# *PART ONE*

# PSYCHOLOGICAL PATTERNS

## CHAPTER I

# INTRODUCTION

It is the purpose of this book to penetrate and, if possible, to destroy the bulkhead which has appeared between psychology and physiology, a partition that has created, artificially, two watertight compartments. It might be objected that the philosophy of materialism, which has so thoroughly permeated the thinking of cultured people in modern times, has long since broken down this barrier by making psychology a branch of biology, and biological data only a subdivision of physical phenomena. "During the epoch in question [nineteenth century], and indeed also at the present moment, the prestige of the more perfect scientific form belongs to the physical sciences. Accordingly, biology apes the manners of physics. It is orthodox to hold, that there is nothing in biology but what is physical mechanism under somewhat complex circumstances."[1] When we think "scientifically" we tell ourselves that thoughts are only epiphenomena, manifestations of underlying material activities and that "reality" belongs to the latter alone. This patter the layman cheerfully accepts from the science that has given him the internal combustion engine and wireless telephony. He says, so long as he is philosophizing, that the real world is composed of matter, stuff which reveals itself to his senses directly or indirectly. Thoughts have no existence apart from the words or signs which transmit them and the physiological processes which produce these expressions. His universe, as one protagonist of materialism puts it, is made up of atoms and aether; there is no room for ghosts. But this philosophy, although it relieves him of the necessity of going to church, has otherwise little effect on his daily life. Tacitly he constantly assumes the existence, the reality, the paramount importance of thoughts, even of those that evade and defy adequate expression. He allows the course of his life to be guided by ideals, entities no more material than the doctrine of the Trinity. And the orthodox

[1] A. N. Whitehead, *Science and the Modern World*, Cambridge, 1926.

scientist, when he leaves the laboratory or the rostrum, behaves in precisely the same way. Insensibly, therefore, we have drifted into a dualistic attitude. Our heads profess there is nothing but matter; in our hearts we know mind exists. Say what we will, the bulkhead holds, the watertight compartments are there.

The point of this preamble is that it is not a simple task to do away with this dissociation. Experience seems to shew us that there are two separate worlds; and that this judgment is more emotional than intellectual makes it the more inexpugnable. The reader, then, is almost certainly prejudiced in advance and will, therefore, have a hard time to understand the argument. Added to his task will probably be a necessity to lay aside his materialistic bias that—willy-nilly—has become part of the mental fabric of every civilized man to-day. To quote Whitehead again: "We are now so used to the materialistic way of looking at things, which has been rooted in our literature by the genius of the seventeenth century, that it is with some difficulty that we understand the possibility of another mode of approach". Finally, there is a technical difficulty, well-nigh insurmountable. Even if what I hope to shew be granted, that psychological and physiological phenomena are the expressions of the same underlying agencies, the fact remains that the phenomena are different, they are labelled with different terms and studied by different methods. Most important of all, they are investigated by different men. Hence the psychologist is rarely conversant with physiology and *vice versa*. A vocabulary applicable to either field is bound to be foreign to workers in both subjects. To have the argument skip from one field to the other is certain to be puzzling and I will try to avoid it so far as possible. If the reader is to remain unconfused, he must bear in mind the general programme of the book and keep himself constantly oriented thereby. My first task is, therefore, to sketch out the argument.

In an effort to understand emotions I have brought together and analysed a rather large number of observations drawn mainly from psychopathological material, since, in this, emotional reactions are relatively more prominent than in normal life.[1] The conclusion was reached that emotions appear when instinctive responses are stimulated but do not reach untrammelled expression. This led naturally to an examination of the nature of "instinct",

[1] *Psychology of Emotion Morbid and Normal*, London, Kegan Paul, 1925.

which was found to be an automatic, unreflective type of habit reaction, the habit being either racial or individual in origin. In other words, this "instinct" may be looked on as a set behaviour pattern, modified perhaps by consciousness, but never initiated thereby. Examination of mental life from the genetic and objective points of view, which has been fostered by both psychopathology and behaviourism, has produced the modern theory that the basic structure of mind is to be found in such patterns, and many behaviourists go so far as to claim that the superstructure is similarly composed. That is, psychology can get along without the concepts of consciousness and will. For centuries our infant science has been swaddled in wrappings of metaphysics and epistemology, its individuality hidden and its growth prevented. If it is to have a chance to develop, these garments or bandages must be removed. The behaviourists seem to have thrown the baby out with the bath, but that does not mean a change was undesirable. The formula as applicable to the foundations of mental life would seem to be useful. At least, to me it appears so fruitful an hypothesis that I am taking it as the starting point of the present work.

One of its chief advantages is that it makes unnecessary any sharp discrimination between the physiological and the psychological. A "pattern" can refer equally well to integrated reflexes and to instincts. And nowhere is this more valuable than in dealing with emotions where bodily manifestations play such an obvious rôle. The James-Lange hypothesis would claim that what is subjectively felt is just the somatic disturbance. Unfortunately, this admirably simple formula is rendered untenable in its original statement by the findings of neurology, both experimental and clinical. Emotions, exhibited both objectively and subjectively, may persist when practically all of the body is cut off from nervous connection with the brain. To get round this difficulty Lloyd Morgan and Sherrington have proposed that visceral reactions may have some sort of re-presentation in the cerebral cortex which is capable of reactivation. This assumption makes possible the correlation of a large number of phenomena and I have adopted it, calling these "re-presentations", for reasons to be discussed shortly, "images". Such "images", I hope to shew, form an integral part of reaction patterns, which are, indeed, nothing but sequences of images that serve as stimuli for separate elements in

a train of actions, in the absence of present, material stimuli appropriate for such actions. A general and tentative conclusion from the study of emotions was that *the basis of mental life is an unconscious flux of images; when these enter consciousness, becoming subjective data, they are the fundamental elements of which "thoughts" are composed; on the other hand, they initiate and control many physiological processes of both voluntary and involuntary systems.* The present work is to be devoted to the elucidation and development of this formula.

*First*, I shall review the conclusions cited above, outlining the nature of the evidence on which they were based, and from this go on to study the way in which consciousness utilizes the unconscious flux of images to produce the different kinds of mental events which have been called faculties. This will lead to the formulation of certain Laws of Patterns as exhibited in the mental field.

*Second* will come an excursion into the realm of physiology. To call the basis of mental life the higher functions of the nervous system is the crassest kind of tautology. I shall try, rather, to shew that the reaction pattern is composed of a flux of "images" which appear first in quite simple physiological processes. If past experience operates in the present without a material reappearance, something of the nature of "image" is in existence. If this repetition occurs at a primitive physiological level, then something, which is ordinarily held to be peculiar to mind, is characteristic of so-called non-mental activities as well. In fact, I shall go so far as to claim that this reappearance of the past in the present is what differentiates organic from inorganic nature. I would suggest that the relationship between physiologic and psychologic is not merely one of analogy but of an identity of an essential element common to both. This is, of course, like the materialistic claim, but according to my scheme the identity resides in an element that is impalpable, immaterial, the very "stuff that dreams are made on."

In order to make clear this point and to lay the ghost of materialism, I may borrow an analogy invented by Dr Clark-Kennedy to explain to his medical students the mysteries of physiology. Suppose some inhabitants of Mars descend to our earth and investigate a railway train and its behaviour. These Martians know all about Newtonian physics, the laws of thermodynamics

and so on. They have the same senses as we, but, we presume, cannot perceive human beings directly; and—to avoid Gilbertian embarrassments—to them human raiment and tools are also imperceptible. The creatures set themselves to study a passenger train. It is seen at once that the engine pulls and the brakes stop it. Elaborate measurements and calculations shew that consumption of coal meets all the energy requirements, the locomotive and brakes are analysed and comprehended, the law of the conservation of energy holds. But why does it progress by fits and starts? What makes the throttle open or close? This unseen agency troubles the materialistic Martian until some intrepid experimenter puts his hand on the appropriate levers and finds that he can start and stop the train as well as any ghost. The Martians now use the trains and the theory of ghosts is remembered only as a superstition of unenlightened days. It is true that there are mischievous sceptics who will keep pointing out that no one has yet explained why luggage will insist on passing from the platform to the train or *vice versa*. But the mass and inertia of the luggage are so trifling when compared with that of the train and the quantity of it varies so much that it is evident to common sense that luggage has nothing whatever to do with the running of the train. Besides it is an interesting example of a tropism! And then one day some idle Martian strays by a football field and observes the extraordinary movements of the ball. When his report has been accepted and his observations confirmed, consternation rules until some savant shews that in all its long parabolic flights known ballistic principles are in operation. The principle of the conservation of energy holds! Some heretics continue sceptical, however, and they revert to the study of trains. They assume that there are ghosts, because nothing but ghosts could account for so many of the football's movements. In order to discover the habits of these ghosts, correlated mysteries are scrutinized. It is learned that cabs, 'buses and lorries come to the stations and depart in a definite time relation to the trains. The passenger vehicles are a puzzle, but the goods in the lorries can be followed. The latter lead to farms, factories and warehouses. The economic life of man is reconstructed from the behaviour of his goods. Eventually, even the rules of his games and religions are sketched out. The life of man is known; but he himself remains an hypothesis. It is important to note, however, that the

more is found out about this hypothetical man, the more his body can be reconstructed, the fewer do the exceptions to the law of the conservation of energy become. "Man" is an answer to the Martian's question "Why", not to "How". In any competent theory purpose and mechanism explain each other mutually; they should never be mutually exclusive.

If the argument of this analogy be now applied to biological study, the programme I have set myself may be more readily understood. Mechanism explains so much in the field of physiology that it distracts attention from the problem of purpose. When we turn to psychology, however, mechanism explains little or degenerates into tautology. On the other hand, psychology is characterized by purpose, a view that William McDougall has so skilfully popularized. But so soon as "purpose" is identified in simpler mental reactions, it begins to be detectable in physiological phenomena as well. There is—from a materialistic standpoint—some unknown factor or factors running through the whole of life, no matter how vital activity may be expressing itself. The natural field wherein to investigate this $X$ is that in which it is most prominent. So, if we wish to discover the laws of what is non-mechanical, we should study the phenomena least complicated by mechanism, that is to say, the mental. Having worked out these laws, we may then turn to physiology and see whether the psychological laws in their simplest forms cover the $X$ at that biological level as well. The second part of this book will, then, be devoted to an attempted answer of physiological questions in terms that were originally psychological. If the endeavour succeed, we shall have got a vocabulary that is at once psychological and physiological, in other words that is truly biological. Essentially, I am not trying to answer fundamental questions, but to provide a terminology in which they may be discussed without prejudice.

## CHAPTER II

## DEFINITIONS OF "IMAGES"

As stated in the last chapter, a conclusion from the study of emotions was that these arise when instinctive processes are activated but do not achieve immediate or free expression. We must now consider what some of these terms mean and what the statement implies.

For present purposes an instinct may be taken to be a pattern of behaviour; that is a set, routine, automatic mode of response to a given stimulus. When this pattern is in free operation, a series of co-ordinated muscular movements takes place, and—so the evidence seems to indicate—nothing else occurs. If, however, the reaction is held up in any way, then a kind of overflow appears which constitutes emotion. This in turn may be exhibited in two ways, emotional expression and affect. The former consists of contractions of voluntary limb muscles in gestures, of face muscles in grimacing, smiling, etc., and of various integumental and visceral discharges (sweat secretion, hair erection, changes in blood pressure, contraction of the walls of hollow viscera, endocrine secretions and so on). The biological origin and function of these emotional expressions has been studied by many workers, from Darwin onward. Affect is the peculiarly subjective and personal reaction that conscious beings experience with emotions, it is "feeling".

There are large problems involved in the answer to the question as to what physiological and psychological processes underlie this strange phenomenon of affect. My conclusion has been that, although bodily changes may—and undoubtedly do—produce an effect on consciousness as a vague and unlocalizable "feeling", unconscious mental disturbances play an important, and perhaps dominant, rôle. What is the nature of these latter activities? Morton Prince has hypnotized patients suffering from attacks of distressing affect and then got a retrospective account of painful experiences going on at the time of an attack, described as anyone will retail a vivid dream of the night before. At the time of the

attack the patient is consciously quite unaware of these mental processes. Since these dream-like experiences take the form in memory of images (as indeed most true dreams do) and since they are active although not at the time conscious, Prince has called them "co-conscious" images. In my book on Emotion I have given considerable space to a discussion of such phenomena and have even suggested that in such co-conscious images we may find the roots for all our conscious thoughts and actions. But, before we can go on to a consideration of this hypothesis, it is necessary to consider a basic question. What is an image? How can something that we know only as a consciously introspected phenomenon be justifiably conceived as existing unconsciously?

One would expect to see "image" defined in every text-book of psychology, but I was surprised to find the meaning taken for granted in five standard text-books in which I searched. The nearest approach I could discover was this sentence from William James: "Sensations, once experienced, modify the nervous organism, so that copies of them arise again in the mind after the original outward stimulus is gone". This occurs in his *Principles* at the beginning of the chapter on Imagination; perhaps it is intended as a definition. In a more recent book Woodworth[1] gives a definition: "A sensation or complex of sensations recalled by a substitute stimulus is called a 'mental image' or a 'memory image'".

Etymologically the word image is derived from the same root as gives *imitation*. So the notion of repetition, echoing, copying, is there. But it is not an exact, complete repetition, for, if it were, the phenomena of hallucination would occur: there must be some kind of dilution or weakening in the reproduction. Plainly our definition must introduce some discrimination between the normal and abnormal types of reproduction of past experience.

Again, is consciousness necessarily present when true images appear? When a patient describes a scene enacted before his eyes that would account adequately for his reaction, are we to deny an imaginal form to these mental processes because the subject was unaware of them at the time, merely in that part of his whole mental structure which we call consciousness? Or the argument may be brought nearer home, brought within the experience of quite normal people. When we sleep we are not conscious, at

[1] Robert S. Woodworth, *Psychology, A Study of Mental Life*.