1, b_2, b_3, b_4, which we have learnt to connect with corresponding differences in the appearance of plants. But this may not be so. We may be in doubt as to whether b_1 is likely to be an operative condition or not. In this case, the final solution of doubt will probably depend on further experiences of a similar kind; in which we find ab_1 connected with P_1, or it may be ab_2, ab_3, etc., connected with P_2, P_3, etc. The whole process is a simple form of what logicians call Induction. The case of the astronomer, perplexed by discovering aberrations in the path of a planet, leads to a process having more affinity with Deduction. He does not in the first instance solve his problem by observing the new body which creates the disturbance. It is rather the conflict itself which, in the regressive movement of thought which it produces, calls up the idea of a disturbing body, having a certain situation and direction of movement, as the only means of making the system of astronomical knowledge consistent with itself. The actual observation of this new body follows on this as a further apperceptive process.

We have said that the solution of conflict sometimes takes place through the formation of a new system involving a higher noetic synthesis. This means that systems which previously existed in relative detachment and independence, become unified in a single whole. For simple illustration we may refer to the progress of the child towards higher concepts—a progress forced on him by the urgent need for understanding the language of those around him. To borrow an instance from Steinthal,[1] the child may initially connect the word *table* with a certain shape and size. Tables may for him at the outset = big, square tables. He hears the word applied to small tables, and to round tables; this at first puzzles him; but he ultimately works his way out of the difficulty by noting the common use and purpose of a table, and connecting the word with this. *Round* and *square* are now to him kinds of table; the corresponding ideas are special sub-groups comprised within a higher system. On process of this kind depend all epoch-making ideas, scientific or practical, or æsthetic. Newton's long brooding over the problem of the motions of the heavenly bodies, led to a higher synthesis, which blended into the unity of a single system our knowledge of the paths of the planets, and our knowledge of the conditions under which things fall to the earth. Many persons before Newton may have idly entertained the passing question: If stones and other bodies fall to the earth, why does not the moon fall also? What made the question fruitful in Newton's case was that it arose in connection with a vast problem which persistently and intensely occupied his mind. It thus became the starting point for complicated trains of ideas leading to the resolution of conflict. In this process it became clear that the moon did fall in a manner and degree modified by special circumstances. In like manner the

[1] *Psychologie und Sprachwissenschaft*, p. 173.

problem of synthetic propositions *a priori* produced in the mind of Kant a higher synthesis, which had never before existed for any human being. The idea of a synthetic judgment *a priori* could not be apperceived positively or negatively by any mental system which had grown up in the course of philosophical thinking; it could not be identified either as mere matter of fact or as "a truth of reason". It persisted in presenting itself as at once both matter of fact and not matter of fact and both truth of reason and not truth of reason. The difficulty was solved by Kant's conception of the synthesis implied in the very possibility of experience. With this the hard and fast distinction between the particular percept and the thought universal disappeared, and it was seen that matter of fact is essentially constituted by the universal function of thought.

Michael Angelo said that genius is an infinite capacity for taking pains. This is not, I think, an adequate account of genius; but we are now in a position to see how large a measure of truth it contains. The capacity for taking pains must not be identified with capacity for industrious plodding and patient attention to detail. Looked at in this way, it would no doubt be true that Michael Angelo's definition is a very good definition of what genius is not. But what the great Italian probably meant was the power of sustaining mental conflict. If Newton could maintain for hours at a stretch a struggle with difficulties which would exhaust and disgust the ordinary mind in five minutes, it is sufficient to stamp Newton as a genius. We have in the previous chapter considered another aspect of genius—its facility. We then said: "A process of patient and laborious sifting and rejecting, is exactly the characteristic which is conspicuous by its absence in the mental construction of the man of genius". In this there is no inconsistency with our present position. On the contrary, the possibility of persis-

tently maintaining a mental conflict depends on the resources at the disposal of the thinker. If he is helpless in the face of a difficulty, so that it is for him a mere dead strain, and general stagnation of mental process, he finds it unendurable. A rich and abundant flow of ideas and a power of construction, which reaches its end with facility and certainty through relative suggestion without continual trial and error, is precisely what makes possible the infinite capacity for taking pains. When these conditions are fulfilled, conflict leads to the maximum intensity and fulness of mental activity, instead of to blank suspense. The fault which can fairly be found with Michael Angelo's statement, considered as a definition, is that it is not sufficiently general in its application. Only genius can sustain mental conflict in the way described; but a man may be a genius without grappling with difficulties in this strong and enduring way. The power of rich and facile construction is in itself a sufficiently distinctive characteris Mozart was a man of genius as well as Kant.

§ 14. CONDITIONS DETERMINING THE TRAIN OF

The direction of attention is guided coinciden working of two sets of conditions: (1) By t excitability of different apperceptive groups; (2 impressions and by preformed associations betwe subsequent links in the train of ideas. The portance of these co-operating conditions may va A sense-impression may sometimes appear to c attention by its mere violence, or the succession of pr tions in the focus of consciousness may in certain cases to be almost wholly determined by the strength and intimacy of the associations which link together the sequent parts of the series *inter se*. But subjective selection determined by the preformed organisation of apperceptive systems and by the conditions which at the moment favour or retard their activity,

is never wholly inoperative, and as a rule plays a conspicuous part. Among competing sense-impressions attention, *ceteris paribus*, singles out those which are most interesting, *i.e.*, those which tend to produce the greatest amount of change in the most excitable systems. Similarly, when one presentation a tends by association to revive simultaneously x, y, z, the selection of any one of them, x, in preference to the others, depends, *ceteris paribus*, or the special significance and interest of x. Association and sensory stimulation bring into the field a limited number of rival claimants, each of which, so to speak, solicits attention. The decision between their respective claims depends on the comparative excitability of the apperceptive systems with which they are severally congruent. It depends also on the nature and degree of this congruence. If a presentation is so conformed to an apperceptive system, that it can be assimilated with a certain degree of facility and ɔidity, assimilation will not be apperceptive. The likelihood · assimilation will be apperceptive is greater in proportion › want of congruence. On the other hand, the likelihood ˙milation will take place at all is, *ceteris paribus*, on the degree of congruence. A presentation may pperceived by a dominant system simply because it ñcient affinity with it.

§ 15. Thought and Association.

ıence of ideas or percepts may have little claim to be a train of thought. Some mental transitions are able to the mere play of association. Thus it may happen ın conversation that the casual mention of a name leads the mind to fly off at a tangent to a topic entirely disparate from that which previously occupied it. This is what Hobbes calls "ranging," as opposed to methodical thinking. In ıdle reverie our thoughts are apt to range or ramble from one topic to another, guided only by casual connections of ideas.

Transitions of this kind are specially characteristic of weak and untrained minds. Disciplined thinking, on the contrary, is marked by continuity of interest. A train of ideas is not a train of thought unless each link in it is a stage in the evolution of a dominant system; unless it presents successively the parts or aspects of some kind of whole. In discussing "suggestibility," we had occasion to consider the tyrannical supremacy which a mental system may acquire simply because other systems are unexcitable and therefore unable to compete or conflict with it. In contrast to this, the full development of thought presupposes not the abolition of competition and co-operation, but their full and unimpeded exercise. The dominant system prevails over others, equally favoured by the working of association and by sensory stimulation, merely because it is more comprehensive, better organised, etc., than its competitors. The general excitability of the other elements which compose the mind, as determined by conditions of this kind and by co-operation, remains unimpaire There is therefore nothing to hinder the conflict of s Indeed conflict is likely to become more frequent and tense in proportion as thought is more sustained and

In strictness, wherever sequent ideas or p related to the same apperceptive system, they train of thought. Thus in the developed conscious rate what must in theory be termed trains of th always going on. The transitions due to the mere association are not transitions between isolated ideas, between thought-sequences. When the mind rambles mo these thought-sequences may be very brief—may be mere shred ends of thought. But even in the most indolent attitude of mind they always have some degree, however small, of continuity and internal development.

The various trains which satisfy our definition of a thought-

varying degrees. It is possible that our ideas as they successively emerge may all have reference to the same general topic, and yet they may occur in so sporadic and orderless a sequence that most people would hesitate to call the process thinking. The ruins of an old castle may carry our minds back into the past, so that our fancies and reflections all have more or less reference to feudal manners and customs. Nevertheless we may wander from point to point in a very desultory manner. The transitions can never be entirely desultory, but in so far as they are so, the essential characteristic of thinking is wanting. There is only *ranging* within certain broad limits. The degree in which thinking is present, is the degree in which the order of presentation of the parts is fixed and determined by the idea of the whole. This presupposes that at every step the relation of the sequent parts is attended to, so as to evolve before consciousness in a systematic way the plan of combination characteristic of the whole. In so far as this is not the ·se, the relations between the parts tend to escape attention. ects successively presented have an interest of their ·pendent of their interconnection; the relations :m serve as transitions from one term in the ideal ıl series to another, without appearing in clear s as integral parts of the total subject-matter to ght is directed. On the other hand, the more fully equence deserves the name of a thought-process, the ersistently are the connecting relations attended to; presentation constitutes a further determination or elopment of its predecessor, instead of merely displacing it in an order of exclusive succession. No one would hesitate to say that we enter on a train of thought when the sight of a ruined castle leads us not to desultory fancies, but to an attempt to reconstruct its past history, having regard to chronological order and the natural sequence of events.

We may distinguish between different kinds of thought-

process, according to the different ways in which the successive links of the ideal chain determine each other. Thought reaches its highest development with the organisation of what we may call "proportional systems"; in these there is a pervading identity of form in the plan of interconnection, according to which the constituent elements of the several sub-groups are related *inter se.* The sub-groups themselves may be combined according to the same plan in the unity of the whole system. The Hegelian philosophy, as it exists in the mind of the Hegelian, is, as we have seen in § 7, a signal instance of this mode of mental organisation. But in all normal human minds which have reached a certain degree of development there exist systems approximating more or less to the same type. Whoever has learned in any degree to apprehend geometrical or numerical relations as such, has developed a proportional system—a system adapted to apperceive objects in other respects most diverse from each other, merely because they agree in being capable of entering into certain relations. The pressure of practical needs gives rise even in early stages of mental growth to systems which are to a great extent proportional in their constitution. The special lines of action by which on different occasions we realise the same end, may vary according to circumstances: but these different ways of doing the same thing for the most part correspond in broad outline although they differ in detail. This correspondence is of a formal or proportional kind, because it consists in a certain common scheme of relation connecting the different lines of action with the one end.

In the next chapter we shall have to consider a mode of thought-process which preconditions the formation of all but simple and rudimentary proportional systems, and which, in co-operation with language, is the main factor determining the development of *conception.* We refer to what, in a wide application of the term, may be called *comparison.*

CHAPTER IX.

COMPARISON AND CONCEPTION.

§ 1. Analysis of Comparison.

In comparison we search for relations of likeness and difference, agreement and disagreement, between objects. It always occurs as part of a more comprehensive apperceptive process. It is subservient to the attainment of some ulterior end, theoretical or practical, and this end constitutes the impulse and incentive to it. The process itself involves a peculiar transitive movement of attention from one object of comparison to the other: the peculiarity of this mental transition is that attention remains as far as possible fixed on *A*, in the very act of fixing it on *B*. In all relatively complex cases there is a backward and forward movement of thought; attention is concentrated first on *A*, then on *B*, then again on *A*, and so forth. The comparison resolves itself into a series of comparisons between several distinct features or aspects of the object compared. Let us take as an instance the comparison of a garden flower with the same flower as it grows wild. Here the primary motive is the desire to know whether the flowers are merely varieties of the same species—or it may be a general interest in the kind of changes which are produced by cultivation. We compare in order the different parts of the flower, as our botanical knowledge has taught us to distinguish them. In passing from the scrutiny of a given part of *A* to the corresponding part of *B*, we endeavour as far as in us lies to keep in view the

characters of both at once. As the result of the process there emerges an apprehension of agreement and difference, together with a more or less sharp distinction between the points in which the objects agree and the points in which they differ. The process is simplified when the comparison has reference to only one character. Thus we may be called on to match a particular colour, out of a number of other colours of like intensity. If the colours differ little in quality from each other and from that which is to be matched, comparison is necessary, though in a relatively simple form.

It is obvious that all arrangement in graduated series is based on comparison of a somewhat complicated kind; for not only have the parts of *A* and *B* to be compared with each other, but the degree of likeness and difference between *A* and *B* has to be compared with the degree of likeness and difference between *C* and *D*.

Instances of the kind given belong to an advanced stage of mental life, in which conceptual thinking has already been developed. Our present interest is in more rudimentary forms of the process, which may be regarded as a transition to conception. Let us suppose that a person sets himself to do one of those wire or cane puzzles which we owe to the ingenuity of the Hindus. There are two modes of procedure open to him: he may work with his head or with his hands. Usually, if he be experienced he mingles the two methods; but for our purpose it is necessary to place them in sharp contrast. If he is simply fumbling with his fingers it sometimes happens that he hits on the right process by accident; but when this is so, he is unable to put the puzzle together again, or, when it is put together for him, to do it the next time he tries. On this method it is also a frequent occurrence that he tries repeatedly ways of manipulation which have proved unsuccessful. Now the characteristic feature of this method is the failure to compare

with each other the various alternatives which present themselves. There is a transition from one attempt to another attempt; but the transition is not guided and controlled by consideration of the points in which the new attempt differs from the old. The systematic worker, on the other hand, tries to make clear to his mind beforehand whether the new trial will conduct him to the same difficulty which he had encountered in preceding trials; or, if he fails to see this beforehand, he takes notice of it when it occurs. The specific modifications of the total apperceptive system, which arise in each successive stage of the process, apperceive each other; and where the mental transition is from alternative to alternative, this mutual apperception of the several parts of the series is essentially a process of comparison. This instance is somewhat complicated; a simpler is afforded by any attempt to fix in our minds the position of an object, so that we may be able to find it again. In general, our perception of where a thing is, is a consequence of perceiving it at all; but wherever there is a motive for explicitly defining its whereabouts, so that we may be sure of remembering it, we find ourselves comparing its position with that of other objects. The thieves who visited Ali Baba's house saved themselves the trouble of comparison by putting a cross on the door; but when the captain himself came he probably noted the position of each of the surrounding objects, and compared it with that of the house, fixing the points of agreement and difference. The process of imitation supplies an important group of illustrations. Imitation in its rudimentary form does not involve comparison. The germ of it, as Professor Baldwin has pointed out, lies in self-imitation—a kind of circular process, by which the child goes on repeating the movements he has found efficient in producing an interesting result. When any interesting object is presented to him, which resembles consequences he has found to flow from his own activity, he tends to renew this activity. This is imitation.

But it is not at first accompanied by any attempt to correct his own performance in conformity with the copy. For this there is required some special motive; *e.g.*, the desire to speak intelligibly, or to draw lines on paper which really bear a resemblance to the outlines of a man or animal. Hence arise all stages and degrees of comparison, from the vague recognition that the result is not that which was aimed at, to the deliberate submission of the result to the criticism of others, with the view of finding wherein it comes short.

§ 2. Comparison a Process Distinctive of the Human Mind.

"The comparing them one with another, in respect of extent, degrees, time, place, or any other circumstances, is another operation of the mind about its ideas, and is that upon which depends all that large tribe of ideas comprehended under relation. . . . How far brutes partake in this faculty is not easy to determine. I imagine they have it not in any great degree: for, though they probably have several ideas distinct enough, yet it seems to me to be the prerogative of human understanding, when it has sufficiently distinguished any ideas, . . . to cast about and consider in what circumstances they are capable to be compared. And therefore, I think, beasts compare not their ideas further than some sensible circumstances annexed to the objects themselves."[1] The opinion here expressed by Locke has met with a very remarkable confirmation in the recent experimental inquiry of Mr. Lloyd Morgan into the nature of animal intelligence. He there shows that the way in which even the higher animals learn by trial and error, is an extreme form of the process by which a man solves a puzzle with his hands rather than with

[1] Locke's *Essay concerning Human Understanding* (Fraser), vol. i., pp. 204-205.

his head. Mr. Morgan, for instance, threw a stick into a field surrounded by railings. A dog, which had been trained to fetch and carry, bounded after the stick, and brought it back in his mouth as far as the railings. But here he was confronted with a difficulty; he could get through himself, but he could not get the stick through. His experience had not taught him that the only way of succeeding was by grasping the end of the stick; instead of this, he tugged now here, now there, in a perfectly uncritical way. If, by accident, he did get hold of the right end of the stick, or if Mr. Morgan showed him how to proceed, this seemed to yield him no assistance on the repetition of the experiment. He had stumbled on the solution, but could not do the trick again. This was no casual observation; it was a systematic experiment repeated day after day, and only one of a course of similar experiments. It is evident that the dog here passed from one alternative to another without selective comparison; so that when he hit on the right one or was shown it, he failed to note the points in which it differed from unsuccessful attempts. It should not of course be hastily inferred that animals are incapable of comparison; Locke's cautious statement that "they have it not in any great degree," is probably the right one. Nor ought we to conclude that animals, even when they do not compare, cannot learn from experience. The reverse of this is the case. Even in a blindly tentative process, the failure of the wrong alternatives will gradually decrease the chance of their renewal. The unsuccessful attempt becomes fainter and less persistent until it disappears, and the converse will hold of the successful attempt. All that is presupposed for this is the general principle that mental activity, obstructed in one direction, tends to divert itself into other channels. Hence, it is possible with sufficient patience to teach animals tricks without their understanding what they are doing. The point is that when they learn in this way

they are not aware why one way is right and another wrong. The right way is simply forced on their attention by the trainer; or, if they are left to themselves without external assistance, by the circumstances of the case.

Mr. Morgan, in agreement with Locke, formulates his result in the denial that animals perceive relations. This is at least a misleading way of stating the case; unless we put an artificial restriction on the meaning of the term *relation*, it would imply that animals cannot perceive the position of objects in space or their motions. Wherever any part of a whole is distinguished or identified, its relation within that whole is perceived, however indefinitely. Hence we should say, not that the perception of relation is deficient in animals, but only that that definite perception of relation is deficient which depends on comparison. Comparison is absent inasmuch as the successive moments of an apperceptive process, though unified by their relation to a common end, fail to enter into apperceptive relations with each other.

§ 3. Comparison as Rudimentary Conception.

What is conception? Without a clear answer to this question, all that follows will be unintelligible. Evidently, conception and perception stand in antithesis to each other. This antithesis is often represented as identical with that between the universal and the particular. Now if this is taken to imply that perception involves no universal element, it is entirely false and misleading. All thought implies a universal; and a perception is a thought. At the least, it implies distinction and recognition, and so carries with it a reference to an object which remains the same in its varying appearances. The transition from the percept to the concept is not a transition from the merely particular to the universal. The difference is rather this: in perception universal and

particular are indistinguishably blended ; the universal element lies entirely in the bare fact that the particular is recognised. Now the essential character of conception is that in it the universal is thought of as such, in contradistinction to the particular ; implicit in the percept, it is explicit in the concept. We may put the case in terms more strictly psychological. We have now become familiar with the distinction between an apperceptive system and the train of presentations which succeed each other in consciousness, and which are in turn detained and intensified by movements of fixation. Now, apart from conception and the conditions on which it depends the successive parts of this train consist only in particular images. The universal objective reference involved in recognition, identification, etc., depends upon the connection of these images with an apperceptive system of which they are the serial expansion or evolution. Now, if we may put it so, the problem which conception has to solve is to make possible the entry of the universal, as such, into this current of ideas. The apperceptive systems which at the outset exist for consciousness only in the apprehension of the particulars which are successively presented must themselves become parts of the series ; they must become capable of being detained and dismissed by movements of fixation, and so form stages in the evolution of a higher system. The universal must, so to speak, be dragged from the dim background of consciousness, and thrust into the foreground, there to be scrutinised and manipulated by the mind. It is language which makes this possible : how it does so, we shall have to consider in the next chapter. Here we have to point out that there is a yet more fundamental factor involved, without which language would be powerless. This factor is the process which we have just analysed—comparison.

In comparison we first become conscious of the antithesis between the particular and the universal. The reason is that

in it we become aware of the universal, as the common element which connects two clearly distinguished particulars. Thus the common element stands out in contrast to the differences; whereas in mere recognition no such contrast exists. Apart, therefore, from comparison, there can be no point of departure for conception.

§ 4. Comparison as Quantitative.

Lotze has pointed out that all comparison between simple objects, such as colours, sounds, etc., has reference to gradations of quantity. "If . . . we speak of bright blue, dark blue, black blue, we arrange this manifold in a series or a network of series, and in each series a third member results from a second by intensification of the same sensible change in a common element as that which gave rise to the second out of the first."[1] Where the gradations are not, as in this instance, intensive but extensive, that form of comparison which we call measurement becomes possible. By actually bringing together two extensive magnitudes in space, we can not only detect which is greater and which is less, but also by how much the one differs from the other. Now if we have two series of measurable gradations, A, B, C, D, etc., and α β, γ, δ, etc., and if the value of each of these series corresponds in the way of concomitant variation, quantitative comparison leads to the apprehension of proportion. We find that a certain ratio between the terms of the one series A and B, corresponds to a certain ratio between the terms of the other series α and β. When this result is fixed in conceptual language, or expressed in symbols, there arise those abstract formulæ to which we referred in § 10 of the chapter on Relative Suggestion. Without the aid of language and of symbols they could not, of course, come into being. But the

[1] *Logic*, Bosanquet's translation, p. 22

fundamental process involved in their production is that of measurement; language and symbols come into play only as auxiliary to this process, and as perpetuating its results.

§ 5. Conception by Means of Representative Examples.

This form of conceptual process has received special attention from English nominalists, such as Hobbes and Berkeley. The favourite illustration is drawn from the practice of mathematicians, who, having a particular triangle or other figure before them, regard it as representative of the class to which it belongs, to the neglect of its specific and individual features. This mode of conception presupposes comparison; and it may be that rudimentary phases of it are possible without the aid of language. There is an error which must be carefully guarded against in this connection; the process is often described as consisting in an exclusive attention to certain aspects or characteristics of the particular object, to the disregard of others. But this may take place without anything that can be properly called generalisation. I may be exclusively interested in the shape of a thing, rather than in its colour or other qualities, and yet I may not regard the thing as representative of other figures resembling it. It may be that the shape interests me merely because it is æsthetically pleasing, or because I want to fit it into a certain compartment. The truth is, that we are on an entirely false track when we attempt to trace conception, even in its most rudimentary stages, to inattention. Attention does not become conception merely by becoming circumscribed and one-sided. It is even untrue to say sweepingly that when a particular is regarded as representative of a class, its own distinguishing features are disregarded. On the contrary, it is necessary that they should be definitely recognised as irrelevant. The mere neglect of the particular is not enough;

we must contra-distinguish identity from differences. If we follow the proof that the angles of a triangle are together equal to two right angles, in the case of a particular triangle, this particular one is for us representative of all others, because, in the language of Hobbes, we observe that "such equality is consequent, not to the length of the sides, nor to any other particular thing in the triangle; but only to this, that the sides are straight, and the angles three".[1] In other words, we must recognise the particular length of the sides, as belonging to a series of alternative modes in which the universal or identical character of a triangle may receive specification. What gives the proof value, is the recognition that specific variations of this kind do not affect the theorem in its generality, but only the special manner in which it is exemplified in particular cases.

In the absence of language, this definite line of demarcation between what is specific in each case, and the pervading identity which connects particular cases into a class-group, can in the first instance have its source only in comparison, which exhibits particulars at once in their agreement and in their difference. It is in the first instance possible only by the operation of an apperceptive system, which has been produced in the process of comparing particulars with each other.

This mode of conception is necessarily confined within narrow limits. It presupposes that the common features of the class may be contained within the object as it is imaged or mentally pictured; in other words, it does not go beyond what Locke calls "certain sensible characters". For this reason we must refuse to regard it as the normal or ordinary procedure of the mind in apprehending the universal, as such. Even the individual considered as the unity of his manifold

[1] *Leviathan*, p. 20 (14).

states and actions cannot be conceived in this way. Even within the limits which we have assigned, it may be reasonably doubted whether this mode of conception ever arises without the aid of language. The conditions most favourable for it are those in which the class characteristics are such as can be brought into special salience by appropriate movements of fixation; and can so be in a manner detached for separate consideration from the context in which they occur. In this way attention may preserve itself from wandering to irrelevant details or to general aspects of the object other than those which belong to this or that class concept. Language supplies a mode of fixing attention which is infinitely wider in its scope.[1] It does not directly intensify and detain the presented content of an image or percept; it operates directly on an apperceptive system, and so fixes and detains a certain subjective point of view or way of regarding the object. Without its help it would seem that the process giving particular ideas universal signification can be at the most only rudimentary and transient. Such an analysis of a particular object as is required for its description would be impossible without language. It presupposes a serial succession of conceptual attitudes, each bringing out different aspects of the thing considered, and all combining with each other into a unity. This implies a distinct and orderly sequence of different apperceptive processes without mutual interference or distraction arising from competition. Language effects this by the singling out for exclusive predominance one system after another till each in turn has done its work. This happens both in the process of description and in listening to description, as well as in the observations which make description possible.

[1] See chap. x., § 1.

§ 6. Generic Images not Identical with Rudimentary Concepts.

There is a common way of treating the nature of the concept to which we have not yet referred. It proceeds on the assumption that mental images become transformed into concepts by passing through a certain process of decay. From this point of view a concept is nothing but a faded mental picture. The fading must however be of a certain kind and be due to certain conditions; it must be such as to produce a generic image. An image is called generic when it possesses a distinct and salient centre or core corresponding to the common characters of a class, together with a vague and inconstant margin corresponding to the specific features of the individuals composing the class. Its genesis is admirably described by Professor Huxley: "Now when several complex impressions which are more or less different from one another—let us say that out of ten impressions in each, six are the same in all, and four are different from all the rest—are successively presented to the mind, it is easy to see what must be the nature of the result. The repetition of the six similar impressions will strengthen the six corresponding elements of the complex idea, which will therefore acquire greater vividness; while the four differing impressions of each will not only acquire no greater strength than they had at first, but, in accordance with the law of association, they will all tend to appear at once, and will thus neutralise one another."[1] He illustrates by a reference to composite photographs, in which features common to the faces photographed come out strongly, while the rest, in which they differ, are left vague. This illustration has been often repeated, but it seems to me rather a bad one. The indistinctness in a composite photograph requires special scrutiny for its de-

[1] *Hume*, pp. 94-95.

tection. It does not to the ordinary observer look in the least like a generic image, but like a quite definite portrait of an individual.

So far as I know, no serious attempt has ever been made to confront this theory with the ordinary facts of our mental life. Yet this is a task of no great difficulty. In the first place, we should, according to the theory, expect generic images to constitute a separate class of mental pictures, broadly distinguishable from pictures of particular things and events, by the peculiar kind and degree of vagueness attaching to them. But is this really so? If we leave out of account unusual developments of the visualising faculty, we may fairly say that all images, as compared with percepts, are vague, and it does not appear that the images which are treated as representative of a class, are more obscure than others, or that they have a different kind of obscurity. If I trace in my mind's eye the course of a river, or a walk which I have taken, and if I do not make any extraordinary effort to recall details, the images which pass through my mind are mere outline sketches, in which certain characteristic features of objects have a certain prominence, while the rest is left vague. Yet the ideal train is wholly concerned with particulars and not with universals, as such. Suppose that, on the contrary, I desire to bring before my mind the general characters distinctive of the kind of substance called "chalk" and that for this purpose I call up mentally the image of a piece of chalk. I find that the kind of image which suits my purpose best, is one which is much more definite and detailed than those which serve my turn in recalling a series of particular facts. On the whole, the obscure and fluctuating character of a mental image seems rather to unfit it as a vehicle of generalising thought. It is a fiction to suppose that, apart from the co-operation of language, the obscurity can be permanently confined to marginal features, in such a way that the central

core alone detains attention. The marginal obscurity makes the whole picture evanescent and fluctuating. The effort to fix and detain the essential features naturally tends to make the whole image more definite and detailed. In many instances a percept better fulfils the function of a class-type than a pictorial representation. In studying geometry, for instance, we prefer to have actual diagrams on paper rather than merely mental diagrams. On the other hand, in recalling particular facts, generic images are often sufficient, and their fuller definition an irrelevant superfluity; because the particular as ideally represented differs from the particular as presented to sense-perception. The particularity of the percept consists in actual contact with physical reality in all its wealth of detail. It is represented, as Mr. Bradley has pointed out, by the word "This," as distinguished from "Thisness". On the other hand, when we ideally represent a particular fact as such, its nature as particular consists in its being referred to a unique position in a temporal or spatial series. If we can do this unambiguously, there is no need to picture it in its perceptual details.

It would seem that the mental imagery of persons who do not visualise vividly is nearly all of the generic kind. It would be interesting to know how far and in what way the mental pictures of those who do visualise vividly differ according as they have a particular or a general significance. The statistics collected by Mr. Galton throw little light on this point. He does indeed observe that persons much occupied in abstract thinking have vague imagery; whereas the contrary is the case with those whose minds are accustomed to dwell on particulars. This is easily accounted for by the fact that persons much engaged in abstract reasoning carry on their trains of thought by means of words and their meanings; mental imagery being a more or less superfluous accompaniment, if it is present at all. What we want to know is

whether distinct visualisers visualise more or less distinctly when they regard the pictured object as representative of a class. Mr. Galton records an observation which bears on this point: "Suppose a person suddenly to accost another with the following words: 'I want to tell you about a boat'. What is the idea that the word 'boat' would be likely to call up? I tried the experiment with this result: One person, a young lady, said that she immediately saw the image of a rather large boat pushing off from the shore, and that it was full of ladies and gentlemen, the ladies being dressed in white and blue. . . . Another person, who was accustomed to philosophise, said that the word boat had aroused no definite image, because he had purposely held his mind in suspense. He had exerted himself not to lapse into any one of the special ideas that he felt the word boat was ready to call up, such as a skiff, wherry, barge, launch, punt or dingy."[1] Here it appears that the young lady envisaged the representative picture of a boat in general with the same kind of determinate detail as she would have envisaged that of a particular boat. The generality of the reference did not lead her to form a generic image. The case of the man is different. It may be doubted whether he would have formed an image at all, except perhaps some shadowy fragment of outline, if he had not been challenged to do so by Mr. Galton's inquiry. In his case the image performed no essential function in the conception. The essence of the concept, as it existed for him, is already presupposed in his purposely holding his mind in suspense, in his exertion not to lapse into special ideas. This purposeful exertion was possible only because he had a pre-notion of a boat in general, and so could mould his mental picture in accordance with it. This pre-notion was contained in the simple understanding of the word; the implicit appre-

[1] *Inquiry into the Human Faculty*, p. 109.

hension of its meaning apart from any mental image, whether generic or not.

We should expect a dim percept to fulfil the same function as a dim image, and we actually find Professor Huxley recognising the existence of generic percepts which he straightway identifies as percepts of the general in distinction from the particular: "In dreams, one sees houses, trees and other objects, which are perfectly recognisable as such, but which remind one of the actual objects as seen 'out of the corner of the eye,' or of the pictures thrown by a badly-focussed magic lantern. A man addresses us who is like a figure seen by twilight; or we travel through countries where every feature of the scenery is vague; the outlines of the hills are ill-marked, and the rivers have no defined banks. They are, in short, generic ideas of many past impressions of men, hills, and rivers."[1] Surely this reduces the whole theory to an absurdity. The mind is perhaps never further removed from the conceptual standpoint than it is in dreams. The implication is that vague perception is in itself generalisation. Imperfection of the sense-organs ought, on this view, to be a great help towards conceptual thinking.

§ 7. Functions of Generic Images.

We have contested the theory which would find in the generic image, as such, the origin of the concept; but we freely admit that when a conceptual attitude has once been attained through the formation of appropriate apperceptive systems, the generic image is for the most part a more convenient class-representative than a percept, or a more fully individualised picture. This is illustrated by the case of the man to whom Galton refers, who exerted himself not to lapse into any special ideas. The inconvenience attending this use

[1] *Hume*, p. 96.

of the generic image is its evanescent and evasive character, but this inconvenience makes itself felt only where we strive to dwell on the class characteristics, so as to analyse them, or to keep them before our mind during a train of reasoning. Hence examples drawn from geometrical procedure constitute the stock illustrations of those who, like Berkeley or Hume, regard the general concept as an object presented in its detailed particularity, but considered in a certain light, or from a certain point of view. Where only a passing reference to class characters is required, the generic image has the special advantage of saving time and effort. It brings before consciousness the relevant points without dissipating mental energy in the task of reviving a mass of specific details. It should not, however, be forgotten that this salience of the relevant and obscuration of the irrelevant depends to a very large extent on the use of general terms. How far, apart from some kind of language, the mere generic image would avail as a vehicle of conceptual thinking, it seems impossible to determine. For us, its use is always connected with that of general terms; and, in the case of animals, we have no good evidence that it fulfils a conceptual office at all. Instances of deaf mutes who have not learnt a conventional language, and yet appear to have general ideas, may be thought to point to an affirmative answer: but we must remember that intelligent deaf mutes always possess a more or less extensive and complex gesture-language; and that gesture-language, more than any conventional system of sounds, is adapted to assist in the formation and to sustain the conceptual function of generic images.

In any case, the part played by the generic image in memory and expectation of particular things and events, is at least as important as that which is played in conceptual thinking. If, in mentally retracing a series of past experiences, we were compelled to go into full detail, an

enormous waste of time and energy would be involved. It would never do to have to take up the whole of to-day in recalling what we did yesterday; as a matter of fact we should only occupy a few minutes, at the most, on such a task. We simply make an outline sketch, in which the salient characters of things and events and actions appear, without their individualising details. Mere forgetfulness in part helps to make this possible; but the generic image is an immense assistance. If I picture myself as eating my breakfast at the beginning of the day, it is enough to have a generic image of the breakfast-table and of myself sitting at it, and possibly of the food presented to me. I pass over the details connected with the arrangement of the breakfast-table, and the succession of particular incidents which took up the half-hour spent in eating. Hence it is possible for me to recall the whole event of taking breakfast, which occupied half an hour, in the fraction of a minute, and then to pass on to something else.

We must finally call attention to a peculiarity of the generic image which, though it does not establish its claim to be called an embryo concept, yet prepares the way for conception and assists the conceptual process. I refer to its effect on the flow of ideas. In a generic image suggestion by contiguity in time and space is obstructed; the several diverging lines of association tend to neutralise each other. Where there is a special motive for recalling a time or space series, the result of this is a leap from one generic image to another with omission of intermediate detail; but where there is no special interest in reviving a train of particulars, the result is that suggestion by similarity tends to substitute itself for suggestion by contiguity. In this way the flow of ideas breaks loose from the order prescribed by the succession of percepts. Occasions are afforded for comparison which would otherwise not occur. Whether, and in what degree, the mind avails itself of these, depends upon its previous development, and

upon the controlling interest of the moment. In idle reveries such suggestions frequently occur with little or no attempt at comparison or systematic arrangement. When this is so, we have what has been called *reproductive imagination*, as opposed to memory and expectation. "It consists," as Dr. Ward says, "in a shifting play of images more or less 'generic,' reminding one of 'dissolving views'."[1]

§ 8. Intuitional Thinking.

In the next chapter we shall have to consider at length the dependence of thought on language. As a preliminary to this, it must be pointed out that this dependence is far from absolute. Even complex trains of thought may be wordless; the phrase "independent of language" is, however, ambiguous; it may mean that a certain mental process is possible antecedently to language, or it may mean that though the process would be impossible for a mind which had not been educated by the use of verbal signs, yet it can nevertheless take place without them. As my main concern is with the analysis of mental operations in the developed consciousness, and not with their genetic evolution, the phrase is here used in the second sense. From this point of view there can be no doubt that many trains of thought are independent of language and even of generic images fulfilling in a rudimentary way the functions of language. A train of ideas is a train of thought in so far as its successive parts are progressive stages in the construction of an ideal whole according to a plan. Thought appears to be independent of language and of analogous signs only when the constituents of this ideal whole are capable of being definitely imaged, or presented in sense-perception, so that they can be made prominent and detained by movements of fixation. This condition is fulfilled in the comparison of

[1] Article on "Psychology," *Encyc. Brit.*, 9th edition, part 77, p. 63.

particular objects with reference to their obvious sensible characters. Such pictorial presentation is sufficient for the purposes of thought when "perfectly individualised connections in time and space are in question".[1] Thinking of this kind we may, following the example of Steinthal, call *intuitional thinking*. Intuitional thinking may require strenuous and persistent intellectual exertion and high intellectual power. In these respects, it is perhaps not inferior to that kind of thought which depends on language. In playing chess, in manipulating algebraical symbols, in constructing a piece of machinery, words or equivalent signs are not for the most part required. According to the testimony of Galton, and others who possess a turn for machinery, thought about mechanism does not depend on language, but on "mental imagery," immediately exhibiting the relations constitutive of the whole which the movement of attention is constructing. Aphasic patients, who have almost entirely lost command of language, may yet retain intact their skill at chess or cards. It may appear strange that I have adduced the manipulation of algebraical symbols as an example of intuitional thinking. In so far as the algebraist in operating with symbols requires to be guided by a sense of their significance, he is, perhaps, thinking in signs analogous to those of language. But in so far as he proceeds merely according to certain prescribed rules of operation, disregarding for the time being the interpretation of his symbols, his mode of thinking is intuitional. This will appear more clearly when in chap. x., § 1, we distinguish *expressive* signs from other signs.

§ 9. In what Sense Intuitional Thinking Involves Generalisation.

If we except the process of comparison, the successive objects of the train of ideas in intuitional thinking and the

[1] Bosanquet's *Essentials of Logic*, p. 80.

ideal whole which results from their synthesis are not general but particular. On the other hand, the plan of combination according to which these objects succeed each other in the focus of consciousness and unite to form a whole, is not particular but general. This general plan is not, however, as such, a part of the train; in emerging out of implicit into explicit apprehension, the general scheme becomes particularised; it becomes embodied in those concrete and determinate relations of concrete and determinate elements which constitute the product of the process. The universal element in intuitive thinking is never itself attended to in contradistinction from its particular embodiment: it is to be found only in the apperceptive activity which gives interest and significance to the serial process as a whole. It controls the working of the associations by which presentations succeed each other in the focus of consciousness, so that by relative suggestion a specifically new whole is constructed on the model of a preformed type. A chess-player need not in actual play think about the general laws of the game or about general maxims derived from previous experience. It is much nearer the truth to say that he thinks *by means of* such laws or maxims than that he thinks *about* them. His insight into the dangers and advantages of a particular position, the particular move which suggests itself to him at any moment his prevision of the line of play which is likely to be adopted by his adversary, are all due to the operation of an apperceptive system which has become organised in the course of previous experience. This system is the unity in which are combined the connected products of many particular experiences. It is therefore universal. But its universality is exhibited only in the general plan of synthesis by which particular objects of attention are interconnected so as to form an intuitional whole. The universal, as such, is not distinguished and identified. Hence there is no need for

words; for the word, as we have seen, is a movement of fixation which performs the same functions in regard to universals as other movements of fixation do in regard to percepts and images.[1]

[1] "Words are needed when we have to attend to the general plan of any system, as in thinking about organisms with reference to their type, or about political relations—about anything, that is, which is not of such a nature that the members of the idea can be symbolised in pictorial form. It would be difficult, for example, to comprehend the respiration of plants under a symbolic picture-idea drawn from the respiration of the higher animals. The relations which constitute a common element between the two processes do not include the movements, feelings, and visible changes in the circulatory fluid from which our image of animal respiration is chiefly drawn; and we could hardly frame a pictorial idea that would duly insist on the chemical and organic conditions on which the common element of the process depends. In a case of this kind the word is the symbol which enables us to hold together in a coherent system, though not in a single image, the relations which make up the content of our thought" (Bosanquet, *The Essentials of Logic*, pp. 80-81)

CHAPTER X.

THOUGHT AND LANGUAGE.

§ 1. The Essential Functions of Language.

Language, in the widest application of the term, includes the natural signs of gesture language, the conventional signs of the manual language taught to deaf mutes, and all kinds of written language as well as articulate speech. We may for the present confine ourselves to the consideration of articulate sounds, and regard these as the type of other systems of signs which perform a like function. Language in this sense has its origin in a simple association by contiguity between an "articulation-sound complex" and a percept. Initially this associative connection is devoid of anything which can be called significance. The sound has no other relation to the percept than that of mere juxtaposition in time. It is entirely detached from the system of relations which interconnect the parts and qualities of the perceived object into a whole. The utterance of the sound and the hearing of it produce no change in the object: and the presence or absence of the object is in no way a condition of the production of the sound. The interest of the sound arises, in the first instance, not from its connection with the percept, but from its connection with the person who utters it. The child takes pleasure in emitting more or less articulate sounds before it begins to understand spoken words. Hence the sounds uttered by others have a special interest for him, and he early shows a disposition to

imitate them. The persons surrounding him frequently repeat certain names when his attention is engaged with certain objects. Hence the first association between name and thing; but the name is at the outset not a name for the child, it is merely a special sound associated with a special percept in a quite casual and indefinite way. Now it is precisely the casual and indefinite nature of the connection which facilitates the transformation of the sound into a name. The sound does not enter into the network of associations comprehended under the percept. Instead of occupying a distinct place within the perceptual synthesis, it is associated with the percept as a whole. Its occurrence is quite independent of the presentation of its associate. It thus becomes a means of fixing the attention of the child on the object when it would otherwise pass unnoticed or comparatively unnoticed. This is effected by exciting the appropriate apperceptive group. The sound of the word tends to call into renewed activity the psychical disposition left behind by the previous experiences in which it has occurred. Thus if the object is at hand, the word serves to call into play the right apperceptive system to meet it. The word is thus a means by which other persons can fix the child's attention on this or that object; it is also a means by which the child fixes his own attention: even when it is in the first instance uttered by another person, its full efficacy depends upon the child himself repeating it or attempting to repeat it. When he has thus learned the command which it gives him over the direction of his own thoughts, he soon becomes able to use it independently of external prompting: it is an instrument which he finds at his disposal for the performance of the work in which he is keenly and persistently interested—that of examining the world around him and making himself intellectually at home in it. It also gives him another power of equal value, that of directing the attention of others to the objects in which he is interested.

We are now in a position to assign the essential function of language in its relation to thought. It is one movement of fixation among others, but it possesses certain distinctive peculiarities of the utmost importance. Other modes of fixation, such as the various muscular adjustments of the sense-organs, are merely modes of detaining and intensifying sensory presentations. They may in the main be regarded as constituent parts of the images and percepts which they detain and intensify, and hence they cannot occur antecedently to these and evoke them. It is quite otherwise with words. Their efficacy is due to their association with the cumulative product of previous experience. Hence what they fix and detain is not a sensible presentation, as such, but an apperceptive system. They are not constituent parts of this system, but are merely associated with it. Thus they may occur antecedently to it and so call it into operation. With this point is connected another of the greatest consequence; words are not merely means by which a person can fix the direction of his own attention; they are also means by which he can fix the attention of others. It is, as we have seen, through experience of the control exercised by others upon the direction of his own attention that the child learns to use language himself as a tool for thinking with. It is evident that the two functions of language, (1) as a means of communication, (2) as an instrument of thought, are inseparably connected and interdependent. The child, in the very act of understanding what others say, learns to understand himself. The word, as used by others, is significant for him because of the distinctive part it plays in his own mental activity; and, on the other hand, it is just because he has learned its use in his own thought-processes, that he is enabled intelligently to use it as a means of determining the thoughts of others.

Words, and all presentations which discharge an analogous function, may be called *expressive signs*. As such, they must

be carefully distinguished from (1) *suggestive* signs, (2) *substitute* signs.

A suggestive sign merely calls up a certain idea, which may then be attended to independently of it. When we purposely associate *A* with *B*, so that *A* may on occasion remind us of *B* or indicate the actual presence of *B*, we are using *A*, not as a means of expressing a *meaning*, but only as a mnemonic help. The essential point of difference is that *A*, when it has once suggested *B*, is of no further use and may be altogether dismissed. *B*, when once it emerges, can be understood and attended to without any further reference to *A*. Thus, in chess-playing, the shape of a knight serves only to remind the player that he can make certain moves with it. But it does no more. The moves themselves must be made the immediate object of attention. They cannot be attended to mediately through any sign which suggests them. Similarly, the chalk-mark placed by the robber on Ali Baba's door was a suggestive sign. It was merely a means of identifying a certain object; when once it had performed this service, it might be rubbed out. In general, suggestive signs serve only to bring something to mind: they are not a means of *minding* it when once it is recalled. An expressive sign, on the contrary, is a means of attending to its signification.

Expressive signs differ from substitute signs in a manner exactly the inverse of that in which they differ from suggestive signs. A suggestive sign has fulfilled its purpose and becomes of no further avail so soon as it has suggested its meaning. A substitute sign is a counter which takes the place of its meaning; so long as it fulfils its representative function, it renders useless all reference to that which it represents. The counters are manipulated according to certain rules of operation, until a certain result is reached, which is then interpreted. The operator may be actually unable to interpret the intermediate steps. Algebraical and arithmetical symbols are to a

great extent used as mere substitute signs. The same is true of the symbols employed in formal logic. It is possible to use signs of this kind whenever fixed and definite rules of operation can be derived from the nature of the things symbolised, so as to be applied in manipulating the signs without further reference to their signification. A word is an instrument for thinking about the meaning which it expresses; a substitute sign is a means of *not* thinking about the meaning which it symbolises.

§ 2. Language and the Train of Ideas.

In the preceding section we have reduced the conception of language to its lowest terms. We have assigned the minimum which is requisite to constitute a *word*. We have not even assumed the existence of trains of ideas. It is true that the association between *name* and *thing* can only take place at a period of mental development when the child is beginning to become capable of ideal representations. But the efficacy of the name in fixing attention on a sensible object depends merely on its function as the prompting cue of an apperceptive system, and does not necessarily involve the revival of a mental image. It is possible that if the object were not present, the idea of it would not be called up by the word, which is nevertheless capable of prompting and assisting attention to the percept.

We now pass to another function of words, which is of especial importance in early stages of mental development. The word can discharge its essential and indispensable psychical function without necessarily calling up an associated mental image; but the calling up of mental images is a very important part of its office. Indeed language is a most potent factor in the growth of ideal representation. An image may be either called up by another image, or by a percept. The percept has the greater reproductive efficacy; it reinstates

its associate more vividly and distinctly, and with greater ease and certainty. From the nature of the case, the earliest trains of ideas must consist in memories and expectations having their starting-point in sense-perception. Now the spoken word shares in a high degree the reproductive efficacy characteristic of a percept. But it is linked with its associate under conditions essentially different from those under which a memory train is formed. The association between the successive parts of a memory train is ultimately traceable to a corresponding series of external events; hence if one link in the chain is to be given in perception so as to revive another in idea, the order of nature must bring about at least a partial renewal of the original train of external occurrences. It is quite otherwise with the "articulation-sound complex"; the occasions for its perceptual existence are quite independent of the occasions which determine the perceptual existence of its associate. Thus ideal revival by its means becomes independent of the recurrence of connected trains of external events. What is of still more importance is that the production of the word-percept always lies within the power of the subject himself, and is not affected by external circumstances. He can command it at will, and he has therefore a corresponding command over its associate image. "With young children and uncultured minds—who, by the way, commonly 'think aloud'—the gain in this respect is probably more striking than those not confined to their mother-tongue or those used to an analytical handling of language at all realise."[1] In the minds of such persons mental trains are mainly pictorial, and actual utterance or at any rate subdued articulation gives them a power to detain and vivify their mental pictures, which more than compensates for the expenditure of time and energy

[1] Dr. Ward's article, "Psychology," *Encyc. Brit.*, 9th edition, No. 77, p. 76.

which it involves. It should however be noted that even internal speech may to a large extent fulfil a similar function. Articulate sounds are capable of being reproduced with unique distinctness, strength and freedom. We have drawn attention to this point in a previous chapter. "Let any one select for mental experimentation any word or sentence; he will find that he has almost as great a control over the internal articulation as over the external. The chief restriction appears to lie in the inability to make the represented sound as loud as the actual sensation, but, apart from this, one may do almost what one likes with it."[1] As internal speech thus approximates in freedom, facility, and distinctness to external speech, it has an analogous reproductive efficacy. Of course this control over internal articulation is only acquired by practice; and it is therefore natural to children and uneducated persons to have recourse to actual utterance.

Inasmuch as a name is impartially associated with the presentation of different objects of a class, and with the same object on different occasions, it will tend to call up a generic rather than an individualised image. When the image is particularised, this is due to concurrent conditions determining the course of suggestion. Now whatever advantages a generic image may possess for the purposes of thought are immensely enhanced by its connection with the name; and whatever disadvantages may arise from its evasive and fluctuating character are thereby in a great measure counterbalanced. The association of the name with constant characters has been strengthened by repetition; and its association with variable characters has been correspondingly enfeebled. It thus tends to revive the central core of the generic image, rather than the vague and fluctuating margin. When the image is vanishing, as it is specially apt to do just because its generic character

[1] Bk. ii., chap. ii., p. 215.

renders ineffectual in its case the ordinary movements of fixation, the repetition of the word retains or recalls it.

§ 3. Combination of Words.

The distinction between the particular and the universal is foreshadowed in the very simplest function of the name—that of fixing attention on a perceived object. The same apperceptive system is excited in a twofold way: it is excited by a name, and it is also excited by a sense-impression. The apperceptive system as a permanent mental possession is capable of apperceiving on different occasions different impressional experiences. It is applicable to different things of the same class, and to the same thing under different circumstances. Now the name excites it as a whole, without imposing on it any specific limitation. The sense-impression, on the contrary, in exciting it also particularises it. Thus there is a contrast between the part played by the name, and the part played by the sense-impression, corresponding to the antithesis between universal and particular. This contrast may be regarded as an anticipation on a lower level of the distinction between predicate and subject. The apperceptive system as particularised by the sense-experience is subject; as excited in its generality by the name, it is predicate. If we were to claim for this antithesis of universal and particular the title of an inchoate conception, we should, I think, be at least more in the right than those who search for the beginnings of conception in the generic image, as such. But the distinction is at first so vague that we prefer to regard it rather as foreshadowing the conceptual attitude, than as actually exemplifying it.

Language gives birth to conceptual thinking only when words are combined in a context.[1] We must take into

[1] We here disregard the use of names in prompting and facilitating comparison, which will be referred to in a later section.

account not isolated names, but names so conjoined in successive order as to excite in combination distinct apperceptive systems, which apperceive each other, and unite in a complex whole, without losing their relative independence. To understand how this takes place, the analysis of the function of detached names must be carefully borne in mind. The conjoint operation of words is conditioned by their separate operation.

Consider such a percept as that of a flying sparrow. Suppose that we are simply watching the sparrow without formulating what we observe in a proposition, such as, *The sparrow flies.* In this wordless perception, the mental disposition *F* left behind by previous experiences of flying, and the mental disposition *S* left behind by previous experiences of sparrows, are both appercipient; but there is not any definite antithesis in consciousness between two points of view; there is no analysis of the total phenomenon into its two constituents—the sparrow and its flight. In this respect there is a broad contrast between wordless perception, and that which finds expression in a proposition. In the wordless perception of the flying bird the two systems, *F* and *S*, are stimulated and particularised by a single wave of excitation. Though we speak of them as *two*, they are not, properly speaking, *two* for the percipient. When the verbal formula comes into play, the case is altered. Each word, as it successively emerges, stimulates only its own appropriate system; and, as often as it is repeated, it fixes and detains this rather than the other. The two points of view are held apart, instead of being inseparably blended. They are held apart, however, without losing their connection as constituents of the total perception. The whole object is thus analysed into two parts—the *sparrow* and its *flight*. At the same time these two parts are apprehended as constituents of a whole, so that the analysis is accompanied by a synthesis. The *flight* is apprehended as

the flight of a sparrow, and the *sparrow* is apprehended as flying.

The distinction between the two constituents of the perceived objects, is also a distinction between the universal and the particular. Not that one constituent is exclusively particular, and the other exclusively universal; both are at once particular and universal, relatively to each other. The apperceptive system F produces a specific limitation of S, and S produces a specific limitation of F. The same act, *e.g.*, *flying*, may be performed by many different agents. Other birds fly besides sparrows. Other animals, such as the bat, fly as well as birds. The boy's kite also flies. Thus to assign the agent in any case is to particularise the general act of flying. So, too, flying is only a particular mode of a bird's existence. Birds may hop on the ground, or sit on a nest. Thus to specify what the bird is doing at any moment is to particularise the general view of it as a bird.

Of course we need not assume that the distinction between action in general and special agents, and between agents in general and special action, emerges into consciousness in its full definiteness merely through the combination of appropriate words in a single instance. The name of the same or similar agents will be repeatedly combined in analogous manner with the names of varying actions, and that of an action with those of varying agents. The same kind of action will also be again and again perceived and verbally expressed, in connection with the same kind of agent. These varying recurrences of the processes we have analysed, will register themselves as modifications of the mental preformation; hence in subsequent apperceptive processes the antithesis between universal and particular will become more and more definite and salient. It will be especially salient and definite when ideal revival, aided by language, takes the place of actual perception. For in this case what occurs is not so much a conceptual analysis of what

is already given in the way of perception, as a construction in which the concrete image emerges through conceptual synthesis. The conditions are even more favourable when one kind of action is ideally revived while another is perceived. Here actual comparison co-operates with the analytic-synthetic function of language.

In referring to the antithesis of universal and particular, we have so far had in view mainly a special form of it. The term *universal* has been tacitly taken as equivalent to *general*, and the term *particular* as equivalent to *instance* or *example*. We have taken into account only the distributive universal, represented by the class-name. This point of view is almost forced upon us so long as the only source of conceptual thinking which we consider is comparison. But generality is only one form of universality; and its main importance depends on its connection with other forms. Wherever a multiplicity is in any manner unified, wherever there is a relation of whole and part, wherever an identity pervades and connects differences, there is an antithesis of universal and particular. The antithesis between agent and action is a case in point. An agent is not merely a member of a class; it has a continuous individual existence, embracing manifold states and activities, successive and simultaneous. In the proposition, *The bird flies* the special act of flying is distinguished as a particular phase in the continuous existence of the bird. The special function of proper names is to fix attention on this kind of universal. In the sentence *John eats*, the word *John* excites an apperceptive system, which combines in systematic unity the results of the speaker's previous experiences of John's states and acts, and of their interconnection. It does not stand for a particular object, but for a system of which only the ultimate components are particulars. *John* is not a determinate image but a universal, which, as such, includes within it a multiplicity

of determinations incapable of being united in any percept or mental picture. When the word *John* is followed by the word *eats*, the corresponding mental systems are excited to activity, and they apperceive each other. The result is that the specific act of *eating* is singled out as a special phase in *John's* total existence, and set in conscious antithesis to this as the particular to the universal.

It is unnecessary to go into detail concerning other forms of the universal. What has been said about acts, as represented by words, evidently applies also to states and qualities, as represented by adjectives. A spatial whole is in like manner capable of being conceptually analysed and reconstructed by separately naming its parts and their relations to each other. This involves the use of prepositions. So too the whole, which is constituted by an action originating in one thing, and terminating in or directed towards another, is analysed by naming the agent, the activity, and the object. The name of the action stands for the total process, agent and object being special determinations of it. The different modes in which it terminates in or is directed towards an object may be verbally expressed by different prepositions or case-endings. Other special modifications of an activity, as distinguished from the activity in general, are expressed by adverbs. Degrees of resemblance and difference are marked by the comparatives of adjectives and by such words as *more* or *less*. Here the whole which is analysed is a graduated scale of quantity or quality. It would be tedious, even if it were possible, to refer to all kinds of universality. In conclusion, we must notice that all other antitheses between universal and particular are only apprehended in connection with the antithesis between the general and its special instances. A whole is conceptually distinguished from its constituent parts only because a similar form of combination has repeatedly occurred with varying components, or because the constituents have appeared in other forms of

combination. It is this which accounts for the common tendency of psychologists to identify the general, as such, with the universal, as such.

§ 4. The Social Factor.

It does not belong to our present purpose to discuss the origin of language. We have throughout assumed, and shall continue to assume, a society already in possession of a system of verbal signs. Our primary problem concerns the relation of words to thought in the individual members of such a society. But the use of words as instruments of thinking is inseparably bound up with their use as means of communication. It will therefore be advantageous, both in view of what has preceded and of what is to follow, to define and distinguish the chief modes in which the function of language in the mental processes of the individual is conditioned by the function of language as a medium of social intercourse.

In the first place, the social function of language supplies continually a powerful impulse and incentive to thought. Practical needs, curiosity, personal interest in others, perpetually depend for their gratification on the individual being able to understand what others say, and to say what others can understand. Just as the felt need for control over his immediate material environment leads the child to explore with hand and eye objects of perception, so the felt need for control over his social environment prompts him to search for the meaning of words and sentences. To omit reference to this influence of the social factor in discussing the relation of language to thought, would be like describing the mechanism of a steam-engine, without referring to the motor power of the steam.

In the second place, language as a social possession is a

means of guiding the thought-processes of individuals in directions which have already been successfully followed up by others. Thus the individual in his intellectual progress finds paths already marked out for him, instead of having to find his way through a trackless labyrinth. Let us suppose that the child's attention is attracted by a somewhat unfamiliar object, which he has difficulty in identifying. Instead of being left to his own unaided apperceptive processes, he may receive guidance and help from those around him. It may be that at the outset a number of alternative systems compete with each other in his mind. Some bystander names the object; the name, if it be at all familiar, singles out one apperceptive system to the exclusion of others, and removes the mental distraction. If the name is unfamiliar, it will nevertheless form the starting-point for the formation of an apperceptive system. The desire to understand it will arouse attention whenever it occurs, and will lead to comparison of different instances of its application. But even on its first application the child may be enabled to understand more or less definitely its significance by the assistance of others. The bystander, instead of merely naming the object, may proceed, by a combination of words, to draw attention successively to its distinctive features and their interconnection. He thus invokes appropriate apperceptive systems in suitable order, and these, by the analytic-synthetic process described in the last section, combine into the single system which is required for understanding the nature of the object. In this way external influence produces an orderly evolution of apperceptive moments where otherwise there would be chaotic competition. The difference is comparable to that between the unguided movements of a mob and the disciplined movements of an army. A good example of the way in which the systematic organisation of language as a social possession gradually leads up to a corresponding organisation of thought-process in the

individual mind is afforded by the way in which the child learns to distinguish and combine the parts of speech. Initially, a sentence is not a sentence for the child. Either the whole verbal combination acts on his mind as if it were one word, or some portion of it alone is significant to him. Thus he himself in speaking is for a long time apt to use single words which stand for vague unanalysed objects. "When the child says 'up,' for example, that word is indicative of a certain mode of sense-experience—the experience of being lifted. . . . We must not be misled by the fact that the word 'up' is used as a preposition, into saying that the child is here employing a preposition. . . . Nor is the word to be regarded as a sentence, but simply as a definite sound which he has learnt to associate with a particular piece of objective sense-experience."[1] It is only by the recurrence of the same sounds in varying combinations that each acquires its distinctive function. The part played by each becomes restricted and defined by the action of the others. Thus, to borrow a metaphor from Lotze, the stones out of which the later structure of thought is to be built are gradually hewn into shape. In opposition to Lotze, however, we must insist that the only effective means by which they can be fashioned, is their own interaction. They must mould each other—and at this point the metaphor fails us; for their interaction is not comparable to mutual friction, and they can have nothing of the hardness of stones.

Finally, it is due to the operation of the social factor that words carry with them not only a reference to the objects they denote, but also to the minds of other persons, and their thoughts and feelings concerning these objects. We noted at the outset, that the "articulation-sound complex" which becomes transformed into a word, is initially associated with

[1] Lloyd Morgan's *Psychology for Teachers*, p. 171.

the person who utters it, and primarily derives its interest from this association. The constant use of words as means of communication preserves this personal reference, which clings to them even in silent thought. Thus language is the chief agent in constituting what has been called "the social object". The individual is perpetually prompted so to formulate his thoughts as to render them intelligible to others as well as to himself.

§ 5. Comparison as Conditioned by Conceptual Analysis and Synthesis.

The conceptual analysis of objects by means of language reacts on the process of comparison and is in turn influenced by it. In the first place, the several points of view connected with the different words applicable to the same complex object yield separate points of departure for comparison. Thus if we have two objects X and Y, and if X has been conceptually analysed into the constituents a b c d, and Y into the constituents α β γ δ, it becomes possible to search successively for the likeness and difference of a and α, b and β, c and γ. Within each of these processes taken separately language again plays an important part. It makes possible an analysis of the nature of the agreement and difference of the terms compared. Thus we are enabled to say that a is α in so far as both a and α contain a general character A, and that they differ inasmuch as A in the one case has the modification m_1 and in the other the modification m_2. This presupposes, of course, that m_1 and m_2, although they are relatively specific, have yet a generality which has made it possible to refer to them by a word or a combination of words. Thus we may say of two objects that both are purple, but that the one is a blue purple and the other a red purple. Comparison is most fruitful where in a number of different instances of the general

character A, the modifications m_1 m_2 m_3, etc., form a graduated series, so that their differences are reducible to varying degrees in the same quality or qualities, and expressible in terms of comparison stating their relative positions in the series. When this point has been reached, the difference of any two terms m_1 and m_5 will be apprehended as a kind of distance constituted by the intervening terms m_2 m_3 m_4, which connect and separate them. Through this mediation it becomes possible to recognise an identity of character between objects which otherwise would not have come into comparison at all. A purple, which might otherwise simply pass for a red, may be identified when it occurs in its place in the series of transitions from blue to red. In this way also it becomes possible to form a graduated scale of differences, uniting by intermediate terms extremes which would otherwise never come into comparison. In this way, for instance, it becomes possible to regard the straight line as a special case of the ellipse. Mr. Bosanquet refers to the impression made on him by the collection of flint instruments in Salisbury museum. He had previously found it hard to believe that the rude specimens shown him were really due to human hands; but conviction was immediately carried to his mind when he saw a collection arranged in a graduated series from the clumsiest productions of primitive man to the most finished works of modern art.[1] Reference may also be made to types of structure in natural history and comparative anatomy.

§ 6. The Explication of Concepts.

Let us now go back to the point which we had reached at the end of § 3. We there showed how language becomes the means of analysis of a perceived object into conceptual constituents, and of its concomitant reconstruction by conceptual

[1] *The Essentials of Logic*, p. 144.

synthesis. We mentioned also that when this synthetic-analytic process is revived in idea apart from the perceived presence of the object, the constructive aspect of the process assumes a relative priority and predominance. The mental picture is apt to be vague, until the successive emergence of the moments of the conceptual process has given it determinate form. Even then it often remains a mere generic image. This will be best illustrated by the movement of ideas which takes place in the mind of a person listening to a description of an object which he has never himself seen. We may suppose that the purpose of the describer is to evoke in the mind of the listener as determinate an image as possible of the thing described. "We wish to describe quicksilver to a child. We say that it is something like this pewter in its brightness and the way it reflects the light; it is even heavier than this lead; it is liquid like water, so that I could pour it from one vessel to another. And we might further qualify each of these statements so as to render them more exact."[1] Now if this process be carried far enough, it is quite possible to produce in the child's mind a fairly definite mental picture; but this picture only arises gradually, as one item of the description succeeds another. Detailed imagery connecting itself with the several words as they fall one after another on the ear of the listener, is a mere superfluous incumbrance. Irrelevant and inappropriate details suggested by preceding words are annulled and suppressed by succeeding. Even in the end it is quite possible that the mental image may be very vague. Supposing it to be definite, it may none the less be felt to be untrustworthy. But it does not follow that the conception of the object called *quicksilver* is correspondingly untrustworthy or vague. For the word quicksilver is not only associated with the image, but also with the process of conceptual

[1] An illustration given by Mr. Lloyd Morgan, *op. cit.*, p. 178.

synthesis. There are two ways in which the mind may bring into explicit consciousness the meaning of a word. It may translate it into an equivalent combination of other words, so as to reconstruct it by successive syntheses of its conceptual constituents; or it may call up a mental picture of the object named. We may call the one the verbal, and the other the intuitional, explication of a concept. *Explication* here means a serial expansion of the apperceptive system with which a name is connected. In minds accustomed to abstract thinking, verbal explication usually takes the place of, or at least predominates over, intuitional, even when translation into imagery is easily practicable. But in the case of certain concepts there are difficulties in the way of the intuitional procedure, which make the verbal more or less compulsory. The greater is the multiplicity of distinct features which the conceived object unites within it, the more difficult is it to bring them together in a single picture. In reading a minute botanical description of a plant, fragmentary images of its various parts may occur to the mind; and yet we may be unable in the end to gather together these detached bits of imagery into a whole. The same thing may happen even in the case of a plant we have previously observed ourselves and scrutinised in detail. The difficulty is transformed into an intrinsic impossibility when the complex whole comprises constituents which cannot from the nature of the case be observed together. From this point of view we may say that the more we know about a thing, the less we are able to represent it adequately in a mental picture. If our conception of a certain plant includes not merely the features of its external appearance, but its internal structure as revealed by a microscopic examination of its tissues, in all kinds of sections and cross-sections, the complex multiplicity of distinct characters which it includes cannot be mentally envisaged at once. They can only be brought before consciousness in a

series. It is possible that this might be done without words; but it is hardly ever accomplished in this way. The process is always to a large extent one in which the mind describes the object to itself. In such instances as this the object can be more or less adequately imaged piecemeal, though not as a whole.

But the difficulty may arise from the generality of the concept, as well as from its complexity. The best statement of this point is to be found in Lotze. "The comparison of individual men . . . produces a universal image; not indeed in the sense that the universal man can really be painted, but in the sense of the illustrations in a natural history, which purport by one camel or horse to exhibit all camels or horses clearly to perception, in a form which is more than a mere scheme or symbol; or again in the sense of geometry, in which a drawn triangle, though necessarily individual with others existing beside it, yet represents all these others, and in a similarly perceptible form. But this possibility vanishes when we ascend to higher universals, in which these universal images are themselves included in their turn as species: the universal mammal, which is neither horse nor camel nor is otherwise named, cannot even be drawn in a schematic form, any more than the polygon can which has neither three, four, or any other definite number of sides. Thus these higher universals are no longer apprehended in perception, but only in thought, by means of a formula or equation, which prescribes essentially the same relation between various related points, but leads to quite different perceptible configurations, accordingly as the previously undetermined values of these points and their various connections are differently determined in thought."[1] In the case of such abstract, or, as we may say, attenuated universals, the image of a particular example is of

[1] *Logic* (Bosanquet's translation), p. 38.

little avail, apart from the analytic-synthetic process of language, which fixes attention on the common characters in distinction from their specific embodiment. On the other hand, the conceptual synthesis itself is relatively independent of the image, which may either be extremely vague or wholly absent.

The difficulty of intuitional explication is increased when high generality and high complexity are combined. The generality of the component characters renders it difficult or impossible to disengage them for detached consideration from their specific embodiments. Their complexity renders them incapable of being conjoined in the same percept or mental picture. A concept may contain a multiplicity of highly general characters, ultimately traceable to a vast variety of separate observations, experiments and comparisons. Generality by no means implies simplicity. For the zoologist the "animal kingdom" is a general conception, embracing in a single system a vast variety of determinations, which are also general. It includes, besides the abstract characters which might be formulated in a definition of the term "animal," the universal modes of variation, through which these characters are specified in the graduated system of genera and species. This vast multiplicity of highly general characters cannot be brought before consciousness in a mental picture, or even in a series of mental pictures.

We may now return to a point discussed in an earlier part of this work. In bk. i., chap. iv., we urged that the meanings of words may be, and frequently are, implicitly apprehended: the universal with which the word is associated being distinguished and identified as a whole without being resolved into its components. We then had in view chiefly intuitional explication; it is perhaps needless to say that the same holds good of verbal explication. Where the relations of concepts to each other, and their connection in a whole, can be apprehended

without resolving them into their components, such analysis is useless for the purposes of thought. It is true that the play of association will often call up imagery where it is not required; but such imagery is, as we have shown, for the most part irrelevant. It either does not explicate the concept at all, or it does so in an utterly inadequate way. It may indeed fulfil a useful function in thought-process; but this function belongs to it as a supplement of the word, not as an explication of the meaning. It is a component part of the sign, rather than a presentation of the object signified. If, in reading a treatise on political economy, the word "wealth" calls up in my mind the vague picture of a bale of goods, this picture is, to say the least, a hopelessly inadequate explication of the concept of wealth. But it may co-operate with the word in fixing and detaining the mental system associated with this word. The mental imagery that clusters round a word, and supports it in its function, constitutes what has been called the "inner speech-form". We shall have to recur to this point when we come to treat of the transference of meaning by analogy.

§ 7. Universe of Discourse.

Thinking by means of language consists in the formation of an ideal whole by the mutual apperception of the conceptual systems, with which the words are severally associated. This, however, is only one aspect of the process. We have not merely to consider the nature of the elements which unite to form a conceptual whole and the nature of their union. We have also to take into account the permanently dominant system by which each conceptual object entering into a train of thought is apperceived in turn, and which gives to the whole series its unity of plan and unity of interest. The interest through which each object attracts attention must depend on its relation to preceding parts of the series. Only

in so far as these conditions are fulfilled are those desultory transitions excluded, by which one object, instead of being presented as a further development or determination of its predecessors, simply displaces and suppresses them. Words are instruments of thinking, because the mental groups which they excite apperceive each other. But the mere juxtaposition of the expressive signs is not sufficient to produce this result. Ordinary conversation is marked by frequent transitions from one general topic to another through associative links which are not themselves attended to. Within each sentence, it is true, the transitions are, in the strict sense, thought-transitions; this arises, as we shall see later on, from the very nature of the sentence and of those proportional systems which are the psychological counterpart of the objective categories of grammar. But there is no necessary continuity in the interconnection of sentences. The mere play of association, taking the place of thought-development, may break up the train of ideas into disjointed fragments. Thought is continuous only in so far as the evolution of the ideal train is the progressive specification of a previously indeterminate whole. This relatively indefinite schema, which becomes articulate in the process of thinking, is what logicians call a *universe of discourse*, and what in ordinary language is called a *subject* or *topic*. The title of a scientific treatise, for instance, expresses the subject, which at the outset is comparatively indeterminate, but which receives progressive determination as sentence is added to sentence. In relation to this general subject the whole specific content of the treatise may be regarded as a predicate.

§ 8. The Subject-Predicate Relation.

Possibly this use of the terms *subject* and *predicate* may appear loose and popular. The *subject* of the grammarian or

logician is the unifying centre of a multiplicity of acts, states, or relations, and the *predicate* is the act, state, or relation ascribed to the subject in any sentence. This distinction is of course accurate and important. But it ought not, I think, to be identified with the distinction between subject and predicate. The essential mark of the subject-predicate relation is that it constitutes a sentence. Thus we find that grammarians distinguish between the merely defining or determining use of adjectives, participles, etc., and their properly predicative function. To explain the nature of the subject-predicate relation is at the same time to explain why discourse is broken up into distinct sentences. Now the required explanation is not far to seek, if we start from the popular use of the word *subject* as indicating the general topic or universe of discourse. The predicate of the subject, in this sense, is the whole discourse through which it receives definition and specification Predication, from this point of view, just consists in the definition and specification of what is, at the outset, indefinite and indeterminate. It is because this process takes place gradually by a successive concentration of attention, that language is divided into sentences. The predicate of a sentence is the determination of what was previously indeterminate. The subject is the previous qualification of the general topic or universe of discourse to which the new qualification is attached. The subject is that product of previous thinking which forms the immediate basis and starting-point of further development. The further development is the predicate. Sentences are in the process of thinking what steps are in the process of walking. The foot on which the weight of the body rests corresponds to the subject. The foot which is moved forward in order to occupy new ground corresponds to the predicate.

According to this view, the subject-predicate relation is altogether distinct in kind from those relations with which it

is commonly identified by grammarians. It has nothing to do with the relation of agent to action or with similar categories. It does not express any form of relation inherent in the object of thought; it springs entirely out of the time conditions of mental process in the individual mind. It is a purely psychological category and not a logical category. It only exists because of the narrowness of consciousness. All answers to questions are, as such, predicates, and all predicates may be regarded as answers to possible questions. If the statement "I am hungry" be a reply to the question, "Who is hungry?" then "I" is the predicate. If it be an answer to the question, "Is there anything amiss with you?" then "hungry" is the predicate. If the question is, "Are you really hungry?" then "am" is the predicate. Every fresh step in a train of thought may be regarded as an answer to a question. The subject is, so to speak, the formulation of the question; the predicate is the answer.

The ultimate subject is always the universe of discourse. In some cases this ultimate subject is also the proximate subject of a sentence. When this happens, it may not be represented by an expressive sign and it may even be incapable of being adequately expressed. Under this head come impersonal sentences such as "It rains," "It grows late," etc., and exclamations such as "Fire!" "Murder!"

§ 9. Interconnection of Sentences.

Continuous discourse is composed of sentences. Each of these adds a further qualification to the general topic which forms the universe of discourse. This further qualification is the predicate of the sentence. But the successive predicates are not simply juxtaposed. They unite in that ideal whole which is the product of conceptual thinking—a whole formed by the mutual apperception of the concepts on which attention

is successively concentrated. Each predicate-concept must therefore be apperceived by the partially formed whole which is the product of the previous synthesis of concepts. If we take any given point in the progress of a continuous discourse, all determinations of the general topic which have emerged up to that point form an integral part of the subject, to which all subsequent determinations are attached as predicates. Consider the following series of sentences: "I took the train to London; I arrived at 12 P.M.; I went to an hotel; I found that all the rooms were taken". The "I" which is the subject of the last sentence is qualified by all those which precede it. The full sentence is: "I, having taken the train to London, and having arrived at 12 P.M., on going to an hotel found that all the rooms were taken". This example may be regarded as typical of the mode in which sentences are interconnected, in the continuous development of conceptual thought.[1] The subject of each sentence is not fully expressed within the sentence itself; it is always qualified and defined by what precedes. It must be noted that this interdependence of sentences, through which those that precede specify and define the subject of those that follow, is quite distinct from that interdependence which is expressed by such conjunctions as *if, because, therefore, then, when,* etc. These connecting particles express relations inherent in the object thought about. They therefore belong to a class of categories altogether distinct from the subject-predicate relation, which is purely subjective or psychological.

§ 10. Occasional Meaning of Expressive Signs.

Concepts are apperceptive systems. They are, therefore, excited by co-operation and repressed by competition. These conditions limit the operation of the expressive sign on each

[1] Paul's *Principl s of the History of Language* (trans.), pp. 144 ff.

occasion of its employment. The objects indirectly attended to in a train of conceptual thought are, by mutual apperception, interwoven into the texture of the thought-product. Each expressive sign has power to objectify its associate system only in so far as this system is capable of being incorporated in the conceptual whole which is in process of construction. Hence, the signification of words varies according to the context in which they appear. "When the idea 'man' is present, it is present in some proposition or question, as: 'Man is the paragon of animals;' 'In man there is nothing great but mind,' and so on. It is quite clear that in understanding or mentally verifying such statements, very different constituents out of the whole complex 'man' are prominent in each . . . What is relevant is alone prominent."[1] In sentences like "I never laid a hand upon him"; "John never drew bridle," the hand referred to is not a hand in general, but my hand, the bridle referred to is not a bridle in general, but that which was held by John. Compare such instances as "a good point," "a point of honour," "the bar of an hotel," "the bar of justice," "the tongue of a woman," "the tongue of a balance".[2] Paul uses the terms *occasional* and *usual* signification to mark the distinction between the meaning of a word each time that it is employed and that which by usage attaches to it considered in itself. This nomenclature is convenient, and I shall make use of it. It must be noted, however, that the usual signification is, in a certain sense, a fiction. It is, perhaps, not necessary that there should be an identical element of meaning pervading all the applications of a word. Moreover, this common element, so far as it does exist, cannot be called a *meaning* of the word in the same sense as the occasional signification. When it is disengaged by scientific definition from the various specific applications in

[1] Dr. J. Ward, art. "Psychology," *Encyc. Brit.*, xx., 76.
[2] Paul's *Principles of the History of Language*, pp. 73 ff.

which it is implicitly included, it ceases *ipso facto* to be a general meaning, and becomes one occasional meaning among others. The *usual* or *general* signification is not in itself one of the significations borne by a word. It is a condition which circumscribes within more or less vague and shifting limits the divergence of occasional meanings.

The signification of words varies not only with the context, but also with the circumstances under which they are employed. Signs, such as the personal, possessive, and demonstrative pronouns, demonstrative adverbs, etc., have for their general meaning only an extremely abstract form of localisation in respect of place or time. They, therefore, require, on each occasion of their employment, the aid of individualising conditions to give them definiteness. These conditions are supplied by the context, when the demonstrative refers to some other word in the same discourse. They are also often supplied by the general circumstances which determine the universe of discourse. Such demonstratives as *that*, *this*, *there*, *thence*, primarily refer to the content of present perception. *That* tree means, *ceteris paribus*, the most prominent tree in sight. *Here* means the place in which the speaker is; *now*, the time at which he is speaking, and so forth. The defining power of the universe of discourse is also constantly seen in the case of other words besides demonstratives. "Countrymen talk of going to *town* without further specification, meaning thereby the town nearest to where they happen to live." "Suppose that two friends are out walking together, and that they meet a lady previously unknown to either about whom they exchange remarks. They take the same walk on another occasion, and one asks: 'Shall we meet the lady again?' In this case the reference is clear and unmistakable."[1]

All specification of meaning by context or circumstances is

[1] Paul, *loc. cit.*

due to the competition and co-operation of apperceptive systems. The dominant system which corresponds to the universe of discourse suppresses the activity of those components of the meaning of a word which it is unable to apperceive; and in like manner the meanings of different words limit each other by mutual apperception. In this process not only does what precedes limit and determine what follows, but what follows also limits and determines what precedes.

§ 11. Modification of Meaning by Analogy.

The modification of the meaning of a word by its context is due to its incorporation in a conceptual whole. In so far as the form of this whole is prescribed by a proportional system corresponding to the universe of discourse, all modification of meaning by context is due to relative suggestion through identity of relations. It results from the controlling influence of a proportional system on the train of ideas as determined by association. This is what philologists call extension of meaning by analogy. Its most conspicuous illustration is to be found in cases where the general signification is transferred to a class of objects markedly diverse in nature from those to which the word has been previously applied. The author of the proverb "Speech is silvern, but silence is golden," extended the use of words by analogy, because speech and silence have nothing in common with silver and gold except a similar relation in respect of value. There is also a converse process by which analogy of meaning gives rise by relative suggestion to the formation of a new word. Some years ago there was an exhibition in London called the "Colonies"; afterwards there were other exhibitions which were felt to be in many respects analogous. The analogy, however, lay not in what was exhibited, but in the circumstances of exhibition. Hence, by

relative suggestion, arose new and unheard-of words, such as "Healtheries".

When the meaning of a word is extended by analogy, it often happens that the extension is of a metaphorical kind. The primary relation is between objects which can be easily pictured or otherwise imaged, and it is transferred to objects which are not presentable in this way. When this happens, the original images are apt to survive in connection with the new meaning, although they form no part of it. They then in co-operation with the word assume the psychical function of aids to the fixation of attention, and constitute the most important class of inner speech-forms. When one person says to another "I catch your meaning," he uses a word which in the first instance is applied to actual catching with the hand. If a picture of this act accompanies the utterance of the words, it reinforces the power of the word to fix attention much as an imitative gesture might do.

§ 12. The Objective Categories of Grammar.

The subject-predicate relation is not an objective, but a subjective, category. It is a form of the process of thinking, not of the thought-product. Similarly, the distinction between interrogative, imperative, and assertory sentences is mainly subjective. But most grammatical categories are objective. They are general modes of connection constitutive of the objective unity apprehended by those trains of thought which depend on expressive signs. These general modes of connection are the form, as distinguished from the matter, of conceptual thought. The material constituents of the objects of conceptual thinking consist in special things, activities, qualities, etc., as expressed by specific verbs and substantives. The formal constituents consist in such relations as that of agent and action, object and activity, thing and

quality. In ordinary discourse, form is always the form of a special matter, and as such it is itself specialised. The general meaning which is implicit in all the varying applications of the formal constituents of language becomes explicit only for the scientific grammarian. This general meaning is, like that of demonstrative words, highly abstract, and it is for that reason difficult to disengage it in its purity from its manifold specifications.

To the scheme of relations represented by the formal elements of language there corresponds an extremely comprehensive and powerful apperceptive system of the kind which I have called *proportional.* Thus each material element tends to call up by relative suggestion others related to it according to the general plan of grammatical structure. In such languages as English, the thing and its property or state, the agent and action and object, together with their adjectival and adverbial qualifications, are definitely discriminated by appropriate modes of expression, such as position and inflection. The apperceptive systems corresponding to these groups of relations may be called *syntactic systems.* In general, the more highly developed a language is, the more adequate, comprehensive, and unambiguous are the signs of syntactic relation, and the more powerful and persistently operative are the syntactic systems. It is for the philologist to trace the manifold modes and degrees in which grammatical form is expressed and therefore conceived in different languages. We have merely to consider in broad outline the general nature of such variations. It has been proposed to divide all languages into two classes—the formal and the formless. This division as applied to conventional languages perhaps involves the error of confusing difference in degree with difference in kind. But the distinction appears to be justified if we regard it as constituting a line of demarcation between the language of natural signs and the language of conventional signs. Gesture-language may be

correctly described as formless. In the following sections I shall consider it at some length, because of the insight which it affords into the fundamental nature of expressive signs.

§ 13. Gesture-Language.

Gesture-language is, like conventional language, an instrument of conceptual thinking. The natural signs which compose it are either demonstrative or imitative. The demonstrative consist in some way of drawing attention to an object actually present, or to be found in a certain direction. It is obvious that such indications are not expressive signs, unless they form part of a context. This context is supplied by imitative gestures. The imitation consists mainly in tracing the outline of objects in the air or in copying characteristic features of an action. By copying the act of using a thing or the process of producing it, it is possible to express the thing itself, if context and circumstances exclude ambiguity. Under like conditions, a quality of an absent object may be represented by pointing to a similar object possessing a similar quality. Onomatopœia in all its forms must be regarded as a natural sign. It is, if I may be allowed the expression, a phonetic gesture. Reduplication, in its primitive use, ought perhaps to be brought under the same head.

Such pantomime is sufficiently within the power and under the control of the individual subject. Gestures of this kind are moreover intrinsically adapted to serve as expressive signs, because they suggest only certain salient features characterising a class of objects or actions. They are indeed in their own nature concrete and particular. But their concreteness and particularity are of a kind determined by the conditions of their origin, inasmuch as they are bodily movements made by a particular person at a particular time. If these movements

themselves were of sufficient interest to attract attention on their own account, they could not fulfil their function as expressive signs. They constitute a language, because, in the context and in the circumstances in which they are used, they derive their interest from their general resemblance in certain respects to things and actions, which are in other and perhaps more essential respects disparate from them and disconnected with them. They are thus by their very nature adapted to become expressive signs, exciting the apperceptive systems corresponding to the things and actions which they imitate and so fixing attention on these things and actions.

A brief account of the mode in which this language is taught to deaf-mutes will be the best means of explaining its nature. I take the following details from Schmalz.[1] The more intelligent deaf-mutes form natural signs spontaneously, if they are not altogether neglected by their fellow-men. At first, however, their gestures are mainly demonstrative. "In order to indicate their wishes and needs, they point to the objects in which they are interested if these are present." If the objects are not in sight they fetch them or conduct others to them. The deaf-mute points to a dish or a jug and so indicates his desire for what the dish or jug contains. "If he wants bread he brings the whole loaf, together with a knife, and he hands both to the person who is to cut a slice for him." Up to this point the gestures of the deaf-mute resemble those of dogs and other intelligent animals. They are not expressive signs in the strict sense. They are like any other, means for attaining practical ends, and it must be remembered that the relation of means to end is quite disparate from that of the expressive sign to its signification. But cases occur in which devices of the kind described are inadequate. "The deaf-mute, it may be, wants a drink of

[1] *Ueber die Taubstimmen*, pp. 267, *seq*

water; he sees neither water nor drinking-glass in the room, so that he cannot point to the one nor fetch the other. He takes some one by the hand in order to lead him to the place where the water is. The person to whom this appeal is made refuses to move. The deaf-mute is perplexed and embarrassed. Finally he adopts the device of pointing to his mouth." This is something more than a practical expedient. It is an expressive sign—at least in the germ—such as is not, so far as I know, used by even the most intelligent animals. But the sign is ambiguous. The person addressed may, through a real or pretended misunderstanding, give the deaf-mute something to eat instead of something to drink. He is thus driven to define his meaning by a combination of gestures—a context of natural signs. He directs his hand towards his mouth again; but now he curves it as if it held a glass, at the same time imitating the act of drinking. "At last he makes himself understood, and with the joy of it a ray of light penetrates his intellectual and moral being. This movement, as it were, transforms him into a human being, whereas his previous pointing had been merely animal language. From this time forward he learns to describe absent objects, and he forms for himself a language of natural signs at once betokening and producing a distinctive human power of thought."

"If the deaf-mute does not in good time invent a gesture-language for himself, he must be trained to do so. . . . A number of simple objects are laid before him together with copies of them. He is then taught to recognise the copies as such, his attention being alternately directed to the originals and to the imitations. A copy of another object is then brought before his notice, and he is called upon by an interrogative gesture to seek the original. As a rule, he does so. After this exercise has been continued for some time, the articles imitated are removed and only the copies are retained.

The teacher fixes his gaze on one of these with a look of interrogation. The deaf-mute seeks for the corresponding object and he is somewhat perplexed because he cannot find it. If he does not himself resort to the expedient of imitating the object by a gesture, the teacher supplies him with an appropriate sign. In this way he is gradually brought to understand how an absent object may be represented by a mimetic movement."

§ 14. Gesture-Language tends to become Conventional.

The meaning of natural signs, like that of conventional signs, varies according to context and universe of discourse; and such occasional modifications tend to produce lasting changes of general signification. The restrictions and extensions of meaning thus acquired do not depend on the primary connection between the mimetic sign and what it signifies. They constitute a conventional element in the language of natural signs.

Natural signs also tend to become conventional in another way. There is a strong disposition to abbreviate familiar gestures. The mere hint of a movement, so to speak, comes to be substituted for the movement itself, so that a bystander who has not made a special study of gesture-language is totally unable to divine the meaning of the signs used. In this way the natural pantomime of deaf-mutes tends to become in some degree arbitrary. It would seem however that the deaf-mute rarely loses sight altogether of the natural connection between sign and signification. He is able, if required, to act out in detail his abbreviated gestures. Until he is taught a conventional language, he cannot entirely dissociate the notion of a sign from the imitation of some feature or adjunct of the thing signified. It must be under-

stood that what follows in § 15 on the limitations of gesture-language is intended to apply to it only in so far as it is truly mimetic, and not to the conventional elements which become intermixed with the imitative gestures.

§ 15. Limitations of Gesture-Language.

The language of gestures is, as we have seen, a true instrument of conceptual thinking. It fixates mental systems, which by mutual apperception unite to form a conceptual whole. I cannot, therefore, agree with the view of Mr. Romanes, that it is the natural expression of the "logic of recepts" as opposed to the logic of concepts. On the other hand, it must be admitted that the conceptual thinking of which natural signs are the medium is only of a rudimentary character. Mimetic gestures can represent things and processes only by imitating the broad features of their sensible appearance and especially of their appearance to the eye. Hence they are, in comparison with conventional signs, very deficient both in generality and in power of specification. The more closely objects resemble each other, the more difficult it is to express their differentiating characteristics by imitative movements. In order to distinguish closely allied species of the same genus, it is often necessary to have recourse to a cumbrous accumulation of gestures, where in conventional language a single brief and simple sign would more efficiently fulfil the same function. Thus the sign for a *stocking* must usually include an imitation of the act of knitting, as the mere representation of its shape and the act of drawing it on to the foot would be ambiguous. It might stand for a boot This want of specifying power, which is inherent in the nature of gesture-language, of itself involves a corresponding deficiency in power of generalisation. The concept of a genus is more fully developed in proportion as its special sub-

concepts are more definitely distinguished from it and from each other. Hence the difficulty of specifying by means of mimetic signs is at the same time a hindrance to the process of generalisation. A still more important limitation is that imitative gestures can only express that kind of generality which consists in or is conjoined with the resemblance of objects in their appearance to the senses. Hence concepts of a high degree of abstractness cannot be represented at all by mimetic signs or can only be so represented in an indistinct, cumbrous, and inadequate way. "The more general determinations of magnitude, such as broad, narrow; long, short; thick, thin; high, low; cannot be accurately expressed; the most that can be done is to teach the deaf-mute signs, which are suitable in the largest proportion of cases."[1] It is obvious that such concepts as causality, reciprocity, teleology, development, state, condition, etc., can hardly be expressed by imitative gestures. Broadly speaking, natural signs are capable of fixing attention on universals comprehending particular objects as their subordinate elements; but they can only to a very limited extent fix attention on universals having as their subordinate elements other universals. The thinking which depends on gesture-language may generate concepts; but it can scarcely generate a conceptual system embracing a multiplicity of conceptual components, which are co-ordinated with each other and subordinated to each other according to a scheme of classification. It follows that trains of thought which depend purely on natural signs are not, as a rule, sustained and continuous. The apperceptive systems of which they are the serial expansion are not sufficiently complex and comprehensive to make possible persistent and strenuous intellectual effort. This is one reason why deaf-mutes who have not been made familiar with conventional language display a

[1] Schmalz, *op. cit.*, p. 275.

marked incapacity for disciplined thinking. With them the flow of ideas is predominantly determined by casual associations and by momentary surroundings. Hence they display a peculiar kind of restlessness; not having resources within themselves, they are perpetually seeking the excitement of new impressions from without.

§ 16. Formlessness of Gesture-Language.

The impossibility of giving any adequate expression to abstract relation by means of mimetic gestures includes the impossibility of giving any adequate expression to the objective categories of grammar. The language of natural signs is essentially formless. "The gesture-language has no grammar properly so called. . . . The same sign stands for 'walk,' 'walks,' 'walking,' 'walked,' 'walker'. Adjectives and verbs are not easily distinguished by the deaf and dumb. . . . Indeed our elaborate system of parts of speech is but little applicable to the gesture-language."[1] The same gesture may stand at once for act, agent, object and instrument. Thus a movement imitative of digging may equally well signify the digger, the spade, the hole dug, or the act itself. It is associated with the whole complex including the act, and all the objects obviously implicated in the act. It is restricted in its signification only by context and by the universe of discourse. To remove such ambiguity, conventional elements are sometimes introduced into gesture-language. Thus a deaf-mute may be taught to describe a circle with both hands in the air in order to show that he refers to a thing, and to move one hand to and fro in order to show that he is thinking about a quality. This is, of course, a purely conventional arrangement.

The language of natural signs is fully adequate to the

[1] Tylor's *Early History of Mankind*, p. 24.

expression of varying subjective attitudes, as distinguished from the objective categories of grammar. It is easy to distinguish interrogation, command, and assertion, by means of appropriate gestures. The order in which gestures are made to follow one another seems mainly to depend on the comparative interest felt by the speaker in the objects referred to. What is most important comes first. In this respect gesture-language is strongly contrasted with those conventional languages, which, like Chinese, use the order of words almost exclusively as a means of expressing objective distinctions.

§ 17. The Varieties of Conventional Language.

Conventional signs, being free from the necessary limitations of natural signs, are capable of expressing adequately and accurately the most specific and the most abstract concepts. Actual languages, however, realise this ideal in varying degrees. The significant speech of children belongs at the outset to the same stage of intellectual development as the language of gestures. *Baba* does not signify to the child what the verb *to sleep* signifies to us. It expresses the whole unanalysed complex of things, persons, and actions connected with sleeping, including the nurse, the cradle, the cushion and so forth. Steinthal tells us that a child of his spontaneously invented the word *'dlil*, when he saw a street-lamp kindled. Another time he caught sight of the man coming with his ladder to dress the lamp. The child recognised him in the distance and again cried *'dlil*. Soon afterwards he learned to say *lich* and even *licht*. Six weeks after the incident narrated, he exclaimed *lich* on seeing in daylight the apparatus for dressing the lamps.[1] The first sentences formed by children are, as might be expected, without grammatical form. Steinthal gives some very good examples from his own

[1] *Psychologie und Sprachwissenschaft*, p. 402.

observations. Among these are *Papa hat = Papa has a hat on*, and *Mama baba = I will sleep with Mama.*[1]

Between such mere juxtaposition of words, which are not yet differentiated into "parts of speech," and the grammatical structure of a highly developed language, there are manifold intermediate gradations. Power to express grammatical form depends on power to express abstract relations in general. But in this respect the languages of some savage tribes scarcely attain to the level of a well-developed gesture-language. "The Tasmanians, when they wanted to denote what we mean by *tall* and *round*, had to say *long legs* and *like a ball* or the *moon* or some other round object, eking out their scanty vocabulary by the help of gesture. So, too, the New Caledonians cannot be brought to understand such ideas as those conveyed by *yesterday* and *to-morrow*."[2] On the other hand, such languages are distinctly superior to gesture-language in power of specification, although they hardly attain to the same degree of generalisation. "The Mohicans have words for cutting various objects, but none to convey cutting simply; and the Society Islanders can talk of a dog's tail, a sheep's tail, or a man's tail, but not of tail itself. . . . According to Milligan the aborigines of Tasmania had 'no words representing abstract ideas; for each variety of gum-tree and wattle-tree, etc., etc., they had a name, but they had no equivalent for the expression, *a tree*; neither could they express abstract qualities, such as hard, soft, warm, cold, short, round'."[3] It thus appears that even the rudest conventional languages possess a power of discrimination which cannot be attained by natural signs. It must be noticed, however, that this multiplication of distinctions does not involve any organisation of concepts in a system. There is,

[1] *Psychologie und Sprachwissenschaft*, p. 401.
[2] Sayce, *Science of Language*, vol. i., p. 101.
[3] *Op. cit.*, vol. ii., pp. 5-6.

properly speaking, no conception of the species, as such, where there is no conception of the genus, as such.

According to philologists, the formal constituents of language grow out of material constituents. The highly general relations expressed in the grammatical structure of a developed language have become gradually disengaged from the more specific relations which were the first to be distinctly apprehended by the human intellect. Hence we find that in respect of grammatical form the speech of savage, when compared with that of civilised, races, approaches the rudeness and clumsiness of gesture-language. In Dakota "the modal particles 'ba,' 'bo,' 'ka,' 'na,' 'pa,' 'ya,' and 'yu,' are prefixed to verbal roots, adjectives, and some neuter verbs, making of them active transitive verbs, and usually indicating the mode and instrument of the action. (*a*) The syllable 'ba' prefixed shows that the action is done by *cutting* or *sawing*, and that a *knife* or *saw* is the instrument. . . . (*b*) The prefix 'bo' signifies that the action is done by *shooting* with a gun or arrow, by *punching* with a stick, or by any instrument thrown endwise. . . . (*c*) The prefix 'ka' denotes that the action is done by *striking*, as with an axe or club, or by *shaving*. . . . (*d*) The prefix 'na' generally signifies that the action is done with the *foot* or *by pressure*. . . . (*e*) The prefix 'pa' shows that the action is done by *pushing* or *rubbing* with the hand. (*f*) The prefix 'ya' signifies that the action is performed with *the mouth*. . . . Baksa means *to cut in two with a knife*, as a stick; boksa, *to shoot off;* kaksa, *to cut off with an axe;* naksa, *to break off with the foot;* paksa, *to break off with the hand;* yaksa, *to bite off;* . . . ćeya, *to cry;* naćeya, *to make cry by kicking;* . . . śića, *bad;* yaśića, *to speak evil of*."[1] In the same language there are two classes

[1] *Contributions to North American Ethnology* (published under the direction of the Smithsonian Institution, Washington, 1893), vol. ix., pp. 19-20.

of possessive pronouns; the one expresses exclusively natural or inalienable possession, as minagi, *my soul*, mitezi, *my stomach*, 'mi' being the possessive; the other expresses property in things which can be transferred, such as axes, horses, etc.[1] Similar illustrations might be multiplied without end.

The occurrence of distinctions of this kind in savage languages is sometimes regarded as a mark of their superior accuracy and subtlety, as compared with civilised tongues. Thus the missionary Williams speaks of the "precision and perfection" of certain Polynesian dialects, and refers especially to "nice distinctions in the pronouns". "An instance is found in what we may term the inclusive and exclusive pronouns: for example, in English, we say, 'It is time for us to go'; and the expression may or may not include the person addressed. Now, in the Polynesian dialects there are two pronouns which mark this difference, *matou* and *tatou*. If the person spoken to is one of the party going, the *tatou* would be used; if not, the *matou*. A short time since, I was dining at Bath, when the lady of the house desired the servant to bring a plate, and, politely addressing me, said, 'Put your bones upon the plate, sir'. Now, common as this expression is, it is certainly rather ambiguous. In the language of the Polynesians, however, there would be no such ambiguity, for they have two pronouns to express the difference, *tooe* and *taoe;* the former of which would be used, if my own bones were meant; and the latter, if those of the pheasant of which I had been partaking."[2] It certainly appears odd that a lower grade of intellectual development should be marked by superior nicety and precision of discriminative thought. The truth is that these distinctions, so plentiful in savage languages, are due rather to an incapacity for clearly apprehending

[1] *Contributions to North American Ethnology* (published under the direction of the Smithsonian Institution, Washington, 1893), vol. ix., p. 15.

[2] *Missionary Enterprises in the South Sea Islands*, p. 452.

identity in difference, than to a superior power of apprehending difference in identity. We might, by similar reasoning, claim a superiority for the Japanese alphabet over the English, because it contains a greater number of distinct signs for distinct sounds. This is so, because the signs stand for syllabic sounds, and not for literal sounds. A much smaller number of signs would suffice if it were based on the analysis of the syllable into its components. Similarly, the savage mind has not pushed its analysis far enough to be able to reconstruct certain complex concepts out of simpler. Hence it simply takes the complex concept in its unanalysed totality and marks it by a separate sound. The supposed superiority of savage speech belongs in an even higher degree to gesture-language.

The fundamental differences between various languages, considered as embodiments of thought and instruments of thinking, are best shown by their differences in grammatical structure. In this respect the polysynthetic languages of North America closely resemble a well-developed language of natural signs. "Polysynthesism or incapsulation may be defined as the fusion of the several parts of a sentence into a single word, the single words composing it being reduced to their simplest elements. It is, in fact, the undeveloped sentence of primitive speech, out of which the various forms of grammar and the manifold words of the lexicon were ultimately to arise."[1] "In Cheroki, for instance, *nad-hol-i-nix* means 'bring us the boat,' from *naten*, 'to bring,' *amokhol*, 'boat,' and *nin*, 'us'."[2] In some languages, instead of the verb we find a noun denoting an action, and the connection of the action with the agent from which it originates or the object in which it terminates is expressed by simple juxtaposition, by the possessive pronoun, or by some other adnominal form. Thus, in sentences quoted by H. Winkler from Pokenchi: *Thou thy seeing = Thou*

[1] Sayce, *Introduction to the Science of Language*, vol. ii., p. 216.
[2] *Ibid.*, p. 218.

seest; His scratching his head = He scratches his head; I his biting = He bites me. In Dayak, according to Steinthal, such sentences as the following are typical. *Boat this boat of his choice = This is the boat he has chosen; Witness two these which thy desire = Which of these two witnesses desirest thou?*

It is possible even for prepositions and pronouns to be expressed adnominally. Thus in Pokenchi: *Mouth my face = In front of my face = In front of me; Mouth my head = On me; Mouth my back = Behind me; On-our-one-side-that-(of) us = We all.*

Concord is a remarkable grammatical form characteristic of inflectional languages. It expresses the mutual determination of meaning which is involved in the apperception of the concept of an action by the concept of the agent, or of the concept of a quality by the concept of the thing which it qualifies. Number and gender are important grammatical forms mainly because they furnish a means of expressing this relation by means of concord. The agreement in gender and number of the adjective with its substantive, the agreement in number and person of the verb with its nominative is an expression of the general form of connection which is involved in the synthesis of the concepts of action and agent or of thing and property. The nature of this relation has been already discussed in § 8. The importance of grammatical form consists in the pervasive and persistent control which it exercises on the course of thought.[1] Conceptual thinking is everywhere moulded by the analogous systems which correspond to the schema of relations expressed by the general morphological structure of a language. A language which is penetrated through and through by adnominal form, so that it has no true verb and no true distinction of agent and object, embodies a mode of thinking in some measure different from that which is mediated by Greek or English.[1]

[1] *Cf.* Sayce, *op. cit.*, vol. i., pp. 129, 378; and the Introduction to Steinthal's *Charakteristik der hauptsächlichsten Typen des Sprachbaues.*

CHAPTER XI.

BELIEF AND IMAGINATION.

§ 1. INTRODUCTORY.

IN an early chapter of this work we have accepted Brentano's view of belief or judgment as an attitude of consciousness towards its object, fundamentally distinct from simple apprehension. We have now to investigate the psychological conditions which determine this mental attitude. There are two points of view from which this problem can be approached. We may, like Bain, consider belief as a condition of activity; or we may regard it as dependent on limitation or restriction of activity. Both these modes of procedure yield an indispensable part of the true explanation. In order to attain full insight we must unite them.

§ 2. BELIEF AS A CONDITION OF ACTIVITY.

According to Dr. Bain "the relation of belief to activity is expressed by saying that *what we believe we act upon*". Belief constitutes the psychological connection between means and end. "Wherever any creature is found performing an action, indifferent in itself, with a view to some end, and adhering to that action with the same energy that would be manifested under the actual fruition of the end, we say that the animal possesses confidence, or belief, in the sequence of two different things, or in a certain arrangement of nature, whereby one

phenomenon succeeds to another."[1] Degrees of assurance are measured by the degree in which the desire for the means approximates in intensity to that for the end itself; and by the degree in which the satisfaction yielded by realisation of the means approximates to the satisfaction yielded by realisation of the end. This of course holds good only so far as the means is merely a means, and not an object of conation on its own account. When we are fully convinced that a certain train of events will issue in a certain desired result, we aim at the production of this train of events with an energy of pursuit equal to that of the primary conation. In so far as there are relatively weak links in the chain—points of comparative uncertainty—there is also a tendency to hesitate or be disheartened. Whether or not the agent will be sufficiently disheartened to be brought to a pause, or to act in a flagging or feeble manner, depends largely on the intensity of the original desire. Where this is very strong, men catch eagerly at straws. But it remains true that uncertainty or doubt is in itself a condition which obstructs action. In the typical case of full assurance, success in the intermediate activity which leads up to the desired end, yields a gratification in many cases equivalent to the attainment of the end itself. "The General, believing that a certain force would infallibly enable him to defeat the enemy, makes his attack when he has got the force; and when he is sure of that force reaching him, he feels already the excitement of victory."[2] Where in cases of perfect assurance the attainment of the end yields a pleasure in excess of that which accompanies the successful progress towards it, the difference is due to incidental sources of gratification, distinct from the mere satisfaction of the pre-existing desire.

This doctrine fits in well with our account of conation and

[1] *Emotions and the Will*, p. 569.
[2] *Ibid.*, p. 590.

cognitive synthesis in bk. ii., chap. vi. We there maintained that desire for the end is *eo ipso* desire for the means. It is an integral part of the same complex conation. To bring this view into line with Prof. Bain's, we have only to add that the psychological relations which connect the parts of such a complex, are of the nature of beliefs. In other words, the cognitive synthesis involved is not a play of simple apprehension, but a connected series of judgments.

The obvious objection to Dr. Bain's thesis is that we have many beliefs apparently quite disconnected from action. Bain himself instances such beliefs as that the sun is radiating away his heat, or that in the desert of Sahara there are burning days and chilling nights, or that Britain was invaded by the Romans. His own rejoinder is twofold. (1) He urges that the evidence in such cases is similar to that which we are accustomed to act upon. "*If* we went to Africa, we would do certain things in consequence of the information."[1] It is scarcely possible to imagine an instance in which an illustrative hypothesis of this sort would be inapplicable. (2) He points out that where no special practical aim is immediately present to the mind, there may be a general aim. We gradually learn that knowledge is power; and the love of power assumes the form of the love of knowledge. The reference to a possible future action takes the place of reference to actual present action.

These arguments of Dr. Bain look like special pleading. The second is good as far as it goes, but it is far from covering the whole ground. It remains true that our mental attitude in believing is sometimes purely theoretical, and often predominantly so. Dr. Bain is thus thrown back upon his first position, that hypothetical reference to practical activity is always possible. But this is, strictly speaking, irrelevant:

[1] *Emotions and the Will*, p. 373.

where we believe without actual reference to practice, the mental attitude of believing must be actually distinct and separate from the practical attitude. The whole difficulty, in my opinion, arises from the arbitrary restriction which Dr. Bain places upon the use of the term *activity*. He considers only trains of muscular movements producing a corresponding train of effects in the material environment. But even where such trains exist, the mental action with which belief is connected does not consist in these overt movements, but in the prior process of framing a plan. But there is no essential difference between this inward process, and that by which we work out a theoretical result without reference to external action. In both cases there is an end in view which is reached through a series of intermediate steps. There is therefore no reason why, in defining the conditions of belief, we should take into account only practical activity to the exclusion of theoretical. It is needless to say that the theoretical series must be through and through constituted by beliefs; and that our confidence in the result depends on our confidence in the antecedent steps.[1] This may seem to involve a *petitio principii*. The end aimed at in theoretical activity is the establishment of a belief; hence in defining belief in reference to such activity, we appear to be defining it in terms which presuppose it. Perhaps it would be sufficient to point out in reply that any belief may be either end-term or starting-point of a theoretical train. The whole body of beliefs forms a system of interdependent parts; it is the coherence of the system as a whole which constitutes the possibility of its component elements. If this answer be thought insufficient, we may fall back upon Dr. Bain's

[1] For instance, if these be hypothetical the result will be hypothetical. Where a hypothesis is verified by deducing consequences from it there is a regressive process from the verified consequences to the initial assumption.

position: the system of theoretical belief is in organic union with the beliefs which immediately determine practice. However unpractical our attitude may be in accepting a theoretical proposition, our acceptance means that we can make this proposition a starting-point or a link in processes of reasoning which ultimately lead up to beliefs having a direct bearing on conduct.

In a note to his *Mental and Moral Science*, Dr. Bain has given up his original theory of the nature of belief. He there says: "I consider the correct view to be, that belief is a primitive disposition to follow out any sequence that has once been experienced, and to expect the result. It is a fact or incident of our Intellectual nature, although dependent as to its energy upon our Active or Emotional tendencies." [1] In one respect, we approve of Dr. Bain's change of view. Belief cannot be regarded as a mode of conation. It is a unique mode in which consciousness refers to its object, entirely distinct from desire, or any kind of appetition. None the less, Dr. Bain's original account of the matter may be, and in our opinion is, a correct analysis of the conditions under which belief arises. On the other hand, the doctrine which he substitutes for it is quite unsatisfactory. It is certainly true that the mind is disposed "to follow out any sequence that has been once experienced," if and so far as it thereby satisfies an active tendency. But the picture which Dr. Bain presents to our mind, of a purely passive conjunction of impressions of itself creating such a disposition, independently of the appetitive side of our nature, is a psychological fiction. His examples presuppose a theoretical interest, which has no existence in the rudimentary stages of mental life. As we have seen in the chapter on Conation and Cognitive Synthesis, the growth of our intellectual nature consists in the growing definiteness and

[1] Appendix, p. 100.

determinateness of our "active" nature. Dr. Bain was probably impelled to shift his ground by a sense of his failure to do justice to the passive aspect of belief. This passive aspect exists; but so far from being opposed to the active aspect, it is inseparably correlated with it. The two are co-extensive and interdependent.

§ 3. Belief as Limitation of Activity.

Wherever belief or judgment exists, it involves the control of our activity as thinking beings by conditions which are fixed for us and not by us. In so far as we are left free to think otherwise than we do think, belief is absent; in so far as it is present, the range of subjective selection is confined within definite limits. So far from being opposed to the doctrine of the preceding section, this view is an immediate consequence of it. Our inability to attain ends otherwise than through certain means, constitutes a restriction of mental activity within definite channels. If wishing were identical with having, our freedom would be absolute, and there would be no such thing as belief. The steps of a process issuing in a given result are fixed independently of us. In devising means to an end, therefore, we are not free to make what mental combinations we will. Our thinking, to be effective, cannot be free. We can no more attain our ends without submitting to control independent of our wish or will, than we can walk independently of the resistance of the ground on which we tread.

The limitation of subjective activity may take two distinct forms. We may find ourselves forced to think in a given manner, in spite of an attempt to think otherwise. In this case the limitation is an actual opposition or obstruction. This happens whenever the mind entertains the possibility of an alternative which it is ultimately driven to reject. On the

other hand there may be no attempt to think otherwise. The limitation is then contrasted, not with an endeavour to overcome it, but with the freedom of subjective selection in other respects. When the sun is beating on the head of a man at noonday, he does not raise the question whether it is shining or not. No alternative presents itself to his mind. The fact is simply given and accepted. In view of the fact he may behave himself in different ways, and so exercise his subjective freedom. He may remain where he is, or seek a shelter, or put up an umbrella. But this subjective selection serves only to bring out by contrast the objective coercion to which his thought is subject in the judgment that the sun is shining hotly.

Where limitation takes the form of opposition, it may do so in a twofold way. A preformed anticipation may be destroyed by collision with facts. It is through such experiences that the unquestioning credence of primitive belief gradually gives place to a comparatively tentative and sceptical habit of mind. For the most part, these preformed anticipations are also desires; and their defeat is the disappointment of the will. As an instance we may take the child sucking at an empty bottle. The second mode of opposition belongs to a comparatively advanced stage of conscious life. It involves an attempt to think otherwise for the purpose of finding how far it is possible to do so. The firmness of the connection *A B*, is tested by an attempt to frame the thought of an incompatible connection *A C*. This mental attitude is characteristic of the search for truth for its own sake. The attempt is only made with the view of finding if and how far it will succeed. It is only a means to an end, and the end is attained when the attempt itself is defeated. The whole process is like testing a foothold in climbing, to see whether it will bear us or not; the more resistance the ground makes to our pressure, the more ready we are to trust

ourselves to it. So in climbing up the series of means towards an end, we may test the stability of the several links by a mental attempt to dissolve their connection. In proportion as the attempt proves abortive, the more we are furthered in our progress. On the other hand, the more easily we find it possible to realise in thought opposite alternatives, we become less confident and less energetic in our pursuit of the object along this special line.

In the case of complete doubt, it is equally easy to frame the thought *A B*, and its opposing alternative *A C*. In the ideal case of complete assurance, it is impossible to frame the thought *A B;* so that we are absolutely constrained to think *A C*. Between complete doubt and complete assurance there are all manners of gradations, proportioned to the difficulty of mentally substituting *A C* for *A B*. The reader will here be inevitably reminded of Herbert Spencer's test of truth. The difference between his doctrine and that here laid down, is that for us the unthinkableness of a negation, or, as the case may be, the difficulty of thinking it, is not a test of truth, but of belief. With the following statement we are in substantial agreement: "An abortive effort to conceive the negation of a proposition, shows that the cognition expressed is one of which the predicate invariably exists along with its subject; and the discovery that the predicate invariably exists along with its subject, is the discovery that this cognition is one we are compelled to accept".[1] So far so good; but when Mr. Spencer adds that there can be no "higher warrant," our agreement ceases. It may always happen that what is found to be unthinkable at one time, may become thinkable at another, and *vice versâ*. New data and new points of view are always capable of working a change; to fall back on the unthinkableness of the opposite as an ultimate test of truth, is simply

[1] *Principles of Psychology*, vol. ii., p. 425.

to shut our eyes to further evidence; logically, Mr. Spencer's position is identical with that attributed to ladies; it simply amounts to saying that "a thing is because it is". It makes the mere existence of a belief, or, at any rate, of a full assurance, the evidence of its truth.

Our position differs from Mr. Spencer's in being purely psychological, whereas his "universal postulate" belongs to the theory of knowledge. There is however an objection which affects us as much as it affects him. It will certainly be urged by some that we are confusing what is merely unbelievable with what is unthinkable. It will be said that in many cases we can easily think what we do not and cannot believe. Mr. Spencer rightly answers that in some cases of belief it is impossible even to frame the thought of the negation. This is so in those cases of complete assurance which are called, in the restricted sense of the term, knowledge. As an example, we may take the proposition that two and two make four, or that in Euclidean space two sides of a triangle are together greater than the third. "The two sides cannot be represented in consciousness as becoming equal in their joint length to the third side, without the representation of a triangle being destroyed."[1] In other cases, it is possible, though difficult, to think the negation; but, in these, belief falls short of complete assurance. Where both alternatives are equally thinkable, we have the state of complete uncertainty or suspense of judgment. This is not, however, a sufficient reply. It will still be urged that we can often easily represent to ourselves what we cannot believe. Consider an instance given by Mr. Spencer. We cannot believe that a cannon-ball fired from England can reach America; but we may, with comparative ease, mentally represent it as doing so. The rejoinder to this objection is simply that it is not the same thing which we find it easy to represent and impossible to believe. In thinking of

[1] *Principles of Psychology*, vol. ii., p. 408.

the flight of the cannon-ball from England to America, we simply picture the ball in motion, and the motion as continued until a distant point is reached. So far as we can represent it, it is quite credible. We believe that a cannon-ball can move, and we believe that there are conditions under which it might move over a very great distance. Where disbelief comes in, is in connecting the flight to America with the actual conditions under which the ball was discharged—the size of the gun, the strength of the explosion, together with our knowledge of the strength of materials, and of mechanical science in general. If and so far as these conditions are prominently before consciousness, the flight to America becomes unthinkable, *i.e.*, it is unthinkable precisely in so far as it is incredible. We are enabled to represent the flight by dismissing from consciousness apperceptive systems which would hinder us from doing so. But these very systems are those which condition the belief. Wherever the conditions of belief are complex, it is possible for part of them to be absent from consciousness; and, in so far as this is the case, the negation becomes thinkable. Where we begin with doubt and end in assurance, the conditions which determine belief are not present at the outset; they emerge in the course of the process. A school-boy, in adding up, may be in doubt whether five and six make eleven or twelve; both alternatives may then be for him equally thinkable. But if he separates six into its units and adds them one by one to five, the equation $5 + 6 = 12$ becomes for the time being unthinkable, and he is fully assured of the alternative equation.

In the following sections (4, 5, 6), I shall give instances of belief arising in connection with the various modes in which subjective activity may be limited and restricted. The content of these sections is mainly a reproduction of what I have already said in my article on belief in *Mind*.[1]

[1] O.S., vol. xvi., No. 64.

§ 4. Belief and Impressional Experience.

"I find," says Berkeley, "I can excite ideas in my mind at pleasure, and vary and shift the scenes as oft as I think fit. It is no more than willing, and straightway this or that idea arises in my fancy; and by the same power it is obliterated and makes way for another. This making and unmaking of ideas doth very properly denominate the mind active. . . . But, whatever power I may have over my own thoughts, I find the ideas actually perceived by sense have not a like dependence on my will. When in broad daylight I open my eyes it is not in my power to choose whether I shall see or no, or to determine what particular objects shall present themselves to my view."[1] This statement in the main fairly and clearly expresses the antithesis between subjective freedom and objective coercion which is involved in the existence of sensation. It is however seriously incomplete in two respects. In the first place, it fails to notice the peculiar steadiness belonging to sense-impressions, and communicated by them to the other elements of the perceptual complex to which they belong. So soon as attention to an idea becomes relaxed the idea becomes almost immediately obscured. Thus, as attention is subject to rhythmical intermission at short intervals, the ideas attended to "flicker," as Dr. Ward says, "like the flame of a gas jet". A percept, on the contrary, may maintain itself in consciousness for a considerable time with approximately the same vividness and distinctness. It possesses a fixity independent of our subjective activity. The second respect in which Berkeley's statement is inadequate is that he unduly narrows the range of the antithesis between subjective selection and objective coercion. He represents it as existing only between attention to ideas and attention to percepts. But a little consideration will show that

[1] *Principles of Human Knowledge*, §§ 28, 29.

the same antithesis exists even within the limits of perceptual attention. Even within these limits our activity is to a large extent free. We can choose whether we shall open our eyes or not. When they are open we can choose in which direction we shall look. There is a similar freedom of selection in the case of touch. In the case of hearing and smell it still exists, though it is very much restricted. In contrast with the power of the will over the muscular adaptation of the sense-organs is its powerlessness to determine the nature of the resulting sensation. Only those sensations which are immediately dependent on our own movements form an exception. If we possessed the same kind of command over other classes of impressions, then, in the words of Locke, "the eyes of a man in the dark would produce colours, and his nose smell roses in the winter".

The range of subjective selection is more limited in the case of organic sensations We cannot by any adaptation of the organs of sense, or local movement, get rid of the toothache. We may partially divert our attention, or take active measures to relieve the pain, but that is all.

The belief which simply acknowledges the existence of an impressional experience is nearly always of the primitive kind. It accepts without questioning; it only collides with the thought of its negation when it destroys a preformed anticipation, or when the impression is slight or indistinct.

§ 5. The Real as Physical Resistance.

The limits opposed by material obstacles to the free movement of our limbs constitute a constraint imposed on our subjective activity. In the experience of the irregular interruption of otherwise continuous series of muscular sensations, which, apart from this restriction, are producible at will, we apprehend real existence. This reality, together with

that of impressional experience as such, being communicated to the ideal interpretations by which we link together detached perceptual appearances in systematic unity, gives rise by a very complex process to the presentation of a physical world. I have endeavoured to deal with this subject in my article on the "Genesis of the Cognition of Physical Reality" in *Mind*.[1] The chief point which concerns us here is that belief in physical reality is throughout conditioned by the limitation of our subjective activity. It will be useful to enforce this view by contrasting it with the contrary theory of Mill in the improved form of statement which it has received from Dr. Pikler. Dr. Pikler exhibits Mill's dictum as a special case of the general thesis—that "the '*would be*' of presentation is the '*is*' of objective existence". He differs from Mill mainly by his introduction of will as an essential condition of that permanent possibility of presentation which, as he holds, constitutes physical reality. A possibility of presentation which is not within our voluntary control is not an objective existence. On the other hand, whatever would be presented if it were our will to move our bodies in a certain way is *ipso facto* real. I shall confine myself to one objection which Dr. Pikler has himself noticed and sought to meet.

Presentability at will is a formula which applies to two radically distinct groups of cases. (1) An object is presentable at will when the voluntary movements required for its presentation are merely movements conditioning the perceptive process. (2) It is presentable at will when the voluntary movement by altering the environment actually brings into existence what is afterwards perceived. Now, in the second group of cases, it would seem that permanent presentability dependent on volition neither constitutes nor implies actual existence. We may, if it be our will, break a glass and so

[1] O. S., No. 57.

obtain the presentation of broken glass. But we do not believe the glass to be actually broken merely because we can break it if we like. Dr. Pikler's defence is as follows: "The various possibilities of effects producible through our will upon the things surrounding us may be expressed by saying that these things possess certain objective properties. Nay, in certain cases we actually express them in that way In order to feel the resistance or hardness of a thing, it is not enough to come up close to it, but we must press it; in order to feel its weight, we must lift it; and in order to ascertain its taste, we must act upon it by resolving it in our saliva. That things are resistant, hard, heavy, or have a certain taste, means that by pressing or lifting them, or by resolving them by our saliva, we are able to obtain certain presentations."[1] The motions or the endeavours to move, which are required in some other cases, are only more complicated. "That a certain thing is inflammable (*i.e.*, if we scrape it) is just as much an objective property of that thing as its hardness." It is scarcely needful to point out that this reference to resistance, hardness, and weight, is irrelevant. The movements of lifting and pressure which reveal the existence of these properties play no appreciable part in their production. The case of taste is somewhat different. But it is not to the purpose; for we ordinarily take no account of the part played by the saliva in the process of tasting. When we do take account of it, we say that a body does not become sapid until it is dissolved. In all cases in which the presentation of an object *a* is recognised as dependent on a physical change produced in bodies by our voluntary agency, the fallacy of Dr. Pikler's contention is obvious. The possibility of producing such change does indeed imply an objective attribute; but this attribute never is and never can be *a*. I can command at will

[1] *Psychology of Objective Existence*, p. 77.

the presentation of a body in flames by scraping its surface. But I do not, therefore, say that it actually is in flames. I only say that it is inflammable.

Presentability at will implies existence only if and so far as the reality of the thing presented is independent of the volition by which it comes to be presented. The movements by which we bring ourselves into the vicinity of a body and by which we accommodate our sense-organs, and the use of artificial aids to perception, such as telescopes or microscopes, do not as mere conditions of the cognitive process affect the existence of the thing cognised. We, therefore, regard it as a matter of indifference whether these voluntary actions are executed or not. Whatever *would be presented* if we chose to perform such acts must be believed to exist, whether we so act or not, just because our action would not produce the perceived object, but merely permit it to display its reality as independent of us. This seems to be an adequate account of what Prof. Mark Baldwin[1] calls the "memory-coefficient" in our perception of physical reality. The existence of a physical thing is primarily presented in sense-perception. The remembrance that we have perceived, or the anticipation that we shall or may perceive it, is logically equivalent to the actual perception. But the remembrance and anticipation have this force only in so far as they include a reference to the object as originally revealed to the percipient, *i.e.*, as having independent existence. Thus the memory-coefficient is altogether secondary and subordinate to the perceptual coefficient.

§ 6. Belief and Association.

Association is undoubtedly a cause of belief. If certain objects have once been co-presented in a certain relation to

[1] *Mind*, No. 63, p. 389.

each other, the thought of the one tends to reinstate the thought of the other, in the same relation in which they were originally co-presented. It is sometimes impossible to counteract this tendency without a mental effort, and the required mental effort needs, *ceteris paribus*, to be more strenuous in proportion as the association is closer. Under these conditions preformed associations offer resistance to our subjective activity. In some cases this resistance is insuperable. James Mill used the term "indissoluble associations" to designate these connections by which the range of subjective selection in the combination of ideas is rigidly restricted. He maintained that all cases of belief are referable to indissoluble association. For reasons too obvious to mention, I disagree with this doctrine. But I do agree with him, as against his son, that cases of indissoluble association are *ipso facto* cases of belief. Of course it is assumed that the association operates within the sphere of thought, and not in anoetic consciousness.

John Mill tells us that "what the author of the *Analysis* means by indissoluble associations are those which we cannot by a mental effort at present overcome. If two ideas are, at the present moment, so closely associated in our minds, that neither any effort of our own, nor anything else which can happen, can enable us to have the one without its instantly raising up the other, the association is, in the author's sense of the term, indissoluble."[1] In the main this is a good formulation of James Mill's view. But in two points it is, I think, capable of improvement. In the first place, the ideas need not be so closely associated that no effort of our own, nor anything else than can happen, can enable us to dissolve their connection. The words "nor anything else that can happen" are unnecessary and misleading. The essential point is the limitation or constraint imposed on our subjective activity, under certain

[1] Note at end of chapter on "Belief," *Analysis*, vol. i., p. 401.

given conditions, by an association between distinguishable contents of consciousness. In the second place, it is ambiguous to speak of "one idea raising up another". To preclude misunderstanding, it would be better in a formal statement to say that, when two ideas are indissolubly associated, no effort on our part can enable us to attend to the object of the one without its instantly raising up the object of the other, in a certain fixed relation to itself, as part of a single complex. But even this wording of the definition is not sufficiently guarded. Though *a* may sometimes fail to call up *b* in the way described, yet the association between them may for our present purpose be rightly regarded as indissoluble; the essential point is that when *a* does recall *b*, we shall not be able by any mental effort to substitute for *b* any other and incompatible presentation *x* in the same relation to *a*.

Bearing in mind this preliminary explanation, let us now examine J. S. Mill's criticisms. He begins by admitting that indissoluble, or, as he less happily terms it, inseparable association, very often suffices to command belief. This admission can hardly be refused by any one. If I have just heard a certain series of sounds, and I proceed to recall them in memory, my belief in their time-order may be wholly or almost wholly based on association. If I recall the sounds *a*, *b*, *c* with sufficient vividness and completeness, together with their accompanying circumstances, I cannot help believing that *d* followed *c* and preceded *e*. Of course, I am not now trying to explain how and why we believe in the reality of past time. This would require a consideration of the whole question of time-presentation. All I mean to say is that given a belief in the reality of past time, mere association may be sufficient to constrain us to represent an event as having a certain fixed place in a time-series. Mill's admission, I suppose, comprehends cases like these. It also comprehends cases of a much more doubtful kind—doubtful not as regards

the existence of a belief, but as regards its dependence on association. Thus, as we know, he would actually trace our belief in the infinity of space to this cause. His main contention as against James Mill is that inseparable associations do not *invariably* generate beliefs. It will be sufficient to examine one of the examples which he adduces. If we look at a distant terrestrial object through a telescope, it appears nearer. That is, its appearance is similar to that which it would present to the naked eye if it were nearer. According to John Mill, the idea of its nearness is irresistibly revived by association, although we at the same time are convinced that it is really far off. But is this so in point of fact? It is necessary to analyse what we mean by the distance of an object. As I sit writing, I see a candle before me; the sight of it suggests irresistibly the present possibility of touching it by a movement of my arm, and I believe that I can so touch it. The cause of my believing that I am able to do so is that I cannot by any effort represent myself as unable, except by representing the conditions as altered. Now suppose that the same visual appearance of distance is produced by the telescope, in the case of an object which I know to be altogether out of reach. While I am in the act of believing that the object is at its real distance, I do not anticipate that I can touch it by stretching out my arms. But while I am in the act of thus believing, there is certainly no irresistible association operative, which compels me to represent the object as being within my reach. In other words, my perception of it is not the same as it would be if I were not allowing for the fact that I am looking through a telescope. It is true that there is a certain sense in which I represent the object as near; I represent it as near for visual scrutiny. But in this sense it is near, and I believe it to be so. It is possible that I may momentarily apprehend it as if it were near in other respects; but in this case there is, for the time being, a

deception, a false belief, which is, as James Mill says, "immediately corrected by accompanying reflection". But this accompanying reflection corrects the belief by dissolving the association.

James Mill was right in holding that a connection of ideas which at any moment we find to be indissoluble by mental effort is at that moment a belief. But he erred in regarding this relative inseparability as dependent merely on the strength and intimacy of the association between the ideas connected. The closest association between *a* and *b* fails to enforce the combination *ab*, if this combination is opposed in any instance by sufficiently powerful counter-associations. Thus we readily correct the error momentarily induced by a ventriloquist, who makes lay figures appear to speak. On the other hand, a comparatively feeble association may command belief merely from the absence of counter-associations. This is the basis of Bain's doctrine of primitive credulity—a doctrine fully borne out by all that we know of the beliefs of children and savages, and of the suggested beliefs of hypnotic patients. "It never occurs to the child to question any statement made to it until some positive force on the side of scepticism has been developed." Similarly, a suggestible patient may be made to believe that he is Julius Cæsar, or a pig, simply because opposing mental connections are inoperative.

§ 7. Apperception and Belief.

Ideal combinations may be separable or inseparable according as this or that apperceptive system happens to be predominant. This is best seen in its pathological exaggeration in the case of suggestible patients. The operator calls into play a certain group of mental factors; this group has unchallenged predominance; for all other constituents of the total mental system are relatively dormant. Ideal combina-

tions which are coherent with the suggested group are *ipso facto* beliefs, however absurd they may be in themselves. A patient to whom it has been suggested that he is Emperor of China will believe all that occurs to his mind as implied in his imperial position. He cannot by an effort of will represent things otherwise than as they are brought before his consciousness by external suggestion He must, therefore, accept the suggested situation as real. The apparent reality of dreams is to be explained in a similar way.

Some of the examples quoted by the author of the *Analysis*, and examined by J. S. Mill, ought to be considered from this point of view. I shall refer to one only. Sailors have seen prints of a foot resembling those of a man, and the idea is raised of man making the print. When they afterwards see a monkey, whose feet leave traces almost similar, the idea is also raised of a monkey making the print; and the state of their minds, according to the elder Mill, is doubt. "First, the print raises the idea of a man, but the instant it does so, it also raises the idea of a monkey." Each idea displaces the other in turn and hinders it "from that fixity which constitutes belief".[1] On this John Mill remarks: "This alternation between the two ideas . . . may very well take place without hindering one of the two from being accompanied by belief. Suppose the sailors to obtain conclusive evidence, testimonial or circumstantial, that the prints were made by a monkey. It may happen, nevertheless, that the remarkable resemblance of the footprints to those of a man does not cease to force itself upon their notice: in other words, they continue to associate the idea of a man with the footsteps."[2] In this criticism there appear to me to be two fallacies. In the first place, it is incumbent on the critic to show not merely that an association

[1] *Analysis*, vol. i., p. 430.

[2] Note at end of chapter on "Evidence," *Analysis*, vol. i., pp. 434-435.

between the footprint and a man may persist, but also that the association which persists is the same with that which existed before the opposing testimony regarding the monkey had been obtained. The sight of the footstep suggested the idea of a man as having produced it, not merely as being capable of producing it. If this latter association remains indissoluble, so does the corresponding belief. The sailors still believe that men produce footprints of that kind. But Mill might urge that, even after the conclusive testimony to the agency of the monkey, it is possible for the original ideal connection to recur at least momentarily with coercive force. This is true. But the important point is that this possibility lasts only so long as the sailor is comparatively oblivious of the conclusive evidence connecting the existence of the footprint with the agency of the monkey. So long as the apperceptive system, which is the psychological counterpart of testimony in general and of this testimony in particular, is inoperative, there is room for the momentary belief that the man made the footprint. The sailor would probably say that sometimes when he looked at it he could hardly help believing it was a man's, although, of course, he knew it was not.

§ 8. Desire as a Cause of Belief.

If a certain objective combination presents itself as the only condition, or the most favourable condition, of obtaining a certain end, the active tendency towards this end is of itself a tendency to believe in the objective combination. If denial is tantamount to sacrificing a cherished aim, the whole strength of the desire contributes to enforce the affirmative side. Hence, as general experience testifies, we believe readily what we wish to believe, and are hard to persuade against our will. It is true that the danger and disappointment which this natural tendency is apt to entail, sometimes give rise to an

opposite habit of mind. Just as people are sometimes afraid of doing what is pleasant lest it be contrary to duty, so they may be afraid of believing what is pleasant lest they should be misled by natural bias. But the primary tendency is to believe what favours our interests, and disbelieve what runs counter to them.

This influence of desire on belief often operates by simply diverting the attention from counter-evidence. The more overpowering the conation is, the more likely is this to be the case. Those who are blinded by passion rush headlong to their goal, without taking account of possible obstacles. An angry man will not listen to reason. Testimony on the side opposed to a vehement desire is simply reduced to silence. The mind is so absolutely preoccupied by certain tendencies, that whatever crosses them either never comes before consciousness at all, or, if it does, is immediately dismissed.

But the operation of desire does not lie solely in thus packing the jury, or producing a mental squint. It also directly intensifies the resistance offered by a mental combination to conditions which might otherwise dissolve it. When a man strives to be impartial in the face of pre-existing bias, he finds that he is engaged in a struggle against the opposing force of desire. The prejudice clings to him and resists his efforts to shake it off. The attempt to think otherwise is directly obstructed, in so far as thinking otherwise is equivalent to the destruction of hopes, the arrest of activity, the thwarting of desire. It follows from this that, *ceteris paribus*, the more vigorous and active the mind is, the more ready it is to believe. Youth is sanguine; age is sceptical and hesitates to adapt new views. Whatever temporarily heightens the flow of mental activity, favours the believing attitude. "Elation," as Dr. Bain says, "strengthens the believing temper with respect to whatever is at hand. A traveller in quest of new regions is subject to

alternations of confidence according to the states of mind that he passes through, from whatever cause. He is more sanguine when he is refreshed and vigorous, when the day is balmy, or the scenery cheerful, there being no real accession of evidence through any of these circumstances."[1]

Beliefs formed under the influence of the desire to believe are liable to be checked by counter-experiences. Where this check fails, they persist and are persistently acted upon. But the more often they are acted upon, the more completely they become incorporated with the original conation so as to become an integral part of it; hence the support they receive from it is increased. At the same time association fixes and perpetuates the mental connection; the belief so formed moulds and determines the growth of the mind; in process of time it becomes more and more inseparably connected with a whole system of beliefs which support it and help to explain away whatever contradicts it. We may take as an example the belief in "rain-making" ceremonies so common among savage tribes. Dr. Livingstone says of the Bokwains: "The natives, finding it irksome to sit and wait helplessly until God gives them rain from heaven, entertain the more comfortable idea that they can help themselves by a variety of preparations, such as charcoal made of burned bats, inspissated renal deposit of the mountain coney, . . . the internal parts of different animals, . . . serpents' skins and vertebræ, and every kind of tuber, bulb, root and plant to be found in the country".[2] In order to bring out clearly the point of view of the savage mind in this matter, Livingstone gives an imaginary conversation between a rain doctor and a medical doctor. With strict psychological, though little logical, relevance, the savage doctor insists on the *value* of the rain.

[1] *Mental and Moral Science*, p. 381.
[2] *Missionary Travels in South Africa*, p. 22.

"If we had no rain, the cattle would have no pasture, the cows give no milk, our children become lean and die, our wives run away to other tribes who do make rain and have corn, and the whole tribe become dispersed and lost; our fire would go out."[1] The medical doctor says that God alone can command the clouds. "Only try and wait patiently; God will give us rain without your medicines." The answer is: "Whoever thought of making trial of starvation! is death pleasant then?" It is in vain to represent the want of connection between the supposed cause and the supposed effect: for the circle of savage ideas as to natural causation is too different in kind from that of the civilised man to enable the savage mind to see the absurdity. The belief in rain-making forms part of a more or less coherent system of beliefs, which have been moulded by it, and which it has helped to mould. "Other tribes place medicines about our country to prevent the rain . . . we must dissolve their charms by our medicines." The savage view is supported by the whole weight of tradition and general consent. "When we first opened our eyes, we found our forefathers making rain, and we follow in their footsteps." It is useless to appeal to the test of direct experience. The rain doctor says to the medical doctor: "I use my medicines, you employ yours: we are both doctors, and doctors are not deceivers. You give a patient medicine. Sometimes God is pleased to heal him by means of your medicine; sometimes not—he dies. When he is cured, you take the credit of what God does. I do the same. Sometimes God grants us rain, sometimes not. When He does, we take the credit of the charm. When a patient dies, you don't give up trust in your medicine, neither do I when rain fails. If you wish me to leave off my medicines, why continue your own?"[2]

[1] *Missionary Travels in South Africa*, p. 24.
[2] *Ibid.*, pp. 24-25.

A theoretical objection may at this point present itself to the reader's mind. We have said that belief "involves the control of our activity as thinking beings by conditions which are fixed for us and not by us".[1] It may be urged that this view is inconsistent with the admission that the desire to believe is in itself a cause of belief. But in the first place it must be noted that the desire to believe is a result of the limitation of our activity. It is forced on us by our inability to realise our ends immediately. The necessity for the use of means is fixed for us and not by us. So, too, the limitation in the choice of means due to the limitation of our experience, is a necessity fixed for us, and not by us. In the second place, what is in itself a subjective tendency, may be, in relation to another subjective tendency, a restricting or controlling condition. The desire to live after death is one subjective tendency; the love of the truth for its own sake is another. Under the influence of the scientific impulse, we may strive to sift impartially the evidence for and against immortality: but the desire for continued individual existence will resist the attempt to think of death as the final cessation of our individual consciousness.

§ 9. Primitive Credulity.

The serious beliefs of the savage appear to the civilised man like a wild play of fancy; and it is difficult for him to realise that for any mind they can be real convictions. It seems to him as if savages believed whatever came into their heads, and that what to him are vagaries of imagination are to them facts. Modern anthropology has, however, shown that their madness is full of method. The root of the matter is that they must make themselves at home in the world somehow. They have a multitude of practical, and, to some

[1] P. 239.

extent, of theoretical needs, which cry out for satisfaction: and the material for satisfying them is limited. This limitation acts in two ways. In the first place, thought-combinations are possible for them which are impossible for us; because in us they would clash with whole systems of ideas which in the comparatively undeveloped consciousness of the savage have no existence. In the second place, the limitation of their material limits their choice of alternatives. They have to follow out certain lines of mental activity, because no others present themselves. Belief is that by which we live; and, since the savage must live as he can, so he must believe as he can. Compelled to travel in a pathless wilderness, it is no wonder that the slightest suggestions of a track are enough to determine his course; and when it has been so long traversed as to become a beaten track, it is no wonder that he should obstinately adhere to it. Unacquainted with the modes of natural causation as revealed to civilised science, his mind adapts itself to the mysteries of nature in the only way it can—by representing natural agencies as analogous to those with which he is familiar, *viz.*, those of human beings. Hence his animism and anthropomorphism. It is under the conditions of savage life that we meet with the best, if not the only, examples of that curious fallacy described by Hume—the confusion of subjective with objective necessity. Any association between *A* and *B* through which the idea of *A* calls up the idea of *B*, leads to a belief in a causal relation between them, or at least leads the existence of *A* to be regarded as forerunning or indicating the existence of *B*. The practices of magic supply a vast variety of examples. There is, or was, a superstition among sailors that whistling at sea will raise a "whistling" gale: to melt the waxen image of a man is to produce his death: to destroy his footprints is to spoil his journey or otherwise hinder him. The clothes a person has worn, or the cuttings of his hairs and nails, are supposed to be

in mysterious sympathy with himself, so that he can be injured by their means. "The simple idea of joining two objects with a cord, taking for granted that this communication will establish connection or carry influence, has been worked out in various ways in the world."[1] The destruction of a looking-glass is a sign of death, for it suggests the destruction of the persons whose images have been reflected in it. Any one who has tried the *Psychical Research* experiment of attempting to communicate his thoughts to another by mere mental concentration, will have found how strong the disposition is to believe that he is actually doing so. It would be easy to give illustrations sufficient to fill a volume. They show how slight is the basis needed for the formation of a fixed belief, where practical interests are involved, and where alternative lines of thought are absent.

§ 10. The Conditions of Imagination.

To imagine is simply to think of an object, without believing, disbelieving, or doubting its existence. How is this mental attitude possible? In the first place, a negative condition must be fulfilled. Those associative and apperceptive combinations which would destroy or repress the imagined combination, must lie dormant. In reading a fairy-tale, a wide circle of ideas embracing our knowledge of natural causation, must be in abeyance, if there is to be an illusion. But this in itself is not enough; it serves to make certain mental combinations possible which would be otherwise impossible; but it does not explain why these combinations are merely floating ideas, and not beliefs. In the hypnotic trance, and in dreams, ideal representations take place which the normal conditions of waking life exclude; and the reason is, that the mental dispositions which would interfere with

[1] Tylor, *Primitive Culture*, vol. i., p. 117.

them are for the time being inoperative. The result, however, is not imagination, but absurd belief. The difference may be in part accounted for by the difference in the mode in which interfering conditions are excluded. The apperceptive dispositions which fail to exercise their controlling influence in dreams, are rendered inert by circumstances independent of our subjective wish or will. In trains of imagination, on the other hand, they are absent, merely because the direction of our subjective interest for the time being excludes them. But this distinction, again, is not adequate; for in the blinding influence of passion, we find dominant desire paralysing the action of those constituents of the mental system, which might interfere with a certain train of ideas; and yet the result is, not imagination, but biassed belief. A person carried away by passion is ready to act on his perverted judgment, and to make it the basis of reasonings leading to new beliefs. But the attitude of imagination is quite different. The imagined combinations, as such, are never made the basis of action with a view to an end, or of reasoning with a view to the establishment of a fact. So soon as the mind begins to treat its floating ideas as a means to the realisation of an ulterior end, theoretical or practical, opposing mental combinations, which have previously lain dormant, immediately springing into action destroys nascent belief. We here find the essential positive conditions of constructive imagination. The activity of ideal combination exists for its own sake, and not for an ulterior end. It is not directed towards any actual change in the external world, or towards the extension of the preformed body of beliefs. Hence the imagined combinations do not present themselves in that relation to activity which, in agreement with Bain, we hold to be essential to the believing attitude. It is true that the activity of imagination has an end in view,—an æsthetic end, it aims at bringing pleasing elements into pleasing relations, so as to constitute a pleasing

whole. But the means for the attainment of this end are not the imagined objects as such, but the representation of them. So far as the mind considers its mental combinations with respect to the æsthetic end, its attitude becomes critical, and gives rise to æsthetic judgments, not to the play of fancy. Such judgments relate largely to the internal congruence of the different parts of the æsthetic whole. This constitutes one form of *truth* in artistic imagination. Combinations within the imaginative process must be consistent with each other, however free they may be from external control.

§ 11. Imagination as Play.

The essential nature of make-believe may be further elucidated by the general conception of "play" as opposed to "earnest". It may indeed be regarded, at least in its æsthetic and quasi-æsthetic function, as a play of the intellect, a sporting with ideas. Now the most obvious characteristic of play is that it is an activity which exists for its own sake, not for any ulterior end. This is seen, as Professor Lazarus points out, even in metaphorical applications of the word. We speak of the "play" of a fountain, because the movement of the water in this case simply returns upon itself. We do not speak of the "play" of a river which is rushing towards the sea: for this movement is considered as having a goal or end other than its own existence. Like the play of the fountain, a game at whist or chess or billiards or football or patience is an end in itself. Its own intrinsic interest constitutes the condition of its possibility, its *ratio essendi*. If we are pursuing it with some ulterior end in view, *e.g.*, to win money, then *pro tanto* it ceases to be play and becomes earnest. To put the same point in another way, those activities which we call *play* are characterised by their relative insulation, their detachment from the general system of human ends and aims.

They are essentially unpractical, apart from their reflex influence on the mind. A game of whist, as such, leaves no result which can form a stepping stone to new results in the complex series of actions constituting the main stream of our existence,—actions each of which is in certain aspects a means, in other aspects an end. It simply passes time, or, to use a more emphatic expression, *kills* time. Play, while it lasts, and in proportion as it is merely play, forms a kind of universe of interest by itself. Nor is this all. Besides the detachment of play in general from the total system of human ends, each playful activity is isolated from others. The moves I make in one game of chess do not, as such, affect the course of the next. Of course it may happen that my skill improves by practice. But it is noteworthy that just in so far as I consciously aim at improvement in this way, my mental attitude ceases to be merely sportive. In trying to fix in my mind chess positions and artifices for future use, I am turning a game into a serious pursuit.

Now, as games or other pastimes are detached from the general network of relations which make up the system of human life, so make-believe is detached from the general network of relations which make up the system of human knowledge and belief. Reading a fairy-tale or a novel is in this respect like playing at billiards or at football. And just as the playful attitude of mind is only possible on condition that we dismiss those practical interests which are irrelevant to it, so make-believe is only possible on condition that we abstain from thinking of the systematic interconnection of facts in the real world in so far as it logically excludes or at least fails to include the make-believe circle of ideas. Æsthetic illusion is simply make-believe, and make-believe is a kind of intellectual game. But it does not follow from this that art is nothing but play. Art is playful only in so far as it is illusion. But it is not merely illusion; if it were, it could not be art. A

work of fancy or imagination must be leavened throughout by make-believe; but the leaven is not the loaf. In order to get a starting-point for free construction we must, to some extent, cut off the points of attachment between our ideas and that system which forms our knowledge of the real world as a single connected whole. But we do not and cannot do so completely. Otherwise the result would not be æsthetic illusion, but mere nonsense. The degree of detachment from the real differs in different cases. It is greater in Grimm's *Fairy Tales* than in *The Ring and the Book.*

Make-believe involves not only making, but belief which is made. So far as æsthetic illusion extends, the making or fiction extends, and our ideas merely float without anchorage. But within the sphere of the illusion, within the floating circle of ideas, there is plenty of room for judgments of real significance,—for judgments which apply *mutatis mutandis* to the real world. Thus the plot of a story may be a fiction, and the characters may be fictitious also in some degree, and yet the development of the characters and of the incidents may be accepted as true and natural. Indeed, it may fairly be maintained that in this respect a fiction, just because it is fictitious, has an advantage over a matter-of-fact narrative, *e.g.*, a biography or history. For in the evolution of a train of historical events a multitude of conditions are at work, which can only be very partially ascertained: hence the historian must either leave the connection of events to a great extent obscure, or abandon matter-of-fact and indulge in make-believe.

The constructive imagination, on the other hand, lays down its own conditions at the outset. It is autonomous instead of being a slave of the actual. "Truth, narrative and past, is the idol of historians (who worship a dead thing), and truth operative, and by effects continually alive, is the mistress of poets, who hath not her existence in matter, but in reason."[1]

[1] Davenant (quoted by Coleridge, *Biog. Lit.*, p. 215).

It must never be forgotten, however, that this truth is only obtained by artifice.

Up to this point we have regarded the mind's play with floating systems of ideas only in so far as it assumes an artistic form. But it must be carefully noted that this is only a part of the whole office of imagination. We play with ideas on numberless occasions when art is far from our thoughts.

All castle-building and day-dreaming come under this head. As T. Brown says: "The dullest plodder . . . who sums up, in the evening, his daily tables of profit and loss, and who rises in the morning with the sole object of adding a few ciphers to that book of pounds and pence, which contains the whole annual history of his life,—even he, while he half lays down his quill to think of future prices . . . has his visions and inspirations like the sublimest poet".[1] Even sensible and serious persons have moments of reverie in which they picture themselves as in desirable though unattainable situations, or as invested with desirable though unattainable power,—simply indulging themselves in the thought of such things without raising the question of their possibility. I have known quite prosaic persons who confessed that they frequently in hours of relaxation wove little romantic dramas in which they themselves figured as taking a striking part and gaining applause by the brilliancy of their conversation. All these structures in the air, whether they be castles or cottages or hovels, agree in being detached from earth and floating loose. They are, in fact, floating ideas.

§ 12. Influence of Imagination on Conduct.

Make-believe cannot determine action as belief does. It does not constitute points of support by means of which we can advance to the attainment of ulterior ends, practical or

[1] *Philosophy of the Human Mind*, vol. ii., p. 377.

theoretical. But, in other ways, floating ideas are certainly capable of influencing conduct. They do so mainly by supplying, intensifying, or developing ideas of ends to be realised. The actor, in playing his part, is guided throughout by his idea of the character which he represents. He thinks of himself as being that character without believing that he is so. The boys who come to grief through reading stories of pirates and highwaymen do not necessarily take these romances for matter-of-fact. Goethe's novel *Werther* is said to have produced many suicides.

Those who doubt the importance of the influence of artistic fiction on the mind, and so indirectly on conduct, will probably be more ready to admit the analogous efficacy of that private kind of romance which in one of its forms is called "building castles in the air". This kind of make-believe very often takes the form of a drama, in which the day-dreamer is himself the central figure; and when this is so, its tendency to influence conduct is greatest. It often seems a harmless thing to allow our minds to dwell on the idea of an act which we recognise as wrong. It seems the more harmless when the act is so contrary to our principles that we are convinced we should never be capable of actually doing it. Now this is just the most insidious form of temptation. By mentally playing with the idea, we are making it more vivid, distinct, and persistent; and the more vivid, distinct, and persistent it is, the more powerful is its tendency to realise itself. Thus we may ultimately find ourselves actually doing what we at first thought a moral impossibility, or at least something substantially analogous to it. The whole psychological process is admirably described and analysed in a remarkable novel by Dostoievsky,—*The Crime and the Punishment.*

There is yet another way in which "make-believe" may lead us to conduct which our reason and conscience condemn. Professor Sidgwick has recently drawn attention to those cases in

which we act contrary to a general resolution under the influence of a seductive feeling. He points out that in so doing we usually avail ourselves of some pretext which, so to speak, smoothes the way to the unreasonable action by giving it, for the time being, some appearance of reasonableness. He distinguishes two classes of instances. In the one we erroneously but sincerely persuade ourselves that the general rule is inapplicable: in the other we sophisticate ourselves, "being obscurely aware of the sophistry". It is with the latter case that we are here concerned. The interesting question is: How does the self-sophistication take place? Now it seems to me that I never in such cases judge that my pretext is valid. My action is not the result of such a judgment. If it were, my action would be a relatively rational one. On the other hand, I do not usually judge that the pretext is invalid. What happens is that I dismiss the question of its validity or invalidity, and simply dwell on it as a floating idea. At the outset I may be in some measure aware that my excuse is futile; but the seductive feeling leads me to contemplate it complacently, and to let slip from my mind countervailing considerations. Thus it comes to fill the field of consciousness merely as a floating idea, and allows the "seductive feeling" to determine action by guarding against interference.

CHAPTER XII.

PLEASURE AND PAIN.

§ 1. Statement of Problem.

Some psycho-physical processes are pleasantly toned, others unpleasantly toned, and yet others almost, if not quite, indifferent. The question which confronts us is: What is the difference in the nature of variously toned processes, on which the difference in tone depends? There is a common answer to this question, which must be dismissed at the outset, as not satisfying the conditions of the problem. Roughly speaking, agreeable feeling is attached to processes which conduce to the welfare of the organism; and disagreeable feeling to those which are injurious. Many writers have seized on this broad fact, and made it the basis of a general theory. But in the attempt to carry out this view, they have found themselves confronted by striking exceptions. Alcoholic intoxication, for instance, is pleasant but not advantageous. In recent times an attempt, on the whole successful, has been made to restate the general principle in such a way as to explain the existence of exceptions. The general correspondence between pleasure and organic welfare, and between pain and organic injury, has been traced back to the operation of natural selection. Animals which took pleasure in what was injurious to them, or failed to take pleasure in what made for their welfare, would be at a disadvantage in the struggle for existence. Hence, in the long run, pleasant experiences

would come to be coincident with beneficial states or actions, and unpleasant experiences with the contrary. On this view, however, there is no reason to expect the correspondence to be absolute. It will exist only in so far as natural selection has come effectively into play. This doctrine, first expounded by Herbert Spencer, has a very high degree of probability in its favour. But it is not a psychological or a physiological theory of pleasure and pain. It is only, as Mr. H. R. Marshall observes, a theory of the distribution of particular pleasures and pains. It does not define the nature of an agreeable process, as such, and of a disagreeable process, as such. But such a definition, in terms of neural process, or of psychical process, or of both, is what we require. Even a physiological statement which should refer only to the antecedent conditions of neural process, such as the nature of external stimulation, or the state of the organs engaged in vital functions, is not sufficient. The immediate concomitant of consciousness is excitation of the nervous substance; and all ultimate physiological explanation must have reference to this.

As psychologists, it belongs to our plan to start with the most plain and obvious acts of consciousness; and to frame from these a provisional generalisation. Passing, then, to those cases in which the conditions of pleasure-pain are not clearly definable in psychical terms, we shall attempt to indicate the sort of physiological hypothesis, which seems most in accord with the psychological data. Here, as elsewhere, we shall carefully refrain from any attempt to decide debatable questions of physiology either on psychological or on physiological grounds.

§ 2. General View.

Theories of pleasure-pain in general err by being too one-sided. They start, as a rule, from some conspicuous class of

cases, which they regard as typical. Generalising on this basis, they attempt to reduce other cases to the same rule; and, in doing so, find themselves compelled to strain the facts to suit a preconception. I claim for the view which I here advocate the merit of comprehensiveness. All the varying principles of explanation which have found favour with psychologists may be regarded as special applications of it. The reader is already familiar with my general doctrine. It has pervaded the whole treatment of psychological topics in this work. The aim of the present chapter is to present it in a more systematic form, and to guard it against objections. Our starting-point lies in the conception of mental activity, as the direction of mental process towards an end. The end is attained when the process works itself out to a conclusion, and so ceases. *End* thus means both the mark aimed at, and the termination of activity. It is essential for the attainment of an end that the process should work itself out, and not be merely displaced by some other process, or have its course cut short by any extraneous conditions. The antithesis between pleasure and pain is coincident with the antithesis between free and impeded progress towards an end. Unimpeded progress is pleasant in proportion to the intensity and complexity of mental excitement. An activity which is thwarted or retarded either by the presence of positive obstruction, or by the absence of co-operative conditions, or in any other conceivable way, is painful in proportion to its intensity and complexity, and to the degree of the hindrance. This is easy enough to work out on the psychical side. The type of the painful state is *Tantalus*, continually reaching after the fruit which continually evaded him. All pain consists in being somehow *tantalised*,—in having a mental tendency at once stimulated and obstructed. The counterpart on the side of pleasure to the state of Tantalus is not, however, that of immediate and complete attainment. It is the smooth

and prosperous progress towards attainment. With ultimate attainment, the mental tendency ceases to operate, and the pleasure ceases also. It is in the intermediate activity that enjoyment arises. Disturbance of equilibrium is not, as such, painful; otherwise all consciousness would be painful. Nor is equilibrium itself pleasant; otherwise all pleasant states would be states of unconsciousness.

§ 3. Psychological Application

There is no difficulty in applying our general principle of explanation, if and so far as the conditions of pleasure-pain are susceptible of being stated in purely psychological terms. Reserving the discussion of purely physiological conditions, we shall first consider those aspects of the problem which can be dealt with without any reference to the material concomitants and antecedents of mental process. The most notable attempt to treat the problem from this side, is that of Herbart and his disciples. Volkmann, for instance, regards pleasure as arising in connection with the relief of a presentation from arrest. So long as the presentation remains below that degree of prominence in consciousness, which the conditions of mental equilibrium at the time allow to it, it continues to rise in intensity; and this recovery of its due position is felt as pleasure. Pain exists in the inverse case, where a presentation has more than its due prominence in consciousness, and where, therefore, it is in process of being reduced to a lower intensity. Volkmann thus makes the antithesis between pleasure and pain coincident with that between free expansion and forced repression; and to this extent we agree with him. But he entirely misses our conception of activity. On his view, all disappearance of presentations from consciousness ought to be painful in proportion to its rapidity. But this is obviously untrue. A presentation may disappear without the slightest

admixture of disagreeable consciousness, if it be no longer wanted.

In the choice of examples perplexity arises from the very abundance of the material, and also from the trite and obvious nature of most of the instances which present themselves. We begin, therefore, by begging the reader to note that a vast mass of cases is of this trite and obvious kind. This in itself is a great advantage; and it is all in favour of a theory that it should have its starting-point in the most plain and undeniable facts. Professor Bain appears to wave aside a large class of experiences as scarce worthy of consideration, simply because they are familiar and elementary. "In the every-day pursuits of actual life, we may have our aims, expectations, and pursuits either aided, realised, and fulfilled, or else thwarted and baffled. The one case is attended with pleasure, the other with pain. . . . There can hardly be any fact more elementary than that the gain of a pleasure is pleasant, and its loss correspondingly painful. To receive aid and support in our various endeavours is the same as to be successful in those endeavours, and obversely. . . . Every circumstance that, on the one hand, lightens or eases our labours and burdens, or, on the other hand, increases or aggravates them, is pleasurable or painful according to the case. This, too, is a mere necessity of our constitution, and not a separate law of the mind. There is a pleasure in putting forth a degree of exertion within our strength and our skill; the opposite is painful. . . . To have the attention distracted by collateral solicitations is a pain of conflict, otherwise expressed by loss of strength and marring of efficiency."[1] What is the precise nature of the distinction which Dr. Bain here draws between "a mere necessity of our constitution," and "a separate law of the mind"? Perhaps he adopts this curious tone of disparagement

[1] "Pleasure and Pain," *Mind*, N.S., vol. i, No. 2.

because he regards the statement that successful endeavour is pleasant, and unsuccessful painful, as a mere tautology,—as equivalent, indeed, to the statement that being pleased is being pleased, and being pained is being pained. But this is a pure misunderstanding. We do not say that the gain of a *pleasure* is pleasant, but that the gaining of an *end* is pleasant; nor do we say that the loss of a pleasure, as such, is painful, but that the thwarted striving, craving or desire, which follows the loss, is painful. Apart from the existence of such striving or craving, the loss of a pleasure would not be unpleasant, but would be merely indifferent.

We begin with that class of pains which is in any way due to being bored or distracted. There are manifold ways in which this form of disagreeable consciousness may arise; but all have one point in common. The attention is in some way confined to comparatively indifferent or actually distasteful objects, so as to suppress the free flow of mental activity which tends in other directions. The disagreeableness of voluntary attention is of this kind. We determine to fix our thoughts on a certain topic, in order that by that means we may attain some ulterior end. But the topic in itself is not stimulating: hence the mind constantly tends to wander, and has to be as constantly recalled. It is the arrest of mental activity in the repressed tendency to pursue other lines of thought or action, which occasions pain. Another source of tedium is to be found in the restlessness which marks the state of wanting to do something, and finding nothing definite to do. This is especially apt to arise when we are finished with some important occupation, and find ourselves at a loss how to spend the time. In common parlance this is well described as "being at a loose end". Tedium also often arises in listening to a discourse. The topic discussed may be uninteresting, and yet we feel called upon to try to attend to it; so that the natural direction of our mental activity is thwarted. On the other hand, the

topic may be interesting, but the mode of treatment such as to produce tedium. We may not apprehend the meaning of the speaker readily enough, or we may apprehend it too readily. The development of his thoughts may go too fast for ours. In this case our attention is solicited in two directions at once. We endeavour to follow what is being said, and at the same time to grasp what has previously been said, and each of the two competing tendencies interferes with the other, so as to result in a painful struggle. The inverse happens when our ideas outrun those conveyed by the speaker,—and the result is the same, so far as concerns the present point. Perhaps the most ordinary and painful kind of tedium is that which is due to monotony: "The languid uneasiness which we feel from the long continuance of one unvaried object, or from a succession of objects so nearly similar as scarcely to appear varied".[1] The objects may at the outset have been interesting, but in the course of time their interest becomes exhausted. The conations which arise in connection with them approximate to, or attain, satisfaction, and so cease. When under these circumstances they are unavoidably thrust upon us in sense-perception or otherwise, they are simply a clog on the flow of mental activity, which tends to seek other channels. "What patience," says Brown, "could travel for a whole day, along one endless avenue, with perfect parallelism of the two straight lines, and with trees of the same species and height, succeeding each other exactly at the same intervals?" What we should feel with most "fretfulness, would be the constant disappointment of our expectation, that the last tree which we beheld in the distance, would be the last that was to rise upon us: when, tree after tree, as if in mockery of our very patience itself, would still continue to present the same dismal continuity of line".[2]

[1] Brown's *Philosophy of the Human Mind*, vol. iii., p. 56.
[2] *Ibid.*, pp. 58, 59.

The pains we have so far discussed are due rather to competition than to conflict. They arise from attention being drawn simultaneously to disparate objects, rather than from any obstruction which it encounters in a given direction. We turn now to those cases in which mental activity finds an obstacle barring the path to its goal. To begin with a very simple instance, consider the annoyance which those who are interested in books feel in seeing one upside down on their shelves. The unusual position of itself attracts attention, because it is unusual. At the same time it thwarts attention, because it involves a reversal of our preconception of a book and its uses. We cannot freely develop our idea of a book so long as we mentally represent it as upside down. The pain of balked expectation is of a similar kind. I enter a room expecting to find somebody in it, and find nobody. If the anticipated interview was of a disagreeable nature, the surprise will be so far a pleasant one: but if we exclude this condition, the result is always more or less unpleasant, and the unpleasantness is often out of all proportion to anticipated pleasure. We are taken aback: the course of mental activity at the moment is arrested and thrown back upon itself; and the pain is, so to speak, located by us at the point of collision between the outgoing of our energy in a certain direction, and the obstacle which bars its way. Here the question arises whether surprise is always disagreeable. Bain has adduced it as an instance of a neutral state of feeling. The difficulty lies in separating the surprise itself from the circumstances which cause it. Where these are agreeable or disagreeable, surprise is proportionally agreeable or disagreeable. It enhances the pleasure or pain because it augments the degree of mental excitement. When the circumstance which causes the surprise is comparatively indifferent, its tone depends upon the course taken by the mental process of which it is the initial stage. It excites curiosity; there is a mental attempt to

account for it. Now where this mental tendency is utterly baffled, so that we cannot even make a plausible guess as to how the strange fact can have taken place, the pain of bewilderment or perplexity arises. When, on the other hand, we find in the curious incident a field for the more or less free exercise of our ingenuity, or when we can readily account for it on reflection without any special ingenuity, we to that extent experience pleasure. The main point is that surprise must not be considered purely by itself, but rather as the initial stage of a process, however brief. According as this process is or is not impeded, surprise is or is not pleasing.

The hedonic effect of all strangeness or novelty is in general dependent on the same condition. Its efficacy in producing either pleasure or pain is proportioned to the degree of mental excitement it occasions, the intensity and complexity of the mental activity which it arouses. The excitement thus produced is disagreeable in proportion to our mental impotence in face of the strange object,—our inability to accommodate ourselves to it either practically or theoretically, or both. In this lies the explanation of the discomfort caused by the upsetting or interruption of fixed habits. Trivial instances are found in the discomfort which a man is apt to feel in going out without his accustomed walking-stick, or in having to wear a novel kind of dress for the first time. As Adam Smith remarks: "A man grows fond of a snuff-box, of a pen-knife, of a staff, which he has long made use of. . . . If he breaks or loses them, he is vexed out of all proportion to the value of the damage."[1] A countryman going up to town for the first time usually feels amid his pleasures an undercurrent of discomfort arising from the discomposing novelty of interrupted habits; which will be greater in proportion to the limitation of his previous experience of men and manners. In out-of-the-way

[1] *Theory of Moral Sentiments*, part ii., § 3, chap. i.

parts of the country the sight of a stranger is enough to excite disgust and the inclination to throw the proverbial half-brick. An unfamiliar mode of speaking shocks the ears of those who have been exclusively accustomed either to correct pronunciation or to their own dialect. The discomposing effect of strange conditions may often amount to acute anguish and to what is called the terror of the unknown. A country girl introduced for the first time into the streets of a large city may feel actually frightened.

Much more is this the case with the savage suddenly transferred to the conditions of civilised life. Dr. Livingstone records a striking instance of this kind which resulted in madness and suicide.[1] A wide field for illustration is found in superstitious terrors. The fright caused by an apparition is not so much due to any definite anticipation of positive evil, as to the utter strangeness of the experience. It lies so wholly outside the circle of ordinary events, and is so completely opposed to the conditions of ordinary life, that it destroys all presence of mind. It stimulates intensely by its novelty: and at the same time, owing to this very novelty, all lines of action, theoretical and practical, are obstructed. It is a typical case of activity at once stimulated and repressed,—and, therefore, of pain. It is instructive to contrast this overwhelming terror in the supposed presence of an apparition, with the predominantly agreeable condition of reading or listening to a tale of marvel. In face of the actual fact practical adjustment to it is demanded, and fails. Where this practical need is not predominant, the free play of imagination, liberated from the trammels of ordinary experience, is a source of delight. If we turn to cases of fear which arise in connection with some positive evil definitely foreseen, the painfulness of the emotion still lies in impotence or helplessness. The

[1] *Missionary Travels in South Africa*, pp. 682-683.

terror-stricken person is incapacitated for action appropriate to the occasion. In cases of very great terror he cannot even run away. If he can run away, and has confidence in his speed, the fear is greatly lessened. Women are more liable to be frightened than men, simply because they are more helpless. Danger is courted for the pleasurable excitement it produces, by those who are full of resource and enterprise, and can maintain their presence of mind.

The pains of bereavement are easily referable to thwarted activity. The person taken from us has formed part of our life. So far as this is the case, his removal means the repression of our previous modes of thought and action. While the loss is recent, these preformed mental tendencies are stimulated by everything which can remind us of the deceased; but they are stimulated only to be crushed. The mollifying effect of time is due to our learning to live without the lost object of our affections. "In the progress of time, however, other cares and other hopes, unconnected with the lost object of regard, must necessarily engage the mind; and these, as more recent, arise, of course, more readily by suggestion; and thus fill, not the busy hours of action only, but the very hours of meditation and repose."[1] To this it should be added that, when the old memories revive, they revive more and more as mere memories, and not as tendencies to action in relation to present conditions. The pain of bereavement is always capable of acute renewal whenever we have a strong prompting mentally to realise the actual presence of one who may have been long taken from us. This often happens in waking from a dream in which he has appeared.

The pains and pleasures connected with the idea of self are obvious cases of repressed activity. They are indeed the favourite illustrations of such writers as Hobbes and Spinoza,

[1] Brown's *Philosophy of the Human Mind*, vol. iii., p. 44.

who take up a position akin to ours. The key to these feelings lies in the distinction between ourselves as we are, and ourselves as we would be. Wherever the actual self is felt to be discordant with the ideal self, the result is pain. Remorse is a special instance. In it there is a collision between what we have actually done and what we now desire that we should have done. Thus in reflection on our past self, the free course of our present ideal activity is crushed and repressed by the memory of our actual behaviour. The pains of wounded pride and wounded vanity involve a further complication. The discrepancy here is not merely between the ideal self and the actual, but between the actual self as we have previously conceived it, and as we now find it. We have been reposing in our presumed possession of certain powers or qualities, or of a certain position in the eyes of others, accordant with our aims and desires; something then occurs which collides with this self-conceit, and so interferes with the free flow of mental activity, in which we picture our own behaviour and mental attitude, or the behaviour and mental attitude of others towards us in varying situations, either represented as actual, or merely imagined. Thus we are, to use a vulgar phrase, "taken down a peg". The free expansion of the idea of self is confined and oppressed, and we feel mentally stifled. One reason why this kind of pain is so common lies in the influence of desire on belief. We are apt to assume a closer coincidence between our ideal and actual self than in fact exists, just because it is painful to think otherwise. This may take place in two ways: we may either mould our ideas of what is good and desirable in conformity with what we find ourselves to be, or we may mould the idea of self in conformity with what we regard as good and desirable. The former course leads to pride, the latter to vanity.

We have so far paid more regard to the conditions of pain

than to those of pleasure; but it will be seen that each of the sources of disagreeable feeling to which we have referred, becomes a source of agreeable feeling, if the repression or obstruction of activity is absent or is removed. Perhaps our keenest pleasures are due to relief from previous painful tension. But it is a great error to suppose that pleasure only arises in this way, or that, when it does, it is strictly proportionate to the previous pain. Relief from tension is pleasing, because it means the setting free of positive activity. The special intensity of the pleasure which arises under such circumstances is due to the special intensity and complexity of the mental excitement. This again is referable to the fundamental principle that the effect of a stimulus is proportioned to the amount of change which it is capable of producing. The change is obviously greater where it involves relief from previous tension. But the resulting intensity and complexity of free activity need not be merely equivalent to the repressed activity which precedes it. The analogy of a bent spring is not in point. The initial excitement is only the starting-point of a series of excitations calling into play mental dispositions previously inoperative. It may thus diffuse itself over a wider range, and persist over a longer time, than the painful repression which is its pre-condition. Thus a struggle with difficulties which is not too prolonged or too intense, may enhance the pleasure of success out of all proportion to its own painfulness. On the other hand, a success too easily purchased is apt to be unexciting, and therefore insipid. A well-contested game is enjoyable, and a "walk-over" tedious.

Release from pre-existing tension is by no means the only source of pleasure. The stimulus which first arouses a mental tendency, may also simultaneously open the way to its gratification. When a poor man suddenly finds himself in possession of a fortune, part of his enjoyment will arise from the release of previously baffled desire. The poverty which

had previously hemmed him in, had denied him the satisfaction of many keenly-felt tendencies. In his changed situation these have free course, both actual and ideal. On the other hand, his new position will bring with it the awakening of many conations, which had previously slumbered, or had merely emerged in the form of faint wishes. The opportunity of satisfying these, if it does not create them, at least greatly intensifies them, and so opens up sources of pleasure independent of previous pains.

Among the pleasures which are most independent of pain, are those of idleness. These do not of course arise from literally doing nothing, but from doing what is easy.[1] If all activity, as such, is pleasant, in so far as it is free from obstacles, it is not surprising that a favourite mode of enjoyment consists in avoiding trains of action and trains of thought which are apt to be brought to a standstill by obstacles, and can only be continued by painful exertion. Thus the pleasures of indolence are, in Bentham's sense, the *purest* of pleasures, and their purity, while they last, more than compensates for their lack of intensity, as compared with some other enjoyments. Their great enemy is tedium, or *ennui*. In process of time, the sources of easy gratification become exhausted, and restlessness sets in. It must however be admitted, that with certain favourable endowments of mind and fortune, idleness may continue to be enjoyable throughout the course of a long life. For this, however, negative as well as positive qualifications are required. There must be an absence of strong, intrusive tendencies, which can only be satisfied by strenuous exertion. We may close this topic with a quotation from Thomson's *Castle of Indolence*:—

[1] They may also arise from the mere enjoyment of organic or other sensations, as in the case of the cat purring on the hearth-rug. So far as this is the case, the present explanation is insufficient. We refer the reader to what is subsequently said about the pleasures and pains of sense.

Here freedom reign'd, without the least alloy;
. . . . . .
For why? there was but one great rule for al;
To wit, that each should work his own desire,
And eat, drink, study, sleep, as it may fall,
Or melt the time in love, or wake the lyre,
And carol what, unbid, the muses might inspire.[1]

There yet remains to be considered the pleasure due to æsthetic form, and the pain due to its opposite. Æsthetic form is, in Kantian language, the adaptation of an object to our faculty of knowing. Analysis shows that it consists in certain arrangements or groupings of the parts of a whole which facilitate attention. The essential point is, that under æsthetic conditions of presentation, a complexity and intensity of mental excitement is possible, without arrest or hindrance, which would otherwise be impossible, or would involve strain and struggle. Hence the definition of beauty as "unity in variety" is not without justification. The value of the unity, however, consists wholly in its relation to the variety. The more varied are the elements combined, and the greater the pleasure they are separately capable of yielding, the greater is the hedonic effect of that combination which facilitates our apprehension of them. The best illustrations however for our purpose are those in which the pleasure-giving efficacy of the component parts is not prominent. Hence examples which are not in the special sense artistic are peculiarly instructive. The solution of a mathematical problem is called beautiful if the end is reached in a strikingly simple, short, and direct way. The pleasure we feel in it is contrasted with the disgust felt at a demonstration involving long and circuitous processes difficult to follow and to verify. The contrast is at its keenest when we compare the cumbrous demonstration of a special

[1] Canto i., xxxv. The whole poem may be recommended to the attention of the reader.

case with the easy and direct demonstration of the general principle on which it depends. So we call an experiment beautiful when, by a simple and effective device, it decides a question which had previously been clouded with perplexity and confusion. A theory is beautiful, which brings under one point of view a multitude of facts previously dispersed without obvious bond of union; so that, instead of dissipating attention upon a loose aggregate, we can concentrate it upon a unified whole. Under the same head comes that charm of style which arises from mere clearness, compactness, and orderly arrangement. Whatever may be the topic, it is a pleasure to read a writer whose words fit the thing like a glove. It has been said that in reading Hobbes we feel as if we were reading by a good light. The essential use of metaphors is to facilitate lively and distinct apprehension. The analogy of form detaches itself amid diversity of matter, and is thus more easily grasped. At the same time the image contained in the metaphor is usually easier to fix and detain before consciousness, than the point which it illustrates. Thus the total mental activity is at the same time heightened and facilitated. The development of the plot of a novel aims at producing the maximum of excitement with the minimum of painful tension. The curiosity of the reader must be kept alive, and at the same time it must be in perpetual process of being satisfied. Comparatively disconnected threads of interest, with which the story starts, must be brought together into a unity, so that each heightens and sustains the others, and so that the final solution includes them all. Much has been written concerning the pleasure derived from the ludicrous in its various forms. Here we have only to consider two points: (1) Why is a ludicrous connection of ideas exciting? and (2) Why is it pleasing? The excitement, of course, arises from contrast and depends on the rule that, the greater is the change produced in a pre-existing state of mind, the more intense is

the consciousness. But all the forms of the ludicrous involve an abrupt transition from one topic to another incongruous with it. This in itself however would not account for the resulting excitement. If the second direction of attention simply displaced the first, it would rather be a change *of* the pre-existing state of mind, than a change *in* the pre-existing state of mind. The incongruity, or disparateness, of the connected ideas, is not sufficient; there must also be an emphatic reference to some point of agreement which prompts the mental attempt to bring them together into some kind of unity. In this attempt the real incongruity reveals itself, and with this the mental excitement arises. The excitement is *pleasurable* because it is pure play. It is not a stage in the pursuit of any end ulterior to itself, and cannot, therefore, be confronted with obstacles or hindrances. The pleasure of the ludicrous may be taken as a typical illustration of the general principle that all mental activity is pleasant in proportion to its intensity, if there exists no special reason for its being unpleasant. Such a reason might be sought for in the unsuccessful attempt to unite the incongruous ideas; and it does happen, occasionally, that this phase of the process *is* slightly unpleasant. The porter carrying a hare through the street, who was accosted with the "extraordinary question, 'Prithee friend, is that thy own hair or a wig?'"[1] may have felt, as Lamb assumes, momentarily perplexed and bewildered. Lamb imagines his "desponding looks". But as soon as he saw the point of the joke, the release of the mental tension would issue in a pleasure out of all proportion to any previous disagreeableness. As a matter of theory, we may suppose that some slight and evanescent tension is always present; but in most cases it is so very slight and evanescent as not appreciably to colour the tone of consciousness. The release

[1] *Essays of Elia* (Ainger's edition), p. 354.

from it is accompanied by that feeling of superiority to the situation which, after Hobbes, we may call a "sense of eminency".

The effect of æsthetic form in facilitating mental process is conspicuously illustrated by rhythm and symmetry. Rhythm has a very wide range of application, from swinging in a hammock to the march of a hexameter. It enables the mind to anticipate a coming stimulus. Where recurrence is regular, we are prepared for it. On the other hand, an irregularity which defies mental forecast, is perplexing and painful. Where rhythm exists, the oncoming of a stimulus is met beforehand by a pre-excitement in conformity with it, so that when it arrives, the effect is both greater and easier. Concurrence in rhythm between two distinct but simultaneous processes, is especially exciting and agreeable. Dancing to music is an example in point. Another is the correspondence of sound and sense in poetry; the rhythm of the verse corresponds with the movement of the mind in following the train of ideas. Symmetry is the analogue, in simultaneous combinations, of rhythm in successive combinations. In a symmetrical arrangement, the mind is prepared in advance by the apprehension of the part for the apprehension of the whole, and *vice versâ;* and by the apprehension of one part for the apprehension of other parts. The most pleasing modes of dividing a line are either bisection or a division in which the ratio of the whole to the larger part is the same as that of the larger part to the smaller. In the latter case the apprehension of one ratio assists the apprehension of the others inasmuch as the relation remains the same though the related magnitudes differ. As regards both symmetry and rhythm, we must remember that, after all, they are merely forms, and that their pleasure-giving efficacy depends on their filling-in. The greater the variety of matter, the greater is the effect of unity of form. Much has been written concerning the

pleasures derived from musical sounds and their combination. I am deterred from treating this topic because of my own ignorance and incapacity in all that regards music. It is sufficient to say that the views of experts seem to harmonise with our general account of æsthetic pains and pleasures. There is, however, one point on which I can speak from personal experience,—the irritation due to combinations of sounds which at once attract and disappoint attention. Charles Lamb has vividly described this kind of annoyance. "I am constitutionally susceptible of noises. A carpenter's hammer, in a warm summer noon, will fret me into more than midsummer madness. But those unconnected, unset sounds, are nothing to the measured malice of music. The ear is passive to those single strokes; willingly enduring stripes while it hath no task to con. To music it cannot be passive. It will strive—mine at least will—spite of its inaptitude, to thrid the maze; like an unskilled eye painfully poring upon hieroglyphics."[1]

This long array of examples has probably tried the reader's patience. It would be possible to fill a volume with the same sort of thing, without exhausting the material. Our purpose is served if we have made clear the general applicability of this kind of analysis wherever the conditions of pleasure and pain can be expressed in psychological terms. If this is doubted or denied, a negative instance ought to be adduced, and we feel confident that no such instance will be found. The difficulty of the psychological explanation arises precisely where from the nature of the case it must arise. It arises where the conditions of pleasure-pain can only be expressed in terms of physiology; and where physiology fails to tell us exactly what it is that takes place.

[1] *Op. cit.*, p. 54.

4. Physiological Application.

What in its psychical aspect we call the direction of mental activity towards an end, is, on the physiological side, the tendency of disturbed neural arrangements to equilibrium. By equilibrium is meant a stationary condition, in which further alteration will not take place unless it is externally initiated. We have made use of this conception, and illustrated it from the psychical side, in discussing attention and apperception. After Avenarius, we have called the process intervening between the initial disturbance and restored stability, the *vital series*. Our present thesis, for which the reader has also been in some measure prepared, is that pleasure and pain depend respectively on the uninterrupted or interrupted course of the vital series. In so far as the neural disturbance simply serves to initiate and support the process of recovery in modes predetermined by the nervous organisation, there is concomitant pleasure. On the other hand, any kind of hitch or hindrance in this process is unpleasant. This physiological formula is primarily based on the evidence supplied by those pleasant and painful processes which are open to psychological analysis. It is now to be applied to those pleasures and pains which depend on conditions that can only be fully defined in physiological terms. The assumption is, that where psychological analysis fails, there is a fundamental analogy in the neural process concerned. In baffled desire the process of return to nervous equilibrium is in some way thwarted. In this case the neural process has a psychical counterpart which can be defined with reference to its commencement and to the end which it seeks. In the pain of toothache, such psychological definition of the thwarted conation is not possible; but it remains permissible and even necessary to assume a failure to recover nervous equilibrium, owing to positive or negative conditions. Under this formula

we include whatever influence nutritive relations may possess in facilitating or impeding neural function. We do not however agree with those who find the whole or the main explanation of sense-pleasure and pain in the relation of wear and repair. Special questions bearing on this point will be discussed in their place.

It will be objected that we have failed to account for the existence of *neutral* modifications of consciousness. In considering this question, it is important to distinguish between the total consciousness at any moment, and its component parts. We simply deny that, in the waking state, our mental attitude is ever wholly without pleasant or painful tones. We are always being more or less satisfied, or dissatisfied, or both. The examples of indifferent modifications of consciousness usually refer to the partial constituents of a complex state. It is said that the ordinary sensations of sight and touch have a purely cognitive function, without admixture of pleasantness or unpleasantness. We admit that this is virtually true. The reason is to be found in the operation of habit. When the conditions of a neural reaction are frequently repeated in a uniform way, the form of reaction itself becomes, so to speak, stereotyped. The neural arrangement becomes so preconformed to its appropriate stimulus that the amount of disturbance it undergoes is small, and it recovers itself in a fixed and unvarying manner, by means of a vital series which is short and simple, and disconnected from the main stream of psycho-physical process. In proportion as it becomes thus automatic, it loses prominence in consciousness. But intensity of pleasure or pain depends on the intensity and complexity of the pleasant or painful excitation. Hence the effect of habit is to diminish to what is virtually a vanishing point the pleasantness or painfulness of habitual impressions, considered in their own intrinsic nature, and apart from their relations to other components of a complex whole. Though in theory we

may still ascribe to them agreeable or disagreeable tone, yet this is for the most part so small in relation to the total consciousness that it is virtually negligible. They can only become markedly pleasing or painful when they occur with unusual intensity, or after an unusually long intermission, or otherwise under comparatively novel conditions.

There is another mode of statement of the conditions of pleasure-pain, which, though it is probably not so general, may help to make our position clear. We may start from the conception of a psycho-physical disposition. Through inherited constitution, or through habitual exercise, certain fixed neural arrangements come into being, specifically prepared for certain kinds of process. Certain neural elements are so co-ordinated that they normally act together in a fixed order, manner, and degree. Now, whatever disorganises the working of such neural systems, whether it be the absence of co-operative conditions in the environment, or the presence of disturbing conditions, or the interference of simultaneous nervous processes, or the inaction of part of the elements concerned, or the undue intensity of their action, or its undue continuance, or its taking place at the wrong time,—however it comes about, the derangement of systematic co-operation is painful in proportion to the intensity and complexity of the total excitement. Of course it is not meant that pleasure lies in the identical repetition of previous process. Such repetition is rather a condition of indifference. The specific working of a nervous arrangement does not exclude constructive re-adaptation to varying conditions, or, as we have called it, relative suggestion. To have recourse to the language of Mr. Cyples, "the general frame" of the neural diagram "is repeated in analogues,"[1] with special variations due to varying conditions.

[1] *The Process of Human Experience*, p. 168.

In what follows we shall examine separately the feeling-tone of muscular exercise and repose, of organic cravings and their satisfaction, of those cutaneous and other sensations, which, by a peculiar limitation of the word, are called distinctively *pains*, and of the ordinary sensations of the special senses.

§ 5. Muscular Action.

According to a well-known theory of Dr. Bain, "movements arise without the stimulation of sensible objects, through some energy of the nerve centres themselves, or some stimulus purely internal".[1] The saving clause here, which refers to "some stimulus purely internal," destroys the distinctive significance of the theory. But it is clear from Dr. Bain's general exposition, that he intends to maintain the possibility of a nervous discharge to the muscles which is determined purely by nutritive conditions. When the building up of tissue has reached a certain point, it, so to speak, breaks down of itself without external prompting. Full feeding takes the place of stimulation from without. "As the battery of the torpedo becomes charged by the mere course of nutrition, and requires to be periodically relieved by being poured upon some object or other, so we may suppose that the jaws of the tiger, the fangs of the serpent, the spinning apparatus of the spider require at intervals to have some objects to spend themselves upon."[2] Now if this process really takes place, it is evident that we have in it a typical example of the conditions of pleasant feeling. The initial disturbance of neural equilibrium arises entirely from the building up of tissue; and the ensuing excitation is, *ceteris paribus*, a simple and direct recovery of relative stability. The vital series proceeds without hitch or hindrance. Dr. Bain's thesis has been severely criticised: it

[1] *Mental and Moral Science*, p. 14.
[2] *Ibid.*, p. 17.

seems impossible to verify it in its pure form in any given instance, for there is no case in which external disturbance is wholly excluded. But for our purpose it is sufficient to emphasise the undeniable fact that a high state of nutrition is accompanied by a correspondingly high degree of excitability; so that, as Dr. Bain observes, the sensory stimulus may be of the feeblest kind, while the motor discharge may be of quite disproportionate intensity. Hence, both muscular and other activities are especially pleasant when we are fresh and in good health.

Owing to the operation of habit, most ordinary movements are virtually neutral as regards pleasure and pain; but even these may assume a slightly pleasing character when they are renewed after food and repose. The pleasure, however, soon sinks into indifference. Part of the cause is here undoubtedly the instability due to previous building up of tissue; but it may be questioned whether this would in itself be sufficient, apart from the relative novelty of the new start after intermission. Mr. Rutgers Marshall would explain such instances by the assumption that "all consumption of surplus-stored energy is pleasant". To this it may be objected that the pleasure fades away long before we can suppose the exhaustion of the surplus. In a long day's work, the habitual muscular action may be indifferent for much the larger portion of the time spent in it, the initial stage of pleasure being very brief in comparison. We should rather expect, on Mr. Marshall's view, a period of pleasure passing rapidly through a transition point of indifference to one of pain, as we must suppose that the surplus is being used up during the whole period of exertion. In any case, the nutritive conditions are a positive source of marked pleasure only when the building up of tissue has reached a point where it tends to break down of itself upon a comparatively slight stimulus.

Mr. Marshall attempts to bring under the same point of

view the pleasure attending renewal of action after unusually prolonged intermission. Dr. Bain objects that in such instances the organs concerned have often actually fallen off in condition. "When General Wolseley disembarked in Egypt, with an expeditionary force, he found his operations retarded by the inability of the horses to gallop."[1] Mr. Marshall's rejoinder is not satisfactory. He begins by alleging that the inefficiency is a result of deficient co-ordination of the motor processes following on intermitted practice, and he affirms that the pleasure connected with renewed action is due to nourishment through rest. Obviously, this does not account for the comparatively rapid exhaustion which takes place under such circumstances. Hence Mr. Marshall has recourse to a supplementary hypothesis. He thinks that the "quick loss of ability" is due to a disturbance of the old nutritive habits. This is special pleading. So far as our knowledge goes, the general rule as to the blood-supply is that it streams to the part which needs it at the moment. It is possible that, through disuse, vaso-motor arrangements may be altered so as to require readjustment when action is renewed. But, on this assumption, we should expect to find the inconvenience most prominent at the outset of activity. In point of fact, the loss of ability occurs just when time for the necessary re-arrangement has already elapsed. The simple explanation of the pleasure felt after unusually prolonged intermission of activity, lies in the annulling of the effect of habit. Custom brings with it such a pre-conformity between neural pre-arrangements and the condition which stimulation tends to produce in them, that when they are excited, the disturbance is small, definitely limited in range, and rapidly compensated. Prolonged disuse impairs this accommodation of organ to stimulus, so that the excitement

[1] *Mind*, N.S., vol. ii., p. 184.

on renewal of action is increased. As Dr. Bain observes: "An organ is at its very best, in point of preparation for activity, by being exercised up to the proper limits, without the loss of a single day, as in the training of pedestrians, mountain-climbers, boxers, or athletes".[1] But the habitual repetition which keeps up the condition of the organs exercised, diminishes the pleasure.

Where there is a felt tendency to action, and outlet is denied to it, pain ensues. This is a typical pain of restriction, and falls under our formula of itself. Nervous equilibrium is widely disturbed; and at the same time the course of the vital series by which it would otherwise be recovered, is barred. Perhaps it would be unnecessary to add more on this point, were it not that Mr. Marshall has given another explanation. According to him, "painful restriction of the normal activity in an organ does not imply *action*, but rather *non-action*, in the organ restricted, nor does it imply *inefficiency* in the organ *restricted*".[2] Mr. Marshall has evidently before his mind the restriction of muscular movement; and by the restricted organ he must mean the inactive muscles. We admit that the pain of restriction does not arise from these, except in so far as stimulus received from them may prompt to motor discharge. The immediate source of uneasiness lies in the repression of the out-going current. There is a pent-up stream of activity which is painful, not because it does not exist, but because it fails to find vent. Mr. Marshall urges that this and other pains of restriction are widely diffused instead of being definitely localised. This is far too sweeping a statement when it is extended to pains of restriction in general, so as to include all thwarting of desire or anticipation. It is broadly true, however, as regards motor activity. But this constitutes

[1] *Mind*, N.S., vol. ii., p. 184.
[2] *Pain, Pleasure and Æsthetics*, p. 195.

no objection to our view; if the pain of restriction is diffused, the pleasure of exercise and of release from restriction is equally so. The more muscles are brought into play, the better. The boy released from school feels a wide-spread delight in free movement corresponding to the diffused uneasiness of his previous confinement. Besides this, it must be noted that every pain of restriction is apt to carry in its train general discomfort and impatience, because it disturbs the working of the nervous mechanism as a whole. If only by distracting attention, it bars the way to other activities, and thus becomes a general centre of obstruction. Mr. Marshall's own account of the matter is as follows. It may well be taken as a test case for his theory, and we shall therefore make a full quotation. "What happens when a normal activity is obstructed as the result of contradictory forces or failure of stimuli, but without radical change of nutritive supply? All the connected organs will, it would seem, take up into potential form all the energy they are able to store. But after that? If the blood-currents still persist without use of the material which they carry with them for the organ, they will fail to move on in their course with normal ease; the nutritive channels will become gorged, their muscular coatings and their proper nerves forced to do abnormal work under conditions of excess and beyond the limits of storage. Moreover, the effect will not by any means be limited to the nutritive system. The whole make-up of the organism will react to open up the obstructed path; the directly disabled elements calling for aid in the shape of nerve force, and those thus called upon looking to still others for help; until, in some cases, the full width of the system is aroused to break down the obstruction."[1] The first question which here arises is, why should the nutritive channels become gorged? Where

[1] *Pain, Pleasure and Æsthetics*, p. 213

the organ is inactive, according to general principles the blood-supply will be smaller, and in any case, it does not seem clear how the normal flow of circulation comes to be blocked in its onward course. This is much more likely to happen, if at all, when the organ is active, so that the blood becomes charged with waste products. The whole explanation looks like a mere figment invented for the occasion. Again, if the muscular coatings of the vessels and their proper nerves are forced to do excessive work, it is not clear why this should be an immediate occasion of pain. The vaso-motor mechanism is supplied by the sympathetic system, which is not, as a rule, directly concerned in conscious process. What is said about the reaction of the whole organism is very vague; but, so far as I can understand it, it seems to fit in even better with my account of the matter than with Mr. Marshall's. The physiological hypotheses propounded by him must be left to the final judgment of the physiologist, by whom they would, I am inclined to think, be promptly rejected. At any rate, they do not appear to be in any way called for by the psychological facts.

Muscular exertion, after fatigue has set in, is unpleasant, and often extremely painful. In general, two conditions appear to be here involved. In the first place, waste of tissue has outrun repair; in the second, the accumulated products of waste probably exercise an influence directly unfavourable to the activity of the exhausted organ. In both ways, neural process may be retarded and disorganised. At the very moment that fatigue of the muscle itself demands increased exertion, in order to produce an equal effect, the fatigue of the nervous tissue obstructs and retards its action. The disorganisation which accompanies action under conditions of fatigue contributes largely to the painfulness of the total state. When we are tired we are also "shaky". On first beginning to hold out a moderate weight at arm's length, the experience

is not unpleasant; at the same time the muscular action is balanced and steady. The motor co-ordinations which it involves take place in a normal way, as provided for in a specific manner by the acquired habits and constitution of the nervous system. When fatigue sets in, muscular exertion becomes disorderly; the arm shakes, and gives convulsive jerks. The inco-ordination continues after the exertion has ceased; and it extends not only to the arm itself, but to the muscular system generally. The balance of the system cannot be recovered until the conditions of fatigue have passed away; and until this happens, all muscular action, above a certain low limit of exertion, is painful. Sometimes the painful state due to inco-ordination continues even after complete cessation of activity. This is apt to happen when over-exertion has been extreme, or when, owing to weakness or ill-health, we are not in a fit state for it.

As a rule, however, repose after exertion which has reached or passed the limits of fatigue, is agreeable, because the cessation of effort opens the way for the recovery of nervous equilibrium. In repose, repair of tissue can undo the effects of previous waste. We must, however, avoid the temptation to treat this as being of itself an immediate concomitant of agreeable feeling. Physiologists are inclined to deny that the mere process of nutrition, as such, has an immediate correlate in consciousness at all. Mr. Marshall would meet this difficulty by his theory that pleasures of rest are due to the stimulation of organs which have not taken part in the previous action, and are therefore fresh. Unfortunately for this view fatigue is as general and has as much right to be called a systemic state as repose. When we are thoroughly tired, we are indisposed for any kind of exertion. We do not tire ourselves out in certain directions, and leave ourselves fresh in others. After a long day's walking we are not merely disinclined for further walking, we are also disinclined for gymnastic

exercises, or serious study. We prefer to say, not that the pleasure is due to the excitement of fresh brain-tracts, but that it is due to stimulations so slight and unexacting that they do not interfere with the general process of recuperation. But even in this modified form, Mr. Marshall's view does not cover the whole of the case. In discussing fatigue, we saw that over-exertion is apt to leave a general neural disturbance behind it. The distinctive source of the pleasure of repose appears to lie in the process by which this disturbed equilibrium of the nervous system is recovered, under favourable nutritive conditions. When fatigue has been extreme, the process of recovery is often delayed either because it awaits the recovery of favourable nutritive relations, or for some other reason. It seems a sufficiently probable supposition, that when nervous co-ordination has been disorganised beyond a certain point, it will for that very reason readjust itself with difficulty. The vagueness of this statement is unhappily forced on us by ignorance of the actual details of the physiological process. In any case, the fact is indisputable, that there is such a thing as being over-tired, and that when this occurs, cessation of muscular action is not repose. Even when sleep ensues, it is apt to be attended by troubled dreams, in which we feel an uneasy continuance of previous effort. Such dreams, of course, are not confined to the case of muscular over-work; the over-tasked student or man of business often engages in sleep in a futile struggle with the difficulties of waking life. It should be noted that this after-effect of over-exertion is not merely systemic. Along with general uneasiness there is also a definitely localised uneasiness. This is so for the most part in primary as well as in what we may call secondary fatigue. The pleasures of repose correspond, both in their general diffusion and in their specific localisation, to the pains of fatigue. After holding out a weight with the arm till the exertion has become painful, the

relief which follows discontinuance of the action is both general and special. We have a conspicuous pleasure which we refer directly to the cessation of muscular exertion in the arm; and we have also a vaguely localised satisfaction in resting the whole body, and in sitting or lying down. Where localisation becomes blurred, it will be found that the fatigue itself has been proportionately diffused. It often happens that the localised relief is most marked in the commencement of repose; and it afterwards becomes inconspicuous or ceases to be distinguishable from the general sense of ease. Many other details require to be analysed and explained; but it is clear that Mr. Marshall's sweeping denial of localisation cannot be maintained.

We have seen that the pain of fatigue is in part connected with motor inco-ordination. Such disorganisation of motor function is always disagreeable from whatever source it may arise. When the normal course of movement is interfered with by convulsive jerks, by tremor, or by innervations of muscles not concerned in the special activity, the process itself is unpleasant quite apart from its failure to attain an ulterior end. The inco-ordination may be due to the unfamiliar nature of the adaptation required, or to the presence of unforeseen conditions falsifying anticipation. The beginner at billiards, straining all his powers to make a particular stroke, may find that his hand disobeys him and moves convulsively. The failure to find resistance where it was expected, as in lifting an empty water-jug supposed to be full, disorders the working of the motor apparatus in a highly disagreeable way. The execution of delicate and complex movements with facility and precision yields a corresponding pleasure when the deadening effect of habit does not intervene.

§ 6. Organic Cravings.

Organic craving arises when an organ is in whatever way excited to its specific mode of activity in the absence of environing conditions required for the fulfilment of the appropriate action. Its most common occasion is the arrest of regularly recurrent function. The craving of hunger normally arises when on the recurrence of the usual time for eating, food is denied. The pain of such an experience ranges itself without difficulty under our formula. The stomach is stimulated to act in accordance with its special function and an essential condition of its activity is wanting. There is a disturbance of neural equilibrium with arrest of the corresponding vital series.

Mr. Marshall is logically bound by his theory of the pains of obstruction to regard the pain of hunger as due to over-feeding. The stomach being the organ obstructed must according to him be inactive, and the disagreeable consciousness must be due to the failure of the inactive organ to take up into its substance the nutrition with which it is supplied, and to the consequent clogging of the nutritive channels. Critical comment on this appears superfluous. Hunger proper is a sensation definitely localised in the alimentary canal and not an experience vaguely diffused over the whole organism with the exception of the stomach. The stomach is not inactive in hunger. It is uncomfortably active though it cannot gain its point. The paradox of tracing the pain of hunger proper to over-feeding may no doubt be explained away. But it becomes real in the case of inanition or faintness due to the failure of the customary supply of nutriment to the organism in general, including the nervous system.

It is superfluous to deal separately with other organic cravings such as those for fresh air, for drink, for tobacco and opium, and for sexual pleasure. In all these cases excitation

exists together with some kind of interruption or obstruction of the vital series which would lead to cessation of activity through specific processes predetermined by the constitution of the nervous system.

§ 7. Pain-Sensations.

The word *pain*, besides its general application to cover all displeasure or dissatisfaction, has also a peculiarly restricted sense. It is distinctively applied to a certain class of sensations arising from disease or violent disintegration of tissue. When these are produced by stimulations of the skin, they are clearly distinguishable from ordinary cutaneous sensations, such as those of pressure and temperature. Extreme heat and extreme cold produce the same painful experience, which is very different from the sensations either of heat or of cold in their disagreeable phases. Under the influence of anæsthetics and in cases of hysteria and of locomotor ataxia, the sensibility to pain-sensations may disappear while other dermal sensibility persists. It has been shown experimentally that an interval of time separates pain-sensations from those of pressure or temperature when both are produced by the same stimulus. The pain-sensations occur later. Pain-sensations have a sensory quality distinct from their mere disagreeableness. It is possible to compare them in other respects besides intensity. Goldscheider following Erb enumerates the following modes of difference and agreement: (*a*) The admixture of other sensory qualities; as in *burning* pains, etc. (*b*) Localisation and diffusion; as in *pricking* pains, etc. (*c*) The temporal sequence and rhythmic alternation of the different phases of the experience; as in *throbbing* pains, etc. (*a*) may be dismissed as of secondary importance. The essential points of difference and agreement are to be found in the temporal and local distribution of the constituents of the complex experience.

Pain-sensations form a class by themselves as truly as do sensations of pressure or of smell. It is possible that they are mediated by a distinct set of nerves. At any rate there appears to be no psychological objection to such an hypothesis. The problem belongs properly to physiology.

On the main question why these experiences are disagreeable we must in absence of detailed knowledge express ourselves vaguely. The violent and abnormal character of the stimulus deranges the normal working of the nervous mechanism—possibly in some such way as that in which violent discharge to a muscle produces cramp. There seems to be no sufficient reason for making inadequacy of nutritive supply the sole principle of explanation. All that we can say is that the destructive action of the stimulus is of a kind or degree or both which precludes or hinders a reconstruction in accordance with the constitution of the nervous system. Thus the general flow of mental activity is impeded, and sooner or later the vitality of the organism as a whole is lowered.

§ 8. Sensations of the Special Senses.

Sensations of sound, light, flavour, odour, temperature and pressure all become disagreeable when they are intensified beyond a certain point. At least this is the general rule; possibly there are exceptions; there are some who do not appear to find any degree of sweetness disagreeable. The converse proposition, that all these sensations are agreeable when they are not too intense, has also been maintained. It may be true; but it is difficult to verify in some cases. Certain flavours and odours are unpleasant even when they are very faint. Mr. Marshall and others have referred the disagreeable effect of over-intensification to nutritive relations alone. But on this view it is difficult to explain why one flavour, for example, should be disagreeable even at a low

degree of intensity, while another continues to give pleasure even at a very high degree. There is no reason in the nature of the case why the quality of the stimulation should not count as well as the quantity. Though the sensation may appear simple to introspection, the neural process is complex and involves a vital series which may be obstructed either through unfavourable nutritive relations or otherwise. As regards actual details we are in a state of almost complete ignorance. It appears however from the researches of Dr. Féré that pleasant sensations of this kind have an immediate "dynamogenic" effect. They increase the vigour of the nervous system generally so that in the case of hysterical patients they produce a marked increase of muscular power as measured by the dynamometer. Disagreeable sensations operate in the reverse way.

A pleasant sensation when uniformly continued beyond a certain time subsides into indifference, and if we continue to attend to it, it becomes disagreeable. In general, the disagreeableness seems to be mainly of the nature of tedium in so far as it is not due to muscular fatigue arising from continuance of the movements of fixation. So long as the stimulus is pleasing, its removal will give rise to the pain of unsatisfied conation, unless attention is diverted into other channels. Continuance of stimulus until indifference is reached is a necessary condition of the completion of the vital series.

When impressional experience which has been pleasing is ideally revived, after satiety has passed away, a demand for renewed stimulation arises. Hence every pleasure of sense may subsequently give rise to craving or desire.

In conclusion we may refer to the question whether disagreeable feeling may arise in consequence of under- as well as of over stimulation. Tickling is often regarded as a case in point. It is urged on the other side that a light touch may really constitute a strong stimulus, and also that accompanying

spasmodic movements ought to be taken into account. We should, I think, distinguish two conditions under which tickling is unpleasant. It is highly unpleasant when it is carried to an extreme so as to produce violent motor reaction. But it is also very unpleasant when it arises from an extremely slight and brief contact which is not repeated in the same place at short intervals. The discomfort then seems to arise from an unsatisfied craving for further stimulation which requires to be appeased by rubbing, scratching, or renewed contact. The extreme pleasure some persons feel in having their face or the palm of their hand tickled, seems to consist in the satisfaction of a kind of cutaneous craving aroused by previous contact and gratified by more or less regular repetition of the stimulus. Enjoyment of this kind seems capable of being almost indefinitely protracted. At any rate the operator becomes bored much sooner than the patient.

§ 9. The Psychological Theory of Sense-Pleasure and Pain.

It must be admitted that our psychological theory of pleasure and pain is not so easily applicable to the pleasures and pains of sense as to those which involve ideal activity. It may even be said that it breaks down at this point, and that we have merely masked the failure by substituting physiology for psychology. The truth is, that any purely psychological theory must, from the nature of the case, to a certain extent break down when it comes to deal with sense-pleasures and pains, because it cannot here find sufficiently definite data for its verification. At the higher levels of mental life the psychical conditions of pleasure-pain are definitely ascertainable. They are referable to processes which we can describe by assigning their several phases and their co-operative factors

in psychological terms. This holds good only to a limited extent in the case of sense-pleasures. The disagreeableness of a bitter taste is connected with the peculiar quality of the bitter sensation. Definite psychological explanation must depend on definite psychological analysis of the sensory process concerned. But no such analysis is possible. The felt bitterness is, for introspection, something simple and uniform, in which we cannot discern co-operating factors and distinct phases.

What, then, is the psychologist to do? He must, in the first place, show that the psychological data which *are* forthcoming support his theory or at least harmonise with it, although they may not be sufficient to establish it. There are certain broad facts to which he can point. Thus, *ceteris paribus*, a pleasant sensory process tends to maintain itself until satiety is reached, and, *ceteris paribus*, it then tends to cease. In smoking a cigar, I go on puffing it so long as enjoyment lasts; where enjoyment ceases, I tend to leave off. Similarly, the cat on the hearth-rug maintains its comfortable position and its curious action of purring so long as it continues to be gratified by doing so. It shifts its position when the pleasure palls. This feature of sense-pleasure supports the view that pleasure lies in the satisfaction of a conation. While the pleasure lasts, the conation is being satisfied. It is working itself out. When satiety is reached, it has been satisfied. It *has* worked itself out, and reached its termination. Until satiety is reached, there is always a tendency for the process to go on. Again, if the pleasing sensory process is discontinued or obstructed *before* satiety is reached, the experienced tendency becomes an experienced tension. If my cigar goes out, or if I let it fall while I am in the full current of enjoyment, an unsatisfied craving results. If one gently tries to push the comfortable cat off its hearth-rug, or to alter the attitude which it has been actively maintaining, one may,

so to speak, feel with the fingers the resistance of the obstructed conation. This, again, fully harmonises with the psychological theory which we advocate. Equally favourable to it is the fact that any pleasing experience may give rise to an unsatisfied conation, when its conditions are only partially repeated; as when the corresponding idea is called up, and the external stimulus withheld. Further, the movements and the attitudes (which may here be regarded as a kind of movement), expressive of sense-pleasure and pain respectively, present a material analogue of the psychical condition. In pleasure, movement is free and harmonious. In pain, co-ordination fails, and the corresponding movements are irregular, jerky, and mutually conflicting; so that the external process, like the internal, is at war with itself.

These comparatively vague characteristics of sense-pleasures and pains furnish the sole psychological clues to their explanation. The psychologist may content himself with referring to them without entering further into the question. He may fairly say that the explanation demanded by the more abundant and definite data of the higher processes, presumably applies also to the lower; and that what we know of the lower at least harmonises with it. But the correlation of physiological and psychological process suggests, at this point, a most interesting problem. Where definite psychological formulation fails, definite physiological formulation may still be possible; and the question which naturally arises in his mind is, whether his general psychological explanation can be so translated into definite physiological terms as to give a more or less definite physiological explanation of the hedonic aspect of sensations. And, in particular, it is incumbent upon him to compare the theory thus suggested to his mind by psychical facts, with any current physiological theory which may appear not so well to fit these facts. Final adjudication on his suggestions must be left to the physiologist; but it is quite

legitimate for him to indicate the direction in which psychology points. It is even possible that the physiologist may find such a treatment of the subject suggestive. If he, in his own sphere, can independently establish a physiological explanation analogous to the psychological theory, that theory may be regarded as finally proved.

THE END

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