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A NEW PRIMER OF PSYCHOLOGY



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A NEW PRIMER OF PSYCHOLOGY

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TO
N. K. SEN.

FOREWORD

THE object of this book is to provide an easy exposition of the difficult arguments and conclusions of recent Psychologists. A fresh comment here or a new opinion there is all that the author claims as his own. But an attempt has been made to knit the various *new* theories together into a system and to explain *all* the broad facts of mental life with reference to fresh principles by bringing them under the concepts recently introduced ; and it is hoped that the book will in this way prove useful to the beginner in Psychology.

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I

GENERAL

Data of Psychology — ‘All the special sciences,’ says Stout,¹ ‘grow out of the common matrix which is supplied by that ordinary pre-scientific knowledge of the world which we call common sense, the knowledge possessed by the “plain man” or the “man in the street.”’ More than any other science, Psychology as studied at the present day borrows much of its data from facts with which we are all more or less familiar. Every day we have to deal with our own and our friends’ likes and dislikes, personal whims and idiosyncrasies, modes of behaviour, emotions, desires, thoughts and opinions. All these are excellent material for psychological study. Even our dreams and casual memory and oblivion of past incidents, names and dates, the so-called chance happenings and the slips of the tongue and the pen, and the insignificant movements of our limbs and features, are utilised as highly suggestive objects of observation. Only the psychologist looks at them from a different point of view and interprets them in a different manner from that in which the ordinary man sees and understands them. ‘The one rule,’ says Ladd,² ‘for the

¹ *Manual of Psychology*, p. 28.

² *Psychology*, p. 21.

student of Psychology—a rule which he carries about with him when far away from books or psychophysical, and biological laboratories—is this: seize upon every manifestation of psychical life, try to make it an object of knowledge, and try to *explain* it in accord with other facts and known laws of psychical life. From the infant to the adult Kant, from the idiot or madman to Aristotle, from the meanest subject to the statesman or the emperor—all things psychical are yours, and are to be converted if possible into integral parts of your psychological theory.'

A far more valuable source of psychological data is provided by the standard works of art and literature. Drama, poetry, sculpture, painting and music are all apt objects of study from the psychological point of view in so far as they give us an insight into the structure of the popular mind.

Besides the expression of mental life in conduct and literature, there are certain branches of scientific knowledge, such as philology, anthropology, mental pathology and the hypnotic and psychoanalytic methods of curing nervous diseases, which contribute to the fund of material upon which the psychologist works. Since thought finds its expression in language, the different levels of linguistic development point to the corresponding stages in the mental development of the people. In the same way a comparative study of the emotions and beliefs of primitive races is undoubtedly of great psychological value. The psychological examination of the insane, of those born blind, deaf and mute, of the anæsthetic and of people who have no sense of smell, affords immense assistance in attaining to accurate

knowledge of the workings of the normal mind. The recent discovery of the psychoanalytic method and the force of suggestion on human and animal behaviour has thrown a flood of light on the structure of mind, and has virtually revealed the great wealth of subconscious mental phenomena.

Mental Processes.—Any occurrences in the external world or within the body itself which excite a sense-organ are technically known as ‘stimuli,’ and the changes which are produced in the body as a consequence of stimulation are called ‘responses.’ If we observe the stimulus-response mechanism carefully, we shall find that in most cases the responses in the form of bodily behaviour are utterly disproportionate in volume and complexity to the impressions made by external things on our sense-organs. We may borrow an apt illustration from MacDougall¹ to show what a world of difference would be made in the behaviour of a person reading a message delivered to him if a single letter were added to that message.

Suppose the original stimulus—the written sentence, ‘Our son is dead’—is slightly changed so as to read, ‘Your son is dead.’ The perusal of the former sentence, as MacDougall puts it, may result only in writing a letter of condolence or the utterance of an expression of grief, while the latter sentence may throw the reader into paroxysms of profoundest sorrow and cause a total change in his character throughout the rest of his life. Obviously the single letter ‘Y’ has no such force as would produce all this change. It is something that *goes on in the man or happens to him* immediately after

¹ *Body and Mind*, p. 268.

the stimulus is presented to him, which is responsible for this surprising change in his behaviour. X Between the presentation of a stimulus and the discharge of an appropriate response there needs must occur changes of a very complex and systematic nature and of extreme importance to the organism. What results in the case cited above is, briefly, the emotion of grief. It may in less serious cases be only a perception, an idea, an image, a memory, or a complex of two or more of such phenomena. It is changes of this nature going on in us that are known in Psychology as 'mental processes.' Mental processes resemble physiological processes in so far as they have some sort of connection, however mysterious may be its nature, with a living body. Like a physiological process, a mental process cannot be seen hanging in the skies. It must be *my* mental process or *yours* or somebody else's. But mental processes differ from physiological processes in a much more important point: they are, in the words of Royce,¹ 'private property,' whereas physiological processes are in comparison 'public property.' What is meant by this somewhat figurative language is this: that if a physiological process—circulation, respiration or digestion—is going on in an organism, everybody can examine it. Nay, the doctor is in a better position to examine the physiological processes of a patient than is the patient himself. But the one great feature which distinguishes a mental process from all other processes in the world is that it is available for direct observation only to the person whose mental process it is, and to nobody else. Two or more of us can perceive or imagine or remember the same object, but

¹ *Outlines of Psychology*, p. 2.

it is in no way possible for us to share one another's perceptions, images, ideas or memories.

Mind and Consciousness.—Mind has been defined as the sum total of mental processes.¹ But what we find in a being endowed with mind is not only a series of particular states that have no relation to each other. Even those psychologists who speak of mind in terms of mental processes do not consider it to be a mere aggregate of these, but regard it as a *continuous* flow. The various mental states which follow one another are compared to the waves of a stream rather than to so many islands separated by water. When we pass from the totality of mental processes at any one moment to the state of the mind at the next, we do not go through an abrupt change, but have only a *gradual* transition. The previous experience enters into and modifies each succeeding phase of mental life.

Besides temporal continuity, there is a deeper kind of unity which binds mental processes together. Mental phenomena are not found in isolation, but are met with only as parts or phases of a complex whole. 'The unity of consciousness,' says Stout,² 'is clearly implied in such pairs of correlative terms as expectation and disappointment, trial and failure, desire and satisfaction, purpose and fulfilment.' An expectation can be disappointed, a trial can fail, a desire can be satisfied and a purpose can be fulfilled only if the same individual experiences both of a pair of them, not otherwise. Here a word of warning must be given against the tendency to think of the unity of mind after the pattern of the unity of a material

¹ Cf. Titchener's *Primer of Psychology*, pp. 4-7.

² *Manual of Psychology*, p. 12.

thing. The unity of a material thing is the unity of component parts extended in space and each spatially, external to the other, while the unity of mental life is *conative* unity. To borrow an apt illustration from a contemporary author¹ of great eminence, you get up in the morning, dress, wash your face, take your coffee, read for a while, go to college, and so on. All these at first sight seem to be distinct activities, quite independent of each other. But a closer examination reveals to you the fact that they all rank among the different steps you have to take if you wish to obtain a University Degree. All these different activities are one in the light of the *purpose* they have in view. These several purposes themselves are subordinated to a still higher one, and so on, until at last our whole life seems to be an attempt to realise one life-plan or ideal that we have set before ourselves.

Whenever we are occupied with any one subject or topic, we do not confine our attention to a particular mental process, but are conscious of a number of them, all dealing with the same subject-matter. Sometimes some of them are separated from the rest by the lapse of considerable time, yet they are all concerned with the same topic. In our classroom lectures, for example, we take up the topic where we left it in the preceding lecture. Although any two lectures are temporally discontinuous, they are conatively continuous in so far as they deal with the same subject-matter. The topic developed in a long course of lectures may be one and the same.

Although mental life is essentially teleological, that is,

¹ S. Radhakrishnan, *Essentials of Psychology*, p. 23.

purpose, we ought not to assume that a clear or full *anticipation* or idea of the end which is pursued is always present. 'In many of our own voluntary actions,' says MacDougall,¹ 'the end is anticipated or foreseen in the most general manner only. To take a trivial but illustrative instance, you cough in order to clear your throat; or, experiencing a slight irritation in your throat, you put out your hand, take up a glass of water, and drink in order to allay it. How very sketchy and ill-defined may be your thought of the end of your action. . . . From our own experience we are familiar with actions in which anticipation of the end varies from that of the most clear and detailed nature through all degrees of incompleteness down to the most vague and shadowy, a mere anticipation of change of some undefined kind.'

Mental life is thus seen to consist not merely in a succession of different states, but in an activity which is, consciously or unconsciously, ever busy in the pursuit of ends.² Dr. Jung³ has introduced the conception of psychic energy in order to explain this activity. 'All psychological phenomena,' he says, 'can be considered as manifestations of energy, in the same way as all

¹ *Social Psychology*, p. 358.

² The only end pursued by mental life is declared by the evolutionistic psychologists to be the preservation of the individual and the race under the conditions of competition—the attainment of fitness to survive in the struggle of existence. But however useful mental phenomena may be for this purpose, existence in itself cannot be the final goal of mental life. With the problem of what the ultimate end of life is, however, empirical psychology has nothing to do.

³ *Analytical Psychology*, p. 231.

physical phenomena are already understood as energetic manifestations. I call it *libido*. . . . From a broader point of view libido can be understood as vital energy in general, or as Bergson's *élan vital*. The first manifestation of this energy in the suckling is the instinct of *nutrition*. From this stage the libido slowly develops. . . . This process of development continues into adult life, and is connected with a constantly increased adaptation to the external world.'

Whenever we make an effort to achieve an end, our psychic energy is expended. In the simplest mental processes, *e.g.* that of coughing to clear the throat, mentioned by MacDougall, the psychic energy expended is very slight.

To sum up, then, by mind we understand not merely a sum-total of mental phenomena, nor only a continuous unitary whole manufactured by putting these together, but an individual made up of ever-changing processes, possessing conative unity and continuity, and charged with psychical energy. We may therefore define mind as an organism which by a discharge of energy continually expresses the life that it has, in the form of so-called 'states of consciousness.'

In the last sentence of the preceding paragraph we have purposely characterised states of consciousness as 'so-called.' This should not be understood to mean that mental processes are not conscious, or that consciousness is not a manifestation of mental activity. On the other hand, all conscious states are mental, and consciousness is nothing but a type of mental activity. But conscious processes alone do not make up mind. A large part of our mental processes are such that we never

become conscious of them. They remain unconscious for the whole of a lifetime. The fact is that if we define mental phenomena as conscious phenomena we cannot get a clear conception of mind as a whole. 'Conscious phenomena,' says Tansley,¹ 'are constantly appearing as fragments of a larger whole. They cannot be understood without reference to that whole. . . . It follows that we must assume the existence of unconscious mental processes to complete the whole of which conscious mental processes are clearly a fragment. In other words, the hypothesis of an unconscious part of mind is necessary to the progress of psychology, and that is its sufficient justification.'

In order to illustrate the contents of the unconscious part of mind, let me quote a concrete example given by Dr. Jung.² 'A merchant, who is happily married, father of two children, thorough and painstaking in his business affairs, and at the same time trying in a reasonable degree to improve his position in the world, carries himself with self-respect, is enlightened in religious matters, and even belongs to a society for the discussion of liberal ideas. . . . This man *consciously*³ considers himself to possess all the fine attributes just described—no more, no less. Then it must obviously result that he is entirely unaware that a man may be not merely industrious, thorough, and painstaking, but that he may also be careless, indifferent, untrustworthy ; . . . This worthy merchant forgets that quite recently he allowed several letters to remain unanswered which he could easily have

¹ *The New Psychology*, p. 49

² *Analytical Psychology*, p. 279.

³ The italics and the parenthesis below are mine.

answered at once. He forgets, too, that he failed to bring a book home which his wife has asked him to get at the bookstall, where she had previously ordered it, although he might easily have made a note of her wish. But such occurrences are common with him. Therefore we are obliged to conclude that he is also (unconsciously) lazy and untrustworthy. He is convinced that he is a thoroughly loyal subject; but for all that he failed to declare the whole of his income to the assessor, and when they raise his taxes, he votes for the Socialists. He believes himself to be an independent thinker, yet a little while back he undertook a big deal on the Stock Exchange, and when he came to enter the details of the transaction in his books he noticed with considerable misgivings that it fell upon a Friday, the 13th of the month. Therefore, he is also (unconsciously)¹ superstitious and not free in his thinking.'

Keeping in view all the facts mentioned above regarding the structure and activity of mind, let us now consider some important characteristics of the succession of mental processes. To start with, every state of mind that is present at any time is stretched over an appreciable period of time called the psychical or the specious present. Although it is generally spoken of as the *moment* of consciousness, it comprises a number of mental processes and *occupies time*. It is in this sense that Titchener² speaks of a getting-up consciousness, a breakfast consciousness, and so on. In every such *now* of consciousness we are obviously directly aware of the

¹ The parenthesis is mine.

² *Primer of Psychology*, p. 20.

strictly *present* states, and the past and the future states are made present to the consciousness through memory or anticipation. 'Consciousness,' in the words of Lloyd Morgan,¹ 'does not deal with the past or the future, but with representations of past or future events.' And these *representations* occur in the present moment of consciousness.

I have already directed the attention of the reader to the continuity of mind. But mental processes do not resemble so many links of a chain. *Each mental process is like a wave in a stream of water* which transforms itself into another wave; and there is no hard and fast line separating one wave from another. The stream of conscious mental processes flows at two levels—a higher level and a lower level. All the mental processes that are clearly before consciousness at any time occupy the higher level, while those of which we are not fully conscious are relegated to the lower level. The processes on the lower level are not altogether of no account for the state of consciousness. They provide a setting or background for the processes on the higher level. Every consciousness is what it is in virtue of the subconscious background.

We have seen that besides the subconscious or the 'foreconscious' mental processes which occupy the troughs of the succeeding waves of mental phenomena, there also exist in the mind entirely unconscious mental processes which may never reach the threshold of consciousness. Such processes are sometimes described as 'Infra-conscious.'

The diagram (Fig. 1) illustrates the various levels

¹ *Introduction to Comparative Psychology*, p 11.

of mental phenomena on the analogy of a stream of water.

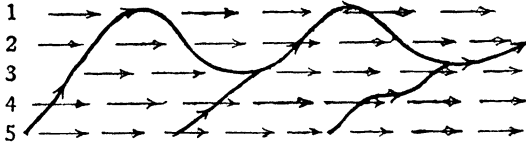


FIG 1—THE STREAM OF MENTAL PHENOMENA

- (1) represents the level of consciousness
 (2) and (3) represent the levels of subconsciousness and foreconsciousness
 (4) and (5) represent the unconscious level

The same facts regarding consciousness are sometimes illustrated by another analogy. The state of mind at any moment is compared to a field.

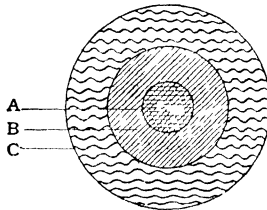


FIG 2—THE FIELD OF MENTAL PHENOMENA

- A. Conscious processes
 B. Subconscious processes
 C. Unconscious processes

In this field there is a central or focal region, the region corresponding to the highest level of the wave of consciousness. Then there is a marginal region which is occupied by the subconscious mental processes; and, thirdly, there is the extra-marginal region in which reside the infra-conscious or unconscious mental pro-

cesses lying altogether below the threshold of consciousness. To revert to the example of the merchant cited before, at any time the details of business with which he may be then occupied constitute the focus of his consciousness. His own opinions about himself—that he is industrious, thoroughgoing, loyal, trustworthy—make up his subconscious or the foreconscious, which comes up to the conscious level every now and then. So long as these items of his knowledge remain subconscious they occupy the marginal regions. The moment they flash up to consciousness, they appear in the centre of his consciousness. Again, he has the defects which were noted above, of which he is never conscious. These are all extra-marginal for him. While the conscious processes are constantly changing, the subconscious and the unconscious processes are comparatively more permanent. They abide while a considerable number of conscious processes have succeeded one another. It is these processes, therefore, which go a long way in maintaining the continuity of mind from one state of consciousness to another.

Introspection and Observation.—For those psychologists who define mental phenomena as conscious phenomena, the chief method of psychology must obviously consist in Introspection—the examination of mental processes by the person whose mental processes they are. For an observation of our own experience the designation of Introspection is very convenient, in so far as the name suggests that the business of the psychologist consists mainly in the observation of self. Introspection is looking self-ward, as opposed to Inspection, which denotes looking outwards at things and processes

other than the self. 'States of consciousness can only be observed by *introspection*—that is, by the turning of the mind on itself. Consequently this faculty of internal observation must be our chief instrument in the study of the mind.'¹

Curiously enough, Nature has so ordained that we are often least familiar with things with which we are in a sense most intimate. We feel quite at home if somebody talks to us of our books and clothes, friends and enemies, houses and playgrounds; but we are soon perplexed if we listen to a discourse on the circulation of our own blood or the digestion of our own food, although the latter are operations which are considerably closer to us than the former objects. *These* exist in the world *outside*, while the others are processes going on in our own bodies. Still greater is our difficulty if we attempt to look into our mental operations. To a layman introspection is a task well-nigh impossible for him to perform. The beginner in Psychology almost always fails entirely to seize upon a mental process. 'In our first attempts,' says Titchener,² 'we are "all at sea."' It is only by long practice that one can learn how to observe mental processes. Like all other faculties, introspection is also made perfect by exercise. The more you keep yourself occupied with unfamiliar things, the more you grow familiar with them. Patience is sure to stand an observer of mental phenomena in good stead till, in the end an expert in the art of introspection finds it as easy to grasp a mental process and study it as to open a book and begin to read.

¹ Maher, *Psychology*, p. 11.

² *Primer of Psychology*, p. 24.

There is an even greater difficulty which besets psychological observation. Introspection itself being a mental process, it interferes with the mental state which it aims at observing in its isolation. A mental process being introspected is surely different from one running its course in absolute freedom. Introspection is a unique state of the mind, and colours all that it covers. To introspect, therefore, is not to observe a mental phenomenon in its purity. Hence psychological observers do not examine any mental process while it is actually present. They let it run its course undisturbed, and observe it immediately after it is gone. It is on account of this that introspection may be called a ‘*post-mortem* examination.’ Just as a dead body cannot give us a thorough insight into the workings of a living organism, in the same way introspection is but a poor substitute for a direct knowledge of the living, active, mental process. The truest knowledge of mind consists only in that direct intuition or immediate perception of mental life which we all feel more or less unconsciously as we ourselves live it. A poet, an artist, or a philosopher knows best what life consists in—much more than a poor scientist can detect even with the aid of the most elaborate methods of introspection and interpretation.

These methods are consequently falling into bad odour. The New Psychology aims at removing the veil which covers the real springs of mental life, and it finds introspection sorely inadequate for the task. Moreover, the discovery of the unconscious has rendered introspection utterly helpless so far as that great portion of mental activity is concerned. How can a man introspect a state of mind of whose existence even he is

altogether unconscious? That which always remains below the threshold of consciousness is altogether beyond the scope of introspection. Psychology was shrouded in mystery for many centuries in the past, and is again drifting towards mysticism, from which the experimental school of psychologists tried their best to save it. As we have already seen, the data of Psychology are sought from the facts of trance, insanity, and hysteria; heredity and phantasies of childhood, slips of the pen, reveries and dreams. And the method consists only in a systematic observation of all these phenomena with a view to inferring from them the existence of mental states which nobody has ever consciously observed—the foreconscious and the unconscious operations of the living, active mind. The technical name now given to a psychological observation of this kind is Psychoanalysis.

Psychoanalysis is defined by Dr. Jung¹ as the reduction of an actual conscious content of a so-called accidental nature into its psychological determinants. The principle of psychoanalysis is based upon the theory that all psychical phenomena must be explained with reference to psychical causes. The Experimental and the Physiological psychologies betray a tendency towards the explanation of mental processes in terms of physiological changes. All mental phenomena are said to be conditioned by physiological processes, and the task of the psychologist is supposed to consist in tracing them all to their true bodily conditions. In this respect the New Psychology is fundamentally different in spirit and point of view. The immediate cause of a mental alienation,

¹ *Analytical Psychology*, p. 207.

for example, is no longer to be looked for in an abnormal condition of the brain, but is nowadays supposed to consist in some unconscious mental phenomena, completely hidden from the view of the patient as well as the physician. The origin of the new analytical Psychology is mainly Psychotherapeutic. It therefore falls exclusively neither within the scope of Psychology nor within that of medicine. By virtue of the principle of association—conscious and unconscious—to which we shall have an opportunity to refer in detail, those causes of abnormal mental phenomena are discovered which lie below the threshold of consciousness; and no sooner are these subliminal operations brought to the level of consciousness than the abnormality in mental life ceases, and the patient recovers from the disease.¹

Observation and Experiment.—Experiment as a psychological method is being resorted to both by the old introspective and by the new analytic school of Psychologists. Strictly speaking, no hard and fast line can be drawn between the processes known as ‘observation’ and ‘experiment.’ Both consist in an examination of relevant facts from a scientific point of view. Experiment is only a more thorough observation. It aims at greater precision and accuracy in the examination of scientific data. Hence it has often been defined as observation under ‘standard’ conditions. While observations are made under natural circumstances, an experiment is performed under circumstances artificially determined by the experimenter. That psychical facts should be examined under standard conditions is rendered necessary by the nature of psychological data,

¹ See Chapter VIII.

in order to ensure some degree of uniformity in the working and the results of the science. Very often they are very different processes that go on in different minds, or in the same mind at different times, which are all given the same name. To take an easy example, my experience of pleasure when I taste a delicious food is entirely different from my experience of pleasure when I find an appropriate expression to convey a difficult thought, although both states of mind go by the same name. In the same way, my mental process when I say I am happy or sorry or afraid or angry is more often than not considerably different from your state of mind when you attribute the same feelings to yourself. Thus it is absolutely necessary that, *so far as it lies in our power*, we should try to observe a mental fact under determinate circumstances. In this way, and in this way alone, is it possible for different observers to work together upon one and the same problem.

Psychology has been experimental in this sense ever since its inception. But modern psychologists have introduced Experiment into Psychology in a more technical sense, the sense in which experiments are nowadays performed in scientific laboratories. They measure the durations and intensities of mental processes just as they carry out measurements in a natural science. The method they follow is to give various stimuli to a person who is asked to make notes of what goes on in him under different conditions which the experimenter changes at will. Various instruments are also devised to measure the exact time which elapses between the stimulus and the response, and the exact degree of the intensity of the response. From the varying lengths

of delay and the varying nature and intensity of the response they infer various things about the quality and quantity of the mental process. The reader will have a clearer insight into the details of what a psychological experiment is when he comes to the Reaction-Time experiments in Chapter X.

II

MIND AND BRAIN

The Central Nervous System.—The trend of present-day Psychology is to make a study of mental phenomena entirely independent of any investigation of the physiological activity of the organism. But mental processes are so intimately connected with nervous processes that by far the larger number of psychologists view all states of mind as accompanied and conditioned by definite processes in the bodily organism. The science which studies mental life in its connection with the physiological functions is known as Physiological Psychology. Every psychosis is supposed to be a neurosis. ‘The fate of the mind,’ in the words of Angell,¹ ‘is bound up with the experiences of the physical body.’ One of the problems, therefore, which a psychologist is called upon to solve is the tracing of the appropriate physiological conditions of every mental phenomenon that he studies. The only explanation of mental processes is said to be found in the nervous processes by which they are supposed to be determined. Without presuming to decide between these schools, one may point out the fact that a working knowledge of the physiology of the nervous system is necessary for a thorough understanding of

¹ *Chapters from Modern Psychology*, p. 45.

Psychology. We have seen that mental life is essentially teleological, and that one of the greatest aims towards which mental activity is directed is the sustenance and the preservation of the self. This is the purpose for which a nervous system is eminently fitted. 'Creatures destitute of some form of nervous system,' says Angell,¹ 'are practically incapable of prompt and appropriate adaptation to these surroundings. . . . By means of its nervous system every part of an animal organism is brought into vital connection with every other part and the outside world. Adaptive co-operation becomes the controlling principle in the life activities.' The more complex and the more highly developed is the nervous system of an organism, the greater is the chance for that organism to come out successful in the struggle for existence. Man, who occupies the highest place in the scale of organic evolution, and commands the largest number of most complicated mental processes to cope with the difficulties of life, also possesses the most highly evolved type of nervous system.

In the completely developed nervous system we can distinguish a peripheral part and a central part. The peripheral part of the nervous system consists of nerve fibres which connect the central part with the sense-organs, muscles, or glands with which the body is equipped. A bundle of nerve fibres is technically known as a nerve. Those nerves which carry an impulse from a sense-organ² to the central nervous system are called 'sensory' or 'afferent' nerves, while those which transmit the impulse from the central part of the nervous

¹ *Psychology*, p. 16.

² See Chapter IV.

system to either muscles or glands are said to be 'motor' or 'efferent' nerves.

The central part of the nervous system is made up of the brain and the spinal cord. The brain is divided into three parts. The uppermost is called the cerebrum. At the base of the cerebrum lies the mid-brain. The lowermost part of the brain is the cerebellum or the hind-brain. The medulla oblongata or the 'bulb' connects the brain with the spinal cord.

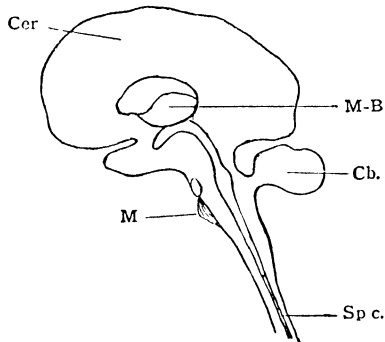


FIG. 3

Cer the cerebrum, *M-B* the mid-brain, *Cb* the cerebellum, *M* the medulla oblongata, and *Sp c* the spinal cord.

(After Angell)

An impulse may pass from a sense-organ to a muscle by way of the spinal cord without reaching the brain. The pathway of such an impulse is called a reflex arc. Even if you take away the brain of an animal it will respond to many stimuli by means of these reflex arcs. Every organism possesses these instinctive mechanisms, which help to secure the preservation and sustenance of the organism. 'For example,' say Smith and

Guthrie,¹ ' a foreign object in the nose calls forth a sneeze response that removes the irritating object. The visual stimulus of a fleeing mouse causes the cat to make movements that result in the mouse's capture, just as the mouse, receiving the visual stimulus of a cat, is impelled to make movements of flight. A baby will grasp the person who holds him if the support is suddenly released. One of the responses to stumbling is extending the hands, and this protects the more vital parts of the body from injury.'

An impulse, starting from a sense-organ, may either return from the spinal cord directly to a muscle or gland, as we have seen, or it may be transmitted from the spinal cord to the cerebellum, and may return via the spinal cord to a muscle or gland ; or else from the spinal cord it may reach the cerebrum by way of the medulla oblongata and the mid-brain, and return thence via the spinal cord or via the mid-brain and spinal cord to certain muscles of the body.

An organism becomes conscious of its own activity only when the current reaches the cerebrum or the brain cortex ; and the kind of consciousness that takes place is supposed to depend upon the part of the brain cortex that is excited, different parts of the brain cortex giving rise to different specific modes of consciousness. If there were no cortex, there would be no sensations, memories, or ideas ; and if any particular part of the brain cortex of an organism is injured or destroyed, the particular mode of consciousness depending upon its excitation will entirely cease to occur in that organism. The cerebral cortex is often compared to an overlord which receives sensory stimulations through the mediation of

¹ *General Psychology*, p. 28.

peripheral nervous centres, and similarly communicates with the muscles and glands by means of the nervous centres in the spinal cord. The physiological condition of consciousness has been described as 'the total mass

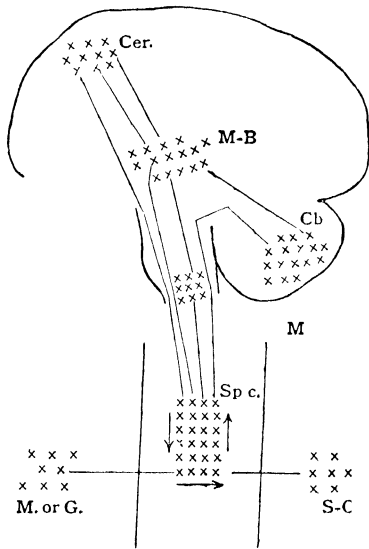


FIG 4

Cer the cerebrum, *M-B* the mid-brain, *Cb* the cerebellum, *M* the medulla oblongata, *Sp c.* the spinal cord, *S-O* a sense-organ, *M* or *G* muscles or glands

of shifting tensions going on all over the cortex at any given moment.’¹ The responses which are made independently of the cortex are comparatively simple. They are more or less fixed and uniform. All the more complex operations, like discrimination, self-control,

¹ Angell, *Psychology*, p. 54.

learning by experience, and moral and intellectual advancement, involve cerebral activity. 'The cerebrum,' says Stout,¹ 'initiates or arrests, combines or separates processes in the spinal cord, the bulb, the cerebellum, and other groups of neurons. . . . It combines and adapts, arranges and co-ordinates the relatively simple movements provided for by the reflex nervous mechanisms, so as to produce more complex modes of bodily behaviour.' In the performance of those activities which cannot be efficiently executed by the simple stimulus-response machinery of the spinal cord, the medulla oblongata, the cerebellum or the mid-brain, the brain cortex has to be active in some way or other, and consciousness appears as a consequence of cerebral activity. The function of the cortex is thus of an organising and supervising nature. It is due to the brain cortex that a suitable action ensues when two or more conflicting natural propensities are at play together. Sometimes one is encouraged and the others are inhibited; while at other times both are suitably modified to give rise to an action which is equally different from any which would have been performed if only one of the rival impulses had been at work. Every organism endowed with a cerebral cortex is, therefore, in a position to adapt itself to its surroundings. It is not entirely at the mercy of the natural play of instincts. The brain cortex regulates and harmonises all the activities of the lower nervous centres. It exercises a check over those which prove to be injurious to the organism and strengthens those which are beneficial, and in this way binds them together into a unified whole with a unity

¹ *Manual of Psychology*, pp. 71-2.

of purpose. Formation of character is possible only by virtue of cerebral activity.

The Mind-Body Relation.—Thus we have seen how closely connected conscious and cerebral activities are. The greater in size as compared to the whole body and the more complex is an animal's brain, the wider in range and the more complex are the processes of that animal's mind ; and a deficiency in mental life is always connected with a defect in the brain. We have now to enquire what precisely is the nature of this relation of body and mind—how they differ from each other, and whether a causal relation holds between mental and physiological phenomena. 'In the nature of the case,' says Hoffding,¹ 'only four possibilities can be conceived : (a) either consciousness and brain, body and mind, act one upon the other as two distinct beings or substances ; (b) or the mind is only a form or a product of the body ; (c) or the body is only a form or a product of one or several mental beings ; (d) or, finally, mind and body, consciousness and brain, are evolved as different forms of expression of one and the same being.'

Interactionism and Parallelism.—The first of these four alternatives alone is dualistic, while the other three are monistic. Besides the interactionist view, that mind and body act upon each other, there is another dualistic theory known as Dualistic Parallelism. According to both, mind and body are two distinct beings or substances, but according to the latter hypothesis they do not act and interact upon each other. The one, on the other hand, is supposed to run alongside the other. The truly parallelistic view, however, indicates a tend-

¹ *Outlines of Psychology*, p. 54.

ency to refrain from theorising in this matter rather than construct any definite hypothesis to explain the facts of experience regarding the relation of body and mind. It may be dualistic or monistic. It is definitely known that every psychosis is a neurosis, and that, *vice versa*, every neurosis is a psychosis; and the psychologist, according to the impartially parallelistic point of view, need go no further. It is supposed to be beyond the scope of psychology to speculate about the precise relations which exist between the two. The parallelist may be either a dualist or a psychophysical monist.¹ Against the interactionist hypothesis it may be urged that mental phenomena and physiological processes are utterly heterogeneous in nature, and the two cannot therefore be causally connected. It is easy to think how one physical movement can lead to another, but it is very difficult to conceive that a sensation or an image or any other mental process can be the cause or the effect of a bodily movement. We know that when we desire to raise our hand, the hand rises, but the exact connection between the desire on the one side and the movement of the hand on the other still remains a mystery, and it is this mysterious nature of the connection that cuts much of the ground from under the feet of the interactionist theory.

In order, therefore, that we may be able to establish a connection of cause and effect between these two sets of phenomena, it is necessary that they should be homogeneous in nature. In short, the duality between mind* and body must cease. However different they may appear to us, mental and material phenomena

¹ See page 31.

must in essence be the same. Hence the monistic views mentioned above. Let us examine them in detail.

Monism.—The first of the three monistic views enumerated by Hoffding is called materialistic monism. According to this view, the mental is only a function or a side of the material. It maintains that the phenomena of mind are only changes or functions of the brain. The brain secretes thoughts and feelings, just as the liver secretes bile or the kidney secretes urine. So much so, that it has been established that certain definite phenomena of consciousness are connected with the functions of certain definite parts of the brain.

Now, monistic materialism is as inconceivable as interactionism. If we cannot conceive how body can act upon mind, still less can we think of the brain giving out mental processes. The analogy between the brain and the glands of the body entirely fails if we give a moment's consideration to it. The glands, being material in themselves, can secrete only material substances like bile, lymph, tears, sweat, or urine. But a material substance like brain cannot possibly secrete an immaterial substance like mind. Nor can we, strictly speaking, talk of the secretion of mental processes as we can talk of the secretion of physical substances. Mental phenomena are not extended in space, and cannot be said to be 'given out' or 'contained' by any material substance or reservoir. We are thus forced to decide that materialistic monism is as unsatisfactory a theory as interactionism.

Opposed to this hypothesis is that of spiritualistic

monism. 'Monistic spiritualism,' says Höfding,¹ 'is the view according to which the mind is a mental substance, and the mental is the only reality; everything material, all movement in space, is but an outer form of a mental life. It is based on the impossibility of explaining the mental by the material, and on the fact, partly overlooked, partly undervalued by materialism, that our conception of matter is a mental product, and that apart from our conception of it we do not know what matter is. . . . The mental is properly the only thing fully intelligible to us.' Such a theory may be quite feasible on metaphysical grounds. Mind may be the only ultimate reality, and all that appears to us as concrete and material may be only a projection or 'reification' of our mental creations. But, as a natural science, Psychology cannot adopt a metaphysical point of view. Psychology is not concerned with the question whether mind or matter is the ultimate reality, but aims only at explaining the facts of experience in the most satisfactory manner. 'Even if it be granted,' says Höfding,² 'that everything is mental, and that nothing exists except thoughts and ideas, there still remains a distinction between ideas of material movement and ideas of phenomena of consciousness; and thus again arises the problem how these different sets of ideas, which have arisen in accordance with experience, are to be combined. In other words, the empirical problem is independent of the metaphysical. We do not here examine whether mind or matter is the most fundamental; we enquire in what way mental and material

¹ *Outlines of Psychology*, p. 62.

² *Ibid.*

phenomena are connected in that experience, which every system of metaphysics consciously or unconsciously presupposes.'

The reader may now be inclined to think that we are unconsciously drifting towards the theory of parallelism which we have before rejected as indicating a dread of constructing hypotheses. This is far from being true. On the other hand, we positively espouse the cause of monism, though neither the materialistic nor the spiritualistic school of monism. If the dualist fallacy consists in endowing mind and body with independent existence because the one can be clearly distinguished from the other, the materialists and spiritualists fall into the opposite error of merging them both into one indistinguishable ultimate reality. The fact of experience, on the other hand, shows that although mind and body are one and indivisible, they are clearly *distinguishable* as two different aspects which ought not to be confused with each other. Nor is the one derived from the other. Thus we come to the fourth alternative mentioned by Höfding, that mind and body are evolved as different forms of expression of one and the same being. In so far as a living organism is the product of evolution, mind and matter are each an aspect of natural existence. The individual and the individual's mind on the one hand, and the cosmos and the individual's body on the other, are alike products of an evolution which is one and continuous. At a certain stage in the evolution of the cosmos there appears the individual's body, distinct from the material surroundings but not separable from them, just as at a certain stage of development in the individual there arises the individual's mind, which

is in its turn distinct from its body but cannot be separated from it. Mind and body are, in the words of Lloyd Morgan,¹ 'distinct from each other; and the distinction is fundamental; but they are nowise independent and separate in existence. The apparent dualism is a dualism of aspect, not a dualism of existence.' Let us call this belief 'Psychophysical Monism.' Of the psychophysical organism, the psychical aspect alone forms the subject-matter of psychology. But the physical aspect may at times afford our only clue to the understanding of mental phenomena. In this sense we are parallelistic and do not object to an explanation of mental phenomena with reference to physiological processes when other methods of explanation fail.

A student of the New Psychology must of necessity be familiar with the concept of Evolution first applied to biological phenomena by Darwin. According to this theory every organism is the outcome of a continuous process of gradual development from the comparatively simple forms to the more and more complex ones. The seed evolves into a tree, the tadpole into a frog, and the human babe into a grown-up man. As with the individual, so with the race. Lower forms of plant and animal life evolve into higher and higher forms. The civilised man of to-day is the highest product of biological evolution, and there is no reason to believe that the process is at an end, and that its result will not be a still higher type of human being.

The New Psychology is essentially a biological science inasmuch as it is evolutionistic to the backbone. 'The same power which lives, expands, and takes form

¹ *Comparative Psychology*, p. 2.

in the outer world of the material, also discloses itself in its inner world as thinking, feeling, and willing.'¹ The appearance of mind is now supposed to mark an important stage in the evolution of species. When once it has come into existence, the mind grows and gives rise to more and more complex forms of mental life in the race as well as in the individual.

¹ Hoffding, *Outlines of Psychology*, p 67.

III

ANALYSIS OF MENTAL PHENOMENA

Knowing, Feeling, and Willing.—An attempt has been made in the first two chapters to make the reader acquainted with the nature of the subject-matter of Psychology. He has been told that in a psychological discourse he could expect to hear about sensations, perceptions, images, ideas, memories, emotions, feelings, sentiments, thoughts, resolutions, etc., etc., some or all of which he must have experienced in his own life. Facts of experience like these have been differently styled mental processes, mental phenomena, states of mind, states of consciousness, and so on. Under whatever name they may be studied or referred to, it is these common experiences of life which constitute the subject-matter of Psychology.

The common experiences of life are generally *classified* in three groups—knowing, feeling, and willing. As I am writing this, the sensations of sight and touch which I am receiving from the paper and the pen, the ideas which are occurring to me, and the images which any of these things may call up in my mind—all these contribute to my knowledge of the situation, and are examples of the first group of mental facts, viz. knowing or ‘cognition.’ While I am having all these cognitive

processes, I may also be experiencing within myself a pleasure caused by the success which I have attained in putting together all this and in expressing it in an appropriate manner. This is a feeling or an 'affect.' Besides knowing and feeling in this way, I am also performing certain actions. Activity of one form or another is a fundamental property of mental life. We have seen how the conception of energy is allied with that of mind. Psychological energy is spent whenever mind is active in any way. This illustrates that kind of mental process which is known as willing or 'conation.' The word 'willing' is also used in another and a narrower sense when it is taken to mean the power of consciously choosing between two possibilities, or 'volition.' It is not in this sense that we use the word willing here. Conation is therefore a better term than willing for use in this connection.

The word 'classified' has been emphasised in the previous paragraph because, as a matter of fact, classification as applied to distinction between cognition, affect, and conation is a misnomer. The example given above is an example of an integral mental operation, the writing of a page of this book. It is not made up of three separate mental processes, each complete in itself. The knowing, the feeling, and the willing that we have distinguished in this mental process are only three distinct aspects of one and the same mental phenomenon. We cannot separate the one from the other. At the same time as I perceive the paper and the pen, I am in some way affected by them and act upon them in a certain way, the whole making up but *one* compact mental operation. It is only as a result of *analysis* that

we can distinguish the one aspect from the other. For the layman, activities like this are homogeneous wholes without any distinguishable parts or aspects.

It is inaccurate, therefore, to say that a mental process may be either cognitive or affective or conative—that we may have only a knowledge or a feeling or a conation in our mind at any time. We should rather say that every mental process is a complex which has a cognitive, an affective and a conative side. Whenever we know, we also feel and will, and whenever we feel or will, we also know. It is important to note that all three aspects of mental life must be present in every single manifestation of mind. There can be no mental process which lacks a cognition, an affect or a conation. Even such acts of cognition as the perception of a familiar object are tinged with some slight affect, either pleasurable or unpleasurable, and impel us to some kind of activity, however inappreciable it may be. The conation may sometimes consist only in the excitation of the muscles which control the internal organs of the body, like the blood-vessels, heart, lungs, or any of the numerous glands. The strength of conation is in each case directly proportionate to the intensity of the affect. The stronger the affect, the more powerful the conation; and the weaker the affect, the more feeble is the conation. When the affect attached to a mental process is very weak, the conation may consist only in a slight change in the bodily attitude.

So great is the part played by conation in mental life that one school of the New Psychology limits the scope of this science to animal and human behaviour. Not only is an understanding of behaviour supposed to be

essential to an understanding of the mind, but it is contended that what we do and the circumstances under which we do it are open to observation, and may be stated exactly as no mental phenomena are and can be. 'All that we can observe in our fellow-man,' say Smith and Guthrie,¹ 'is his behaviour. He moves his body and its appendages as he goes from place to place or as he arranges the objects around him. In conversation he contracts the necessary muscles and is heard to speak. In emotional expression he blushes, his pulse is altered, his hands grow cold, his liver gives up its sugar, and we see shame, anxiety or anger. His thoughts, as such, are known to no one but himself.'

Just as affection and conation are there whenever there is knowledge, so also we must know the object upon which we act whenever we have a conation and its concomitant affect. We must have some idea of the object in order that we may desire it, like it, hate it, or act upon it in any way whatever. But there is a characteristic of the cognitive aspect of mind which distinguishes it from the affective and the conative aspects. It is this: If the cognitive side of a complex mental phenomenon is on the conscious level,² the affect and the conation corresponding to it must also interfere with consciousness in some way or other, the affective and the conative aspects of a complex, on the other hand, may give a clear colouring to the consciousness at a particular time, while the cognition with which they are connected may remain below the threshold of consciousness. Everyone at times experiences certain feelings without being able to point out their source, and is

¹ *General Psychology*, p. 2.

² Cf. Chapter I

conscious of vague desires and cravings without being able to say anything as to their nature or the objects towards which they are directed. That is to say, the affect and the conation are felt at the conscious level, while the cognition to which they are attached remains in the subconscious.

If knowing, feeling, and willing are not separate and independent kinds of mental process, but only the three aspects which are present in each and every mental phenomenon, let us inquire whether we are in any way justified in talking of cognitive, affective, and conative mental processes. There is a sense in which some activities of the mind are cognitive, some affective, and others conative. According to this terminology a cognitive process is not altogether devoid of affect and conation ; nor is an affective process devoid of cognition and conation ; nor is a conative process devoid of cognition and affect. But a process is styled cognitive, affective, or conative according as this or that aspect of mental life *predominates* in it. A perception or an idea is thus known as a cognitive process, not because it has no affect or conation, but because the cognitive aspect predominates in it as compared to the affective and conative. Similarly, an emotion or a sentiment is called an affective process because the affect predominates, and an instinct or a resolution a conative process because the conative aspect predominates in it. It was from this point of view that the old psychologists classified mental phenomena into knowing, feeling, and willing.

The contention of the New Psychologist is that mental life is primarily conative and only secondarily cognitive

and affective. The function of mind is supposed to be self-preservation and self-maintenance. The Old Psychology attached undue importance to the cognitive aspect of mental activity. It has now been established beyond doubt that cognition and affect are only subsidiary to conation. The activity of mind is, in brief, mainly a conative activity. Hence the importance of the truth that the unity and continuity which bind mental phenomena together are conative unity and continuity.¹

¹ See Chapter I

IV

SENSATION

The Sense-Organs — ‘The difference between the behaviour of animals and the behaviour of inanimate objects,’ say Smith and Guthrie,¹ ‘depends upon the fact that animals possess *specialised* structures. The most important of these structures are the sense-organs (receptors), the muscles and glands (effectors), and the nervous system.’ We have seen that a nervous impulse or a stimulus-response current always travels from a sense-organ through the nervous system to a muscle or a gland. Having the preservation of the individual in view, Nature has placed the sense-organs at points from which they can take note of every action of the surrounding physical forces on the body. No occurrence which can affect the organism in any way, or in which the animal is in any way interested, can take place in the animal’s environment without the sense-organs being excited and the appropriate response made.

Sense-organs are spread all over the surface of the body, external as well as internal. If an enemy is before us, our eyes tell us of his presence. A smell may indicate the presence of something harmful, and our nose at once takes notice of it. If we are given a bitter

¹ *General Psychology*, p 3. (The italics are mine.)

substance to eat, our tongue informs us of the danger. If somebody calls us, our ears promptly convey the message to us, and if we are pinched or bruised, it is the duty of our skin to bring the danger home to us. Again, the sense-organs situated inside our bodies tell us whenever we suffer from indigestion, defective circulation of the blood, disorders of the lungs, or an abnormality in the secretion of the glands.

Although we know that the sense-organs are certain specialised structures of the body in which the sensory nerves terminate, it is very difficult to define a sense-organ. 'One end of an afferent neurone,' says Thorndike,¹ 'is stimulated by physical or chemical forces. It may be more or less specialised to suit it to this work. It may be connected with bodily structures specially fitted to cause the physical or chemical force to influence it. The peripheral end of an afferent neurone, or a group of peripheral ends of afferent neurones which act as a unit, together with such bodily structures, is called a sense-organ. A sense-organ may be so simple an affair as a mere terminal arborisation of a neurone ending freely in the outer or inner surface of the body. It may be so complex as the eye, a sense-organ which includes not only endings of thousands of neurones in the retina, but also a lens to focus light rays upon them, an arrangement to alter the shape of the lens so as to focus the light from objects of different distances, an arrangement to regulate the amount of light admitted, an arrangement to shut out light altogether, and an arrangement to move the eyes so that light will come from any one of many directions.' Thus what is meant by saying that

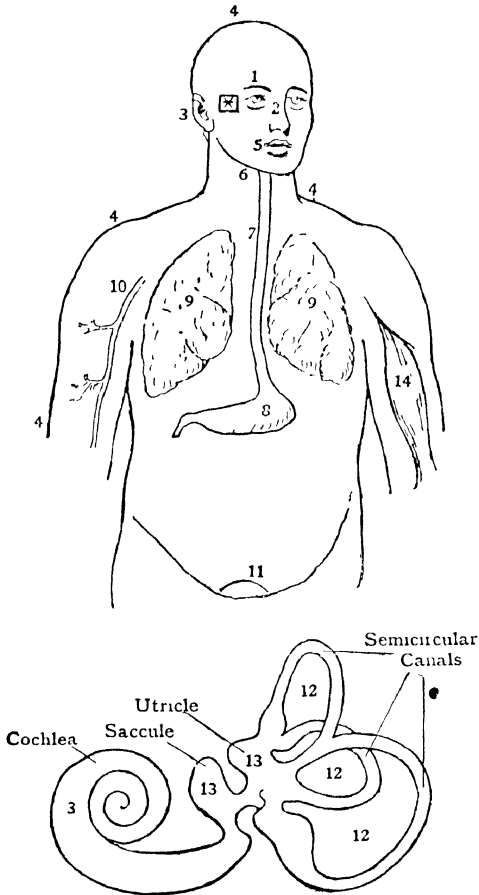
¹ *Elements of Psychology*, p. 154

sense-organs are specialised structures is, in the first place, that they are 'sensitive to situations that affect the life processes of the animal,' and, secondly, that they have developed the characteristic of each being excited by a special kind of stimulus and by no other. The stimulus that in the normal course of things arouses a particular sense-organ to its characteristic function is called the stimulus *adequate* to it. Each sense-organ has its own adequate stimulus.

All the sense-organs which have been so far discovered to be appreciably specialised are indicated by numbers in Fig. 5. They may be roughly divided into three groups,¹ viz. —(a) Those which are situated on the outer surface of the body and receive external stimuli, (b) those which are located in the enteric tract and are excited by the stimuli acting on the inner surface of the body, and (c) those which are found deeply embedded in the bodily tissue. The first group consists of the eyes, the nose, the ears, and the skin; the second of the tongue, the upper part of the throat, the œsophagus, the lungs, the stomach, and the bladder, and the third group of the blood-vessels, the semicircular canals, the saccule and the utricle, and the muscles and tendons.

The limited space at our disposal in this elementary exposition of the New Psychology does not permit us to go into details about the structure and working of the various sense-organs. It is not possible to do more than give a brief account of the most important ones and bring the nature of all the adequate stimuli to the notice of the reader. The most developed sense-organs

¹ See Sherrington, *The Integrative Action of the Nervous System*, Lecture 91, for the Threefold Classification of Sense-Organs.



(After Smith and Guthrie)

FIG 5—THE SENSE-ORGANS

1, the eye, 2, the nose, 3, the ear; 4, the skin, 5, the tongue, 6, the throat, 7, the esophagus, 8, the stomach, 9, the lungs, 10, the blood-vessels; 11, the bladder, 12, the semicircular canals, 13, the utricle and the saccule, 14, the muscles and the tendons

are the eye and the ear ; next in order come the skin, the nose, and the tongue.

The eye occupies the highest place in the scale of the development of sense-organs. The stimulus for which the eye is peculiarly adapted consists in the rays of light falling on the retina. It is the nature of the wave, the place at which the ray falls on the retina, and the way in which it affects it which determine the nature of the

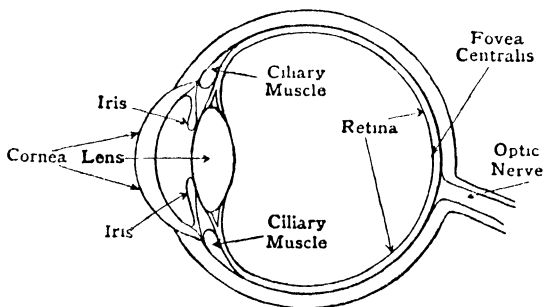


FIG. 6.—THE EYE.

sensation that may be given. Before the light stimulus reaches the retina it has to pass through the cornea, the iris, and the lens. (See Fig. 6.) The cavity of the eye is filled with a transparent substance (the aqueous humour and the vitreous humour). The iris is pierced by a small hole, which looks like a black spot when we look into a mirror, and is ordinarily known as the pupil. It is through this opening that light enters the eye. The lens is provided with a self-adjusting apparatus, the ciliary muscles, which, like the iris, regulate the mode of receiving light into the eye. By virtue of the activity of the iris the pupil becomes larger or smaller, and by

the contraction and relaxation of the ciliary muscles the lens becomes more or less convex, according as the eye has to adapt itself to near or to distant vision, to bright or to dim light. The retina is the seat of the photochemical substances from whose excitation the sensations of sight originate. That particular spot in the retina which is shown in Fig. 6 as the Fovea is most abundantly supplied with the protoplasmic substance which is specially fitted for light stimulation, and hence the sensations which we get when an image falls exactly on this place in the eye are the richest and the most complex sensations of sight. The visual impulse is carried from the retina to the brain through the optic nerve

The stimuli that are appropriate to excite the ear are particles of air which strike the tympanic membrane or drum of the ear. The air vibrations are collected by the external ear and are diverted into the auditory canal (see Fig. 7), which terminates at the drum. The air vibrations cause the tympanic membrane to vibrate, and as a consequence of this there starts a movement in the series of bones known as the hammer, the anvil, and the stirrup, which run across the middle ear. The base of the stirrup communicates the vibration to the labyrinthine bony cavity of the complex inner ear, which is lined by a membranous sac and is known as the cochlea. The cochlea, like the cavity of the eye, contains a fluid. The immediate stimuli for the sensations of sound consist in the vibrations which are set up in the fluid. From the lining membrane of the cochlea, in which there are auditory nerve-endings, the impulse is carried through the auditory nerve to the brain.

As compared with the eye and the ear, it is indeed very little that we know about the structure of the other sense-organs. We have now to consider the skin. Although the entire body is covered by a thick membrane which we call the skin, it is not every part of this covering which acts as a sense-organ. The cutaneous recep-

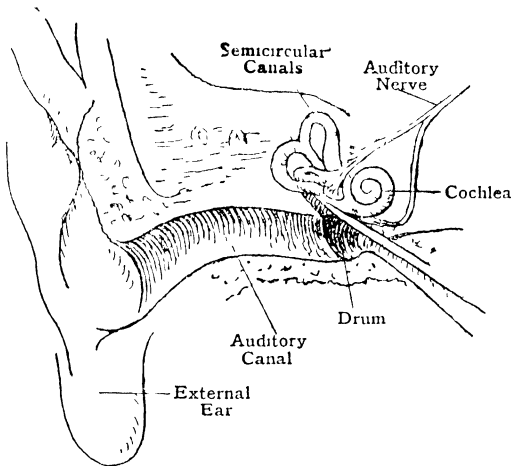


FIG 7 —THE EAR

tors are so many separate spots at the nerve-endings which are spread all over the body beneath the outer covering. As these sensory nerve-endings are embedded within the bodily tissue, the skin ought to have been placed in the third of our groups of sense-organs rather than in the first. But as they all run along the skin, the outer surface of the body, it has been customary to regard the skin as an external sense-organ. This shows that, like the grouping of mental phenomena into knowing, feeling, and willing, the arrangement of sense-

organs in the three classes given above is only a convenient grouping and not a scientific classification based on any rigid theory.

The nerves ending at different points in the skin do not give us the same kind of sensations. Some spots in the skin are *touch* organs, others are *warmth* organs, and still others are *cold* organs and *pain* organs. On the hairy surfaces of the body, nerve fibres coil themselves about the roots of the hairs, while on those parts of the body where hair is absent, nerve fibres enter into enclosures of touch corpuscles. The adequate stimulus for touch is therefore pressure either upon the skin adjacent to a touch corpuscle, or to the 'windward' of a hair, or upon a hair growing upon the skin. The nature of the warmth and cold organs is still very obscure. The adequate stimulus in these cases is generally supposed to be provided by surroundings warmer or colder than the surface of the body affected. But as a result of experiments it has been found that other causes than these may also give rise to a thermal sensation. The dilation or contraction of the neighbouring blood-vessels, for example, has a marked effect on the temperature sense. According to one view, phenomena like these are supposed actually to increase or decrease the temperature of the sense-organ, while, according to another, warmth and cold organs are considered to have no adequate stimuli at all, in whatever way they may be stimulated, they are supposed to give the same kind of sensation. Certain nerve-endings, themselves free from any other apparatus, perhaps act as the sense-organs for pain. Any stimulus which is adequate for touch, warmth, or cold may give rise to pain when it has exceeded certain

limits. Pain is the greatest guardian of physical health. The prolongation of intense stimuli must obviously be injurious to the organism, and hence the alarm is given by physical pain so that we may avoid the harmful stimulus.

The structure of the sense-organs of smell, which are situated in the mucous membrane lining the upper portion of the nasal cavity, is in essence the same as that of the nervous system. In this respect the olfactory sense-organ differs from all the other sense-organs. The olfactory nerve carries the odorous impulse from the nose to the brain. The adequate stimuli for smell are certain gaseous substances which are inhaled so as to come in contact with the organs of smell.

To come to our second group of sense-organs, it is not only the tongue which has the sense-organs of taste, but in some cases the other parts of the mouth also. The gustatory sense-organ is of the shape of a bulb into which penetrates the sensory nerve-ending. The bulb opens on the surface of the mucous membrane of the mouth, and the liquid stimulus for taste percolates to it. There may be taste organs of more kinds than one—sweet organs, sour organs, salt organs, bitter organs—just as there are touch spots, heat spots, cold spots, and pressure spots on the skin. Under any circumstance the adequate stimuli for the organs of taste consist of sweet, sour, salt, and bitter substances dissolving into the mouth and filtering through the pores of the mucous membrane.

It is still a debated question whether there are any sense-organs in the alimentary canal. Food substances, internal secretion, and internal movements in the

alimentary canal do undoubtedly yield certain sensations. Thirst, nausea, and hunger are always referred to the soft palate, the œsophagus, and the stomach respectively. But all these sensations are in some way or other connected with the general state of the body rather than confined to any particular sense-organ. Even if the alimentary canal is the seat of any sense-organs, their precise nature and mode of working are shrouded in mystery. The adequate stimuli for these organs are obviously the absence of or presence of food or drink in different quantities.

There are two sense-organs which are situated close to the organ of hearing, and are also connected with it, viz. the semicircular canals and the two membranous sacs called the utricle and the saccule (Figs. 5 and 7). Each of the three semicircular canals is at right angles to the other, and thus they stretch right and left, back and front, and up and down respectively. They are bony cavities containing a fluid substance. When the head is rotated in any plane the fluid inside the canals, which are only half filled with it, changes its place, and this movement excites the nerve-endings adjacent to their walls. 'This action,' say Smith and Guthrie,¹ 'may be understood by thinking of a bucket filled with water into which projects moss that is attached to the wooden surface. When the bucket is rotated, the water lags behind and the moss is bent. If the bucket is kept twirling for a short time, the water takes up its motion and continues to move when the bucket is stopped, thus reversing the direction of the moss. The semicircular canals work in a similar way, so that when a person has

¹ *General Psychology*, p. 22.

been whirled for a short time in a revolving chair and suddenly stopped, he responds as though he were being turned in the opposite direction. The adequate stimulus to these organs is rotatory movement of the head.'

According to some physiologists, the semicircular canals as well as the membranous sacs called the saccule and the utricle, and according to others only the two latter, contain a gelatinous mass with small particles of calcium carbonate (known as otoliths) rather than a liquid. The pressure of this substance on the sensory walls of these cavities varies with the position and movement of the head. The utricle and the saccule are called the static organs. They tell us of the position which the head occupies at any time, and the stimulus adequate to these organs is also the movement of the head.

The muscles and tendons are sensorially excited when any stimulus which would ordinarily give only a sensation of pressure is continued for a length of time. They are also known as strain organs. The exact mode of their excitement is very little known, the adequate stimulus for their excitation being the continuance of a cutaneous sensation for a length of time. Certain defects in the composition or circulation of the blood serve as adequate stimuli for the blood-vessels, which thus do service as sense-organs. A peculiar sort of excitement in the bladder also gives us sensations of an obscure type which play an important part in certain forms of emotion. Nothing definite is yet known as to the adequate stimuli which excite the bladder in this way. The lungs give us many important sensations according as the air that we breathe is insufficient, suffocating, or exceptionally refreshing.

Classification and Analysis of Sensations.—Everyone knows the sensations of sweetness, heat, or stuffiness. Similarly, we have all experienced pleasure and displeasure, and everyone understands what it is to desire or to wish. Yet no person can describe to another what one of these experiences is. Unless you have yourself tasted a sweet object or touched a hot substance or found yourself in a stuffy room, the idea of sweetness or heat or stuffiness cannot be imparted to you in any manner whatsoever. In the same way, if you had never felt pleased or displeased or had never felt a desire or a wish, nobody could make you understand what these things were. Our inability to define these experiences is a proof that they are of the nature of *elements*. To define is to analyse. But an element is precisely that part of any fact which is irreducible and unanalysable.¹ Undefined experiences, therefore, are the elements of mental life. Everyone can have a direct knowledge of these for himself and can describe and understand the more complex forms of experience with reference to them.

Sensations are the elements of cognition as pleasantness and unpleasantness are those of affection, and appetites and impulses those of conation. We have seen that a typical mental process comprises all the three aspects of mental activity—cognitive, affective, and conative. It follows necessarily from this that sensations, affects, or cravings never come alone. Every time that we are mentally active we have a number of sensations which determine our knowledge, one of the two affections which decides how we should feel, and one

¹ Calkins, *Introduction to Psychology*, p. 18.

or other of the impulses which points to the nature of our desires at that time. With the feelings of pleasantness and unpleasantness and the various conations of our mind we shall be concerned in two subsequent chapters.¹ Our business in the present chapter is only to analyse and classify sensations.

Before we proceed to our task, let us be clear on two important points which will go a long way towards distinguishing sensations from the more complex cognitive processes on the one hand, and from affections and simpler forms of conation on the other. In the first place, sensations are, like affections and appetites, the result of abstraction. They appear only in combination. For example, when we eat an orange we do not perceive it only as yellow, or as soft, or as fragrant, or, again, as sweet. But we know it as an object which is at the same time yellow, soft, fragrant, and sweet. The colour or the feel of the orange cannot be separated from its smell or its taste. All these are the various qualities or aspects of *one and the same* thing. Each one of these sensations corresponds to one aspect of the whole object. There can be no mental process which comprises yellowness and yellowness alone, or softness and softness alone. A sensation, therefore, cannot be called a mental process. It is only an inseparable part of a concrete mental process, which can be distinguished from other parts of a similar nature but cannot be separated from the whole except in thought or abstraction. It is the elementary and abstract nature of sensation which distinguishes it from all forms of cognition.

Secondly, every sensation is inseparably connected

¹ See Chapters V. and X.

with the excitation of a sense-organ. We have seen that a nervous impulse always starts from commotion in a sense-organ; the first mental concomitant of a nervous current reaching the brain by way of afferent nerves is the rising of a sensation above the threshold of consciousness. So long as an impulse does not reach the brain to cause an excitation there, the sensation corresponding to the organ from which it starts may remain unconscious or infra-conscious. But no sooner does the excitation travel to the brain cortex than we are conscious of an object possessing this or that sensible quality. It is on account of sensation being in this way associated with the activity of a sense-organ that it is described as a psychophysiological process, *i.e.* a process which is neither exclusively mental nor exclusively physiological. The reader will remember that we have embraced the view of Psychophysical Monism regarding the relation of body and mind. According to this doctrine, the body's organic activity is in essence psychophysical. Each sensation has its psychical aspect, corresponding to which on the physiological side there is the excitation of some particular sense-organ. Mental operations may have, as their psychological counterpart, a cerebral activity resulting from the excitation of any sense-organ whatsoever.

The problem of classifying sensation presents peculiar difficulties, as at the lowest calculation the normal human being is supposed to experience more than fifty thousand kinds of sensation. It is not possible to distinguish each of them by appropriate names and characteristics, and we shall consequently confine ourselves to arranging them into a few broad classes.

Sensations may be classified either on the basis of their psychological likenesses and differences, or according to the various sense-organs to which they are referred. The first method of classification alone is, strictly speaking, psychological. But it is so difficult to perform that the comparative ease of the second method far outweighs its lack of a purely psychical point of view.

According to the first method, for example, we should separate the colour sensations from those of brightness, and place heat sensations and cold sensations in two different groups.

On the basis of sense-organs, we have as many principal kinds of sensation as there are sense-organs. The table on page 54 gives the main classes of sensations which we receive from the various sense-organs described above.

Of these, the sensations from the eye and the ear alone need special mention, as they come from the most developed of the sense-organs and have evolved into various important distinctions among themselves.

The retina of the eye has a central, a most complex part; and a peripheral, a simpler part. The central portions of the retina give us only white, black, and the various shades of grey, known as the sensations of brightness,¹ while the focal part gives us all these sensations as well as a host of others known as the colour sensations. The sensations of colour fall in a continuous series, which begins with red and runs through orange, yellow, blue, violet, and purple back again to red. If to a certain red we add more and more green, we shall

¹ Strictly speaking, they are various intensities of the one sensation of light rather than so many different qualities of sensation.

get the colours orange-yellow and green in serial order, and similarly by mixing two or more appropriate shades of colour we can get any other quality of colour.

No	Sense-Organ	Kind of Sensation
1.	Eye - - - -	Visual (Sensation of Sight)
2	Nose - - - -	Olfactory. (Sensation of Smell.)
3.	Ear - - - -	Auditory. (Sensation of Sound.)
4.	Skin - - - -	Cutaneous. (Sensations of . (a) Pressure, (b) Warmth, (c) Cold, (d) Pain)
5	Tongue - - -	Gustatory (Sensation of Taste)
6.	Gullet - - -	Sensation of Thirst
7.	Œsophagus - -	Sensation of Nausea.
8.	Stomach - - -	Sensation of Hunger.
9.	Bladder - - -	Sensation of General Commotion
10.	Semicircular Canals -	Sensation of Dizziness.
11.	Membranous Sacs -	Sensations of : (a) Loss of Balance, (b) Movement of the Head.
12.	Muscles and Tendons -	Sensation of Strain.
13.	Blood-Vessels - -	Sensations of . (a) Pins and Needles, (b) Itching.
14	Lungs - - - -	Sensations of : (a) Refreshment, (b) Stuffiness.

Every colour quality has more or less of brightness in it. Every sensation of colour is, as a matter of fact, a mixture of a certain degree of brightness and a certain sensation of colour. While under certain circumstances

we may have the pure sensation of light, we can never have the sensation of pure colour unmixed with brightness.

Certain pairs of colour sensations are such that if both of them are aroused at the same time they nullify each other. If, for example, the image of a red object and that of a green object fall at the same time and on the same place on the retina, you see the object neither as green nor as red, but only as a particular grey. In the same way the sensations of blue and yellow combine to nullify each other. Colours whose mixture thus results in grey are called Complementary Colours.

The effects of the stimulation of the visual sense-organ last even after the stimulus has been withdrawn. If after suddenly looking at a bright object you close your eyes, you will continue to see the light for some time. This is called the Positive After-Image. If, on the other hand, you stare for a time on a coloured object and then look at a white sheet, you will see on the white surface a patch of colour which is complementary to the colour of the object at which you stared. This is known as the Negative After-Image. After-Images are more appropriately called After-Sensations, as they are due to the excitation of the sense-organ which persists after the stimulus is taken away.

Distinctions in auditory sensations are caused by the amplitude and the mode of vibration of the air waves which strike against the tympanic membrane. The greater or the smaller is the amplitude of the wave, the louder or the softer is the sensation of sound. Again, the mode of vibration may be regular or irregular. An irregular vibration of the air waves gives us the various

kinds of noise, snaps, pops, hisses, thuds, booms, etc. ; while air waves vibrating regularly are stimuli for all that wealth of auditory sensations which make up the various constituents of heard music and are known as tones. About eleven thousand simple tones can be distinguished. They differ from each other in what we generally call their pitch. With every variation in the rate at which the air waves stimulating the ear vibrate, the pitch of the tone becomes different. The lowest tonal pitch that can be heard is the result of sixteen vibrations of air wave in one second, and the highest is perhaps the effect of as many as fifty thousand vibrations per second. In the central octave of the musical scale the numbers of air vibrations which give rise to the succeeding notes are as follows —C, 480 ; D, 540 ; E, 600 ; F, 640 ; G, 720 ; A, 810 ; B, 900 , C¹, 960.

Just as all the sensations of colour that we experience are mixtures of brightness and pure colour, in the same way all the tones that we hear are combinations of pure tones and noises ; and just as we can never see a pure colour, so also we can never hear a pure tone. Every tone must be a tone of this man or that, or this musical instrument or that. Two musical instruments might give out the same tone, but they would still be recognised as different instruments by the sweetness or harshness of their sound.

Next to the eye and the ear, the nose and the tongue are the most specialised sense-organs. From the taste organs we get the four different kinds of sensations which we have mentioned above, while from the nose we get a large number of sensations which have not so far been completely enumerated or satisfactorily classified.

The other sense-organs, with the exception of those which lie on the skin, have not attained any high degree of specialisation, and the sensations given by them therefore fall more appropriately under what is known as 'common sensibility'. The sensation of thirst, for example, although generally referred to part of the tongue and palate, is evidently dependent upon a general state of the body. True thirst is not relieved by moistening these parts with water, but only by copious drinking. 'The general condition on which thirst immediately depends,' says J. Marshall,¹ 'appears to be a deficiency of water in the blood; and as the blood is the source of all the secretions, these are everywhere diminished, and those of the fauces and mouth are necessarily deficient. . . . Not only the want of water in the blood produces this feeling, but the access of saline matter will likewise cause it, as is noticed after taking much common salt with the food, drinking salt water, or even taking draughts of neutral vegetable salts, such as seidlitz powders. It is also produced by hot condiments, and by strong alcoholic beverages. It is particularly and distressingly noticeable in cases of hæmorrhage after gunshot wounds or other extensive injuries, and in all cases of fever. The intense thirst experienced by shipwrecked sailors, and by criminals subjected to the torture of thirst, is accompanied by burning pains and sufferings more difficult to bear even than those induced by prolonged starvation, and ending in delirium and mania.'

The same thing may be said of hunger. That it depends mainly on a peculiar condition of the system is shown by experiments in injecting nutrient substances,

¹ *Outlines of Physiology*, p. 443.

in the form of enemata or into the blood itself, either of which processes is followed by a cessation of the feeling of hunger. If unsatisfied, the sensation of hunger passes off after a time, a condition of indifference to food supervenes, and no further sensation of appetite is experienced, extreme prostration and diminution of sensibility setting in, ending in delirium and death.¹

The stimulus to common sensibility, or the organic sensations, as they are often called, is always more or less complex or 'diffused.' The nervous excitement overflows and spreads over the whole organism. Cutaneous pain, to take another example, depends not only on injury to the skin, but also on the changes which are simultaneously caused in respiration, circulation, and the whole activity of the bodily organism. As the sense-organs become differentiated, different kinds of sensations are distinguished from one another. At our level of development the sensations of colour, smell, touch, and taste coming from the same object, say an orange, do not give rise to a common sensibility, but remain as distinct constituents of the perception of the object.

Attributes of Sensation.—We have said that, being elementary mental processes, sensations and affections are not capable of being analysed in their turn. But we can distinguish various characteristics which are found in some or all sensations. These are also known as the attributes of sensation, and an enumeration of these attributes is sometimes termed an 'analysis of sensations.' The most important attributes of sensation are its *quality*, *intensity*, *duration*, and *extensity*. The first three are possessed by every sensation, but there is a

¹ *Outlines of Physiology*, p 445

diversity of opinion regarding the last one. According to some psychologists, extensity or volume is also a characteristic with which every sensation is endowed in some degree, while according to others it is only the sensations of sight and touch that possess this attribute.

The quality of a sensation is that which distinguishes it from every other sensation. *Quality* should not be confused with *kind* of sensation. Red and yellow are sensations of the same kind—visual—but they are different qualities of sensation. Every different shade of colour and every different pitch of tone is a distinct quality of sensation. Sweet and salt are different qualities of sensation; so are different degrees of heat and cold.

By the intensity of a sensation is meant the more or less of it. Two sensations of sound may be exactly the same in tone and pitch, yet one may be louder than the other. In the same way two or more sensations of sight may be of exactly the same shade, say of a certain red, but they may be brighter or duller as compared to one another. The pain of a wound inflicted by a sword is more intense than that of the prick of a needle, though both are the same in quality—and so on with every quality of sensation. The eye and the skin are the sense-organs which are themselves extended. The retina has a certain length and breadth, and so has the skin of the body; and it is easier to understand the extensity or extent of sensations given by these organs. Every object seen throws its image on a certain extended part of the retina, and every object touched similarly comes in contact with an extended part of the skin. We cannot see a colour or feel a pressure, but it must be a

patch of colour or extent of pressure of a certain length and breadth.

If by extensity we mean spatial relation, sight and touch are the only kinds of sensation that can give us extensity. 'The only space that we perceive is either tactual or visual.' But if extensity does not mean extension in space, but a certain kind of voluminousness, all sensations are in some way supposed to possess it. 'The tone-continuum is also universally regarded as steadily diminishing in massiveness or extensity as the pitch increases,' says Ward.¹ Again, 'Organic sensations may all differ unquestionably in respect of massiveness or voluminousness while remaining qualitatively unchanged.'² 'The sound of a croaking frog is vastly more voluminous than that of a shrill whistle.'

The duration of a sensation means the length of time for which it lasts. Every sensation must occupy consciousness for a longer or shorter period—maybe one-hundredth part of a second, or half a second, or more. Every sensation must have some length of duration. 'A sensation which does not last for at least an instant is inconceivable.'³ A painful throb of the head flashing into one's consciousness differs from an abiding migraine in point of duration, although they may be the same so far as the sensation quality goes.

*Weber's*⁴ *Law*.—The quality, intensity, extensity, and duration of each sensation are in some way determined by the kind, severity, amount, and length of the stimulus which causes it. But the changes in the char-

¹ *Psychological Principles*, p. 127.

² *Ibid* p. 116

³ Yerkes, *Introduction to Psychology*, p. 107

⁴ Titchener, *Text-Book of Psychology*, pp. 218-23.

acteristics of a sensation are not always directly proportional to those in the nature of the corresponding stimulus. This fact has been particularly noticed in connection with the relative intensities of sensation and stimulus. As a general rule, the intensity of a sensation increases as that of the stimulus is added to, and diminishes as that of the stimulus is taken away. The heavier the weight that is placed on a man's hand, the more intense is the corresponding sensation of pressure, and the lighter the weight, the less intense the pressure. Similarly, the larger the amount of light under which an object is seen, the brighter is the sensation of sight, and, *vice versa*, the smaller the amount of light, the duller the sensation of sight.

But Experimental Psychology has demonstrated that the increase or decrease of sensation does not keep pace with the increase or decrease in the stimulus. The brightness of an object seen in the light of four candles is not exactly double that of the brightness of the same object seen in the light of two candles. Similarly, the difference in weight between a hundred silver rupees and ninety-nine of them is not exactly the same as that between ten and nine. It has been learnt that if the intensity of a particular stimulus increases in geometrical progression, the intensity of the corresponding sensation increases only in arithmetical progression. That is to say, if the changes in succeeding stimuli presented to a sense are in the ratio of 1, 2, 4, 8, 16, etc., the intensities of the corresponding sensations will correspond to the series $x, 2x, 3x, 4x, 5x$. Before an appreciable change can be made in the intensity of a sensation, the stimulus must be increased by a certain fraction of its own. In

the case of brightness, for example, no change will be effected in the intensity of sensation if one candle is lit in a room which is already illuminated by a light of two hundred candle-power. In order that the objects may give sensations of a higher intensity, at least two candles must be added to the existing light.

Suppose the difference that is felt in the intensity of the brightness of an object which is seen first in the light of a 100 candle-power lamp and then in the light of a 200 candle-power lamp amounts to x . Then in order to increase the intensity of the brightness of the object by the same amount, x , you must see it in the light of a lamp of 400 candle-power and not of 300 candle-power. If to an ink solution which you have prepared by dissolving two ink pellets you add two more pellets, the ink will become a degree brighter. Now, if you want it to become still brighter, and to have the third solution as much brighter than the second as the second is than the first, you must dissolve four more pellets and not two.

The beginner may find it difficult to realise the truth of these statements, but by practice he should become able to introspect for himself and arrive at the same conclusion. Everyone will easily realise that if to 100 units of a stimulus (say 100 lighted candles) we add one more unit, the effect will not be the same as it will be if to one unit we add one more unit. But the novice may have to take it on trust that if we want to produce the same change in the intensity of sensation caused by 100 candles as is made when one more candle is added to a single candle-light, we must kindle not less than 100 candles more. This is precisely what is meant by saying that the intensity of a sensation varies in arithmetical

progression, while that of the corresponding stimulus varies in geometrical progression. If we desire the change in a sensation caused by 100 units of stimulus to be the same as that which is due to the addition of one unit to one existing unit of stimulus, we must add 100 units of stimulus. If we want the result to be the same as it would be if to one unit we add two more units, then to 100 units we must add 200 units, and so on. A variation of stimulus in the ratio of 1, 2, 4, 8, etc. corresponds to a change in the intensities of stimuli in the ratio of 100, 200, 400, 800, etc., not to a series 100, 100+1, 100+2, 100+4, 100+8, etc. in order that similar changes may be produced on the sensation side.

V

AFFECTION AND FEELING

General — ‘ We sense and we feel,’ says Yerkes.¹ ‘ The former variety of experience yields us our thousands of qualities of sensations, and the latter yields us a multitude of simple facts which the psychologist calls affections.’ This is an excellent way of putting the nature of the elementary working of our minds. But we may improve upon this statement and say We sense, we feel, and we desire² This last variety of experience yields us a number of psychical elements known as conations. Classification and analysis of sensations have been discussed in the previous chapter. The present chapter will be devoted to a study of the affections, and an examination of the various forms of conation will be undertaken in a subsequent chapter³

Sensations, affections, and conations being all elementary mental phenomena, it is not possible in Psychology to define any one of them. To distinguish between them the student of Psychology must introspect for himself; and it is easy enough by this method to be able to differentiate the one activity from the other.

¹ *Introduction to Psychology*, p. 147.

² By ‘ desire ’ is here meant only an impulse to action which does not necessarily involve a consciousness of the end.

³ See Chapter IX.

When we go to the fruit market the *sight* of the oranges arranged in pyramids is clearly distinct from the *feeling* of pleasure that we have on seeing them, and both these in their turn from the *desire* which we may have for purchasing and tasting them.

We can at best refer to the concomitant physiological conditions which may serve as the technical marks of distinction between the three varieties of mental operation. We have seen how sensations are in this way distinguished from affections and conations by the fact that while each sensation is inseparably connected with the excitation of a particular sense-organ, and the different sense-organs give us different distinct qualities of sensation, affections and conations have no such connections with sense-organs. The activity of one and the same sense-organ may give rise to different affections and different kinds of conation at different times. The same food may be agreeable when we are hungry and quite the reverse when we are satiated. The same object may be desired under certain circumstances and shunned and avoided under others. 'The two antithetical forms of affections,' says Angell,¹ 'represent the two opposite modes in which any neural activity may go on. They do not depend, therefore, as sensations and ideas primarily do, upon the actions of *specific segments* of the nervous system: they are rather the counterparts of the manner in which the *whole nervous system* is affected by the activity initiated in any segment at a particular time.' 'Affection and conation,' as Stout² puts it, 'usually go together, and are blended in intimate unity.' Whenever we feel strongly,

¹ *Psychology*, p. 118.

² *Manual of Psychology*, p. 112.

we are led to perform drastic actions. If, on the other hand, affection is not sufficiently aroused, the impulse to action is also correspondingly weak.

We conclude, therefore, that affections, like sensations and conations, are elementary mental processes which, though perfectly distinct from one another, cannot in any way be defined from a purely psychological point of view

Kinds of Affection—It has often been said that affections also fall in a series as do the various tints of colour and the various pitches of tone sensations, and that there are therefore an immeasurable number of affections. Although the latter statement is far from being true, the former is not wrong. The truth is that, although there are only two kinds of them, affections can all be thought of as falling in one line, as the different shades of grey fall in one line and are the various intensities of the single sensation of brightness. The series of affections is a series of intensive magnitude, not of qualitative distinctions. When we are more and more pleased or more and more displeased, we have the same feeling in different degrees of intensity. Just as, starting from the typical sensation of brightness known as neutral grey, the degree of intensity may vary in the direction of more and more whiteness or in that of more and more blackness, so also, starting from an *imaginary* neutral state of the mind, which is neither pleasure nor displeasure, feeling varies in two directions, viz. pleasure and displeasure.

We have called the affectively neutral state of mind imaginary because in actual fact there is no such mental process which is not in some way tinged either with

pleasantness or unpleasantness. At every moment of our mental life we are either pleased or displeased. Sometimes the agreeableness or disagreeableness of our state of mind is so slight that we do not appreciate it, just as the blessings of health are not realised except when we lose it, and the miseries of chronic diseases so long as we do not get rid of them. While neutral affection is a non-entity, neutral grey is a true type of pure brightness, and this is an important point in which the series of brightness differs from the series of affection. It is by virtue of the neutral grey that we can understand all the degrees of intensity falling in one single line. But the missing affection of neutrality divides the affective series into two separate *kinds* of affection. All the degrees of agreeableness make up the various intensive gradations of the pleasant feeling, and the numerous degrees of disagreeableness the numerous distinctions in the intensity of unpleasant feeling.

As the whole organism can at any time be affected either in a way wholesome for it or in a way injurious to it, we can have only two qualities of affection—the pleasant and the unpleasant. It has been maintained by some psychologists that there are more qualities of affection than two. Without going into details regarding their theories and entering upon any elaborate criticism, we may note the fact that all such theories fall into the error of confusing feeling as an aspect of every mental process with feeling as a complete mental process in itself. In view of this general tendency of error, we have followed the current usage and have called affection an elementary mental process as opposed to feeling, which is the name reserved for a complete

mental process in which the affective element predominates. According to this terminology, there are innumerable possible feelings, perhaps many more feelings than there are sensations, while there are only two distinct kinds of affection. The perception of a book which we are given as a prize, the thought of passing an examination, the picture of one whom we love, are all different pleasant feelings; while the perception of an enemy, the thought of a failure, and the image of an ugly genie are so many unpleasant feelings. But in all these states of mind the affection is either of the agreeable or of the disagreeable type. There is no third quality of affection.

Bodily Signs of Affection.—So closely is the affective mental life of the individual connected with the well-being of the organism that all the vital processes, including those of assimilation, circulation, respiration, and secretion, are profoundly influenced by intense states of feeling. Certain investigators have even gone so far as to hold that constant and definite physiological changes accompany the two kinds of affective states of mind. ‘Not only will there be,’ says Titchener,¹ ‘particular movements, a particular “play of feature,” or what not, to tell us that affection is there; we must be able to read off from the whole body whether the mind is pleasantly or unpleasantly disposed.’

According to these psychologists, there are four ways of knowing which of the two affective processes is tingeing the mental life at any particular moment. In the first place, when we are pleased, the beat of the pulse is strong; when we are displeased, it is weak. Secondly,

¹ *Primer of Psychology*, p. 62.

if we are in a pleasant state of mind, we draw deep breaths ; if in an unpleasant one, the breath is bated. In joy, for example, we breathe in great breaths, while in sorrow our breathing is short and weak. Thirdly, pleasurable experiences are accompanied by a dilation of the peripheral blood-vessels, and unpleasurable ones by a constriction. Hence we actually expand when we are glad and shrink when in a depressed state. In the fourth place, when we are in an agreeable state of mind our muscles are toned up, and we feel muscularly strong ; while in a disagreeable mood our muscles are in a state of general relaxation, and we feel physically weak. It is proverbial that in a pleasant state of mind we feel equal to performing even the most difficult task, while in an unpleasant state we are unable to exert even the amount of force we ordinarily command.

It is not all experimenters in the field of Psychology who have been able to confirm the truth of these statements. But the school of Experimental Psychology to which belong Kulpe, Titchener, and some of the followers of Wundt attaches immense importance to these physiological expressions of the state of feeling

Sensation and Affection.—We have seen that sensations possess quality, intensity, duration, and extensity. On the side of affection we have noticed that there are only two qualities. Each of these two, pleasantness and unpleasantness, may be of different intensities and durations. Passing an examination, for example, is a more pleasant happening than doing an easy mathematical sum, and the feeling pertaining to the former lasts longer than that consequent on the latter. Affections, therefore, have distinctions of quality, intensity,

and duration, but there is no such thing as extensity of an affection. There cannot be a spatially longer or shorter feeling. In this connection it may be pointed out that some psychologists draw a distinction between sensations and affections by saying that the former are objective while the latter are subjective. Although the sensation of whiteness from the page on which I am writing is not itself eight inches wide and twelve inches long, etc., yet we can distinguish one sensation of sight or touch as more extensive than the other. It is by no means easy to find by introspection what exactly is meant when the psychologist talks of 'extensity' in connection with sensations. It is still more difficult to find out by introspection what is meant by the distinction of objective and subjective among mental phenomena. In so far as all mental phenomena are *of the mind* and do not pertain to outside things, they are all subjective. At the bottom of such a distinction there appears to be the confusion between the object which the mind knows, feels, or desires, and the sensations of which the knowledge of a mental process is found by analysis to consist.

The only sense in which sensations can be taken to be objective is, therefore, the one to which we have already alluded—that is, they are connected with the activity of the sense-organs. And sense-organs have decidedly a closer connection with the outside world than have the internal organs, with whose activity affections are associated. Another point of distinction between sensation and affection as elementary mental processes consists in this, that while a number of sensations may all combine to give us the knowledge of one and the same object, the two affects cannot enter into any feeling

together. Experiments have been performed with a view to investigating how the quality and intensity of the accompanying affection change when a sensation is continued, repeated, or intensively modified by making appropriate changes in the stimuli giving rise to it.

But the results of these experiments are more or less of a theoretical nature, as both sensations and affections in real life come only in connection with divers other mental processes, and never in the way in which they are experimentally produced. An elementary treatise like this on the New Psychology cannot afford space for these discussions in detail.

VI

ATTENTION

General.—We have seen in the first chapter that at any moment of mental life there are some mental processes which occupy our consciousness, while there are others which are kept below the threshold of consciousness. Further observation shows us that on the conscious level itself there are various degrees of clearness with which we apprehend the different objects of consciousness. While we listen to a lecture, for example, we have the words spoken by the lecturer and their meanings clearly before us. But at the same time we are also less clearly conscious of many other things. We know the kind of clothes that the lecturer is wearing, the number and nature of the audience, the time of day, the place at which the lecture is being delivered; we feel the hardness or the softness of the seat, the stuffiness or otherwise of the room, the pleasantness or unpleasantness of the company, and have certain feeble desires, perhaps to change our posture or to cough or sneeze. While we are conscious of all these things, we are not conscious of them in the same way. In psychological language we say that we attend to the lecture and not to the other objects of consciousness unless they force themselves upon our attention. For instance, the

tendency to cough may become so strong that we may be compelled to neglect the lecture, even to leave the room for some time. If we are seized with a fit of coughing while we are in the room, we hear the words coming from the lecturer's mouth but do not attend to them. Our attention is engrossed by coughing and the thought of coughing. The objects of our attention are constantly changing their places—passing from the field of clear consciousness to that of obscure consciousness, and, *vice versa*, from that of hazy consciousness to that of clear consciousness or *attention*.

The difference between the level of consciousness and that of attention should be carefully noted. An object which occupies the field of consciousness is not necessarily within the scope of attention. Every moment of consciousness embraces a psychical wave with 'a summit or crest of clear consciousness, a short rising slope of dawning consciousness, and a longer falling slope of waning consciousness.' The rising and the falling slopes represent certain dimly felt elements of consciousness existing in addition to and alongside of the dominant elements which are represented by the crest or the summit. On the conscious plane itself, therefore, we can distinguish two different levels¹—the level of those mental processes to whose objects we attend, and the level of those mental processes of whose objects we are conscious but to whose objects we do not attend.

On the analogy of the 'field,' the whole area of consciousness may also be divided into two parts²—the

¹ Levels 1 and 2 of Fig 1, p. 12

² Marked *A* and *B* in Fig 2, p. 12.

central and the marginal. The centre of consciousness is known as the 'focus' of attention, and the outlying parts as the 'margin' of attention, or the 'fringe' of consciousness.

The Conditions of Attention.—When it is asked why at any time we attend to a particular object rather than to any other, the answer which is generally given is either (a) because we are compelled to attend to that object, or (b) because we are interested in it. Interest in a certain object implies nothing beyond a tendency readily to perceive that object, and as a consequence to be affected by that object and to have a definite conation with regard to it. Now, if we analyse what we understand by attending to an object of consciousness, we shall come to more or less the same conclusion. Clear consciousness implies strong affection and conation; if our consciousness of an object is obscure, we are but feebly affected by it and feebly impelled to action. The word *interest*, therefore, cannot serve as a satisfactory explanation of attention, and we are led to the conclusion that whenever we attend we do so because we are compelled to attend.

But we may be compelled to attend to an object either by the nature of that object or by the state of our own mind. 'The conditions of any act of attention,' says Pillsbury,¹ 'are to be found in the present environment (objective conditions) and in the past experience of the individual (subjective conditions).' It has been remarked before that mental life is in essence teleological. We know, feel, and act upon those parts of our surroundings which can influence us for good or for evil, and are

¹ *Attention*, p. 52.

indifferent towards those which do not influence us in any way. 'Every animal,' says Titchener,¹ 'must have certain tendencies, if it is to live at all. An animal that neglected loud sounds, that did not notice movement in its neighbourhood, or change in its customary surroundings, would soon fall a prey to its enemies.' The main objective conditions of attention are the intensity, extent, and duration of the stimulus, and the movement and change of the objects of consciousness.

On the subjective side are generally mentioned the set of mental processes which occupy the mind at the time, the line of development which the individual's mind has followed, and the hereditary or acquired traits with which he is provided. When I am writing a book, only the thoughts relevant to the topic come up to the level of attention, while the various sensations which I am receiving from surrounding objects remain confined to the fringe of consciousness, and I do not attend to any concrete object about me. Again, if I am a true student of Psychology, everything which touches the subject will find a central place in the field of my consciousness in preference to all those things which have no connection with the subject and are therefore mostly relegated to the margin of attention, except when to attend to them is an absolute necessity. Similarly, if I am a born musician or a born orator, I shall take more interest in things and topics musical and rhetorical than in others. My neighbours may talk of any other subject, and I shall probably remain indifferent to them. But the moment they begin to sing or indulge in a warm argument, my attention is directed to them. A musician will

¹ *Primer of Psychology*, p 79

be attracted even by a single sweet note sung by a stray bird, while the man who has no ear for music will pay no heed to it.

Forms of Attention.—When attention is determined by an objective condition, it is said to be Involuntary or Passive Attention. It is attention without any effort on our part to attend, and against our will. Bright flashes of light, loud sounds, unpleasant odours, excruciating pains, must be attended to. They intrude themselves upon our attention, and willy-nilly we must take notice of them. Even when I am engrossed in writing, my attention is diverted from my task if the door slams heavily.

Of the subjective conditions of attention, the most important one is the level of mental development to which the individual has attained. It is only at comparatively high levels of growth that we perform actions of our own initiative, *because* we are of the opinion that we should perform them under the circumstances. When we have reached such a high level of development we can also direct the trend of our attention. Musical sounds may be pouring into my ears and smells of different kinds may be entering my nostrils, but I still decide to go on with my work, and simply do not attend to them. I keep my nose closed to the one, as it were, and turn a deaf ear to the other. It is by virtue of the mental control I have acquired by slow degrees that I can thus divert the current of attention into the channel which I consider to be the most suitable one for the time being. Attention so determined is called Voluntary or Active Attention.

Attention is not always voluntary or involuntary.

Very often we are led to attend neither by a fiat of our will nor quite against our will, but as a matter of course. We attend to the daily routine of life in some such spontaneous manner. The young infant attends to the most useful objects in his environment in this way. When we are busy with a particular activity, the objects with which we are concerned and the thoughts that are most appropriate spontaneously come up to the 'focus' of attention. A mathematician finds no difficulty in attending to a problem and its various alternative solutions. In a word, whenever attention is determined solely by the present state of our mind, or by the play of a hereditary or acquired tendency, it is generally neither voluntary nor involuntary. It differs from voluntary attention in so far as it is not attention under difficulties. We do not seem to be holding our mind upon an object by dint of sheer psychical energy. The objects attended to are 'naturally' placed in the centre of consciousness, as at the time there are no other claimants for it. In this way it resembles involuntary attention.

But it differs from purely passive attention in a very important feature, viz it is determined by the very nature of the person attending and not by the object attended to. It is not all persons who can apply themselves with perfect ease to a difficult specialised branch of science or art, such as astronomy or painting. Only the men who possess natural gifts or have received special training are capable of doing this. There are certain things to which each one of us is inclined to pay special attention from his very birth. Some are interested in music, some in painting, some in sports, and

so on. But there are many more things in which we acquire a keen interest and aptitude during the course of life. The specialist in science, the trained artist, and the practised musician all feel the same ease and mastery in handling their respective subjects and instruments as the born orator or the born sportsman feels in attending to the details of his vocation. Attention conditioned in this way is sometimes known as Non-Voluntary Attention.

Bodily Attitude.—It will be remembered that we have described animal organism as a psychophysical unity, and that we have assumed that the activities of this organism are directed towards the attainment of an ultimate goal, at least the preservation of the individual and the race. It follows from these two fundamental theses of the New Psychology that every mental phenomenon has a physiological side to it, and that the whole psychophysical process is destined to achieve an end. We have seen that attention is 'clear' consciousness, and the function of attention, therefore, is to accentuate and promote the activity of the mind. The physiological aspect of attention must, consequently, be such as would lead to a clearer apprehension of the object of consciousness. The physiological counterpart of attention consists in the increased activity of some parts of the nervous system and a corresponding diminution in the activity of the other parts. As a considerable amount of psychical energy is expended whenever we are attentive, there set in a number of diffused motor excitations. The body as a whole is in the state of 'brace' or tension, the muscles are under control (the head, for example, being firmly set on the shoulders), and the respiratory and

circulatory processes are profoundly affected, breathing being kept as steady and noiseless as possible, and the pressure of blood and frequency of heart-beat conspicuously high.

The bodily 'attitude' is more prominent in the case of attention to external objects than in that of attending to one's own ideas. Under the former circumstance, the sense-organ adapts itself to give the fullest amount of the impression. The eye turns towards the object of vision and adapts itself to it, the head is adjusted to the source of sound, the fingers make the appropriate movements when we grope in the dark, the nose sniffs the air saturated with odour; and the tongue rolls the sweet morsel about and presses it against the roof of the mouth. Again, we change the position of our limbs and the general posture of our body with every change of the object of attention. It has been amply demonstrated by psychological experiments that direction of attention is closely connected with bodily movement. When we think of an object, we are inclined to make those very movements which have previously been found useful in perceiving the object. If the object be still within the field of sight, we throw 'frequent furtive glances' upon it, our hands unconsciously drift towards it, and the facial expression appreciably changes as we approach it or recede from it. All these are often a sufficient indication to the expert to allow him to detect the cherished object we have in mind.

Now, when we attend involuntarily or non-voluntarily we assume this attitude in the natural course of things, without any effort on our part. Hence the propriety of the terms 'Passive' and 'Spontaneous' for these forms

of attention. In the words of Titchener,¹ ‘we “fall into” this attitude naturally. Our nervous systems have been drilled, whether by the accumulated experiences of the race or in the course of our early education, and we adjust ourselves to the circumstances without difficulty or hesitation.’ But when our attention to an object is voluntary, we have to throw ourselves into the proper attitude. We have to overcome a conflict in withdrawing our attention from the objects of sense which are always invading the sense-organs. The result is that ‘the adjustment takes place slowly, and is completed only after many checks and hindrances.’

¹ *Primer of Psychology*, p. 84.

VII

PERCEPTION

Sensation and Perception —From among the series of mental processes we have so far studied only sensation and affection, two of the elements of mind. We have reminded the reader again and again that the elementary mental processes never come alone. They occur only as the constituents of complex mental phenomena. We have said that they combine to make up the concrete facts of mind, but we did not mean that individual and isolated sensations and affections are given to us, which we unite into a perception or feeling. The fact is that the actual mental content is always a complex whole, given *as such*. We do not first have the sensations of yellowness, strong scent, soft touch, and sweet taste, and then combine them into the perception of an orange. When we perceive an orange, it is given to us *as* an orange, and it is only later that we may break up our knowledge of the orange into the sensations of yellowness, softness, sweetness, etc. These sensations are only an abstraction, a result of analytic attention, and not complete mental processes in themselves.

In the light of this explanation, we should note that the rough grouping of mental processes into cognitions, feelings, and conations, to which reference was made in Chapter III., is an attempt to classify the complex

states of the mind. These complex states of the mind in which sensations predominate and the knowing side is the most prominent are called cognitions, those in which an affection predominates and the feeling side is the most prominent are known as feelings; and those in which a conation predominates and the active side is the most prominent are said to be conations.

Perceptions fall in the category of cognitions. A perception is generally defined as the cognition of external reality by means of a sense-impression. Sensations therefore form a necessary part of perception. But if a perception is analysed it will be found that sensations alone do not make up a perception. Yellowness, sweetness, and softness in themselves do not amount to the perception of an orange. When we perceive an orange, the yellowness given to us is the yellowness of the orange before us and not that of the gold coin which is in our pocket. Similarly, the sweetness is the sweetness of the orange and not that of the pudding which we had for dinner. The individual act of knowledge is not a hotch-potch of the several sensations but the cognition of an object having several qualities. Yellowness, sweetness, softness are not the one side of a mathematical equation of which the other is the perception of an orange. Rather we perceive an orange as a yellow, sweet, and soft object. To the simple fact of having these sensations should be added the further fact that these sensations *mean to us*, an object. Every perception, therefore, is the knowledge of an object; and in accordance with the general principle that all mental activity is directed towards an object, this fact is necessary to make perception a complete mental process.

Kinds of Perception.—Just as the predominance of sensations in a mental process makes it an act of cognition, in the same way the predominance of this or that characteristic of the constituent sensations makes a cognitive process one of this or that kind. We have seen that every sensation has a particular quality, a definite degree of intensity, a certain amount of extensity, and a certain length of duration, and that one sensation can be distinguished from another by virtue of these characteristics. Some sensations differ in quality, others in intensity, and still others in extensity or duration. One sensation may differ from another in more characteristics than one, but in order that two sensations may be different they must differ in point of quality, intensity, extensity, or duration.

Now, of these characteristics, when in a perception the qualities of the constituent sensations predominate in their varying degrees of intensity, we call that perception a *perception of Quality*, when the extensity of the constituent sensations predominates, we have a *perception of Space*; and when their duration predominates, we say it is a *perception of Time*. It is not that in a qualitative perception the sensations lose all their characteristics except that of quality, and in a spatial perception all except extensity, etc. It is rather that, alongside of the other attributes, in some perceptions the qualitative aspect prevails, in others the spatial, and in still others the temporal. The perception of an orange is a qualitative perception, not because the sensations of yellowness, softness, etc., have no extension or duration, but because in perceiving an orange we are concerned more with the qualities of these sensations in

their varying intensities than with their extensities or durations. This orange is not that orange mainly because this is yellower, softer, or sweeter than that; and whenever we have these qualities of the orange in view, our perception of the orange is a qualitative perception. But sometimes we may prefer one orange to another because it is larger in size, and whenever we do this our perceptions of the two oranges are spatial perceptions. So we may have more kinds of perception than one with respect to the same object. Our perceptions of size, shape, distance, position, and movement are all perceptions of space. But we may also notice the colour, sound, and touch of the same object whose size we perceive, and these sensations will give us a perception of quality. Again, the perceptions of date, time, rhythm, and of frequency and rate of movement are temporal perceptions, not because the visual, auditory, tactual, and other sensations which give us a knowledge of these things have no intensity or extensity, but only because we are interested more in their varying relative and proportional durations than in their other attributes. When we refer to a date, we think of so much time having since elapsed; when we say that it is twelve noon, we mean that half of the day has been spent while the other half is to follow; and when we perceive a rhythm, we notice the regularity with which sensations or groups of sensations follow one another in time.¹

¹ *Note* — If, irrespective of their qualities, the intensities of the sensations which enter into a perception are conspicuous, the perception is transformed into a feeling, as there is a direct and intimate connection between intensity of sensation and affection. (See Chaps. IV. and VI.)

We cannot here enter into the controversy between the Nativistic

Apperception.—We have described Perception as *par excellence* the process through which we acquire a knowledge of external reality. But our perceptions are not impressed on our minds like stamps. Each perceiving mind interprets the sense-impressions in its own way. We perceive the world through various lenses and thus make our own worlds of experience. A kitten readily perceives a dangling ball of worsted which a chicken or a rabbit totally ignores, and a starling takes accurate note of sounds to which the canary is practically deaf. Each species of animals is in this way congenitally endowed with a tendency to perceive certain objects and to be indifferent towards others. Again, during the course of experience each man develops certain tendencies to perception and aptitudes to accurate knowledge which other people lack. ‘Let four men make a tour in Europe,’ says James ‘One will bring home only picturesque impressions—costumes and colours, parks and views and works of architecture, pictures and statues. To another all this will be non-existent, and distances and prices, populations and drainage-arrangements, door- and window-fastenings, and other useful statistics will take their place. A third will give a rich account of the theatres, restaurants, and public halls, and naught besides; whilst the fourth will perhaps have been so wrapped in his own subjective broodings as to be able to tell little more than a few names of places through which he passed. Each has selected, out of

and Empiricistic schools regarding perception of Space. The author, however, believes that a perception of Quality, Space, or Time is not possible unless there is a native bent towards it from the very beginning (See section on Apperception)

the same mass of presented objects, those which suited his private interest and has made his experience thereby.'¹

This passage illustrates in an admirable way the selective power of perception. Besides this, even the perceptions of one and the same object are not the same in different individuals. My perception of a beautifully bound book is surely different from a small child's. The gardener's perception of the land and trees is similarly different from the landowner's perception of the same object. A huge tree means to a woodcutter a thing entirely different from what it means to an exhausted traveller in a summer noon. For the one it is a shady place of shelter, for the other so many maunds of firewood. What we perceive, and in what way we perceive it, is, therefore, determined by our innate tendencies and past experiences. Each perceived thing is in some way different for different individuals, and in the same individual different from all the past experiences of the same thing. 'Perception,' in the words of Angell,² 'is a synthetic experience, and the combination of the new and the old is the essential part of the synthesis. This process of combining the new and the old is often called *Apperception*. In perception, therefore, the raw material supplied by the several senses is taken up into the psychophysical organism, and there, under the process of apperception, given form and meaning by its vital and significant union with the old psychophysical activities. Material taken up in this way becomes as truly a part of the organism as does the food which enters the alimentary tract.'

¹ *Text-Book of Psychology*, p. 172.

² *Psychology*, p. 156.

Thus we have seen that perceptions are either instinctive or acquired. Each perception is an apperception. Sense-impressions are never presented in their utter nakedness. No sooner are they given than they are tinged with the colour of the percipient mind and form themselves into integral wholes to fit the inherited and acquired constitution of the individual. No new experience can ever become part of our knowledge if it is not consistent with the system of beliefs which we already possess. We know things only in the light of our past history.

Illusion and Hallucination.—Although each man's world is different, and one man's perceptions at one time are not the same as his perceptions at another time, yet by careful systematisation and a consensus of opinion we have all come to believe that there exists a reality independent of the knowing mind. This supposition is necessary in order that we may be able to live. Taking this for granted, therefore, we have set up an objective standard of judgment, and consider those perceptions which correspond to it as *normal*, and those which clash with it and are inconsistent with the whole as *abnormal*.

Illusions are a variety of abnormal perceptions, in this sense¹ They arise when a sense-impression is interpreted, not in the way in which it is interpreted normally (that is, by every man, at every time), but in a peculiar and unusual manner. A perfect square looks higher than it is broad. A hollow tooth feels larger than it actually is. The vertical line in Fig. 8 looks longer in the upper diagram than in the lower. The parallel rails of a straight section of railway line seem to meet at the

¹ They are normal in the sense that they are common to the species.

horizon. The surface of a rectangular table seems to be a trapezoid when looked at from a corner. We take the shadow of a tree trunk for a runnel of water, when walking after a shower on a moonlit night, and see a white lamp-post as a ghost



FIG 8
Illusions of size

The instinctive and acquired dispositions which determine our normal perceptions lead us astray when they take entire hold of us, and as a result the sense-organs prove unable to meet the requirements laid upon them. When our minds are predisposed to perceive in a certain way, we always perceive in that way, whether right or wrong. The sense-impressions suggest to us the wholes of which they ought to be the parts, and we tend to perceive the wholes as suggested. Psychologists have not yet succeeded in explaining all the diverse cases of illusion with reference to this principle, but sooner or later, it is hoped, every instance of illusion will be found to conform to this law.

In the case of optical illusions there is often a suggestion which is carried out in spite of the facts being to the contrary. In Fig. 8 we find that there is a suggestion of an enclosed figure, which in the case of the lower diagram is evidently smaller in its vertical dimensions than the upper diagram. In the case of the perceptions of the runnel of water and the ghost, the suggestion comes from the fact that our mind is full of ghost stories in the one case, and in the other of ideas of wetness, etc.

It is not necessary that the suggesting themes shall

always be in our consciousness. In most cases we cannot say how an illusion occurred, because the ideas by which the illusion is suggested are generally found in the sub-conscious level, of which we know nothing. A detailed study of the far-reaching effect of these deep-lying mental phenomena would take us too far afield from the purpose of this elementary account of mental phenomena, and the readers who are interested in this particular branch of knowledge must be referred to special branches of Psychology.

Hallucinations differ from illusions in that while the latter are essentially perceptions, though erroneous, the former consist in the consciousness of objects as if they were physically present when as a matter of fact no object whatever is present. When we take a coat hanging on a hat-stand in the dark for a ghost, we are said to have an illusion ; but if we see a ghost when no coat, hat-stand, or shadow is there, we have had a hallucination. A hallucination is an apparition to which the present state of the subject's mind gives rise independently of any sense-impressions, and should not therefore be called a perception in any sense, true or false, correct or erroneous ; an illusion, on the other hand, is an appearance determined, at least to some extent, by the sensations due to external stimuli, and is thus in a true sense knowledge of reality—false though it may be.

VIII

IMAGES AND IDEAS

Perceptions and Images.—In the previous chapter we have tried to make it clear that mental activity expresses itself in the perception of objects, and that it is only later that by an act of analytic attention we can distinguish the sensational and affective elements of which any perception is made up. Perception has been defined as a concrete mental process which consists in the cognition of objects presented to sense. Now our knowledge of objects is not confined to those before us · we may also possess knowledge of objects not actually present to sense. When we have eaten the orange, we still know the kind of orange we have tasted. The sight, touch, or taste of the orange are no longer there as they were when the orange was still in hand or mouth. Yet we have the cognition of the orange as it looked, tasted, or felt. In ordinary language we say we perceive the object which is before us and have only an image of it in our mind when it is removed.

Imagination, therefore, is like perception in two points. In the first place, an image is a concrete mental process which can be broken up or analysed into so many sensations just as a perception can be analysed. Secondly, imagination is an act of cognition and brings knowledge of things to the mind as perception does. But it differs

from perception in one very important respect. It does not help us with the knowledge of objects that are actually before us, but provides us with a cognition of things which are absent. While the sensations which constitute a perception are due to an excitation of the sense-organs through which they are given, the elements into which an image is analysed are due to the excitation, of their own accord, of those tracts in the brain which are connected with the particular sense-organs without any impulse travelling to them from the sense-organs. In psychological language, the former are Presentations, while the latter are Representations.

It is to be remarked that, just as sensations are never presented by themselves, but come only as constituent elements of concrete perceptions, in the same way no sensations are represented alone, represented sensations are only the result of analysing representations of concrete objects of knowledge. The word 'image' is sometimes applied to such elements of representation also; and, theoretically at least, there are as many kinds of images in this sense as there are sensations. While we have two words on the side of presentation—one standing for the whole presented and the other for the elementary parts of presentation—we have only one word on the side of representation, which does service for both the wholes represented and the constituent elements of representation¹

We come now to the problem which has perplexed so many thinkers of the past, viz. How can we distinguish

¹ The word 'internal sensation' is usefully employed by some psychologists to mean an element of representation and to distinguish it from an element of presentation, the latter being called an 'external sensation'. (See Titchener's *Primer of Psychology*, §§. 14, 16, 39.)

between a perception and an image, an actual presentation and a mere representation? It is not sufficient to answer that in the one the object of knowledge is present to sense, while in the other no object is really presented, as there is no independent method of ascertaining whether any object of which we are aware is actually present or not. This line of argument has led some philosophers to believe that there is no inherent difference between the two, and that the world is all imaginary, a protracted dream.

As students of Psychology we are not directly concerned with the wider problem, but Psychology has contributed very materially to the solution of that problem. From the purely psychological point of view, it has been found, we can clearly distinguish between a perception and an image. Presentations have certain peculiar marks of their own by virtue of which they stand out clearly and show themselves as fundamentally different from representations. Of these characteristics we need mention not more than two here—the fragmentariness of the images and their lack of ‘impressional intensity.’

The total experience given us at any time forms a whole in itself which is aptly called by Dr. Ward¹ the ‘presentation-continuum’ ‘What we call a presentation,’ he says, ‘is still part of a larger whole. It is not separated from other presentations, whether simultaneous or successive, by something which is not of the nature of the presentations, as one island is separated from another by the intervening sea, or one note in a melody from the next by an interval of silence.’ ‘We are constantly surrounded by a large number of objects

¹ Ward, *Psychological Principles*, p. 96

making up the world. They are all the time pressing upon us through the various sense-organs. Every new experience that comes to us must find a place in this total. Every impression must tell upon the whole organism and change it in a specific way. It is on account of this that, in Ward's phraseology, every impression, however faint it may be, possesses a fixity and a definiteness which every image lacks, however vividly it may be given. 'If we mentally image a sound,' says Stout,¹ 'the imaged sound is not part of one continuous whole with the totality of cutaneous, motor, organic, and other *sensations occurring at the moment*'² Whatever sensations are being produced at the time by the impact of the sound-waves on the ear enter into the general consensience, but the merely represented sound is outside the impressional context and remains relatively isolated. Similarly, a visual image, however full and distinct it may be as a purely visual experience, is discontinuous with the total sentience. Only experiences due to actual stimulation of the retina, or some equivalent condition, enter into this. In general we may affirm that all mental imagery as compared with actual sensations has a more or less fragmentary character. The sensory elements revived in the image are cut off from the sensational context and appear in detachment.'

Impressional intensity,' to come to our second point, must be distinguished from intensity as ordinarily understood. It is incorrect to say that an impression is always more intense as compared to an image. The image of a clap of thunder is surely more intense than the perception of the chirping of the cricket. But, as

¹ *Manual of Psychology*, p. 535.

² The italics are mine.

Hume admirably puts it, percepts strike the mind with a characteristic 'force and liveliness' which is lacking in the image. Though of a very low degree of intensity, the chirp of the cricket has a peculiar clearness and vividness which is *qualitatively different* from all images, even if they be so intense as that of a clap of thunder. Presentations and representations, therefore, are two entirely different kinds of experience, which difference is clear on the face of them. The aggressiveness of the percept and the force and liveliness with which it strikes the mind do not belong to the image, and constitute a salient mark of distinction between the two. As in the case of other fundamental distinctions of kind among mental phenomena, this point of distinction can be experienced by each man for himself, and is not capable of being demonstrated in any manner whatsoever.

Types of Imagery.—This distinction between Imagination and Perception raises a very important question. The nature and quality of sensations which go to make up a perception are determined by the sense-organs which are excited and the manner in which they are excited. What, it may be asked, determines the kind of elementary representation which constitutes a concrete act of imagination? When we are reminded of an orange, for instance, should we imagine it as it was *seen* by us or as it was *felt* by us or as it was *tasted* by us? In what terms do we know it now that it is not present to any of the sense-organs? The answer that the psychologist gives to this question is that it depends upon the mental make-up of each individual. If we were to ask a number of persons to think of an orange for a few moments and tell us what had passed through

their minds, we should find that some of them had had a mental picture of an orange before them in which the yellow colour and the shape of the orange were represented with considerable accuracy and detail. We should say that they had had a *visual* image of the orange. Others would find that the sweet smell of the orange filled their minds. Theirs was an *olfactory* image. Still others would report that they were thinking of the soft touch of the fruit which their hands and mouth enjoyed when they had last eaten an orange. These latter had surely had a *tactual* image of the orange. A few might tell us that the taste of the orange was uppermost in their minds, and we should understand that their image was a *gustatory* image. In the same way we may have an auditory image of an object, which would be made up of representations of sound. You entertain an auditory image of a singer or a speaker when you have before your mind the voice of the orator or the vocalist.

Experiment has shown that it is much easier for most persons to call up visual, auditory, and tactual images than it is to have a reliable olfactory or gustatory image. It has further been established that, although with sufficient effort most of us command all three forms of images mentioned above, some one or the other of these types of imagery dominates the imagination of each man. Some persons are eye-minded, others are ear-minded, and still others are touch-minded. All men, therefore, may be arranged into three groups—the ‘visiles,’ the ‘audiles,’ and the ‘tactiles.’ It should, however, be borne in mind that people belonging to any of these types are not altogether devoid of other forms

of imagery. An ear-minded person will not think of an orange in terms of the sounds which it will produce if handled or thrown on the ground, but will, in all probability, have a visual image instead. It is only when there is a possibility of imagining an object in more ways than one that the particular type of imagination comes into play. It is possible to revive the knowledge of a lecturer in terms of sight as well as in terms of sound. In a case like this the visualiser will always call up a picture of the man, while an audile will always have the mode of his speech before him.

Again, in certain professions and departments of life images of a certain type are by far the most useful—nay, indispensable. The artist and the inventor must be good visualisers, and the orator and the musician must have a command over vivid auditory images. But in addition to these, though less perfectly, they should also be equipped with other kinds of imagery. We make use of different types according as we have to deal with this or that kind of object. As it is impossible to have an auditory image of an orange, so it is extremely difficult to have a visual image of a tune heard or a tactual image of a clear blue sky. Every man is, in fact, more or less endowed with nearly all kinds of imagery, but in each some particular type or other predominates, and it is this dominant form of images which determines the so-called ‘memory type’ to which they belong.

Image and Idea.—We have so far described an image as a representative mental process of which an exact parallel on the presentative side is found in perception. But a pure perception is of rare occurrence. A perception always means much more than is presented to the

sense. When we *see* a book, we not only know it to have such and such a colour and shape, but are also aware of the fact that if we touch it, it will feel hard, and if we smell it or put it in our mouth it will give us some odour and taste. In this sense our perceptions in adult life are often described as 'symbolic.' 'In the early days of mental evolution,' says Titchener,¹ 'perception was wholly dominated by the object of perception, the material thing perceived. But as experience grew, and the store of ideas increased, the mind became ready to meet the material thing half-way; a full and complete perception could be touched-off by some single aspect of the thing. . . .' The actual presentations serve as symbols for a host of other aspects presented in previous experiences and somehow included in the perception of the moment.

Representations likewise symbolise many a thing which is neither presented nor represented in the experience of the moment. When I think of an orange, for instance, I do not understand it only as a thing having such and such a colour, shape, smell, touch, or taste, but I mean also an object which is refreshing, which contains juice, which is sold in the market, and which many people enjoy. A representation along with all that it *means* is called an Idea, just as a presentation along with all it *means* is called a Perception. Every representative mental process has two sides to it—the image side and the meaning side. In other words, besides being the image of this object or that, a representation means much more. It symbolises all that the perception of that object symbolises, and is from this point of view an idea. 'So

¹ *Primer of Psychology*, p 101.

far as in our descriptions,' says Angell,¹ 'we have in mind the *sensuous content* of a thought, as for example, its visual or auditory character, we use the term image. So far as we wish to emphasise in addition to, or in distinction from, this fact of sensuous constitution the purport, significance or *meaning* of the image, we use the term idea. Images and ideas do not refer to two different states of consciousness, but to one and the same state, looked at now from the side of sensuous character and antecedents, now from the side of meaning.'

A pure representation is as much a fiction as a pure perception, and what on the representative side completely corresponds to a full perception is therefore not an image, pure and simple, but a fully-fledged idea with both an image side and a meaning side. Although every idea centres round an image, the meaning side is sometimes so preponderant that the image side is totally eclipsed, so much so that some psychologists are even inclined to believe in the existence of imageless ideas. 'It is true,' says Stout,² 'that in general the onward movement of thought involves a train of successive images—images of words if there are no others. But the images do not follow each other quite continuously. There are gaps between them. Though such intervals are empty of imagery, they are by no means absolutely empty. They are filled by immediate experiences which have a quite specific character, although they are vague and indistinct. When, in writing, I have to consider what I am going to say next, my mind may be intensely active and I may have a quite peculiar feeling corresponding to the special nature of the topic with which I am dealing; and

¹ *Psychology*, p. 201.

² *Manual of Psychology*, p. 176.

yet I may not have a single definite image. The mind may be stirred to its depths without anything floating to the surface.'

It is one thing to say that mental activity may go on without *definite* images coming up to consciousness, and quite another to assert that it is possible without there being anything in the way of sensation presented or represented. It is true that our imagery may at times be altogether vague, unimportant, subconscious, or relegated to the merest fringe of attention. But in no case is a mental process possible which has no sensory element in it, clear or obscure, conscious or subconscious, definite or indefinite. However indefinite, subconscious, or obscure the sensory side may be, it is always present in a mental process. Just as it is indulging in an abstraction to speak of pure perceptions and pure images, so also we talk of fictitious mental processes when we bring in imageless ideas or idealess images.

There is one common variety of ideas, to which reference has been made in the passage we have quoted from Professor Stout, which are particularly amenable to an imageless interpretation. We mean ideas which have for their sensory foundations the images of words. When we are pondering over a psychological problem, we have nothing beyond a series of connected words represented to us. No images of the objects which the words signify are called up. Nay, by far the greater number of facts do not mean objects capable of being represented in clear-cut imagery. There rise no images corresponding to the words 'Psychology, 'thought,' 'mental,' etc.

But to say that when we think in words we leave the sensory ingredients of thought behind, and deal in purports and meanings and significances alone, is far from truth. Words themselves must be represented in terms of certain forms of imagery. A word must either be known as a word heard, or a word seen, or a word written or spoken. There is no other method by which we can have a cognition of words. And in so far as our thinking is carried on in words, some kind of imagery or other must be made use of. Visual, auditory, and tactual images corresponding to words are known in Psychology as 'verbal images.' In all the highest forms of mental activity we indulge only in the use of *words*, and the rest is tagged on to them as *meaning*.

There is one more fact which causes verbal imagery to be overlooked. When our purpose is to elucidate and systematise our *ideas* as distinct from *images*, the latter are often very brief, and are relegated to the extreme margin of the field of consciousness. Sometimes they remain entirely below the threshold of consciousness; and therefore when we are busy in conscious thinking we are inclined to ignore their presence altogether. You may read a whole voluminous treatise on an abstract subject like Mathematics or Higher Logic without any definite concrete images looming large in consciousness. The words and symbols are the only images employed, and, our attention being completely occupied by the abstruse subject-matter, they remain for the most part hidden in the lower levels of the mental stream. It is only in this sense that we may agree with Professor Stout in his belief 'that the mind may be stirred to its depths without anything floating to the surface.'

It is necessary at this stage to draw the attention of the reader to the fact that perceptions also, like sensations and affections, are a result of abstraction. So are images and ideas. What is given as a mental process is a presentation or a representation or both with *meaning* and a host of other things which will be dealt with in subsequent parts of this book. The introspective mind takes out a perception, an image, an idea, a sensation, or an affection for study, and the beginner is apt to believe erroneously that these processes exist in themselves and alone at this or that part of mental life.

Association of Ideas.—Everyone is familiar with the fact that one idea recalls another, and that a third, and so on. The thought of a dramatic performance reminds me of the preparations that were made in the college. In connection with these I met a friend. This gentleman was first introduced to me in the tennis court. This brings to my mind a good tennis player in the club. Then I begin to think of certain members and how they boast and swagger. This reminds me of the gentleman's senior in office ; and from this thought I pass to that of an interesting altercation which is said to have taken place between him and a higher officer. Thus my mind turns to the house of a common friend who is loved and respected for his humility and simplicity, and I recall a snug cushioned seat in one of his rooms. Next I am thinking of an interesting intellectual talk that we once enjoyed there in select company, and this brings me back to my vocation and the thought of writing, and thus to the task with which I am actually occupied at this moment.

In answer to the question why one idea should recall another, the psychologists reply that it is because the

two are *associated*. Our object in this chapter is to study the nature and laws of association in their broadest outline. The general principle is that any ideas which come to the mind simultaneously, or in immediate succession, tend to be associated, so that in future the occurrence of any one of them to the mind tends to be followed by the occurrence of the other. The dramatic performance reminded me of the preparations to which it was the sequel. This reminded me of the friend, as he met me at the time when these preparations were being made. This brought up the image of the tennis court, as our first meeting happened to take place there; and in this way any pair of associated ideas will be found to have occurred before, either simultaneously or in immediate succession to one another.

The two conditions of simultaneity and succession have led psychologists to believe that there are two kinds of association, *v.e.* (1) association by Contiguity in space, and (2) association by Contiguity in time. Perhaps the most detailed description of associations so far suggested is that of Professor Myers. He classifies associations into those of Similarity and Contiguity, which he further divides under two heads :

Similarity	{	in meaning.	{	Co-ordination, <i>e.g.</i> baby- infant
			{	Super-ordination, <i>e.g.</i> soldier- man.
			{	Sub-ordination, <i>e.g.</i> man- soldier.
			{	Contrast, <i>e.g.</i> peace-war.
		in sound.	{	in letters or syllables, <i>e.g.</i> port-porter.
			{	in rhyme, <i>e.g.</i> fight-kite.

Contiguity	$\left\{ \begin{array}{l} \text{in time.} \\ \text{in space.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Causal, } e.g. \text{ lightning-thunder.} \\ \text{Verbal, } e.g. \text{ one-two, snow-} \\ \text{snowball.} \\ \text{,, } e.g. \text{ handle-lock} \end{array} \right.$

Without going into details regarding the merits and demerits of such a system of classification, let us confine ourselves here to a brief study of associations by Similarity and Contiguity in general, and to seeing that the ultimate principle underlying the two forms is in essence the same.

The principle underlying association by similarity is simple enough. The thoughts of two similar things are in part identical. Apart from association by coordination, in which the point of identity is patent to all, even other forms of similarity involve partial identity. A soldier is a man, and the man has the soldier in him. Peace and war are two alternative states in which a country may find itself. The whole concept of nation involves the two aspects of a-nation-at-peace and a-nation-at-war. The word *porter* has its first syllable identical with the word *port*, and but for the first letter the words *fight* and *kite* are identical with each other in sound. We have now to see that association by contiguity is also based on the selfsame principle. We apprehend a train of objects in the order *a, b, c, d, e, f*, etc. When we think of *a* in future, *b* is recalled; *b* recalls *c*, *c* reminds us of *d*, *d* brings *e* in its train, and so on. Such a revival of ideas is often known as *Serial Recall*, in contrast to which association by similarity is said to involve *Divergent* or *Cross Recall*. This suggests to us the point of identity in the two forms of association. As in the case of two similar objects, so in the case of a series of

connected objects, the total experience forms a whole, the occurrence of a part of which tends to call up the whole to the mind. The series *a, b, c, d*, etc., lightning and thunder; one, two, three; snow and a game of snowball; handle, lock, and all—each one of these complexes of ideas forms a whole in itself. As *a* comes, the whole series of which *a* is the first part is predisposed to be revived; *b* will come, *c* will come, *d* will come, and the whole series will be repeated one after another. Serial reproduction as well as reproduction of similars, therefore, presupposes partial identity of nature. The only underlying principle is that any mental activity when partially revived tends to repeat itself in its entirety; and this one law of the operation of mind is adequate to explain all the various forms of association of ideas which determine their appearance on the conscious as well as unconscious levels of the psychical stream, and some of which are so subtle in their influence that even the keenest insight into the workings of the human mind fails to detect them.

We may still ask ourselves, why should one rather than another of a number of ideas, which are all associated with the *same* idea, be recalled when that idea occurs at a particular time? If the thought of a dramatic performance can equally recall to me the chief actor, the costly dresses, the illuminated stage, the excited audience, the preparations beforehand, and a thousand and one of the circumstances and events connected with it, why does it suggest one of these at this time rather than any of the others? Frequency, vividness, and recency of association have been mentioned by psychologists as the most potent conditions of recall. That experience

is remembered most readily and accurately which has most frequently, most vividly, and most recently been associated with the idea in question. A student recalls his class-roll number most readily, familiarly, and certainly because he has to make frequent use of it. A fatal accident comes up clearly before the mind, although it was witnessed but once in the lifetime, because the experience was so vivid and singular. I remember distinctly and completely the sentence which I have just finished although it has neither undergone any repetition in my past experience nor reaches any particular degree of vividness, it is remembered because it has only just been written. But when all this is said, the most important condition of memory has not been stated. However frequent, vivid, and recent our experiences may be, their revival is always dependent upon the *present state of the mind*. This fact has often been ignored because the most active part of our present experience, which determines the revival of ideas in our mind, often lurks in the unconscious region. New Psychology deserves all credit for bringing this important fact to light. Some remote and obscure event of our past experience makes its appearance all of a sudden in our consciousness, and we fail to account for its revival by referring to any of the conditions mentioned above. The psychoanalyst comes to our aid and, by employing a simple technique, tells us what there is struggling in the unconscious for a place on the level of consciousness which now and then succeeds in throwing a constituent or an associate of its own up to the surface of the mental stream. The whole mystery is made clear, and the remembered idea is referred to the ideas existing in the unconscious with

which it is associated and by virtue of which it is recalled.

The space at our disposal does not permit us to go into the details and examine the various graphic illustrations of the working of the unconscious. It will perhaps suffice for our purpose to draw the attention of the reader once more to the important fact in mental operation that the working of association holds good in the case of unconscious and subconscious phenomena just as it does on the conscious level, and that this adds to the subtlety of the *modus operandi* of association in the human mind.

IX

INSTINCTS AND EMOTIONS

General Theory.—In the foregoing chapter it was said that perceptions are either intuitive or acquired. The same is the case with ideas and the other concrete processes of the mind. We shall first take up the instinctive bases of mental phenomena and study them in greater detail, and then we shall pass on to the psychical complications which arise in the individual during the course of mental life.

The old schools of Psychology understood instinct only in terms of action, they talked of instinctive movements and instinctive behaviour, but an instinctive perception or an instinctive feeling had no meaning for them. Later psychologists discovered that instinct was intimately connected with feeling. For Dr. Lehmann 'every emotion is at the same time instinct,' and according to Professor James 'every object that excites an instinct excites an emotion as well.' It is only recently that psychological investigations have shown a close connection to exist between instinct and knowledge. An instinct is nowadays recognised as an innate tendency to the occurrence of a mental process, and inasmuch as a complete mental process comprises all the three aspects of knowing, feeling, and willing, an instinct is in the proper and complete sense of the word an inborn

tendency of the psychophysical organism to know a certain object in a certain way, to feel it in a definite manner, and to have specific conations towards it. Nevertheless, the mistake of ignoring the cognitive and the affective aspect of instinctive mental activity is common even to-day.

The best definition of instinct is given by the contemporary psychologist Dr. William MacDougall in his *Social Psychology*.¹ He defines an instinct as *an inherited or innate psychophysical disposition which determines its possessor to perceive, to pay attention to, to experience an emotional excitement of a particular quality upon perceiving such an object, and to act with regard to it in a particular manner, or, at least, to experience an impulse to such action*. When a horse smells a beast in the jungle, he *perceives* it as an object of terror, *feels* towards it in a particular way, and experiences a very strong impulse to turn in the direction opposite to that from which the smell is perceived as coming. All this is the instinct of Fear being operative in the animal's mind.

Reference has already been made in a previous chapter to the teleological character of mental life.¹ Instinctive behaviour is in a sense entirely teleological. The horse or the cow *smells* the beast at a distance because otherwise it would be impossible for the weaker animal to make good its escape, and it would fall an easy prey to the enemy. A strong *feeling* is aroused in the animal at the perception of the enemy, so that in a state of excitement the muscles may be in a better position to meet the danger than they would be in a lethargic condition. Again, it is *impelled to act* in exactly the manner which is

¹ p. 29

best calculated to save its life in the face of the impending menace. The cognitive aspect of instinct is generally given the name *interest* as contrasted with the conative aspect, which is called *impulse*, and the affective aspect, which is nowadays known as *emotion*.

Emotion.—Psychologists are far from being consistent in the use of the word ‘emotion.’ Emotions are generally described as complex feelings. By some psychologists special significance is attached to the complexity of the ‘situation’ which arouses an emotion, but by others to the extreme intensity of affection by which every emotion is swamped, and by others again to the number of organic sensations and bodily movements which are a permanent feature of each emotional excitement. This is not the place to enter into the details regarding the divers uses of the term and to study the merits and demerits of each case. It may be mentioned at the outset that we are to follow in the wake of the recent English writers on the subject, who are all inclined to apply this word to the *affective side of an instinctive mental process*; and hence the appropriateness of the remark that ‘every emotion is an instinct,’ and ‘every object that excites an instinct at the same time excites an emotion.’ The feeling which a horse or cow has in the presence of a beast of prey is the *emotion* of fear.

• The true working of an instinct can be seen only in those cases of mental perturbation which ordinarily go by the name of emotion. It is here that the instinct is exhibited in its true colours—its native intensity and forcefulness. In fear, in anger, in hope and in suspense, the instinct appears in its true colours, while in cases of feebler excitations the instinct either dwindles into a

single response to a simple stimulus tinged with meagre affection or transforms itself into a higher mode of mental behaviour which looks like the polar opposite of an instinctive movement. Led by the parental instinct, the mother in a primitive society simply conceals the child in her garment. The cultured lady of to-day is prompted by the same instinct when she quietly deliberates how best to secure an efficient nurse, and ultimately sends an advertisement to the most widely circulated newspaper in the country. In the first instance the instinct appears in its pristine nakedness, but not with its natural force, while in the second, though without its native forcefulness, the instinct is found working in a form considerably modified by individual education and national tradition. The parental instinct is, on the other hand, exhibited in its original shape and intensity when a mother sees her child in imminent danger. She finds herself trembling, speechless, and perspiring. Her heart beats violently against her breast, and her face loses its colour. She may even throw herself into fire or water without heeding her personal danger, without giving a moment's thought to any more prudent alternative.

Before taking up the question of the transformation of instinct, let us examine the nature of the primary emotions a little more closely.

In every typical state of emotion, the stream of mental phenomena is obstructed by the sudden appearance of a *situation* before us which commands involuntary attention; and as strong affection is, in the words of Titchener,¹ 'the counterpart of passive attention,' the

¹ *Primer of Psychology*, p. 143.

situation is felt as highly pleasant or unpleasant. The situation is instinctively perceived, instinctively felt, and hence instinctively impels us to action. We meet the situation by bodily movements. 'The deer runs when it hears the noise of the hounds, and the sitting bird crouches down upon the nest at the approach of an intruder.' These movements of the body, in their turn, give rise to a tumultuous mass of organic sensations—sensations which come through the muscles, joints, and tendons—and considerably raise the hedonic tone. The emotion overpowers the mind and results in a general perturbation of the organism, giving rise to a number of confused changes spreading all over the body. An emotion, therefore, is formed when the current of mental processes is interrupted by a situation which is instinctively felt and is highly pleasurable or otherwise, and is made still more keenly affective by the numerous organic sensations consequent upon a set of diffused movements instinctively performed by the individual.

Bodily Expression.—The movements which we instinctively perform to meet a sudden change in our surroundings are known among psychologists as the bodily expressions of emotion. The angry animal makes an effort to overcome resistance by main force. The child kicks and struggles and beats the objects nearest to it when he gets into a fit of anger. We sometimes break a piece of furniture or other article which we may be handling in a moment of anger. Similarly, a terror-stricken animal becomes quiescent so that it may escape the enemy's notice; in less violent cases of fear it takes to flight or hides itself. Men are known to have performed extraordinary feats of running and leaping under

the influence of fear. When pursued by a wild animal you would leap over a wall or jump over a ditch which you could not cross in your normal state of mind.

Again, we perform certain movements of the body only to give an indication of the state of our mind to others, so that they also may share our joy if it is a pleasant situation or may come to our aid if we are in an unpleasant predicament. 'The injured man,' says Titchener,¹ 'seems to be tasting something bitter, the disappointed to be tasting something sour, the flattered to be tasting something sweet.' We cry out in a peculiar way when we are afraid, and in a different way when we have won a victory.

As society progresses most of these movements become useless. The gesture movements described in the previous paragraph lose their utility and force in a civilised community where we have appropriate words at our disposal to express all the different states of our mind; and the protective movements first expressed are likewise of little avail in an advanced society where flight is less of a protection than the use of a small firearm hidden in a pocket; and motionlessness or violent efforts are not so effective in the presence of clever human opponents as cunning and superior skill. Yet the habits of action die so hard that they often survive even when they are no longer useful. 'If we men do not run, we do "jump" when we are startled; if we do not crouch down, we do "wince" when we are afraid.'²

Besides these instinctive movements, of a more or less

¹ *Primer of Psychology*, p. 147.

² *Ibid.* p. 146.

serviceable nature, in so far as every emotional excitement is an affective process, its physiological expression includes the normal bodily signs of affection. Consequently, changes of pulse and breathing, muscular strength and bodily volume, are all pronounced in every state of emotion. Further, as emotion is a much more complex and serious affair than a simple feeling, the bodily disturbances are also more widespread and far-reaching. The parts of the body which are particularly affected are the muscles and the glands. The tear-glands secrete tears and make us weep, and sweat-glands secrete sweat and make us perspire ; and the diffused activity of the involuntary muscles makes us tremble whenever we are face to face with an emotional situation.

Classes of Emotions.—Emotions being connected with instincts, it follows that all instinctive acts are tinged with a measure of emotional tone. All the principal instincts are, therefore, marked by emotional excitement in their workings, and a classification of the primary emotions is a task in no way different from an enumeration of the chief instincts. We can here do nothing better than to adopt Dr. MacDougall's list of the principal instincts along with the concomitant emotions.

INSTINCTS.	EMOTIONS.
1 Flight - - -	- Fear.
2 Repulsion - - -	- Disgust.
3. Curiosity - - -	- Wonder.
4. Pugnacity - - -	- Anger.
5. Self-Abasement - - -	- Subjection.
6. Self-Assertion - - -	- Elation.
7. Parental Instinct - - -	- Tender Emotion.

Moods.—In deference to tradition, moods deserve a

mention, brief though it may be, in every text-book of Psychology. But we should not be far wrong if we said that there are as many senses in which this word is used as there are psychologists of repute. Some regard moods as *weaker emotions*, others consider them to be *predispositions to special forms of emotion*, and still others take them to represent *emotions long drawn out*, and there are perhaps a thousand and one other ways in which this term is defined.

If we look closely we shall find that when we are said to be in a certain mood—say, of kindness or vexation—we are not only predisposed to fall into an affective state of the mind, but are actually experiencing a feeling, the affection pertaining to which colours all the mental processes which may come to our mind during its course. ‘After receiving a piece of good news,’ says Angell,¹ ‘we find every event of hours afterwards tending to take on a bright and humorous colouring. On the other hand, it is an equally common experience to find that a fit of indigestion will cast a saffron hue over the most welcome fortune.’ But neither joy nor sorrow is in itself a primary emotion according to the view that we have adopted. A tendency to feel pleased or not to feel pleased is not, therefore, a predisposition to a specific emotion, but only a predisposition to be *affected* by the coming mental process in a certain way. The tendency itself, again, does not make up the complete state of the mind at the time, but there is always something more definite—a specific act of the mind—the mood of satisfaction, kindness, sourness, irritability. It is not an adequate description of a man’s state of mind at any

¹ *Psychology*, p. 391.

time to say that So-and-So is in a mood of cheerfulness or gloominess. It is necessary always to mention the specific feeling which may occupy the mind.

We conclude, therefore, that a mood is in itself a definite mental operation and not merely a *tendency* to the excitation of a mental process. Nevertheless, a mood is closely connected with an emotion. In essence they are the same processes. Both have an instinctive basis, and both are swamped by affection. But a mood differs from an emotion in two definite points. In the first place, the affection in a mood is weaker as compared to an emotion; and, secondly, a mood lasts for a much longer time than an emotion. An emotion is such a strain on the organism that it can only be borne for a very short length of time. We cannot remain afraid or angry in the true sense for more than a few minutes. A mood, on the other hand, lasts for a much longer time. Moods are weak emotions and 'emotions long drawn out.' In fact, an emotion does not generally 'fade out altogether,' but 'subsides into a less violent and more lasting mood.'

Sentiments.—While the life of the animal is something like a see-saw of emotion and mood, in man the instincts undergo a continuous modification, and it is only occasionally that we find ourselves in the grip of a true emotion. By constant repetition the passing states of emotion become habitual, and may even assume the forms of enduring emotional attitudes. If a child, for example, is repeatedly thrown in the company of some person given to outbursts of violent anger, it falls into the habit of fearing him. The very idea of the man becomes capable of arousing fear in the child's mind. Without reference to any particular excitation of fear

in its mind, the child is said to be afraid of such-and-such a man. States of mind like this are the true precursors of those organised mental structures which we call *sentiments*. The emotion of fear may develop into the sentiment of fear, which the child may now begin to have towards the man. In another terminology they are called *Complexes*,¹ which are the permanent assets of every adult mind, work as motives of action, and thus determine his conduct. When a powerful complex is not allowed to spend itself in some conscious activity, it secures a firm seat in the subconscious or the unconscious and makes its existence felt, sometimes in the queerest ways, whenever it finds an opportunity to do so. We shall have to say more about the strange working of complexes when we come to the chapter on Abnormal Psychology. Like instincts, they are also complete mental processes with the three sides of cognition, affect, and conation.

They differ from an instinct in that they are not innate, but are the result of a growth and development which takes place during the course of the individual's life. 'Each sentiment,' says MacDougall,² 'has a life-history like every other mental organisation. It is gradually built up, increasing in complexity, in strength, and may continue to grow indefinitely, or may enter upon a period of decline, and may decay slowly or rapidly, partially or completely.' A number of complexes develop round each instinct, from which they derive the mental energy which they command.

¹ MacDougall proposes to limit the application of this term to the abnormal growths of the nature of sentiment.

² *Social Psychology*, p. 163.

To conclude, then, instincts are the tendencies to complete typical mental processes. In man they grow into sentiments or complexes. Neither perceptions nor ideas nor images are complete mental occurrences, sufficient to occupy the mind at any time, although they are concrete mental phenomena as compared to sensations and affections, which are the barest elements of mind—the merest abstractions.¹

¹ See pp 90-91.

X

MOVEMENT AND ACTION

Reflex Actions and Elementary Impulses.—If you examine a new-born babe, you will notice that certain stimulus-response co-ordinations are provided for from the very time of birth. Soon after it is born the baby cries, sucks the mother's milk, clasps its fingers round whatever object they come in contact with, and occasionally throws its arms and legs about at random. Later on, the eyes begin to move, but independently of one another, and with no special reference to objects in the field of vision. In the course of the first few weeks the eyes develop a tendency to converge and to follow moving objects, and the hands to explore the objects of touch. As development proceeds, the eye and hand movements are co-ordinated with each other. The hand now moves to catch the objects attended to. The child tries to grasp the moon.

Sensations, affections, and impulses inducing the simplest co-ordinations of responses to stimuli are the three types of elementary mental phenomena. In highly complex and systematised forms they enter into all the various instincts and sentiments, and along with the crude embryonic cognition and the faint insignificant affection by which they are in the beginning accom-

panied they are called Reflex Actions. Even grown-up men and animals perform a number of reflex actions, for example, when they wink or sneeze or belch unconsciously. Reflex actions are not bare responses to stimuli. They are *concrete* mental processes like perceptions and feelings, guided by instinct and embodying simple stimulus-response co-ordinations.

Impulse as Motive to Action.—We have said that the individual performing reflex actions is but crudely cognisant of them. We remain entirely unconscious of many a reflex action which we perform during the day. We are aroused to a vague consciousness of them if they are in any way arrested, though we may not know exactly what is missing. You do not know, for example, how often you have winked during the last thirty minutes, but if the eye muscles were rendered inactive you would feel a terrible strain. Some psychologists are of the opinion that we have a clear knowledge of all our reflex activities, which remains infra-conscious. Whether there is any such clear knowledge or not, at least this much is clear, that we are not conscious of their presence when they are being performed.

This fact distinguishes an impulse from a reflex action. A concrete impulse is made up of three things: (1) certain perceptions or ideas; (2) a certain affection, pleasant or unpleasant; and (3) a certain elementary impulse—a clear tendency to perform an action. In the foregoing chapter we have noticed the close connection which subsists between instinct and impulse. Every instinct is, according to Professor James, an impulse; and every object that excites an instinct excites an impulse as well, as has been amply demonstrated in the

last chapter. But all impulses do not possess the naturalness of instinct. Like perceptions, impulses too may be either instinctive or acquired. It is in this sense that impulse is said to be the typical motive to human action.¹ Most of the actions which we grown-up men perform are impulsive actions. We are conscious of the concrete impulse even before the action is actually performed. In most cases an idea of the result at which we aim, an image of similar movements that we may have previously performed, and a perception or an idea of some object by which the impulse is immediately excited, all run their course in the mind before we actually perform the act. I perceive that it is time for me to go to college, leave my work, put on my clothes, and ride my bicycle. I know that whenever I perform this set of movements I succeed in reaching the college, and am well aware of this object, which I keep before me to regulate my activities.

But all impulsive actions are not so complex as this. An animal perceives the near presence of an enemy and impulsively moves away from the source of danger without having the idea of any result or the image of any movement before it. I may be conscious of an impulse in me to go home in the Christmas holidays, or an impulse, while I am writing, to get up immediately and go out into the open air, although I may not be aware exactly why I am prompted to perform any of these acts. What is necessary is the *consciousness* of the impulse and not of the mental concomitants by

¹ It should be noticed that an impulse as such, the elementary impulse, is not a motive to action, but only the psychical counterpart of a physiological movement.

which it may be enriched. Impulsive actions, like reflex actions, play an important part in the working of instincts as well as of the complexes.

Reaction-Time.—Ever since experimental methods came into vogue in Psychology, the measurement of reaction-time has been one of the most useful instruments for detecting individual psychical peculiarities and the existence, nature, and mysterious workings of the unconscious mental phenomena. By a reaction is meant an action performed under standard conditions. The reader is already acquainted¹ with the use of experiment for the purpose of determining the conditions of a fact which is made the object of observation. An action performed under experimental control is technically known in Experimental Psychology as a Reaction. ‘It is agreed between the experimenter and the “reactor” (the person who is thus made to perform an action) that at a signal given by the former a definite movement shall be made by the latter. To get action at its lowest terms, *i.e.* to keep all the conditions of the experiment as simple as possible, the signal chosen is of such a kind as to arouse a single sensation (of noise, light, etc.), and the movement is that, *e.g.*, of a single finger. The instruments used are so constructed that the time elapsing between the signal and the movement can be measured: it is called the “reaction-time.”’² In the commonest form of this test the agent is made to move an electric key with his hand the instant he hears a sound in a telephone held to his ear; and the time elapsing between the giving of the sound and the occurrence of the movement is measured by a very

¹ See Chapter I.

² Titchener, *Primer of Psychology*, p 179

delicate instrument known as the 'chronometer.' Reaction experiments have yielded amazing results. We can by this means find out fairly accurately whether the reactor is used to this type of imagery or that—whether he anticipates the coming sensation in terms of sight, or sound, or touch. Again, some reactors find their attention absorbed by the sensation they expect, while others find themselves attending to the movement which they ought to make; so that what is ordinarily supposed to be the same mental act is not really the same in all cases. A very important kind of reactions are those known as Association-Reactions. The usual method is to prepare a list of words, of which one at a time is exposed to the 'reactor' through a slit in a screen, and he is required to announce as promptly as he can the idea which is called to his mind by the word before him. The time which he takes in doing so is accurately measured. By repeated experiments like this the trained psychologist is enabled to find out the complexes with which the reactor's mind is mostly occupied, whether on the conscious or on the unconscious level, particularly the latter. It is a popular belief that a word which excites an emotional state in the reactor's mind calls forth highly unusual associations, which take an abnormally long reaction-time. The field of contemporary reaction experimentation is so broad that one might go on indefinitely with illustrations and accounts of its marvellous achievements. Such details are, however, beyond the scope of an introductory manual.

Movement.—Ordinarily we talk of movement and action as synonymous. For instance, we have mentioned movements expressing emotions and actions

performed automatically. But it will be well for a thorough understanding of the subject if we attach definite meanings to these terms and thus avoid much confusion. We have seen that in concrete experience elementary impulses are always complicated by the presence of cognitive and affective mental phenomena, very often quite a large number of them. We may agree with Professor Titchener in giving these concomitants of action the name 'motive.' The simplest motives we have come across are those of the reflex actions. Comparatively more complex are the concrete processes which enter into a concrete impulse. Next to be noticed are the stormy congregation of mental processes which make up an emotion and keep company with the typically instinctive operations. Then there are higher forms of mental activity given in the state of active attention, which are, as motives to action, termed sentiments. We can also divide actions into *reflex*, *impulsive*, *instinctive*, and *volitional*, according as they are motivated by the weakest cognitive and affective mental processes (which do not deserve to be called motives), a concrete impulse, a typical instinct, or a sentiment, particularly the self-conscious sentiment. Hence the belief that in a reflex action there is no motive at all. But we have a dim consciousness and a feeble affection even when we act reflexly. Sometimes, on the other hand, parts of our body move without affecting the mind in the least. Some psychologists, as has been said, are of the opinion that the mental processes corresponding to these purely physiological movements are 'infra-conscious.' Without doubting or disputing the view, which has for its foundation the ultimate principle of psychophysical

parallelism, we do not consider it in any way inconsistent with the system of our psychological thought to call such operations of the body by the name of movement. Physiologically considered, all movements of the body which involve the intervention of specialised structures such as the sense-organs, the muscles and glands, and the nervous system, are actions ; the rest may be termed mere movements. Movements are *in this sense of the word* unmotived. But the question whether a living creature ever performs movements thus defined, is still an open one.

XI

MEMORY

General.—Up till now we have been making a study of those mental processes which may take shape in the conscious, the subconscious, or the unconscious. Perceptions, images and ideas, emotions and sentiments, may all occupy the field of consciousness or may hide themselves beneath the surface. Even moods and associations of ideas may often lurk below the threshold of consciousness. But now we come to consider those psychical phenomena which can exist only on the conscious level. Memories, thoughts, and volitions are nothing without the consciousness of them. There is no place for them in the subconscious. By constant repetition they may lose their original force and character, and may then be relegated to a lower level in a disguised form. But, *as such*, no memory, judgment, or deliberation can be subliminal. We must be in a conscious state of the mind whenever we are said to be *truly* remembering or judging or deliberating.

Retention, Recollection, Recognition.—‘Psychologists,’ says Titchener,¹ ‘often speak of “the three stages” or the “triple process” of memory. The three stages are those of retention, reproduction, and recognition. We

¹ *Primer of Psychology*, p. 197.

have a perception : it is *retained* in the mind, as an idea ; the mind *reproduces* it, brings it out again for use, when occasion arises , then, when it is brought out, it is *recognised* as the old perception.'

Let us take them one by one. Although we agree with Titchener in his view that it is misleading to say that the mind *retains* ideas, retention or retentiveness is one of the most important equipments of the psychophysical organism. Mind is far from being a store-house in which we preserve our ideas as we preserve fruit or ice, yet it is certain that when a mental process has run its course it does not vanish altogether. 'No house,' says Stout,¹ 'could be built if each brick vanished as it was laid, and had to be replaced anew. A rope cannot be formed of dry sand which crumbles away as it is put together. Similarly, mental development would be impossible unless previous experience left behind it persistent after-effects to determine the nature and force of subsequent experience, . . . *specific experiences leave behind them specific traces or dispositions.*' This is the law of retentiveness. If this were not operative, no image, no idea, no association or recall would be possible.

If no ideas are stored in the mind which may be taken out bodily at a subsequent time, it is equally misleading to talk of 'reproduction' or 'recollection.' It has been pointed out before that while the object of a mental process, say a perception or an idea, may be the same in different people or in the same man at different times, the actual psychical constitution of the process may be different. My perception of the book which is in my hand is made up of different elements from those of

¹ *Manual of Psychology*, p. 169.

which your perception of the same book is composed. Moreover, this very book *means* to me much more than it means to anybody else. To me it is a book which I received as a prize, of which I have made a thorough study, and which has been my constant companion and helper. To you the same book may mean nothing more than a bundle of printed paper. Again, as Titchener has aptly remarked in this connection, our ideas are not true copies of perceptions. Our memory of a sound may be a sight, and our idea of an organ which we have *seen* may be made up of sweet *sounds* which are expected to come out of it.

When we come to recognition, we touch upon memory proper, and the difference between the old Psychology and the new is thrown into greater relief. For the old Psychology, to have a mental process and to be conscious of it mean one and the same thing; and there does not appear to be much of a difference between James's¹ definition of memory as *the knowledge of an event, or fact, with the additional consciousness that we have thought or experienced it before*, and Titchener's² statement that *whenever consciousness is made up of a central idea, of associates to that idea, and of the mood of confidence, memory is going on*. But according to the new point of view all the processes except the moods mentioned by the latter may go on in the subconscious, and the use of the word 'consciousness' is a misnomer, while the 'additional consciousness' emphasised by the former is clearly *consciousness* in the true sense of the word; and hence, if understood in this light, the definition of memory given by James is in no way faulty. Professor

¹ *Text-Book of Psychology*, p. 287.

² *Primer of Psychology*, p. 198.

James is careful to note that memory proper is the knowledge of a *former state of mind* after it has already once dropped from consciousness. It is now, therefore, not a perception but an idea, with the additional consciousness that we have previously had a perception corresponding to it. When we perceive a man and say, 'I remember having seen him before,' besides the present perception we have also an idea which tallies with the previous perception.

A mere perception with the additional thought that it has also been experienced before, tagged on to the margin of consciousness, is called recognition. While, like memory, recognition proper cannot but appear in consciousness, there are some perceptions and ideas which become so familiar by constant repetition that we simply take them for granted without recognising or remembering. Certain objects are simply *directly apprehended*. Direct apprehension may be placed in the centre of consciousness, like that of the object I am handling and the words I am writing; or it may be given in the margin, as is that of the chirping of the birds outside or the hardness of my chair, to which I am not attending, although I am in a way conscious of them; or else it may remain entirely below the level of consciousness, which is the case with the objects that come to my mind without my being in any way conscious of them. We have already seen how the existence of such mental processes can be detected by the use of experimental methods. Objects directly apprehended are not perceived or called to mind by association for the first time. They are perceived and recalled after they have been many a time recognised and remembered in pre-

vious experiences.¹ Most of the facts directly apprehended are perceived or thought of in consciousness, while the knowledge that they are old friends remains in the unconscious.

Perhaps the way in which we have explained the phenomenon of memory has led the reader to suppose that formation of memory is posterior to the formation of the perception or idea which is referred to the past. Professor Henri Bergson has very beautifully and emphatically brought this common mistake to light. 'The memory,' he says, 'seems to be to the perception what the image reflected in the mirror is to the object in front of it.'² Again, in a later article³ he clearly states. 'I hold that the *formation of memory is never posterior to the formation of perception ; it is contemporaneous with it.* Step by step as perception is created, the memory of it is projected beside it, as the shadow falls beside the body. But, in the normal condition, there is no consciousness of it, just as we should be unconscious of our shadow were our eyes to throw light on it each time they turned in that direction.'

Kinds of Memory.—So many differentiations have been made by psychologists in the examination of memory that it is impossible in this small primer to deal with each one of them. We hear of good and bad memory, complete and incomplete memory, quick and slow memory, serviceable and unserviceable memory, mechanical and rational memory, and passive and active

¹ The reader will perhaps observe that the words 'memory,' 'being reminded,' etc., were not used strictly in their proper sense in Chapter VIII.

² *Matter and Memory*, p. 167.

³ *Revue Philosophique*, December 1906.

memory. I shall confine myself to a description of the last two modes of classification, which I believe to be closely connected with each other.

In *Matter and Memory* M. Bergson has shown that 'we must distinguish a series of different "planes of consciousness" beginning with the plane of "pure memory" not yet translated into distinct images, and going down to the plane where the same memory is actualised in nascent sensations and movements.' This lowest is the plane of mechanical memory. Mechanical memory consists in an image calling up an image—all the images bringing with them a more or less conscious knowledge of their having been experienced in the past. When I see a particular book on the table, I remember that I was the recipient of it on an annual prize-giving day celebrated in the Stephanian Hall at the close of the day. I remember the face and the courteous gesture of the worthy President. I remember the Principal, dressed in his academic robes, calling one name after another, and above all I remember a senior student who got such a large number of beautifully bound volumes as prizes that he could not hold them all in his arms and let them fall at the foot of the dais. In a memory-process like this the reader can picture vividly to himself one image coming after another like the teeth and indentations of a cog-wheel in a perfectly mechanical manner.

As opposed to this there is the process of intellectual memory. When I say that I remember my Psychology, or my lessons for the day, or what the lecturer said in his lecture, I certainly do not mean that I am bringing to my mind in succession, or can at least so recapitulate,

all the events as they took place one after another in my study of Psychology, or in preparing the lesson, or during the course of the lecture. The latest investigations on memory have shown that a single simple idea is capable of developing into a number of images. M. Bergson calls it a *dynamic scheme*. 'I mean by this,' he says,¹ 'that the idea does not contain the images themselves so much as the indication of what we must do to reconstruct them. It is not an extract of the images, got by impoverishing each of them. . . . It is not either—or at least it is not only—the abstract idea of all the images taken together. . . .' The various technical and professional memories are varieties of this kind of process. M. Bergson takes as illustration the memory of a chess-player. 'A skilful chess-player,' he says, 'may be able to play several games at once without looking at the chess-boards. At each move of one of his opponents, the new position of the piece moved is indicated to the player. He then moves a piece on his side, and thus, playing blindly, picturing mentally at each moment the respective positions of all the pieces on all the chess-boards, he is able to win, often against good players, games simultaneously played. . . . The image of the chess-board with its pieces is not presented to the memory, clean cut and ready made, "as in a mirror," but at every move in the games the player has to make an effort of reconstruction. . . . What they keep in mind is not the external aspect of each piece, but its power, its bearing and its value ; in fact, its function. A bishop is not a piece of wood of more or less fantastic shape : it is an "oblique force." The castle is a certain

¹ *Revue Philosophique*, January 1902.

power of "going in a straight line." The knight, a piece "which is almost equal to three pawns and which moves according to a quite special law," and so on. So much for the pieces. Now for the game. What is present to the mind of the player is a composition of forces, or rather a relation between allied or hostile powers. The player remakes mentally the history of the game from the beginning. He reconstitutes the successive events which have brought about the present situation. He thus obtains an idea of the whole which enables him at any moment to visualise the elements. The abstract idea is, moreover, *one*. It implies reciprocal penetration of all the elements in one another. What proves it is that each game appears to the player with a character entirely its own. It gives him an impression *sui generis*.¹

To come now to the distinction between active and passive in memory, it is not sufficient to say, as Titchener does, that while the former is preceded by a stage of active attention, the latter is not. It is true that the former is effortful memory, while the latter is without any effort. But in what does effort consist? We have seen that a schematic idea or rational memory is in essence different from mere mechanical memory. In the former there are very different dynamical elements implied in one another and internally complicated. The memory *Prendergast* in Bergson's mind, *e.g.*, included an impression of a definite kind of strangeness and a feeling of barbarism and rapine (because the word *prendre* means to snatch, and the name 'Arbogaste' occurs in Roman history and evokes vague images of barbarism). Now the effort in voluntary memory consists in trying to

¹ *Mind-Energy*, pp. 161-2.

evolve a schematic idea into an image with its elements distinct and more or less independent. 'When we let our memory,' says Bergson, 'wander at will without effort, images succeed images, all situated on one and the same plane of consciousness. On the other hand, when we make an effort to recollect, it seems that we are concentrating on a higher plane in order to descend progressively towards the images we want to evoke. If, in the first case, associating images with images, we move on a single plane with a movement which I will call horizontal, then in the second case we must say that the movement is vertical and that it makes us pass from one plane to another.'

It is rather difficult to define the schematic idea which rational memory involves and the method of its evolution into distinct images. But by an attempt to analyse his effort in evoking a simple but elusive memory, everyone can find for himself what the processes mean. If you forget the name of an acquaintance and try to recall it, you will feel the existence in your mind of a sort of *scheme* into which enter, as interconnected parts, all the various incidents and vague reminiscences in which the name is enveloped. You may not succeed for some time in remembering the actual name, but you will feel the presence of the whole of which the name is a part. This is a schematic idea which will, by an effort of active attention, be ultimately evolved into the image of the name as seen, heard or written, and is called your active memory of the name.

Training of Memory.—Experiments are being performed every day in connection with the methods and results of memory training. Two facts have so far been

established beyond doubt. In the first place, it is certain that the exercise of memory in a certain direction improves it in that direction. Actors can learn up their parts, clergymen their sermons, and lecturers their speeches with far greater ease and accuracy than other people can do the same things, and they get up other subjects with which they are unfamiliar. The reason seems to be that each man has a ready-made scheme corresponding to his own profession and practice. All the ideas which fit in with that scheme find a more or less permanent abode in it, and are consequently retained longer and called up with less difficulty.

This brings us to the second of the two facts referred to above. What we do ordinarily when we try to learn up something is to use both mechanical and intellectual memory. The consequence is that when we try to recall what we have learnt, neither the reflective consciousness nor the mechanical series of images comes to our aid. The intelligent reconstruction and the automatic recollection are so completely mingled that we become confused between them. Hence the law laid down by M. Bergson, that the facility of recall of a complex memory is in direct proportion to the tendency of its elements to spread themselves out on one and the same plane of consciousness. If the object of learning be merely a verbatim repetition, as of a lesson before the teacher, reflection on the meanings of words obstructs rather than helps the mechanism of recall. If the memories are all of the same order or in one and the same 'plane of consciousness'—in this case that of sensual imagery—they last longer and come up without effort. For the same reason, if our object in learning is not the

repetition of the whole at any particular time, it is best if our memory is of a higher order. We reduce the diffused elements to a scheme, or without attending to the concrete images we try to master the entire scheme.

Robert Houdin performed certain experiments on his own little son. He made the child total up small numbers of dots on several dominoes *without letting him count them*. To this end he exposed the dominoes to the child and immediately removed them. In this way, practising to add up at a single glance, the boy was gradually enabled to obtain instantly at sight the sum of dots on as many as twelve dominoes. 'When we had gained this result,' Houdin says,¹ 'we set to work on a task of a different kind of difficulty, and gave ourselves up to it for more than a month. My son and I passed fairly quickly before a shop of children's toys or before one furnished with different kinds of commodities, casting on it an attentive look. A few steps beyond, we took a pencil and paper from our pocket and tried separately which of us could write down the greater number of the objects we had noticed in passing. . . . It often happened that my son would write down forty objects.' This is a marvellous result, which was achieved by keeping memory confined to a single 'plane of consciousness'—visual imagery. It is therefore particularly to be noticed that the child was not permitted to pass on to a higher plane, *e.g.*, that of counting in his mind.²

¹ *Confidences*, vol. i. p. 8 f.

² The author is indebted for all the passages incorporated in the latter part of this chapter to the volume brought out by M. Bergson in 1920, under the title of *Mind-Energy*, translated by H. Wildon Carr.

Another conclusion that we can draw from this experiment is that learning is easier when we attend to the whole at once. If the child were to look at the toys one by one and count them and try to remember them, he would not succeed in reproducing so many names. If you want to learn up a lesson, it is better to go through the whole at intervals than to take a part each day and try to memorise it piecemeal.

XII

THOUGHT AND LANGUAGE

Abstraction, Comparison, Discrimination.—A schematic idea is the highest type of thought that we can entertain. Before we reach such a general idea we have to pass through what is ordinarily known as an ‘abstract’ or a ‘generic’ idea. Titchener has very suggestively explained an ‘abstract idea’ on the analogy of a composite photograph. In books on medicine we come across images of *typical* maniacs or *typical* tuberculous patients. A number of individual patients, all suffering from the same complaint, are photographed separately, but on the same sensitive plate. In this way the differences in their features are greatly minimised and practically disappear, while the characteristics common to all of them are emphasised, and thus there emerges what is described as a typical face. Similarly, we have generic images, which do not correspond to any individual object, but represent those aspects alone which are common to a whole class of objects. We may have an ‘abstract idea’ like this corresponding to ‘horse’ in general or ‘cow’ in general or ‘man’ in general, not the images of this or that horse or cow or man—a bay horse, a white cow, or a tall man—but a ‘wavy outline’ of an average horse, an average cow, or an average man.

An abstract idea is the result of analysis. We *abstract*

out of a whole those qualities which it possesses in common with others and obtain a generic image. To begin with, an abstract idea is but a poor image. The child calls all men 'father' and all animals of a particular size 'dog.' He cannot discriminate between one man and another, or one animal and another, because his generic image of the one consists of nothing more than a tall, erect figure, and of the other only of the attributes of walking on all fours and possessing a low stature. In order that our abstract ideas may develop into truly general ideas, they must not only be sufficiently rich, but they should also be compared with one another so that *discrimination* may be sufficiently keen. It is always through comparisons that ideas are formed. A child possesses a generic image of 'book.' When he sees a new object resembling a book he compares the percept with the image. If the object before him can be opened and pages inside it can be turned, it is a 'book'; if it has a smooth surface and cannot be opened as a book can be opened, it is only a dummy volume. 'The growing mind,' says Dr. Ward,¹ 'passes beyond mere perception when some striking peculiarity in what is at the moment noticed is a bar to its definite recognition. A deer-stalker, say, is not instantly recognised as a man, because he is crawling on all fours; or a scarecrow looks like one and yet not like one, for though it stands on two legs, it never moves. There is thus a pause and no "naming"; the conflict of ideas—quadruped or biped, clown or boggart—inhibits this step.'

By repeated comparison and discrimination we construct general ideas. Mere analysis of perceptions and

¹ *Psychological Principles*, p. 305.

images into their constituent qualities is not sufficient in itself ; we ought to perform a further process of synthesis. The analysed ingredients are put in new wholes with distinct meanings. 'We give an essentially inadequate view,' says Stout,¹ 'of the generalising function of thought when we dwell exclusively on what it omits. This negative side of the process has got as its indispensable correlate a positive side. In any train of thought we are under the guidance of a controlling constructing ideal whole. . . . Similarly in building a house, we have first to go to the quarry and detach the single stones from it, afterwards hew them into shape, and then build with them a new structure.' This is how concepts are formed. Just as we can build houses of different designs from the same material, so we can make different concepts of the same qualitative factors. There are hardness, colour, smell, sweetness and wholesomeness in the apple as well as the pear, but the structures of the two concepts are different. The one may be associated with more smell and less hardness, the other with more hardness and less smell, and so on. Colour and form are arranged differently in the two, giving them different shapes. The one is known to produce a certain effect on digestion, the other a different effect. No concept is in this way identical with another concept.

Conception, Judgment, and Reasoning.—Endless controversy gathers round the question whether judgments or concepts appear first in our thinking. We have seen how, rising from simple perceptions and images through abstract ideas, we frame concepts. But it has been emphatically asserted that the unit of thought is judg-

¹ *Manual of Psychology*, p. 586.

ment and that a concept appears only as the result of analysing a judgment. A concept is, on the other hand, supposed to be a part of a judgment. Two concepts combine to form a judgment. We have a concept, for example, of an orange and another concept of yellowness. Combining them, we say an 'orange' is 'yellow.' So we must be in possession of two concepts already before we can arrive at a judgment.

The fact is that if there are no judgments without concepts, there are no concepts without judgments. When we recognise the object before us as a dummy volume, or a deer-stalker, or an earthenware imitation of an apple, we always mean statements like : It does not open. It crawls. It has no smell. Although we may not make these judgments explicitly, they are implied in every act of discrimination and a consequent formation of concept. We conclude, therefore, that concepts and judgments arise together. Our first concepts and judgments, however, may be very crude. When we perform the simple acts of discrimination mentioned above, it means that we are on the way to the formation of concepts and judgments rather than that we have formed them definitely and completely. The judgment assumes its full stature when the two concepts are clearly understood as distinct wholes. The concept comes to completion when it is used as predicate in more judgments than one. In a crude judgment the subject is nothing but a vague mass of sensory elements, an aggregate idea, 'a mixed medley of the processes derived from sensation,' which may consist of 'perceptions, ideas, tags of meaning, and what not.' 'It is not an idea in the strict sense of the word ; sometimes, it is not even

a complex of simultaneous associates ; idea may follow idea within it, by successive association. Nevertheless, it has a peculiar singleness of character, due to the fact that the meaning of the central idea in the total complex remains the same throughout.'¹ The subject idea in a crude judgment is in essence the same as a schematic idea, although it is not so complex. It may be nothing more than an object which is before us, a direct apprehension, which is worked over in the state of active attention, and a certain feature is then abstracted which is set up as the predicate. The predicate, in its turn, is equally crude in a simple judgment. It is a vague 'something' which can be thought of as separate from the whole, not a point of discrimination and comparison. Examples of simple judgments we have seen already. To illustrate a more complex form of judgment, we may take the statement, 'Rama was brave.' We have a schematic idea of the epic of the Ramayana, we work over it feature by feature, and come to the conclusion that the hero was brave. The aggregate idea corresponding to the Ramayana is vague, like other schematic ideas, but it is sufficiently complex. It may include a number of simpler concepts. Similarly, the idea of bravery, though a feature abstracted from the character of Rama as depicted in the Ramayana, is a clear-cut concept. We have already had experience of a number of judgments in all of which it figured as the predicate: *X* is brave, *Y* is brave, *Z* is brave, etc. It is in this way that concepts, in the truest sense of the word, are formed.

As full-grown concepts imply judgments, so fully-fledged judgments involve inference. When we say

¹Titchener, *Primer of Psychology*, p 218.

' Rama was brave,' or ' He must be a king,' or ' He is red with fury,' we mean to say that Rama was brave *because* he lived in the jungle and fought the demons, that he is a king *because* he is wearing a crown, and that we judge him to be angry *because* his face is red. Some rudimentary reasoning is generally supposed to be present from the very beginning of conscious life in man.

But inference, in the proper sense of the word, is believed to be a higher process. Angell takes a simple arithmetical problem by way of example: If thirteen melons cost a dollar and forty-three cents, how much should twenty cost? Now, 'melon,' 'cost,' 'cent,' etc., are all concepts. If we analyse the process of reasoning involved in the solution of this problem, we come to a train of thoughts like this: One dollar and forty-three cents—one hundred and forty-three—thirteen times eleven—one melon eleven cents—eleven times twenty—two hundred and twenty—two dollars and twenty cents.¹

What we do here is to pass on from one idea to another associated with it. But this is not all. We are not captured by any and every idea which is in some way associated with the first thought, and so on. We make selections. The object we have in view determines the idea which shall come up.

We may, therefore, define reasoning broadly as purposive thinking—that is to say, thinking carried on in the interests of some plan which we wish to execute, to help us in dealing with some problem which we wish to solve, some obstacle which we wish to surmount.

Understood in this way, reasoning must always take shape on the conscious level—nay, must appear in the

¹ Angell, *Psychology*, p. 268.

focus of attention. Idea may follow idea in the sub-conscious or unconscious, but reasoning proper, with the selective feature predominant, cannot go on below the threshold of consciousness. It is always an operation which needs active attention.

If we expand any process of reasoning, we shall come to a series of judgments strung together—the purpose in hand providing the connecting link :

- (1) Only kings wear crowns. He is wearing a crown ; therefore he is a king.
- (2) *X* was red when he was angry. *Y* was red when he was angry. *Z* was red when he was angry. Nature works uniformly. He is red ; therefore he is angry.
- (3) Thirteen melons cost one dollar and forty-three cents.

$$\text{One dollar} = 100 \text{ cents.}$$

$$100 + 43 = 143$$

$$143 \div 13 = 11$$

Therefore 1 melon costs 11 cents.

$$11 \times 20 = 220$$

$$220, = 200 + 20$$

$$200 \text{ cents} + 20 = 2 \text{ dollars and } 20 \text{ cents.}$$

Therefore 20 melons cost 2 dollars and 20 cents.

Development of Language.—‘ Conceptual thinking,’ says Stout, ‘ would only exist in a most rudimentary and inchoate form apart from the use of some kind of expressive signs.’ In conventional language words serve to express thought. But verbal language is the result of a long course of development. It has grown out of *natural* signs of expression. We are familiar with the bodily expressions of emotion. We frown when we are

angry, and smile to give expression to our joy. But apart from this, the human mind is capable of developing a certain kind of mental process which enables it to communicate to others its reference to objects outside the range of present perception in a way different from emotional expression.

In men, as well as in animals, if a whole group is at some time subjected to an emotion, every one of them is made familiar with the expression of that emotion. If, therefore, any individual behaves in the same manner on a later occasion, his companions will catch the emotion from him without themselves being face to face with the situation which is presented to him. Their behaviour is thus naturally understood ; it carries a meaning with it. But man purposely makes certain signs with a view to making himself understood. Although the signs so made are not merely the physiological expressions of emotion, yet in the beginning they are very natural. When a child or a savage has to direct your attention to an object, he will either point to the object or, if it is not within sight, he will go and fetch it. But if he cannot succeed in doing any of these things, he will describe the form of the object in the air, or imitate it in thought with hands, fingers, or gestures ; or else he will make some sound imitating that produced by the object to which he intends to refer or imitating the sense which he wishes to convey. Onomatopœic words, such as *pooh-pooh*, *bow-wow*, *zig-zag*, *tick-tick*, are the best illustrations of the tendency which people who are unable to use a language universally display. The first advance which is made beyond the gesture-language employed by animals consists in phonetic speech.

But gesture-language and phonetic speech are utterly inadequate to meet the development of thought. Conceptual analysis and synthesis may find some expression in imitative gestures in so far as we may have one mode of expressing a universal or a whole, and a different way of conveying the idea of a particular or a part. *Tick-tick* is an expression for clock, while making a circle with the index finger in the air may demonstrate a wheel in motion. Similarly, *bow-wow* may denote a dog in general, while some peculiar noise or some special gesture may stand for a particular animal of that species. Nevertheless it is very difficult and in most cases impossible to find appropriate gestures and imitative sounds for all the various complexities of thought. We cannot, for instance, express 'Psychology,' 'life,' 'mind,' 'idea,' 'existence,' etc., etc., in any such way. Even where we can express abstract thinking in this manner it means a great waste of time and a heavy drain upon our energy.

Those who have witnessed pantomime shows, or have ever had an opportunity of talking to a man denied the use of speech, can picture to themselves how difficult it is to make oneself intelligible without the use of words. It is almost impracticable to convey any unusual or subtle meaning by the use of signs alone. Engineers have often found themselves in charge of bodies of workmen whose language they could not speak. When any fresh instructions had to be given, they have had to repeat their gestures again and again with all kinds of modifications until they were understood. With people of a low order of intelligence they might never succeed. Similarly, explorers in remote corners of the world have

often learnt the limitations of gesture in explaining their errand and requirements.

Thought, in the proper sense of the word, would have been impossible if it had been restricted to gesture and imitative expression. Thought and its expression grow hand in hand. Animals can command gesture-language alone, and hence they possess but an apology for thought. Animals cannot properly be said to exercise thought at all. The small child and the primitive man do employ thought. But their thinking is as crude and ineffective as their language. A small list will exhaust the whole stock of concepts with which a child's or a savage's mind is furnished. He does not possess any vast system of genera and species. Hence we conclude that, side by side with the development of thought, there goes on a development of gesture-language into conventional language. 'Conventional language consists almost entirely of phonetic elements,' as thought is made up of certain sensory elements. Corresponding to conceptual analysis and synthesis we find, on the other side, etymological analysis and synthesis. Just as the same sensory element may form part of various perceptions and ideas, in the same way the same root, suffix, affix, or prefix may enter into many words; and just as each concept is a unique structure, each word has its own shade of meaning. Conceptual language is a system of words and expressions formed by putting together and modifying phonetic elements, which corresponds to and thus testifies to the existence of a conceptual system. The more developed any such language is, the more developed is the system of thought employed by those who use it. Thought and language evolve together.

XIII

VOLITION

Character and Will.—Volition is recognised by many as a distinct faculty of the human mind. Whenever there is a conflict of motives impelling to action, we exercise this faculty, and our will throws itself on the side of one of them and determines the way in which we act. Man is supposed to be a free agent because he possesses a *free will*. When there are more alternatives than one open to us for action, we are free to act in any way we like, to accept any one alternative and to reject the others. For instance, it is open to me at this moment to go on with my work, to leave the chair and lie down on a sofa, or else to get up, dress myself and go out for a walk. So long as there is no physical obstacle to my doing so, I am supposed to be at liberty to act in any one of these ways at this time.

In the chapter on Emotion and Instinct, however, we have emphasised the fact that the only motives to action are instincts, either in the form in which they are given to us at birth, or in the guise of sentiments which result from the modification, interaction, and development of instincts. The free-will hypothesis is obviously inconsistent with the view there adopted. The libertarian assumes the existence of another potent motive to action, viz. volition. According to this view, an

action may not be instinctive, and yet we may make up our mind to do it.

But if we examine the free-will view more closely, we shall soon find that it does not hold water. If we accept the libertarian doctrine, I am not only free at this time to lie down or to go out for a walk, but I am also at equal liberty to strip myself of all clothing and begin to dance, or to take up a stick and start to belabour the next man or beast that I come across ; or else I may gaze at the sky and try to catch the clouds. These alternatives, surely, are not open to me so long as my brain is sound. It is clear, therefore, that a sane person is not always at liberty to act in any way whatsoever, but that the scope of action is in some way or other limited for him. He may act only in one of the *few* alternative ways that are open to him.

Even this allowance is not made by some psychologists who take up a contrary point of view. They believe that all our acts are predetermined. They are all in accordance with the dictates of our character and habits. If a man is known to possess a certain character, you can predict fairly accurately what course of action he will adopt under given circumstances. He may deceive himself into believing that on a specific occasion he was free to act in another way, but the truth is that he was not in a position to have acted in any way different from the one in which he did act. With his particular character and under those particular circumstances it was impossible for him to have decided upon another course of action.

The New Psychology is inclined more towards Determinism than Indeterminism. It is certainly the present

state of the individual's mind and the environment in which he is placed which determine the line of action which he will take up. But this does not mean that the man of character is like a machine. It is, on the contrary, the characterless man who works mechanically. He is an automaton 'in so far as he *must* act along the line of least resistance.' The strongest impulse must come out victorious whenever there is a conflict of rival impulses as motives to action. If the man of no moral strength has to choose between committing a theft and going without food, he will prefer the former if he is feeling the pangs of hunger, and the latter if his fear of punishment commands greater force than his craving for food. The man of character will weigh the pros and cons. He will never commit theft if his character is good, not because his character compels him to be honest, but simply because he must do the right thing, and he considers this to be the right thing to do under the circumstances.

In a sense the man of character has a free will which the characterless man lacks. But he does not possess a free will in the sense in which the Free-will school believes it to exist. He is free only in the sense that he will act in one way if he thinks that to be the right way, and in another if he thinks that other to be the better. Character is thus a sentiment which Dr. MacDougall calls the Self-Conscious sentiment. Positive self-feeling, the instinct of elation or self-appreciation, plays the most important part in this sentiment. This instinctive tendency forms the centre or the nucleus of 'self-consciousness.' But it does not figure in the self-conscious complex in the same form in which it appears

at the earliest stages of growth. In the sentiment of self-consciousness the instinct of self-aggrandisement assumes the form of *self-respect*. A man of good character is a self-respecting man.

What is meant, therefore, by saying that a man has reached the level of self-consciousness is this, that he has formed a character which dictates to him always to act in the way which appears to him at that time to be best. The self-conscious sentiment is thus the real motive to action which the determinist mistakes for a *will* independent of mental constitution. Acting in the self-conscious manner implies that, before action ensues, we have to weigh the consequences of the several alternatives open to us and find out which is the best of them—which, in short, is the right course of action. Once the right line has been traced, action must be performed in accordance with that. There is no other possibility of action.

It is in this sense that man is not, according to the New Psychology, possessed of a *free will*. On the other hand, inasmuch as the self-conscious individual has to exercise an *effort* so that he may *know* the best course open to him, he is supposed to be a *free agent*. He would not be a free agent if there were nothing before him to accept or to reject, if there were no alternative modes of behaviour open for him, if he were compelled by the state of his mind to act in one way and one way alone. When we act under stress of emotion we act in this way. The emotional excitement overpowers us, obtains the mastery over us, and we say, 'I acted in such and such a way.' Even in law a crime committed under sudden and grave provocation is not so serious as one deliberately planned

and committed, as the phrase goes, in cold blood—that is, when the criminal is completely self-possessed.

The New Psychology does not regard actions as being fixed and determined like the expressions of emotion. Nevertheless, it recognises instinct, in one form or other, as the ultimate spring of action. The primary instinct of self-aggrandisement develops into the self-conscious sentiment and operates as a motive to volitional acts. We cannot here trace the growth of this most important of all sentiments. By constant repetition the acts prompted by positive self-feeling generate in the subject a sense of 'self-respect' which gradually develops into an abiding tendency to act invariably in a self-respecting manner, and thus assumes the form of *self-conscious sentiment*. We may, therefore, define a volitional action as one motivated by the complex of self-consciousness.

Deliberation and Choice.—In the light of the foregoing explanations it is easy to understand what should be meant by the words *deliberation* and *choice*. Obviously, we cannot talk of deliberating or choosing where there is no question of a conflict. We have seen that a conflict arises in a volitional action only in the sense that there are more possible forms of action than one. It is not in any true sense a conflict between *motives*. The one motive which impels us to perform volitional action is the self-conscious sentiment. Conflict of motives is possible only so long as the self-conscious sentiment has not been organised. Still, there is a conflict between rival channels into which action may pass. It is by the exercise of thought, inference, judgment that we decide which is the best course to follow under a given set of circumstances. Action is delayed. All the alternatives

are examined in all their aspects. This is what we call *Deliberation*, and the alternative which we hit upon is the one we are said to *choose*.

Suppose it occurs to a man that he will be able to advance himself financially or otherwise if he goes to *A*, a man of influence, and discloses to him a secret of his friend *B*'s, which the latter has imparted to him in good faith, trusting that as a bosom friend he will not betray him. He reflects that if he does so he will fall in public esteem, his friends will think ill of him, may begin to hate him. Then he consoles himself with the thought that *A* will not make it public, and no one will come to know of his mean conduct. 'But then,' he says to himself, 'should I do a thing which I myself consider to be mean? Is it not beneath my dignity, below my self-respect? No matter whether anybody comes to know of it or not, I must not do a thing which is *wrong*. God above will see and judge, and even if there is no God, I shall judge myself and pronounce a verdict of guilty. My conscience will always feel guilty. I cannot do it, however much it may profit me, even if it were to earn me a kingdom.' Suppose that after this long chain of thoughts has passed through his mind, he decides not to disclose *B*'s secret to *A*. This is a truly volitional action. All these thoughts running their course in his mind one after another are his *Deliberations*. The decision not to disclose the secret is his *Choice*. The one thing to which it is due is the *Self-Conscious Sentiment*, the sense of self-respect which he has cultivated during the course of his life, and which dictates to him the principle that he should never do that which he considers to be a base action. The self-conscious sentiment, in its turn, is

rooted in the instinct of self-aggrandisement, the same instinct which perhaps was active in this man in his early days as an impulse to boast or to bully. In the present instance this instinct is said to be *sublimated*—turned to the best advantage. If it had gone astray, had been directed towards unhealthy channels, he would never have developed the sentiment of self-consciousness as he has done, would never have built up his character. Here in a nutshell is the way in which the human mind develops; but it should be remembered that this is nothing more than the briefest outline.

Habit.—The frugality of Nature is proverbial in the scientific world. Not a particle moves nor a leaf shakes without effecting something useful. There is no wastage of energy. The New Psychology is based on strictly scientific principles, and does not, therefore, believe in any waste of mental energy. The moment that the expenditure of energy ceases to be useful in a particular direction, it is diverted to another channel. As soon as conation is satisfied it ceases to exist.

It is by reference to this principle that the New Psychology explains the phenomena of *habit*. Mental energy is spent most freely in the exercise of effortful attention, and least in the unconscious activity of the mind. The instincts and complexes which remain dormant have accordingly large amounts of stored-up mental energy at their disposal. Nature, therefore, looks to it that if a certain mental operation does not require voluntary attention, the latter is promptly withheld. When a man is learning to ride a bicycle, for example, he attends actively to each movement that he performs—how the left foot is raised and made to rest on the pedal or the

step, how the right foot is brought down on the ground and pushes the body forward, how the whole body is lifted when the machine is in motion, and seated in the saddle, and how the balance is maintained by controlling the handle with the two arms.

Later on, when he has mastered the art of cycling, all this attention and the consequent expenditure of psychical energy is rendered useless. We need not attend to a task which we have perfectly learnt. Hence as soon as the cyclist decides to ride the bicycle which he is wheeling, he does so without any effort or attention on his part. He may at the same time be talking, thinking, or even solving a difficult problem. *Automatically* he sets the left foot on the pedal and performs almost as a single movement all those actions which he formerly went through with effort one by one. As a result of *habit*, volitional and impulsive actions tend to become automatic, perceptions tend to be reduced more and more to apperceptions, and mental phenomena in general tend to lose their affective tone.

If we are once called upon to act in a difficult situation, we deliberate and then decide to act in a certain manner; and should we happen to meet with exactly the same situation again, we need not go through the whole process once more. We have a strong tendency to act in the way in which we acted on the previous occasion. If we yield to the disposition once more, the next time that we are confronted with the same situation the tendency becomes still stronger, and after a few repetitions it becomes a confirmed habit, and we begin automatically to act in the same way whenever we find ourselves in that situation.

If such cases are repeated very frequently indeed,

even consciousness of the situation and the ensuing behaviour may become unnecessary, and we may perceive the situation and act upon it without being in the least consciously aware of it. Thus we may wink to remove the dust from our eyes, and move our hand to scare away the fly which has settled on our face, and yet we may have no conscious knowledge of what we have felt or done. Most of the reflex actions that we perform are thus the degenerate products of impulsive actions which were once performed in the conscious state. They have been repeated so often, and have consequently become so perfect, that they require no conscious guidance any more ; and on the score of economy they are relegated to the unconscious or the subconscious level, and a saving of mental energy is effected so that it may be better utilised.

Habit thus plays a very important part in mental development. It makes difficult operations easy and allows the mind to pass on to the more difficult ones. We master the elements of a particular science or art. Habit soon makes it, as it were, a limb of our mind. We use it freely and unthinkingly, and it enables us to progress still further. If there had been no such thing as habit, there would perhaps be no progress in the world, no learning by experience, no development of the mind. What is difficult in the beginning would remain so up to the end, and no energy would be left for any mental activities which were not primitive. Habit has for its basis *retention*, which we have already examined in Chapter XI., and all the phenomena that we have mentioned here are instances of the general principle of retentiveness—they are possible because experiences leave their traces behind them.

XIV

ABNORMAL PSYCHOLOGY

General.—It is difficult to say what is normal and what is not. Is genius a normal or an abnormal phenomenon? Is a bad memory, which cannot retain even the names of friends and relatives, a normality or an abnormality? When sane persons of good character commit crimes in a state of emotional excitement, do they act in a normal or in an abnormal manner? Are personal and individual whims, caprices, eccentricities and idiosyncrasies all normal or abnormal? No hard and fast line can be drawn between the normal and abnormal activities of the mind. Till lately all the expressions of unconscious mental phenomena were supposed to be abnormal. But now normal behaviour is considered to be such as will maintain a balance and harmony between the conscious and the unconscious. We are said to be behaving abnormally only when the unconscious *predominates* and does not permit a free play of consciousness.

To quote Angell,¹ 'All sorts of differences of opinion, belief, sentiment, and character are compatible with entire normality. The transition from the normal to the abnormal is gradual and not abrupt, and in designating any particular experience as *abnormal* we merely

¹ *Chapters from Modern Psychology*, p 120.

mark it as *relatively unusual*. If it lead to or accompany persistently depraved or incoherent action, we term it insane. But short of insanity there is a vast multitude of phenomena . . . which are foreign to the experience of the rank and file and must so be regarded as in a greater or less degree abnormal' Mediumship, telepathy, crystal-gazing, dreams, and hypnosis are topics with which the atmosphere of the present day is surcharged. The psychologist contents himself with saying that they are abnormal mental occurrences, deviations from the path which mental growth traces, rather than expressions of mental activity in any true sense.

The basic principle of the New Psychology is that all these unusual phenomena, along with the facts of social, animal, senile and child behaviour, to which we shall come in the next chapter, can be brought under the same general conceptions, and interpreted and explained with the help of the same fundamental laws as those on which normal Psychology is based. The New Psychology has for this reason to deal mostly with abnormal happenings, which the Old Psychology usually made no attempt to explain, and some people are therefore inclined to think that New Psychology and Abnormal Psychology are synonymous terms.

• But for the very reason that the New Psychology tries to bring the so-called abnormal working of the mind into line with positively normal mental behaviour, it ceases to be a study of the essentially abnormal. In trying to explain and interpret the unusual modes of behaviour, it has at every step to correct the usual point of view from which we try to understand the ordinary

working of our minds. It aims at replacing the narrow conceptions and principles, which are only competent to explain the routine working of the mind, by the newer and wider laws of mental behaviour, which are found equal to the task of interpreting each expression of the mind whenever and wherever found, and whether styled normal or abnormal.

It is not, however, possible for us to cover the wide range of phenomena named above within the limits of this volume, and we must confine ourselves to a summary consideration of the broad features of the few unusual mental occurrences which are not entirely shrouded in mystery.

Sleep and Dreams.—Our waking life is alternated with periods of *sleep*. The object of sleep is obviously to allow our psychophysical organism to rest or recuperate. When we go to sleep the body is permitted to assume a natural position of repose, the muscular system is relaxed, and attention is withdrawn from all objects of sense. But the moment we cease to be conscious of our surroundings we find our consciousness busy with other things—we begin to dream.

‘Dreams,’ in the words of Angell,¹ ‘afford, perhaps, the most natural bridge over which to pass from the mentally commonplace to the mentally unusual.’ Dream consciousness is like waking consciousness, but it is a mistake to regard the mental processes which run their course in the dream state as typical mental processes. Although we sit, talk, read, write, eat, drink, run and jump in dreams, and sometimes grow angry or fall in love, and even philosophise, we do not *actually*

¹ *Chapters from Modern Psychology*, p 126.

perform all these activities, but please ourselves only with their images, for the most part visual. Day-dreaming, therefore, differs from dreaming in sleep only in this, that the former is set in a faint subconscious background of our *knowledge about ourselves*. While we indulge in a day-dream, we are in some vague manner aware that we are So-and-So, living in such-and-such a place, carrying on such-and-such a business, and so on. If we forgot all this as we do in a dream, we should at once fall asleep. Sleep is, therefore, a forgetfulness, an oblivion. When we go to sleep we try to forget everything so that our mind may get *complete* rest.

But the psychophysical organism is never allowed a complete rest except, perhaps, when it is dead. So long as we are alive, the stimulus-response mechanism is at work. The pressure of our eyelids on the cornea, and of our sleeping-garments, bed-sheets and pillows on the various parts of the skin; sensations in the limbs and viscera; nocturnal sounds like the watchman's cry, the barking of a dog, or the ticking of a clock; and the sounds produced within our own bodies, like snoring or ringing in the ear—all these stimuli, and a thousand others like them, assail the organism while we are asleep, and produce their own sensations.

Not only this, but a number of associations which we *repress* during our waking life because we do not need them, and a multitude of perceptions of which we refuse to take notice for the same reason, lurk in the fore-conscious, in a state of nascent excitement. During sleep that check is withdrawn, and as a consequence they struggle for a place in consciousness whenever we go to sleep. The mating of any one of these with the

appropriate sensation gives birth to a dream. Complications take form in the dream just as they do in the waking life. Some sensations we understand as certain perceptions; others we interpret as certain ideas; and a stream of mental processes thus comes into existence which is partly determined by the sensations actually aroused and partly by the repressed ideas struggling for victory.

Sometimes the same sensation is capable of doing service for more ideas than one, and if they are equally strong, we experience a double image. The author himself remembers having often dreamt of a person who is by turns his father and his uncle, or a figure who is understood to be at alternate moments his maternal and paternal grandmother. More often the one perception or idea immediately gives place to the other. It is for this reason that dream pictures do not last. One image changes into another, and that into a third, and so on. To borrow an illustration from M. Bergson's lecture on Dreams,¹ a green blotch strewn with white points appearing in the field of vision is able to materialise the recollection of a daisied lawn, a billiard table with its balls, and any number of other things besides. We may dream, therefore, that the lawn has become a billiard table, and that that is in its turn *transformed* into something else altogether new.

In the waking life the *interest* of the moment determines in what forms our sensations should be materialised. Gazing at the sky at night, we take a

¹Delivered at the Institut Psychologique, March 20, 1901. A translation by H. Wildon Carr is included in the volume entitled *Mind-Energy* (Macmillan, 1920).

bright speck of light to be a star ; walking on a dark night on a solitary road, we take the same sensation to be a lamp ; while, looking out on a sunny day, we understand an impression of that kind to be a reflection of the sun's rays in a glass pane. In a dream there are no such guiding interests at work, and we are free to interpret the sense-impressions in any way we choose. The dream-self is, therefore, styled by M. Bergson as a ' distraught self, a self which has let itself go.' ' I am in the street,' says M. Bergson ¹ ' I am waiting for a tram-car to pass ; it cannot touch me because I am on the pavement. If, at the moment of its sweeping past, the idea of a possible danger crosses my mind, nay, even if my body instinctively recoils without my being conscious of feeling any fear, I may dream at night that I am run over. I am watching by day at the sick-bed of a friend who is dying. Only a ray of hope springs up for an instant,—a faint ray, I am barely conscious of it,—my dream at night may show me my friend recovered. In any case I should dream he was cured rather than dead or ill.'

We have found that the dream consciousness differs from the waking consciousness precisely in this, that it does nothing. It abstains from selection, and ideas and associations have, therefore, free play when we are asleep. The instincts and complexes which are suppressed by us when we are awake find an opportunity to express themselves in our dreams, and obtain a meagre satisfaction in imaginary display. But even the dreaming consciousness does not tolerate the appearance of every idea and the disturbances caused by every com-

¹ *Mind-Energy*, p. 107.

plex. There are certain things towards which our abhorrence is so strong that they are not only denied to us during waking life, but their presence is resented even in a dream. When we desire to express our entire dissociation from anything, we say, 'I could not dream of it.'

The 'dream censor,' however, does not always succeed in keeping away a certain instinct or sentiment. It may distort its appearance, may compel it to omit or drop off certain parts or features, or may make it exhibit itself not in its nakedness but disguised in symbolic forms. An exhaustive study of the *dream work* will take us too far afield into the psychology of dreams; but we cannot pass on without taking some notice of the most important and at the same time the most interesting part of the dream work, viz. dream symbolism.

When a thought seeks admittance into the dream consciousness and receives a blank refusal, it transforms itself and appears in disguise. It substitutes for each concrete item in it another concrete item, and thus assumes a different form as a whole, precisely in the same way as for each word of a particular language we may substitute one belonging to another language, and thus *translate* a passage from one to the other. The substituted content is known in psychoanalytical terminology as a 'symbol' of the original content. There are certain symbols which have become more or less fixed by constant use. A *house* in dreams generally represents the human form as a whole. When a man dreams of a house being constructed, those learned in the 'mystic lore interpret the dream as saying that he will be blessed with a child. What the New Psychology recognises, how-

ever, is only that a house may stand for a human form. Whether the dream of a house means anything more, it is not the concern of Psychology to ascertain.

Parents appear in dreams as *emperor* and *empress*, children as *little animals*, birth as *water*, death as setting out on a *journey*, and, strangely enough, nakedness is given as *clothes* and *uniforms*. In the words of Freud, dream-symbolism is taken from 'fairy tales, myths, jokes and witticisms, from folklore, *i.e.* from what we know of the manners and customs, sayings and songs of different peoples, and from poetic and colloquial usage of language.' It is their symbolic nature that makes most of our dreams so strange and incomprehensible. To one who is practised in the art of psychoanalysis there is nothing mysterious about dreaming, nothing miraculous.

Hypnosis.—'If I say to you: "Look up at the sky and you will see a balloon," you will find it much more quickly than if I merely ask you to look up and say whether you can see anything. A student who looks through a microscope for the first time is told by the instructor what he is to see; otherwise he sees nothing, although it is there and quite visible.'¹ Again, if, pointing towards the thick foliage of a tree, you say to a little child, 'Look, there's a bird up there,' the child will actually see a bird in the tree; and if you tell a man who is afraid of ghosts that a certain dark spot is haunted, he will see a ghost as soon as he thinks he is at the place you mentioned. Phenomena like these are attributed to *suggestion*. Dr. MacDougall² defines suggestion as a

¹ Freud, *Lectures on Psychoanalysis*, p. 365.

² *Social Psychology*, p. 97.

process of communication resulting in the acceptance of the communicated proposition in the absence of logically adequate grounds for its acceptance. The liability to accept a suggestion is called suggestibility. There are various degrees of suggestibility. The lowest is that of the normal, educated adult. Everybody is liable to accept propositions coming from a quarter which he respects, particularly those touching a subject about which he is not himself in a position to judge. Very often it is sufficient to quiet opposition if you quote a standard authority. The degree of suggestibility is directly proportionate to the height of prestige which the source of suggestion commands and the lack of relevant and systematic knowledge on the part of the person to whom the suggestion is made.

Hypnosis is an extreme case of suggestibility. 'From dreaming to hypnosis is a very short step.'¹ It is a state of artificial sleep known as the hypnotic sleep. Like a reaction-experiment, hypnotism requires two persons—the hypnotiser and the subject. The hypnotiser instructs the subject to fix his attention upon some monotonous form of stimulation—a bright colourless object held between the eyes or the ticking of a watch or metronome. The subject is fatigued after some time and begins to feel drowsy, then he becomes insensitive to the objects which surround him. This is the time for the hypnotiser to give him suggestions.

The subject experiences such an intense pleasure in the process of being hypnotised that he acquires an extreme suggestibility towards the hypnotiser. The latter alone has access to the subject's mind. The subject hears

¹ Angell, *Chapters from Modern Psychology*, p. 125.

only that which the operator tells him, and performs everything that the operator commands him to do. Such a relationship between two minds—the astounding dependence of the subject on the operator—is known as ‘rapport.’

The operator can control the sensory and ideational as well as the conative processes of the subject. By making appropriate suggestions he can render all or any of his sense-organs altogether impervious to stimulation or keenly sensitive to particular stimuli. He can produce any set of images in him, *i.e.* he can make him dream according to his own dictates. He can also accentuate his power of retentiveness and make him recall things which he had forgotten. The operator can also make the subject act in any way he likes, go and salaam to a certain person or beat another, or make his muscles so rigid that his whole body remains motionless and inflexible under any strain, as if it were made of stone. In a word, the subject carries out whatever suggestion the hypnotiser may make.

Sometimes the force of suggestion is so strong that if the hypnotiser commands him to do something at a particular time after the hypnotic trance is over he will unconsciously obey his commands. Crimes are said to have been committed under hypnotic control. Curiously enough, the subject *rationalises* his conduct—finds clever justifications for it to satisfy himself. Such a suggestion is called ‘post-hypnotic’ suggestion or ‘terminal’ suggestion.

The question how a suggestion can be transmitted from the hypnotiser to the subject is still left unanswered by Psychology. It has important bearings upon many

abnormal phenomena witnessed by trustworthy enquirers, and we look to future psychical research for a solution of this problem.

Insanity.—We have seen that the ultimate foundations of mental life are to be looked for in the instincts which every individual brings with him. The instincts become modified by usage and develop themselves into sentiments or complexes. The various complexes with which any mind is furnished live there in harmony with one another. A man loves his fellow-beings, but his love of humanity does not lead him to oppose punishment in general or to remain unguarded in the presence of enemies. Again, a man may look to his own interests, but he need not necessarily be narrowly selfish ; he may quite possibly perform acts of self-sacrifice at times. His devotion to his children, his friends, or his native land does not oblige him to excuse or support any folly in which either may be involved.

We have also seen that certain complexes do not find scope for their display under certain circumstances. They are described as *repressed* complexes. They may make their existence manifest in errors, dreams, hysteric fits and the like. But if they do not find a sufficient outlet for the mental energy with which they are charged, they may cause a more or less permanent obsession in the mind. They may disturb the harmony of sentiments which is so essential for a healthy mental life, and then there results the state of *Insanity*.

Insanity is sometimes said to be caused by a derangement of the brain, but according to our view the psychophysical organism is an organic whole. Cerebral derangement implies mental derangement, and, loss of

mental equilibrium means deformity of the brain. In congenital insanity, the psychophysical organism is so disorganised from the very time of birth that all the instincts are not allowed to work side by side in harmony with one another. Mental balance is lost, and the individual has to be classified as insane.

XV

DIVISIONS OF PSYCHOLOGY

General—The scope of scientific Psychology is limited to the normal workings of the individual, human, adult mind. But in order that we may have a clear perspective of the facts falling within this category, it is also necessary that we should, in some way, be acquainted with the modes of abnormal behaviour and the facts concerning the principles of social, animal, and child behaviour. The last chapter was therefore devoted to a preliminary study of abnormal mental phenomena, and in the present chapter we shall examine in brief outline the relation and indebtedness of scientific Psychology to Social, Animal, and Child Psychology.

Child Psychology.—According to the familiar line from Wordsworth, ‘The child is father of the man’ But this statement is in sharp contradiction to the tenets of Faculty Psychology, according to which Perception, Imagination, Memory, Judgment, Reasoning, etc., etc., are all supposed to be the various faculties of man, most of which are altogether missing in childhood. The child essentially falls short of the true stature of man. These faculties are roused in him only when he

attains to adolescence. The shortcomings of the child are, on this principle, explained with reference to adult perfection.

Faculty Psychology has now given place to Functional Psychology. The mind is no longer regarded as a storehouse of the faculties of perception, reasoning, etc., but these are now understood to be so many ways in which the mind works—so many functions which it discharges. The child, when he is born, is incapable of functioning in all the ways which are at the command of the adult. He cannot use language, he cannot build concepts, he cannot reason or deliberate. As his mind grows, *working on principles fundamentally the same*, he *develops* higher and higher modes of functioning. There is nothing fundamentally new in the adult which is roused in him for the first time. There are no principles not observable in the child mind which govern the workings of the adult mind.

The older idea of mind or soul, as a fixed substance with fixed attributes, is thus discarded. The manifestation of mind starts with simpler beginnings. The child does not hide in him all the complexities of the grown-up individual. His mind is rather like a seed, capable of growing into a tree. He is endowed with all the instinctive tendencies in a primitive form. They develop as they are put into exercise and become sentiments. The explanation of the more developed forms of mental activity is therefore to be sought in the more primitive forms. The psychologist aims, among other things, at tracing the simple beginnings, which are succeeded by greater and greater complexities, and finally assume the most complex form of a fully developed

mind with all its sentiments and principal instincts perfectly balanced.

This is called the *genetic* point of view, or the point of view of growth. 'Thanks to Darwin,' says Angell,¹ 'the genius of our own time is wont to regard all problems from the standpoint of growth and evolution. This is true in Psychology as it is in botany or zoology, in geology or astronomy.' Psychogenesis includes the development of mind in the *race*, which is called Phylogenesis, as well as the sum of mental events between the birth and the death of the *individual*, which is known as Ontogenesis. For the science of Psychology, mental life begins only at birth, because in its pre-natal days the psychophysical organism is not open to observation. Ontogenesis traces the growth of mind from that moment on to the last moment of life.

Infancy and childhood cover approximately the first twelve years of life. This is an entirely artificial demarcation, as no hard and fast line can be drawn where childhood ends and maturity begins. More and more fresh experiences and capacities gradually emerge and become part of our mental equipment. • Again, there are individual differences which render such a division still more impracticable. Some mature early, others take a comparatively longer time. The study of the mental processes that appear during the early part of man's life is called Child Psychology.

It is not our business here to trace the growth of the child from birth to maturity. Concerned primarily with the understanding of facts relating to adult mind, we have only to see what contribution child study can make

¹ *Chapters from Modern Psychology*, p. 273.

towards the completion of scientific Psychology. In examining the methods of Psychology we have noticed that introspection is not always successful because our own consciousness of the mental process under observation tends to disturb its course and modify it. The child is not capable of introspection because it is not a self-conscious being. The phenomena of the infant mind are simple and not reflective. Presentations and images appear in the child's mind in an unsullied form. The child's consciousness is not set off on a background of 'his own importance, his pedigree, his beauty, his social place, his religion, his paternal disgrace.'

As in a hypnotic state every thought tends at once to be realised in action, so in the child mind every cognition brings with it its own conation in a clear-cut form. The child knows of no checks or restraints. 'All conventionalities, proprieties, alternatives, hesitations' are absent from the child mind—the adult reveals its 'skeleton structure' in childhood.

A close examination of childhood, therefore, is a very potent means of verifying the correctness of our mental analyses. The simpler mental phenomena are there available in their native colouring and pristine simplicity. Each instinct can be observed working under natural conditions. The simplest cognitions, affects, and conations can be better studied in the child than in the grown-up man. By far the most important part of our data for scientific Psychology is derived from the study of children. All the most complex sentiments are found to be nothing more than the developed forms of the simple instincts acting and interacting on one another.

It is in this sense that we understand the saying that the child is father of the man.

Animal Psychology.—As it is not within the scope of the present volume to study ontogenesis in detail, so it is not the purport of this small handbook to fathom the mysteries of phylogenesis. But, as has been repeatedly remarked in the foregoing pages, the New Psychology is biological in essence ; and biology regards human beings as having evolved from pre-human animal forms. ‘Accordingly,’ says Angell,¹ ‘it may be reasonably inferred that a study of animal types of mental behaviour will assist us in securing a just conception of the early stages of the human mind, and so possibly teach us more intelligently to interpret the higher manifestations of that mind.’

We have seen that any individual endowed with a stimulus-response mechanism, which acts for the good of the individual, may legitimately claim to have a mind. Every animal, therefore, lives a mental life. Even the unicellular amoeba exhibits mental behaviour, not to speak of the higher animals. By definition, therefore, we ought to seek for the beginnings of mind in the lowest animal. Hence we may presume that psychologists like René Descartes, who deny all mental existence to animals, are in the wrong.

At the other extreme are those lovers of pet animals who are inclined to believe that animals are in possession of all the mental capacities and equipment with which a man is endowed. No doubt, perhaps with the exception of those who occupy the lowest rung of the animal scale, animals are capable of learning by experience, of

¹ *Op. cit.* p. 241.

improving their reaction to given situations. Some of the higher animals such as dogs and elephants also show symptoms of possessing some sort of rudimentary reasoning power. But this does not go to prove that animals are capable of all that is found in man—that they can understand language, can deliberate and argue, and can develop human sentiments.

It is only recently that experimental methods have begun to be employed in the study of animal mentality. It is true that there are very genuine difficulties in the way of such experimentation. Wild animals, for example, cannot be put to experimental test at all. But so far as experiment has been successful, it has been established beyond doubt that the hopes of casual observers and authors of anecdotes about animal behaviour are not well founded. It has been ascertained that although perceptions, images, and associations are found in them, 'there is no evidence of anything essentially systematic or orderly about the behaviour of the animals. The instincts and emotions are very much in evidence, and for examples of instincts in their most primitive forms we have consequently to go to animal behaviour.'

Although the actions of animals must be interpreted in the light of human behaviour, the principle which modern writers place before them is always to interpret an act performed by an animal as *simply* as possible. If an action can be explained satisfactorily by a lower process, it must not be taken as evidence of a higher mental process. By working on this principle it has been ascertained that animals do not think in the way human beings think. Their life is chiefly that of instinct

and emotion. They do not develop any sentiments at all. 'Even if we grant, for the sake of argument, that animals may use human forms of inference, it would still remain true that, in degree, the gap between man and the animals is prodigious, wholly out of proportion to anything we now know of the differences in brain structure.'¹

Social Psychology—We have defined a mental process as one which can be directly known by one man only—its possessor—and have thus seen how the psychological point of view is *individualistic*. You may take the most developed of all the psychic phenomena—love of humanity, piety, justice—and it will be a phase of this man's mind or that. Yet we have it from no less an authority than Aristotle himself that man is a social animal. We live in societies, we make use of language, we follow custom and public opinion, and obey laws and religious instructions. 'Social Psychology has to show how, given the native propensities and capacities of the individual human mind, all the complex mental life of societies is shaped by them and in turn reacts upon the course of their development and operation in the individual.'²

The most important instinctive tendencies which foster the social activities of the human mind are suggestion and imitation, sympathy and antipathy, love and fear, self-subjection and self-display. A complete account of the part played by these innate tendencies of the individual would require a volume to itself. A few illustrations will suffice to give the reader a clear

¹ Angell, *op. cit.* p. 268.

² MacDougall, *Social Psychology*, p. 18.

idea as to how these individualistic traits generate social life.

One of the most potent sources of suggestion in normal life is the herd. Whatever emanates from the leader of the sect, caste, community, nation, or other form of society to which we claim adherence, is taken to be gospel truth. We are neither inclined to challenge it nor to tolerate opposition to it. Hence arise religious fanaticism and class rivalry. Again, the spirit of emulation leads us to follow the fashion of the day and the secret and difficult formal observances of a sect or caste. Social imitation is an extremely important means of entering into a group. Child behaviour can be explained to a large extent by the imitative instinct.

Although the pleasures or pains which we experience are strictly our own, we naturally sympathise with our neighbour if he is in trouble, and feel jealous of him if he prospers. We naturally love those who are in any way connected with us, and instinctively fear the stranger and the opponent.

The most active factors in the growth of social phenomena are the feelings of self-display and self-subjection. We wish that we could be inferior to none, but we respect him whom we realise as our superior. The first of these tendencies is the source of all ambition and growth and advancement. Whenever we make a new acquaintance, the first thing we consciously or unconsciously try to find out is in what respect he is our inferior. If he happens to be a worse athlete, or a weaker player, or less educated, or poorer in health or talents, our pride will be satisfied. If in some respect or other, he far outstrips us, we

pay a tribute of reverence to him whether we give expression to it or not.

Again, we are always inclined to follow the beaten track, to do as others do or have done in the past. Yet we have always a desire to invent some new scheme or some new method of working the old one. All inventions and discoveries are thus prompted by the sense of self-aggrandisement, while the harmonious working of a government, community or other institution is rooted in the sense of self-subjection. The pupil may be superior to the teacher in physical strength, but his extreme intellectual inferiority prevents him from rebellion. Similarly, a junior in office may be more highly educated, more refined, or even more efficient in work, yet official inferiority keeps him within proper limits in his relations to his seniors.

All these propensities of the individual mind are, on the one hand, the foundation on which the productivity and solidarity of society depend, on the other hand, they owe their existence and development to the fact that man lives in society. If man were an isolated being, neither language, nor art, nor custom, nor religion would have made their appearance in him. He would perhaps have been little better than the beast of the jungle. We conclude, therefore, in the words of Angell, that despite the individualistic character of mental phenomena, 'there is a very deep and true sense in which the mind is to be regarded as distinctly social, and not merely a private personal affair.'¹

Relation of Psychology to other Sciences.—Science is distinguished from Philosophy by saying that the former

¹ *Op. cit.* p. 198.

has a well-defined scope while the latter has none. Every science deals with this or that department of Nature, this or that aspect of the universe, while Philosophy studies Nature in general, the universe as a whole. We have described Psychology as a science; but it is connected with Philosophy in a very important feature. It is in one sense a part of Philosophy. It studies how perceptions of things arise, and this is one of the most important problems with which that part of metaphysics which we call Epistemology is concerned.

Again, as regards the relation of body and mind, the fact that the hypothesis of psychophysical monism explains all the phenomena of life and mind so satisfactorily, renders great help to Philosophy proper in grappling with this most difficult of all metaphysical problems. It is to be noted that Psychology does not claim to have arrived at a final solution of this problem, but does nothing more than demonstrate that if this theory be accepted, it will explain these and those facts.

Among the sciences, Psychology of course deals with things which have life and not with inanimate objects. Hence it is very closely related to Biology. The New Psychology falls entirely under Biology¹ and takes all the biological principles for granted. In fact, the three main branches of Biology ought to be Physiology, Anatomy, and Psychology—Zoology being the natural history of animal life, Botany that of plant life, and Anthropology that of human life. The domains of Physiology, Anatomy, and Psychology obviously over-

¹ Some psychologists prefer the name Psychobiology, thus distinguishing the physical and the mental aspects of life, and confining the name Biology to the science of the former alone.

Æsthetics is a Psychology in any sense. Though these sciences deal with the same subject-matter with which Psychology deals, *i.e.* the workings of the mind, they study it from so different a point of view that their spheres lie altogether beyond that of Psychology. They do not deal with cognitions, affects, or conations *as such*, but their purpose is to examine the principles which regulate thought, feeling, and conduct. They aim at finding out the *standards* according to which to judge what is *valid* in thought, what is *beautiful* in feeling, and what is *right* in conduct. They are thus the *normative* sciences of thought, feeling, and volition, while Psychology studies these *positively*. Logic is not the science of thought as such, but the science of the principles of validity in thought; Æsthetics is the science of the principles according to which we judge what is beautiful and what is ugly; and Ethics is the science of the principles according to which we decide which forms of conduct are right and which are wrong.

Psychology is thus seen to be closely related to Philosophy or *Metaphysics*, *Biology*, *Logic*, *Ethics*, and *Æsthetics*. We have already seen how Psychology studies the social side of our mental life, and is thus related to the science of social phenomena, *viz.* *Sociology*. In so far as Child Psychology studies the growth and peculiarities of children, it must also be in close touch with another branch of knowledge—*Education*. Abnormal Psychology has recently made a stupendous step in advance, and has proved particularly useful to the science and art of healing—so much so that a new branch of study has now emerged which is known as *Psychotherapy*, which includes treatment by Hypnosis,

treatment by Suggestion, and, lastly, treatment by *Psychoanalysis*. Thus the New Psychology claims an intimate and important relationship with the science of *Therapeutics*.

To sum up, the New Psychology is most intimately related to Biology and Therapeutics. From the one it borrows its fundamental principles, and to the other it gives the benefits of its researches. It is less closely connected with the younger sciences of Sociology and Education, as they depend mostly upon Social Psychology and Child Psychology respectively. Besides these departments of knowledge, Psychology is also in relationship with the comparatively older sciences of Logic, Ethics, and Æsthetics, which all cover the same territory but look at it from a different point of view.

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