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THE ENERGIES OF MEN

WILLIAM McDOUGALL

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THE ENERGIES OF MEN

A STUDY OF THE FUNDAMENTALS OF DYNAMIC PSYCHOLOGY

BY

WILLIAM McDOUGALL, F.R.S.

WITH SIX ILLUSTRATIONS

SECOND EDITION, REVISED

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PREFACE

THIS book is the outcome of an endeavour to present in one volume of moderate compass the most essential parts of my *Outline of Psychology* and *Outline of Abnormal Psychology*. Together those two books, which were planned as two volumes of one work, introduce the student to all the central problems of psychology. There is need for a less comprehensive introduction to the study of human nature. Many students will never find time for more than one short course in psychology; and it seems indisputable that for such students the most advantageous course of study is one that sketches the human organism in broad outline, comparing man with the animals most nearly related to him, pointing out what he has in common with them and what is peculiar to him, both in his native endowment and in the normal course of his development. It is only by such study that we may hope to find the answer to the great question—What is man that Thou art mindful of him? Only in so far as psychology brings us nearer to an answer to that question can it justify its claim to share in the preparation for life of every student, and to make an indispensable contribution to every discipline concerned with human culture and activities, to literature, art, philosophy, religion, politics, law, medicine, education, economics, sport.

Those students who propose to devote themselves more seriously to the study of man and, perhaps, to specialize in one or other of the many fields of psychology, may well begin with such a brief survey of the two most fundamental problems.

This book, then, is concerned almost exclusively with these two great problems—What is the native endowment of man?

How does that endowment, through growth, differentiation and integration, become the many-sided marvel, a human personality ?

I had conceived the composition of this book as largely work with scissors and paste. But I soon found that my views had developed, in respect, as it seemed to me, of clarity and depth of understanding ; that it was, therefore, necessary to write a completely new book.

The book contains two principal novelties : first, a greatly improved treatment of the instinct-intelligence problem ; secondly, the outline of a theory of the learning process.

In my earlier efforts to throw light on the nature of man, I attributed instincts to the human species. This broad usage of the word ' instinct ' has involved me in endless controversy.[1] In this book I have used the word in a stricter sense, and have preferred the good old word ' propensity ' to designate those factors of our constitution which I formerly called ' instincts '. This concession to my critics does not imply any radical change of view ; but it does meet an objection to the wider usage of the word ' instinct ', an objection not without a certain weight ; and it enables me to treat the difficult instinct-intelligence problem in a more satisfactory manner than I have previously achieved.

The simplification at which I have aimed has been achieved in the main by the omission of all discussion of many topics which commonly find a place in introductory books on psychology, and by confining myself to a thorough discussion of a few topics of prime importance. There is, I think, no other valid way of simplifying the approach to psychology ; except perhaps to keep always in mind the wise dictum of Dr. Hans Prinzhorn : ' Overloading with specialized material is the danger of all instruction.'

The title and sub-title of the book express accurately its general aim. The former is familiar as the title of William James' most famous essay ; in adopting it, I pay my homage

[1] My principal contributions to that controversy are two articles in the *Journal of Abnormal and Social Psychology* (for the years 1922 and 1924) and two articles in the volumes, *Psychologies of 1925 and 1930*.

to that great man. If in the sub-title I had written ' hormic ' in place of ' dynamic ', the particular variety of dynamic psychology presented would have been more precisely designated ; but the word ' hormic ' is not yet sufficiently familiar to the public to find a place on the title-page.

In the light of a considerable experience in introducing students to psychology, I add a few words concerning the way in which, as it seems to me, a book of this sort may best be used in an introductory course. I feel sure that the average student profits little from being made acquainted with a multitude of facts about the nervous system, the structure of the sense-organs and the varieties of ' sensation '. Those few students who aspire to equip themselves for teaching and research in psychology must needs master a mass of such facts ; but such knowledge is best acquired in special courses given in the department of physiology or, if need be, by a member of the department of psychology who has specialized along those lines. The study of sense-perception is a more essential part of the preparation for serious work in psychology. But this also may with advantage be postponed until the student shall have learnt to conceive and to think about the nature and activity of man in a profitable manner, and, especially, shall have resolutely grappled with the question of the native basis of human personality, its distinguishable factors, their modes of functioning, their growth and differentiation and integration to form the infinitely complex whole.

Those many students who make some study of psychology as a preparation for work in some one of the sciences of man need above all to study just these problems ; and they need not only to study them, but also to be led to acquire a profitable and generally useful way of thinking about them. If they acquire from their course in psychology some detailed knowledge of neurones and reflexes and sensations, they will profit but little. And if they learn to regard man as a creature whose activities consist in a series of mechanical responses to sense-stimuli, the time they have devoted to psychology will have been wasted and worse than wasted. It is just

because psychologists have in so many cases ignored, or denied, or neglected to recognize adequately, the purposive nature of human activities that their science has been so widely ignored, or denied, or neglected, by those who should have found it of the utmost value as ancillary to the study of every form of human activity.

The chapters of this book are designed to serve merely as a skeleton sketch. It is for the teacher, in co-operation with his students, to fill in its hollow places and cover it with flesh ; to carry the discussion of each topic further and deeper, and to enrich it with concrete instances and illustrations drawn from the now very large technical literature, from literature in general, and directly from real life.

An introductory course in psychology conducted in this way should rank very high in general cultural value. It must bristle with highly debatable questions that are of interest to every intelligent man. The student is, I venture to think, better served by a book of this sort, one which maintains consistently one definite point of view and scheme of interpretation than by one which presents what has been well called ' middle-of-the-road psychology ', a wealth of facts with a minimum of interpretation, or interpretations so vaguely formulated that they leave the author a member of every school.

Psychologists are still divided in many schools. This state of affairs has many drawbacks ; but it has, I hold, this advantage : the great issues in dispute, if they are sharply pointed up, stimulate the student to think and challenge him to strive towards decisions ; while, at the same time, he gets a glimpse of the extent of our ignorance and of the magnitude of the tasks that lie before us. So treated, psychology, as a provocative to thinking, has, it seems to me, no rival among the academic disciplines.

Any advance shown by this book beyond my earlier publications is largely due to many discussions with my colleagues of the department of psychology in Duke University, Doctors Lundholm, Zener, Rhine and Adams. They are in no degree responsible for or committed to agreement with the views

expressed. But I am well aware that I owe much to them, and take this opportunity to acknowledge my affection and my grateful appreciation of their helpful criticism and suggestions. I have also to thank the editors of *The Journal of Comparative Psychology* for permission to reproduce two of the illustrative figures and one photograph.

Discussions of some difficult problems of secondary importance have been relegated to appendices attached to several of the chapters. These appendices, as also the very condensed sketch of the Schools of Psychology (Chapter II), may well be omitted by the beginner.

W. McD.

August 1932

PREFACE TO THE SECOND EDITION

This preface is for advanced students and teachers only and is strictly forbidden to beginners and the general reader

IN this edition only minor corrections and emendations have been made. I take the opportunity to make in this preface certain statements which might well have been added to the preface to the first edition but which have been suggested to me as appropriate and perhaps useful to advanced students by comments of reviewers upon the book. The reviews I have seen have been fair and friendly, and I have no complaints to make of them. I am not following the amusing example of Herbert Spencer in writing a review of one of his own books in order to teach his reviewers their business. My aim is twofold : first to help students to understand the relations of my work to the rapid and confused course of development of modern psychology ; secondly, to put on record very concisely my own view of those relations and of the nature and leading features of my own contribution to the science of man. I feel also that my more serious readers are entitled to some indications from me as to what features of this very condensed treatment of an immense topic are either peculiar to myself, or originated or elaborated by me and not accepted by all or any large proportion of my fellow experts.

One reviewer describes me as the most subtly eclectic of modern psychologists : and I am glad to believe that the description is not without warrant ; for I have sought to reflect in this one little book all that seems most acceptable in the teachings of the many conflicting schools. But the description and the tone of this and of other reviews imply that my book is merely a well-ordered presentation of generally

accepted doctrines; they reveal no recognition of the fact that the book presents a distinctive theory of man gradually elaborated by me in many books and articles during the last thirty-five years, and that it embodies, in part explicitly but in large part implicitly only, the cream of my many contributions. This failure is inevitable and pardonable enough; for only a very unusual command of the literature, combined with a detailed acquaintance with my books and many widely scattered articles, would enable a reader to recognize that much which I may seem to have taken from the common stock of current doctrine I had first put into that stock.

If few of my colleagues have publicly recognized that a distinctive, comprehensive and well-rounded theory of man is the issue of my labours, I find satisfaction in reflecting that these are as fit as they are few. Especially I have in mind Hans Prinzhorn, whose recent untimely death is a great loss to the world and a grief to his friends and admirers. For Prinzhorn, by reason of his rare command of the whole vast field of relevant literature, and of his sure and penetrating judgment, was one of the very few persons equipped to evaluate, to pass judgment upon, and to appreciate my work and the contents of this volume.

It may be said that a book designed as an introduction to any branch of science should confine itself to the presentation of established facts, of generally approved methods of interpretation and of commonly accepted theories; that the author has no business to give place in such a book to his own interpretations, hypotheses, and speculations. That reflection would, I think, hold good of books introductory to any of the well-developed branches of science. But, unfortunately, psychology has no such facts, no such methods and no such theories. The methods and theories of the present, even more than those of any previous age, are multitudinous and utterly diverse; and in psychology you cannot state the simplest facts without implying in the words you use theories and methods of interpretation. Consider, for example, the two words 'idea' and 'concept', which (or

their foreign equivalents) figure largely in almost every book on psychology or philosophy written since Descartes initiated the modern period of thought. What a wealth of history, what a confused mass of ill-founded assumption and of highly questionable theory and speculation lies behind them ! How impossible to use either word without implying some of this chaos of meanings ! An adequate history of either word would be hardly less than a history of philosophic speculation during more than two thousand years.

If any such sketch of the nature of man as is here attempted is not to be a mere jumble of statements behind which lurks a chaos of unexamined assumptions and incompatible theories, it is necessary that the author shall have thought out his foundations, shall have made clear in his own mind what fundamental postulates he accepts, and shall adhere strictly to these at every point of his exposition. Among all the welter of contemporary books on psychology, are there half a dozen which conform to this prescription ? Such conformity is the first claim I make for this book. I add that my fundamental assumptions are held, not as metaphysical axioms or ultimate truths, but as postulates which may, and in all probability will, require to be changed as science advances. Further, my assumptions are as few as will serve my purpose ; none are gratuitously made, but only such as seem indispensable. For example, I neither deny nor assert the existence of the soul (in the traditional sense of that word) or the dependence of the psychical on the physical. Answers to such questions are not, as used to be assumed, indispensable preliminaries to psychology to be obtained by what is called by courtesy metaphysical research ; they are rather to be regarded as the far-distant rewards of the scientific research of generations still unborn.

I assume that psychic activity is no less real than physical process and no less causally efficacious, a part of nature, neither a supernatural influx nor an unintelligible and otiose by-product.

I assume that psychic activity is always and everywhere teleological, a forward striving towards some end or goal ;

and that such teleological or purposive causation is in no sense a disguised form of the mechanistic causation postulated by the physical sciences. There are two ways of conceiving teleological activity, the hedonist and the hormic: the latter is the primitive and fundamental form of all animal activity; the former is derivative from the latter, and plays any considerable role only at the reflective human level. The consistent carrying through of the hormic principle is a distinctive feature of this book. The principle was used in my *Social Psychology* (1908), and has been developed and expounded in its full range of application in my later volumes. The only author who, to my knowledge, has anticipated me in proposing a purely and consistently hormic psychology (but without working it out in detail) was the late Eduard von Hartmann (in his *Die moderne Psychologie*, 1901).

I assume continuity of evolution, physical and mental, from the simplest animal forms to man, and an abbreviated and distorted recapitulation of the phylogenetic process in all ontogeny. With this goes the assumption (one well supported by the empirical evidence) that the fundamental forms of mental activity occur in the simplest animals, and that the higher forms of mental structure and activity have been evolved by way of differentiation of the primitive forms, in a manner similar to that which we can trace in the development of the human infant. Hence the comparative study of men and animals is of the first importance for the understanding of man and his mental development, and is the method on which I have chiefly relied in shaping my sketch of man's constitution, and especially in seeking to define the native basis of that constitution. This definition is carried to a further point than by any other author, and, subject to correction as it necessarily is, it constitutes a distinctive feature of this book; it distinguishes my work especially from other constructions with which it has most affinity, namely, those of the psycho-analytic schools, all of which have neglected this very fundamental task and owe to such neglect much of their extravagance and lack of balance.

I assume that, underlying and determining the main lines and limits of the mental activity (i.e. the purposive intelligent strivings) of any creature, is a complex organization which we conveniently call its mental structure. The nature of this organization, as also the processes of its growth and differentiation, may be inferred from the creature's observed activities. The gradual building up by such inference of an increasingly valid, adequate and useful account of the structure of the human mind is a main task of psychology. It is a distinctive feature of this book that it accepts this task as a main part of its programme, sketches such structure on simple consistent lines, and gives some account of its growth and differentiation along the lines laid down in my earlier books (most fully in my *Outline of Psychology*, 1923).

An important part of my whole scheme of mental structure is the theory of the sentiments and of character as formed by the hierarchic organization of the sentiments in one integrated system. That account was first rendered in my *Social Psychology*, and has been reproduced with little change, but in condensed form, in my *Outline* and in these pages. It remains, and, I believe, will remain, as my most original and solid contribution to psychology. It made possible the first intelligible account of the process of volition and moral choice and of its relation to the lower forms of action, and brought into the field of psychology a host of profoundly interesting problems which the traditional division of labour had up to that time left to the tender mercies of the moral philosophers. In this volume that account of character and volition is supplemented by a chapter which presents very concisely a theory of tastes and the process of their formation, a theory first roughly indicated in my *Character and the Conduct of Life* (1927). Beside this account of character and its formation stands the parallel account of the structure and development of intellect. The latter was first outlined in my volume *Psychology* (of the H.U.L., 1912); the processes of development were more definitely described in my *Outline* (1923); and the account is in principle completed in this volume by a very briefly stated theory of the integration of intellect.

In addition to the main features of my scheme indicated above, I would list the following more special contributions developed in earlier publications and embodied, however briefly, in this book.

A chemical theory of the qualities of temperament implied by the terms introversion and extroversion. It was Dr. C. G. Jung whose discussion secured for these qualities their now so popular recognition and vogue. But I venture to think that my account clarifies and simplifies these traits and brings the theory of them into line with the general chemical theory of temperament. It is a special development of a general physiological theory of the action of anæsthetic and stimulant drugs upon the brain which I foreshadowed as early as 1898 and have developed and supported by various experimental observations. It was formulated in some detail for the drug alcohol, in my contribution to the volume of joint authorship issued by the governmental committee on alcohol.[1]

Closely connected with the foregoing is the theory of cerebral dissociation first elaborated in my article on Hypnotism in the *Encyclopædia Britannica* (11th ed.). This is a subsidiary part of my psycho-physical theory of the hypnotic state and its phenomena, a part which is hinted at only in this volume (in the discussion of dissociative disorders). The psychological part, my theory of suggestion and of the hypnotic *rapport*, is more fully presented ; I regard it as of considerable importance, for, so far as I can see, it is the only plausible and tenable one before the public ; and hypnosis, with its many striking phenomena (so grossly neglected by most psychologists, just because they have no theory that can take account of the facts), may well be regarded as a touchstone of psychologies, their *pons asinorum* which very few can cross. This theory of suggestion was first stated in my *Social Psychology*, and more fully developed in later publications, especially my *Abnormal Psychology*. It can claim the advantage of the support of Professor Freud, who (in his *Group*

[1] *Alcohol : Its Action on the Human Organism*. H.M. Stationery Office, 1917.

Psychology), while professing to reject my theory, puts it forward with the unnecessary complication of a most speculative and improbable account of the genesis of suggestibility in the human species.

I entered the field of scientific work as a physiologist and turned to psychology by way of psycho-physiology and experimental studies directed to illuminate the neural basis of sense-perception and the working of the neurone systems in brain and cord. A list of my contributions in that field would be out of place, since most of them are too special to bear directly on the topics of this volume. But some of them, which are embodied here, may be mentioned. The hypothesis of inhibition by drainage (which continues to be the only one generally applicable to the phenomena of inhibition in the central nervous system) was formulated by me in 1902 and was made the basis of my theory of light and colour contrast and of the explanation (1905) of the formation of neural associations of all sorts (including the so-called ' conditioned reflexes '), and remains, to the best of my knowledge, the only workable explanation of that process. It presupposes the validity of the assumption that energy liberated in the neurones on excitation (whether it be electric energy or some more special form) can be and is transmitted from one neurone to another. This assumption has not been verified by direct experiment, and consequently is not accepted by most of the physiologists of the laboratory. Yet it is justified by the fact that almost every student of the working of the nervous system as a whole (whether clinical neurologist, psychiatrist, psycho-analyst, or psychologist) finds himself compelled to adopt it. Notably, all the psycho-analytic schools adopt it in their doctrine of the *libido* ; and underlying all the teaching of the now so influential school of *Gestalt* is the assumption of fields of energy not confined to the substance of the neurones but spreading continuously through large tracts of the nervous system. Further, at least one eminent physiologist, Dr. K. S. Lashley, has recently been driven by his own experimental observations on the cerebral processes to adopt it, under the form of the dictum that the cerebral cortex works in some

sense as a whole, its various parts co-operating with and supplementing one another as a field of energy common to all.

The same assumption is presupposed in my theory of the innate propensities as energizers of the cortical processes. This view, which I have advocated on psychological grounds for many years, has now been directly substantiated by the experiments of several physiologists of the highest rank (summarily described in the Appendix to Chapter XXII of this volume). This neurological interpretation of each propensity as a thalamic system having two-way connexions (native or acquired) with various cortical systems (abilities), which maintain reciprocal or circular actions between the members of each such couple, is one which, as I have argued in various publications, and most explicitly in my *Abnormal Psychology*, is demanded by a multitude of facts, both psychological and physiological: by the facts on which Sir Henry Head founds his distinction between protopathic and epicritic sensation; by the functioning of the sentiments and complexes; by the facts of the phobias and compulsive acts and perversions, and by many other morbid phenomena. And it fits neatly with the general scheme of the evolution of the nervous system and of the parallel evolution of mental functions.

Again, this theory harmonizes with the chemical theory of introversion-extroversion mentioned above.

I regard as a very useful contribution my disentanglement of disposition, temper and temperament from a long-continued and worsening confusion with one another, and with character. Here the theory of the varieties of temper is most distinctively my own.

The analysis of personality into five principal classes of factors is a natural sequence to this disentanglement; it brings some prospect of order and system into a chaotic topic which figures largely in the recent literature.

The theory of the learning process has remained incomplete in spite of much discussion, and experimental study. I claim to have completed it in principle in this volume, by pointing

to the essential role of foresight and of anticipatory feeling, illustrated by my own prolonged experiments with animals.

Lastly, I mention my theory of laughter and of humour (only slightly touched on here), which has, in addition to its other merits, that of forming a natural and consistent part of my whole scheme of human nature. Many books and articles on this topic have appeared since my theory was first put forward; and most of them dismiss it on quite trivial grounds. I am tempted to reply by making the following general comment. With few, if any exceptions, these discussions of laughter have been essentially amateurish, inevitably defective because their authors are not psychologists. I do not see how any man, however original and acute his intellect, may hope to solve so subtle a psycho-biological problem as laughter without having devoted many years to the intensive special studies through which alone a man may make of himself a competent psychologist. Yet this, like all the very difficult psychological problems of æsthetics, seems to be regarded as a fair field for any literary man who may choose to rush into it. Psychology continues to be the one field of science in which the layman and the amateur and the general reader regard themselves as equally competent with the life-long student to judge of the value of any hypothesis. And there seems to be no prospect of a change in this respect: for the only way by which the amateur in this field can become conscious of his amateurishness is by getting rid of it.

Looking back on my own career as I write the last words of what is likely to be my last book on psychology, I realize how long-drawn-out was the process through which I gradually attained to a reasonable degree of general competence. My best hope for this volume is that it may lighten a little the labours of some of those who are setting out upon the same arduous path.

W. McD.

July 1933

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THE ENERGIES OF MEN

CHAPTER I

INTRODUCTORY

IN the present age, psychology is the most important, as it is the most difficult, of the sciences. It is the most important because it is the only science directly concerned to study and to interpret or explain the conduct of men ; and in the present age, when the natural sciences have radically transformed our environment and have made it very much more complex, both physically and socially, than the environment of any former age, we are in danger of individual and social disaster through lack of such understanding as psychology seeks. For only through understanding the conduct of ourselves and of others can we hope to regulate it satisfactorily, to adjust it successfully to the many novel and constantly changing circumstances of our lives. Under the simpler conditions of former ages, conduct was regulated in the main by traditions and ancient customs which no man ventured to dispute or to defy. Traditions and customs are no longer adequate to the complexities of the modern world : the spirit of inquiry has challenged their authority and, in so doing, has robbed them of their power to control our conduct. Whether we like it or not, we are forced to ascend to the plane of rational regulation ; and Reason, however powerful, can guide us aright only in the light of knowledge, knowledge of the nature of man, of the springs of his conduct, of the nature and sources of his knowledge, of the process of reasoning itself, its defects, its liabilities to error, to bias, to excess and defect.

Further, alongside the natural sciences, we cultivate in

our universities a number of studies concerned with various departments of human activity, studies such as politics, economics, history, biography, jurisprudence, education and sociology; and these can hope to become scientific only in so far as psychology can furnish them with valid knowledge of human nature and true principles of interpretation of human conduct.

Psychology is the most difficult of the sciences: for it is concerned with the conscious activities of men; and each man is an organism, a vast complex of physical, biological, and mental events, constantly influenced by and reacting upon the physical, biological, and mental events of the environment in which he lives. The physicist confidently assumes that the physical events with which alone he, as a scientist, is concerned, are all of one order, are all fundamentally of one nature. The biologist's task is more difficult: for he has to relate the biological events with which he is immediately concerned to those of the type with which the physicist deals, physical events occurring both within and around the organism; and he has no guarantee that biological events are of the same order, express only the same laws, as those of physical science. If, as so many do, he proceeds on the assumption of the essential identity of the laws of physical and biological events, he may be running in a blind alley; and some leading biologists stoutly maintain that most of their colleagues are doing just that. The psychologist's task is still more difficult: for he is confronted, not only with this age-old problem of a possible radical difference in kind between physical and biological events, but also with an obvious difference of kind between physical and mental events; and the relations between the events of these two orders present a most troublesome problem which the psychologist cannot evade.

Thus, at the very outset of our inquiry into the nature of man and his mental activities, we have to consider a problem which the greatest intellects have discussed for two thousand years without reaching agreement, perhaps the most difficult of all the great problems that perennially vex all reflective

minds. We must *provisionally* accept as a working hypothesis one or another of the several possible answers to this problem that are in good standing at the present day.

The Relations between Mental and Bodily Events

Let us glance very briefly at these answers. Some are of the nature of attempts to evade, rather than to solve, the problem. Thus some authors say that psychology is concerned wholly and solely with mental events and need take no account of physical and biological events; that it may build up a pure science of the laws of our mental life. This position proves unacceptable: for our mental events seem to be constantly influenced by, and in turn to react upon, events within the body and physical events without it. Indeed the function, the *raison d'être* of mental events seems to be the modification and control of those other events; on the one hand, the adaptation of the reactions of the organism to the world about it; on the other hand, the moulding of the physical environment according to the felt needs of the organism, as when man makes clothing, tools or things of beauty.

Equally unsatisfactory is the opposite and, at the present time, more popular way of evading the problem. It consists in assuming that man's nature and behaviour can be adequately described and explained in terms of the physical structure and events of his body. This programme takes its stand on the belief that the laws of physics are adequate to the explanation of all biological events. Its argument runs—The laws of physics are the laws of material systems and of all events that occur in them; all organisms are material systems; hence the laws of physics are the laws of all organic events, of all events that occur in organisms.

But this is to ignore two very obvious, highly important and closely related peculiarities of organisms; namely, some organisms (perhaps all) are the seat of conscious events; and in some organisms (perhaps all) events occur *as though* they were steadily directed to some goal. We see this *goal-seeking* in all the processes of growth and especially clearly

in the growth through which bodily injuries are repaired; we see it still more clearly in much of the behaviour of the higher animals, as when a dog persistently seeks its natural prey, or finds its way home in spite of many difficulties and obstacles; we see it most clearly in our own actions, when we clearly envisage a goal, desire strongly to attain it, and work persistently towards it, using all obvious means and, perhaps, discovering or inventing many that are not obvious.

In instances of the last type we notice the intimate relation of these two fundamental peculiarities of organisms, namely, conscious activity and goal-seeking. The relation is in fact a very close correlation in time; it may be stated as follows: Whenever we are consciously active we are striving (definitely or vaguely, strongly or feebly) towards some goal; and, whenever we exhibit the outward behaviour of striving towards some goal, we find, if we reflect, that we are consciously active, that our seeking, our striving, is a conscious activity.[1] Notice also that, in a sense, we can understand and explain the goal-seeking activity in terms of our conscious foresight and desire, in terms of our conscious striving towards the foreseen or anticipated goal. Further, when we observe other creatures, whether men or animals, striving towards goals, we cannot begin to understand, or explain, or interpret such behaviour without attributing to them some inward activity of a nature essentially similar to our own conscious foresight of and desire for a goal. We are thus led to suspect that goal-seeking behaviour, whenever and wherever it occurs, is accompanied by, or is a manifestation of, conscious activity; and, though we cannot hope to establish the generalization beyond all possibility of doubt, it becomes a fair working assumption that conscious activity (allied in nature to our experience of desireful foresight) and goal-seeking behaviour are always but two partial aspects of one total system of activity, a psycho-physical activity.

In the inorganic world of the physicist we find no indications of these two correlated peculiarities of organisms; and

[1] There are apparent exceptions to this generalization; but they are rare and anomalous incidents.

the laws of physics, as at present formulated, seem incapable of explaining or of throwing any light upon either of them.

Nature seems, then, to present to our contemplation events of two different kinds, the physical and the psycho-physical. The former are the events of the inorganic realm, which physical science explains with ever-increasing success in terms of mechanistic causation (the principle of causation that finds the explanation of present events in terms only of the causal influence of antecedent events, without reference of any kind to possible future events). Psycho-physical events, on the other hand, cannot be completely explained in this way ; for the explanation of them we have to take into account foresight of the possible future course of events and striving guided by such foresight. All such events, all foresighted strivings, seem to be instances of a second fundamental type of causation, that type which we call *purposive* or *teleological*.

Psychology is not directly concerned with the question whether these two types of causation are radically and ultimately different. Science has to proceed *as though* its descriptions and explanations corresponded to the real nature of the things and events it deals with ; while at the same time it recognizes that these descriptions and explanations are inevitably inadequate to the reality and are, therefore, susceptible of improvement. The progress of Science consists in making such improvements. Thus, in the nineteenth century, physical science sought to describe all physical events in terms of the motions of particles having mass and momentum, and to explain all changes in terms of the communication of motion from one particle to another. It is now recognized that such descriptions and explanations, though useful, were inadequate ; and they are now largely superseded by other methods of description and explanation. We must recognize that a similar fate may be in store for whatever systems of description and explanation we may devise and adopt in biology and psychology. Our business is to use, as effectively as possible, whatever system may seem most serviceable in the present state of knowledge. Never

theless, description and explanation in terms of causation are the very tissue of Science ; and progress consists in rendering descriptions more exact and causal explanations more refined.

It has often been proposed that Science should content itself with description and should forswear all explanation in terms of causation. But the whole history of Science shows clearly that such a policy would be fatal to its progress. It is the search for causal explanation that produces fruitful hypotheses, which in turn lead to new observations and more adequate descriptions. In this respect psychology is no exception. Its task is to describe as fully as possible the observable events of the human organism and to explain them by the aid of causal hypotheses.

The human organism seems to be the seat of many events that can be described as purely physical and explained in terms of mechanistic causation : such are the flow of the blood in the vessels ; the movements of the bony levers when pulled by the contracting muscles ; simple reflex movements of parts of the body, such as the jerk of the leg when the tendon below the knee-cap is tapped ; and many chemical changes, such as the taking up and release of oxygen by the hæmoglobin of the blood.

Secondly, it is the seat also of the mental events of which we are immediately aware ; and these seem to be essentially goal-seeking and to be explainable only in terms of purposive causation ; as when you find the desired solution of a problem, because you have worked for it, sought it, striven towards it as your imperfectly envisaged goal.

Thirdly, the organism is the seat also of events which, although they can be described as physical events, are yet distinctly of a goal-seeking nature and seem to require for their explanation some guidance of the physical events by the influence of purposive events. Now in the case of many events of this third class, namely all our deliberately made voluntary movements, we are directly aware in each case of a purposive activity, of a striving for the goal towards which the bodily movement is directed. It is, then, a natural inference that the purposive mental event modifies and guides

the course of the physical movements of the limbs concerned, thus giving to those movements their goal-seeking nature.

On the other hand, in many instances, some physical event, such as physical stimulation of a sense-organ, seems to initiate or to modify the course of some purposive mental event.

We thus have abundant grounds for assuming that the events of the two kinds can and constantly do exert reciprocal influence; and we do well to follow where the facts lead us, accepting the interplay of mechanistic physical and of purposive mental events. No sufficient reason has been adduced for regarding such interplay or reciprocal influence as impossible, or the assumption of it as improper. Yet, in speaking of *psycho-physical interaction*, we must recognize that the expression may distort the truth in that it seems to separate the psychical and the physical; whereas these may be but two partial aspects of the concrete reality, two aspects of a system of psycho-physical activity which are distinguishable but inseparable.[1]

While we accept, as the best working hypothesis, the principle of psycho-physical interaction, we should not ignore

[1] The adjectives 'mental' and 'psychic' are sometimes used as synonyms; but more commonly a difference of meaning is recognized, however vaguely, and we shall do well to make this difference clear and explicit. 'Mental' we shall use to denote all processes and structures directly involved in the intelligent purposive activities of men and animals, whether they be regarded as physical or non-physical or of a mixed nature (psycho-physical). 'Psychic', on the other hand, we may use to distinguish the non-physical from the physical. We have direct acquaintance with and experience of psychic processes; we attempt to describe such processes by speaking of subjective events, of consciousness, of conscious states and processes, of feeling, sensation, sense-data, *sensa*, ideas, awareness, immediate experience, introspectively observed facts. Such non-physical psychic processes are natural occurrences; they are a part of nature which it is impossible to ignore, deny, or explain away. But the word 'psychic' is often used to imply much more than these processes of immediate experience; namely, it is used to imply processes which are neither physical nor immediate experiences of any mind or subject, though allied in nature to the latter. When the word 'psychic' is used in this sense, it may also be used to imply that such non-physical and

the fact that very many men whose views are entitled to respect are strongly prejudiced against the principle and prefer to assume one or another of the many alternative views. All these fall into three principal classes as follows: (1) *Materialism*, which asserts that mental events are wholly dependent on and caused by physical events; (2) *Idealism*, which maintains the contrary, namely, that in some sense what we call physical events are a mere appearance to us of events which intrinsically are psychical, of the same nature as our directly experienced mental events; (3) *Neutral Monism*, which asserts that both psychical and physical events are mere appearances or aspects of one unknowable reality. This last obscure doctrine was until recently in much favour among psychologists in the form of *psycho-physical parallelism*, the doctrine that the psychical events and the brain-events of any man run strictly parallel but are not causally related.

All of these formulations are up against the difficulty pointed out on page 5, the difficulty, namely, that physical and mental events seem to express two very different systems of laws, the laws of mechanistic and of purposive causation, respectively. And though we admit that this difficulty may possibly be overcome in some way which the efforts of two thousand years have failed to foreshadow, however vaguely, we maintain that, pending such discovery, we do well to discuss our psychological problems *as though* the principle of psycho-physical interaction were true; *as though* the light from the sun somehow plays a part in my seeing things illuminated by it; *as though* the vibrations of the bell some-

non-conscious processes occur, not only as aspects of psycho-physical events, but also independently of all physical process. When 'psychic' is used in this sense it commonly carries a further implication, namely, the existence of a realm of purely psychic reality, a realm of psychic being and activity, a realm of pure spirit. These implications are highly controversial.

The questions raised by such usage of the word 'psychic' cannot be answered by any one science; they are commonly regarded as belonging to the province of philosophy. Fortunately, psychology can go far without taking up towards these questions any other attitude than one of benevolent neutrality.

how play a part in causing me to hear its clanging ; *as though* the pain I feel on touching a hot iron may somehow play a part in causing the withdrawal of my finger ; *as though* my strong desire to see the home and the people I love may in some way prompt and guide my returning steps ; *as though* my foresight of the rise of prices on the stock market may have some causal relation to my buying of stocks. Such are the 'extravagant' assumptions to which we are committed by the principle of psycho-physical interaction ; they are the assumptions of common sense and common speech. If we reject the principle in favour of any one of those other doctrines, we are needlessly driven to clumsy circumlocutions highly prejudicial to clear thinking.

The Problem of Energy

The title of this book announces its claim to go beyond mere description of our mental life, its aim to explain as far as possible the activity of men. So long as any science is content to describe only, it does not require the conception of energy. Energy is something that we postulate for the sake of introducing order and system into our explanations of the course of events, in order that we may formulate dynamic laws of agency, influence, or causation. In the physical sciences it has been found extremely useful. The biological sciences were for a long period occupied in the main with description and classification. But they are now advancing to the explanatory stage, concerning themselves with dynamic problems, seeking causal explanations in terms of energy and the interplay of energies. Psychology is no exception. In the past it has been mainly occupied with description and classification ; but of late years it has become increasingly concerned with the dynamic problems of human activity ; every year it becomes clearer and more generally agreed that the essential task of psychology is to achieve such understanding of human activity as will make possible a more effective guidance and control of the energies of men.

That in struggling with some difficult problem we expend energy seems clear. Nothing is more exhausting than intense

thinking. It is equally clear that rest, sleep, and food bring restoration of energy, enabling us to renew our mental efforts. Facts of this order imply intimate relations between our mental activities and the energies of the body, especially those of the nervous system. The problem discussed in the preceding section may be restated, stated perhaps most profitably, in the form: Does mental activity involve some form or forms of energy other than those recognized by the physical sciences?

In view of the purposive nature of human activity, the positive answer to this question seems inevitable. We must postulate some energy which conforms to laws not wholly identical with the laws of energy stated by the physical sciences. We have at present no sufficient ground for postulating more than one such form of energy. We may provisionally speak of it as *mental energy*, using the word 'mental' in the broad sense defined on page 7.[1] Or we may call it *psycho-physical energy*; a name which implies its relations to both the psychic and the physical realms. Or we may call it *hormic energy*. The adjective 'hormic' derives from a Greek word meaning an urge or impulse towards a goal; it thus points to the distinctive rôle of the postulated energy, marks it as the energy peculiar to purposive activities.

Does the psycho-physical or hormic energy conform to the law of conservation? Is it convertible into the forms of energy recognized by physical science? Is it derived, by transformation, from those forms? These are legitimate questions. But at present we have no sufficient grounds for definite answers to them. They must be postponed until we shall have ascertained more fully the laws of hormic activity. In the pages of this book we approach the problems of human nature from this dynamic point of view, endeavouring tentatively to formulate those laws.

[1] If we should call it 'psychic energy' we should seem to make far-reaching assumptions about psychic realities independent of the physical realm, which, as we have seen, are best avoided as highly controversial. Professor Bergson has written of 'mind energy'.

CHAPTER II

SCHOOLS OF PSYCHOLOGY

IN spite of the widespread popular interest in psychology and of the rapid growth in recent years of university departments devoted to instruction and research in psychology, the science is still in some respects in a very unsatisfactory condition. Psychologists are divided by differences of opinion on many questions that affect profoundly their ways of conceiving the science, its problems and its methods. The most fundamental of such divergences was discussed in the introductory chapter. It is well that the student should have from the outset some acquaintance with others of these deep-going differences. I shall, therefore, very briefly state my own view of the principal problems, departments and methods of psychology and indicate the peculiarities of other authors and schools.

The central task of psychology always has been, still is, and always will be, to describe the mental constitution and activities of the normal civilized adult and to explain those activities in terms of general laws and fundamental postulates. From time to time we hear it said that the task of any science is merely to describe things and events as accurately as possible in general terms; and that no science should attempt to explain. But all the history of thought shows clearly that the search for causal explanation of events is the very breath of Science. So long as 'natural history' was content to describe and classify, it hardly deserved the name of science. Natural history was converted into biological science by the formulation of hypotheses for the explanation of the evolutionary process. The evolution of animals and plants had often been described before Lamarck

and Darwin put forward their hypotheses to account for it, to explain it. These hypotheses, these attempts to find causal explanations of the course of evolution, have stimulated and guided a vast amount of observation and experiment. Again, the origins and the aims of Science are essentially practical. The various sciences were begun with practical ends in view, namely, man's better control and direction of natural processes. And the increase of such control, the more effective intervention of man's will in nature's processes, the bending and subduing of natural events to the purposes of man, is still the ultimate justification of Science. This is as true of psychology as of mechanics and bacteriology. But it is only understanding of causation that gives us power effectively to intervene, to control and direct the course of natural events; man's efficiency as a causal agent depends upon the degree of his understanding of causation. All scientific endeavour culminates in the effort of psychology to throw light upon the causal activity of man, to understand how his thinking, his planning and striving, is in some degree successful in attaining his goals, in realizing his desires. The essential task of psychology is to render his thinking and his striving more successful, to give them greater causal efficacy.

The earlier efforts of men to explain took the form of laying down various axioms (highly general propositions that seemed obviously and ultimately true) and of deducing the explanation of particular events from such axioms. But modern science has learnt to begin with observation of particular events, to generalize its descriptions of such events, and to seek proximate explanations in terms of such general descriptions or empirical laws or hypotheses, gradually making its explanatory hypotheses deeper and more general; at the same time keeping them plastic and tentative, recognizing that it has not reached, and perhaps never can reach, ultimate truth.

Each science has necessarily, at each stage of its development, to accept certain postulates or fundamental assumptions in terms of which it seeks to explain all the types of event with which it is concerned; and these postulates have changed

with the development of the sciences. Thus, in the nineteenth century, physics worked with the postulates of matter and motion, or mass and momentum; and now these are giving place to radiation and fields of energy. Chemistry worked with atoms provided with certain valencies or affinities, conceived vaguely and metaphorically as hooks that bind the atoms together to form molecules. But now, as physics and chemistry come nearer together, these relatively simple atoms give place to very complex whorls of energy. And no one can foretell what the postulates of physics and chemistry will be fifty, or even ten, years hence.

Psychology has followed the same general course as the other sciences. In its earlier period the common assumption, accepted as axiomatic, was that each man's mental life is the expression of his soul, an indestructible immaterial entity, endowed with certain faculties, or capacities for certain kinds of activity; and each concrete mental event was to be explained deductively as the working of some faculty or conjunction of faculties of the soul. The method chiefly relied upon was *introspection*, the direct observation and description by each psychologist of his own experience; each one checking and generalizing his own descriptions by taking account of similar descriptions rendered by other observers.

With the rapid development of physiology in the eighteenth and nineteenth centuries, much attention was given to reflex action as a type of bodily movement; and there were brought to light many evidences of the influence of bodily processes on the course of mental life. The mental effects of bodily disease, of drugs, of fatigue, and especially of injuries to the sense-organs, nerves and brain, were closely studied. Thus *physiological psychology* took shape.

In the middle of the nineteenth century the problem of the relations between mental events and physical events within and around the body was attacked experimentally; this attack was a specialized branch of physiological psychology usually distinguished by the name *psycho-physics*.

A little later it was realized that the experimental method might be applied more widely to other problems of psychology.

It was seen that the psychologist might with advantage make his introspective observations in a laboratory and under conditions that could be defined, repeated and varied at will: he could then invite other men to report their introspective observations made under similar controlled conditions. Thus *experimental psychology* began to take the place of the traditional purely observational psychology.

All this was a great extension of the methods and resources of the science, and was highly conducive to progress; but there were also unfortunate consequences. Many of those who had approached the problems of human nature from the side of physiology jumped to the conclusion that our mental life is wholly dependent upon the brain, and that all explanation must be in terms of current physiology; that, therefore, the study of the brain is the sure and only profitable method of advancing psychology. Most of those who took this view adopted the doctrine of *epiphenomenalism*, which asserts that all mental events are but quasi-real, shadow-like effects of brain-processes, and have no causal efficacy. Thus arose a physiological psychology, narrow, dogmatic, and thoroughly materialistic.

An equally narrow school arose in consequence of the development of experimental methods: a school which regarded experimental psychology as a discipline apart from all others. It proclaimed introspection by experts under laboratory conditions as the sole legitimate method; and it conceived the task of psychology to be exclusively the rendering of a complete analytic description of the flow of experience in terms of ultimate units or atoms of consciousness, together with certain laws of the composition of such units. Such psychology is called by its critics *introspectionism*, or, by some of its exponents, *structuralism*. Most of those who took this narrow view accepted the doctrine of *psycho-physical parallelism*, according to which all mental events run parallel with brain-events, but are not to be regarded either as influenced by or as influencing those brain-events.

In opposition to those too narrow schools, we must maintain that all psychology is both physiological and experi-

mental, that, in face of all its problems, it must make fullest use of all relevant physiological knowledge and of all possible experimental methods of research.

As a further consequence of those too narrow and over-specialized ways of conceiving the aims and methods of our science has arisen a school still narrower and more specialized. It was apparent that *experimental psychology* (in the narrow sense of *introspectionism*) could contribute little or nothing to the explanation of human behaviour. Further, it was held by many physiologists that all physiological explanations must be in terms of the mechanistic laws of current physics and chemistry. And it was clear that, if either *epi-phenomenalism* or *psycho-physical parallelism* were true (and both were very widely accepted), the processes of consciousness are of no influence on our behaviour and, therefore, do not need to be taken into account in explaining it. Yet it is the behaviour of men in which we are chiefly and practically interested. Let us, then, it was suggested, concentrate our efforts on the study of human behaviour and on its explanation in the mechanistic terms of current physiology. The simple reflex-action is a train of physico-chemical events. Let us regard all more complex forms of behaviour as consisting of more complicated reflexes, native or acquired, reflexes compounded in various ways ; let us cease to worry about the insoluble and sterile problems of consciousness ; let us abstain from wasting our time in introspection ; let us make psychology a purely objective science, a special department of physiology, the department which is concerned with the reactions of the whole organism rather than with the processes going on in the several organs.

Thus was engendered the variety of psychology still popular in American colleges, crude or extreme *behaviourism*.

Such crude *behaviourism* had two merits ; first, it was a call for more attention to bodily behaviour, the objective or external expressions of mental activity, expressions which had been unduly neglected by psychologists ; secondly, it was a protest against the sterility of pure unaided introspection, against the separation of conscious activities (or introspectively

observed events) as material for a discipline cultivated in abstraction from the totality of the organism.

Since psychology must study the organism as a whole, regarding its conscious activities as functions of the whole organism, recognizing that the organism is the seat of many events which, though not introspectively observable, are yet in many respects very similar to those we can observe; and since the observation of behaviour is in all departments of psychology important and in some (as in animal psychology) our only available method, it may be said that all psychology is, or should be, behaviouristic. *Behaviouristic psychology* (in this sense) is approved by many psychologists and philosophers who neither deny the value of introspection nor believe in the validity of purely mechanistic explanations of human and animal behaviour.

Psychology, after having been cultivated for many centuries as a branch of philosophy, has endeavoured to become scientific. And, since the inception of this movement about the middle of the nineteenth century, most of the psychologists who have taken part in it have felt that psychology, in order to become scientific, must model itself upon the physical sciences. Under the influence and example of those sciences they have worked with two principal aims; first, to find mental units comparable to the atoms of the physicists and the chemists; secondly, to find explanations of all mental events and of all human actions in terms of mechanistic causation. They have felt that the unity of the person (which in some sense is an obvious fact) must be interpreted as a unity of composition or aggregation of elements, as the molecule was regarded by chemists as an aggregation of atoms. And they have felt that to admit the causal efficacy of conscious striving towards goals would be to render psychology unscientific: for their acquaintance with the physical sciences had led them to regard the physical realm as the whole of nature and all that is natural as physical. Hence to them, psychical or mental events seemed non-natural or supernatural. They could not deny the occurrence of such events; but they could not bring themselves to give them a

rôle in the realm of natural causation. Hence also, although it is obvious to the meanest intelligence that human life, from beginning to end, is a perpetual striving to attain, to obtain, to maintain, is a never-ending pursuit of goals and ideals and a seeking for means and ways to such goals, all this appearance of goal-seeking (or teleological activity) was regarded as illusory, as something which, if we would be scientific, we must explain away, must interpret in terms of mechanistic causation, the only kind of explanation recognized by the physical sciences.

Under the influence of these two prejudices, *physiological psychology* and *experimental psychology* (in the narrow sense defined above) have been the types of psychology chiefly cultivated in the universities; and, in striving to become branches of natural science, conceived as necessarily physical science, they have lost touch with human life.

The academic psychology cultivated in this spirit has failed to produce results of any great value for the guidance of practical dealing with human problems, for medicine, for education, for economics, for politics; it has failed to render an account of human nature that can serve as a basis for the special sciences that deal with the achievements of the human mind, what the Germans call the sciences of the mind or spirit (*die Geisteswissenchaften*), such sciences as history, ethnology, linguistics.

Hence reforms were inevitable; and reforms (reactions against the narrowness and sterility of the atomizing mechanistic psychology of the universities) are a rising tide at the present time.

One such reform movement has taken shape in one of the major strongholds of the academic psychology, namely, the psychological institute of the University of Berlin. It is in the main a reaction against the atomizing tendency of academic psychology, against the description of mental events as compounded from elements. It insists on the unity of each phase of mental life, a unity within which every distinguishable part is in active relations with the whole and is what it is only as a part of the whole. Such a complex whole is termed

a *Gestalt* or configuration. Owing to the ability and energy of the men who are leading this reform and to the obvious truth of their main contention, this movement is gaining a wide hearing and is commonly spoken of as having generated a new school, the school of the *Gestalt psychology*.

But one swallow does not make a summer, and the *Gestalt* movement is but a harbinger of the more comprehensive reform that is needed in academic psychology. Three other reform movements are active within the German-speaking lands. One of these, somewhat diffused and having no unified school of representatives, arises from more intimate concern with individuals and their peculiarities. Academic psychology has sought to describe in general terms the mental life of *homo sapiens*, and to explain its course in terms of universally valid laws. But individual peculiarities are undeniable. Every individual is unique; and some students have found the peculiarities of individuals and the differences between them more interesting than their common features. Therefore, they study individuals, protesting, like the *Gestalt* school, against the atomizing of academic psychology. Some of them seek to distinguish and define a number of types of personality. Thus arises a *psychology of types*, of *individual differences*, or a psychology of personalities. Many of these students doubt or deny that mechanistic principles can profitably be applied to the explanation of the activities of persons.

Other students, concerned primarily with the sciences of the spirit, disappointed at the failure of academic psychology to provide them with general principles of human activity that they can profitably apply in their special fields of study, and seeing no promise of its progress in that direction, propose to develop for themselves the psychology which they so urgently need. They say in effect to the professors of psychology: 'It is clear that you mean to persist in following your natural-science models, physics and chemistry. It is clear that the psychology you are developing can be of little or no service to us. We suspect it is bankrupt, but go your way. We will go ours, developing our own psychology.

We shall thus have two distinct psychologies cultivated academically; yours, the "strictly scientific" (*natur-wissenschaftliche*), and ours, the human psychology (*geistes-wissenchaftliche*).' And, of course, in so far as this school can be said to have formulated any principles of explanation, those principles are purposive rather than mechanistic. This proposal seems to me a gospel of despair, a *pis aller*, justifiable perhaps as a temporary expedient, pending the radical reform of academic psychology. But we surely cannot look forward to the long continuance side by side of two sciences of psychology using radically different principles of explanation and rendering radically different accounts of human nature! Nor can the psychology of the future that is to be applied to all practical problems and is to provide a basis for all the human sciences afford to ignore all the knowledge that has been and still is to be gained by the methods of physiological and experimental psychology, however narrow their outlook and however mistaken their principles of interpretation hitherto.

The third of these movements has come from medicine and the genius of a single man, Professor Sigmund Freud. Concerned primarily with the treatment of neurotic patients, and finding nothing of value from this point of view in the academic psychologies, Freud has struck out certain principles for the explanation of neurotic symptoms and has gone on, with the aid of a rapidly increasing band of disciples, to extend these principles to the life of the normal man in his social setting. Thus *psycho-analysis*, having begun as a method of medical treatment, has developed into a system of psychology. The members of this school have been little concerned to systematize their principles or to relate them with those of academic psychology or of the sciences in general. They seem content to find evidence of the validity of their methods and principles in their success in treating neurotic disorders. It is therefore difficult briefly to define those principles or their relations to those of other schools. But two things are clear: first, that, however obscurely stated, the principles of explanation are thoroughly purposive rather than mechan-

istic; desires, wishes, urges, impulses towards various goals are the causal factors invoked for the explanation both of morbid and normal forms of activity. Secondly, the school owes its success, both in popular esteem and as a productive movement in medicine, to this full, though somewhat obscure, adoption of purposive principles of explanation.

Another reform movement of great importance is due to the initiative of Professor Charles Spearman of the University of London, who has enlisted in his school many enthusiastic workers. Spearman repudiates the tendency to make psychology wholly subordinate to, a mere branch of, mechanistic physiology. He asserts the independence or autonomy of psychology, although he is ready to accept whatever help physiology can give. He is chiefly concerned to define the nature of 'intelligence' and to discover and formulate the most general or fundamental laws of intellectual activity. Especially, he has directed attention to an aspect of mental activity which had been grossly neglected by most modern psychologists, namely, the function of grasping relations of all kinds. Academic psychology had tended to be content with describing mental life as the mere passive reception of sense-impressions from the physical world about us and as the retention and quasi-mechanical interplay of such retained impressions (spoken of commonly as 'ideas').

Spearman has forcibly reminded us that mental life is an active process; that mental activity involves, fundamentally and in all its phases, the grasping of relations, relations of time and place and causation, of likeness and difference, of magnitude and intensity and quality, and many others; that any account of our mental life which does not fully and frankly recognize this activity is very inadequate and misleading.

The Psychology Expounded in this Book

The psychology expounded in these pages attempts to combine in one system what is true and useful in all the principles and methods of all the schools mentioned above.

It recognizes the equal importance of subjective and of objective observation, of introspection and of the study of behaviour, both made as precise as possible by the use of experiment under laboratory conditions. It makes use to the fullest extent of all knowledge of the organism attained by physiology, especially the physiology of the nervous system and of the chemistry of the body. It insists that mental activities are physiological functions of the whole organism, functions that are of the first importance in effecting its adaptations to its environment. It repudiates the attempt to exhibit these functions as aggregations of elements of any kind. It points to the obvious truth that we have no guarantee for the common assumption that the principles of the physical sciences (as they now exist) are adequate to the needs of the biological sciences. It insists that these sciences, and psychology in particular, must have the courage to stand on their own feet and to formulate and boldly use whatever methods and principles seem most profitable for their purposes. Especially it insists that to allow the prestige of the physical sciences and the consequent prejudice in favour of mechanistic principles of explanation to blind us to the goal-seeking nature of human and of animal activities, is to vitiate all the data of our science. We must frankly and fully recognize this peculiarity of organic events: we must regard our own most developed forms of activity, our deliberate purposeful efforts, as the instances in which the nature of goal-seeking activity is most fully revealed to us; and we must seek to explain the lower obscurer forms of organized activity in the light of our understanding of these higher forms into whose nature we have more insight, rather than seek to explain the higher in terms of the lower and more obscure, in terms of principles of explanation taken over from the physical sciences, principles which, even in their own sphere, are now widely challenged and are in constant flux, and which are shown more and more clearly, as science progresses, to be wholly inadequate to the events of the organic realm.

Since at the present time it is not possible to explain

organic events mechanistically or physical events in purposive terms, we recognize the validity of both the mechanistic and the purposive principles of explanation, each in its own sphere ; admitting that neither mechanistic nor purposive causation is fully intelligible in any deep or ultimate sense. Only the further progress of science can show whether both principles of explanation must remain valid, because useful, or shall show that the truth of both can be taken up into some deeper, more comprehensive principle.

In this book, then, we shall not follow the practice, which came into fashion among scientists during the nineteenth century, of setting mental activities apart as non-natural events having no place, no role, no function, no causal efficacy in the natural world. We shall rather follow the practice of common sense and common speech, recognizing without reserve mental activities as functions of the organism the range of whose influence within the whole system of functions is a matter for unprejudiced investigation. I have little doubt that, at a date which many of my readers will live to see, the present-day prejudice which leads so many biologists and psychologists to deny all causal efficacy, all natural function, to our mental activities will be recalled by historians of science as one of the strangest aberrations of the human mind.

We shall seek to define the most general laws or principles of activity, regarding that as our chief aim. The normal adult man, being the organism in which the nature of mental activity is most fully revealed, will be the centre of our interest. A second principal aim will be to describe the highly complex organization or structure of his mind. The general principles of mental activity would seem to be valid wherever and whenever there is mental life. The structure of the human mind, though it may resemble in many respects the mental organization of animals, more especially of the higher animals, is peculiar to the human species. Human beings, although they all conform to the type of the species in respect of mental organization, yet differ considerably in respect of innate constitution ; and such differences become accentuated through

the influence of widely differing environments. The study of such differences of human organization is best named differential psychology; this falls into two main branches, racial and individual psychology (the latter is often called the study of personality). With these two branches we shall not be directly concerned in this book. At the same time we shall recognize many other branches of psychology, some, such as the experimental and psycho-physical branches, being defined by their special methods of study; some, such as the psychology of children, of animals, and of social groups, by the particular classes of organisms which they study; some, such as pathological psychology, by their special aims; and some by the predominance of interest in the application of psychological principles to practical problems, such as those of education, medicine, economics, politics, and jurisprudence. And we shall regard all these special branches as capable of contributing towards the central task of psychology, the better understanding of human nature, in the individual and in the race, of its relations to the physical and the organic realms, and its potentialities of further development.

This book teaches, then, a frankly and thoroughly *purposive psychology*. Such psychology is distinctive only in so far as other schools neglect, ignore, or deny this most fundamental peculiarity of all our activities, their purposiveness. As soon as (and the date cannot be far distant) all psychologists recognize this peculiarity, *purposive psychology* must lose its distinctiveness and become merely *Psychology*, a science using all possible methods of studying man, the objective and the subjective, the behaviouristic and the introspective methods, dream-analysis and free association, the methods of the laboratory, of the field-anthropologist, of the mental tester, the statistician and the social observer, of the physiologist, neurologist, psychiatrist and brain-surgeon, of the gland-specialist and biological chemist; and, above all, the method of comparative study of men and animals must not be neglected.

Two Types of Purposive Psychology: the Hedonist and the Hormic

But there are two very different forms of purposive psychology, which sometimes are combined in one system (as by Professor Freud) but which in principle are quite distinct. Both recognize, as fundamental facts of all our mental activity, foresight of and desire for goals, goals which may be of a concrete and highly practical kind (such as food, shelter, repose, victory in conflict) or purely abstract and intellectual, such as honour or virtue or the solution of a mathematical problem.[1]

One form of purposive psychology asserts that the true goal of all striving, that which we truly desire and strive for, is the pleasure that comes with success; that we desire such things as food, safety, victory, glory, the good of others, not in and for themselves, but only because and in so far as we expect that successful striving for these things will bring us pleasure, our expectation being founded on past experience of such success. This is the *pleasure-pain theory* of action, known technically as *psychological hedonism*. The most serious and obvious objection to this theory is that it cannot be applied to the actions of animals and young children. It has, however, great plausibility; for successful striving is normally pleasant, and its final stage, that of attainment to the goal, is commonly suffused with a pleasure or satisfaction which

[1] It should be noted that even when the problem is an historical one, the answer to which is some event long past, the search for the answer is still a forward-looking process; the solution of the problem lies in the future, even though it consist in the description of some long-past event. In general our mental life consists in a perpetual reading of riddles and solving of problems; and the answers and solutions always lie before us as the goals of our striving. Consider the extreme case of striving to recollect some past incident of your own life; though the incident is past, your recollection of it (as you endeavour to recollect) is still in the future, a goal which you look forward to and desire to attain. Where there is no difficulty to be overcome, no striving is needed, and we act automatically, subconsciously. In proportion as the obstacle or difficulty that lies between us and our goal is great, our striving is intense and our mental capacities are called fully into play.

outlives the activity and which can plausibly be said to have been the goal of action.

Purposive psychology of the second kind, the psychology of this book, maintains that the hedonist theory is false; that what we desire and strive for is the object itself, the food, the shelter, the victory, the glory, the good of another; that these things are not, as the hedonist asserts, desired merely as means to the goal of pleasure. Here is one instance in which, in seeking to decide between the claims of rival theories, we must rely chiefly on introspection. Ask yourself the question: Is it true that, in striving for food, or shelter, or victory, or glory, or the relief of another's distress, what you truly and fundamentally desire is the pleasure that may come with the success of your striving? Do you not rather really desire and strive to attain these things themselves, regarding them as intrinsically good and desirable?

If you agree with me that the second answer is the true one, if you believe that you yourself (or any other person) may make or ever have made, a painful self-sacrifice, knowing or expecting that your action will bring you more pain than pleasure, then you are logically bound to reject the hedonist theory. And if you reject that theory while recognizing the obvious truth that most, if not all, your activities are purposive (or directed to goals), you are then confronted with a deep question; and the difficulty of finding an answer to this question is a main ground of the popularity of the hedonist theory. The question is: Why do you, why does any one, desire this or that or the other? Why does man seek these goals? There is, however, an answer, an answer which, though it may seem to lack finality, is yet an answer that in its own way is very satisfactory. That answer runs as follows: You desire and seek this or that or the other goal, because you are constituted in that way. Or more generally: Man is so constituted that, like animals of other species, he desires and, under appropriate circumstances, strives to attain certain great natural goals, food, shelter, companions, a mate, knowledge, and so forth. And this answer is satisfactory in that it stimulates us to further inquiry: for it raises the question—

How did the human species come to be so constituted? A question to be answered only by further research into the processes of organic evolution.

The purposive psychology which accepts this answer is the *hormic psychology*. It asserts that each animal species is so constituted that it seeks or strives for certain natural goals, the attainment of which satisfies corresponding needs of the animal. Since these needs and the tendencies to satisfy them, to strive towards the corresponding goals (such as food, shelter, and mate), are inborn and transmitted from generation to generation in all members of the species, they are properly called instinctive. Such inborn tendencies are often spoken of as instincts; but since this word cannot be used without provoking controversy and needless difficulties, it is perhaps better to avoid it; and perhaps the best word to use here is the good old word '*propensity*'.

The hormic psychology, then, recognizes that man, like other animals, inherits certain propensities natural to his species; that these are the primary grounds of all his strivings; that the goals for which he strives are either the natural goals of his native propensities, or are means towards such goals (such e.g. as money) accepted, after experience of them, as goals in themselves.

In spite of the fact that the psychology of the several psycho-analytic schools[1] is thoroughly purposive and is therefore in many respects a vast improvement upon the older academic psychology, it remains in each of its forms (that given by Freud and his school, no less than that of

[1] We have seen that psycho-analysis was developed by Professor Sigmund Freud, of Vienna, as a method for the treatment of neurotic disorders (sometimes called functional diseases of the nervous system or, popularly, nervous breakdown or nervousness). Under his fertile leadership the teachings of this school of medical psychology have developed into a somewhat unsystematic, highly speculative and much controverted system of psychology; and several minor schools have split off from it, especially those of Dr. C. G. Jung and Dr. Alfred Adler. In view of their common origin from the method of psycho-analysis and their common acceptance of some of Freud's fundamental principles, they are usually classed together as the psycho-analytic schools.

Alfred Adler and that of C. G. Jung) the narrow doctrine of specialists, of physicians whose gaze is fixed upon their patients and who, if they take a glance around on a more varied prospect (as they all have done) still see all the phenomena of human life through their medical spectacles; a narrowness of vision which, by a seeming paradox, naturally leads to unbridled and fanciful speculation of a kind which estranges the scientific mind. Hence they remain outside the main stream of development of psychology, though exercising a powerful influence upon it. The hormic psychology gratefully acknowledges the great value of much that these schools have brought to light and seeks to incorporate all that seems to be of positive and enduring value, both in their clinical observations and descriptions and in their theoretical interpretations.

CHAPTER III

THE SIMPLER FORMS OF MENTAL LIFE

IF the mental life of the civilized man were the only form of mental life presented for our contemplation, we might well despair of obtaining any useful understanding of it. For long ages the philosophers who concerned themselves with the mental life fixed their attention almost exclusively on the civilized adult: it was largely for this reason that, while other sciences were rapidly extending man's mastery over the physical world, psychology remained rudimentary and ineffective. Descartes, the most influential thinker of the opening years of the modern period, accentuated this tendency to set apart the mental life of man from all other fields of scientific inquiry, to separate psychology from biology: for he taught that animals are merely complex mechanisms without mental life, and that man is a similar mechanism to which is attached a mind, soul, or thinking thing, *res cogitans*.

Other thinkers, recognizing that animal activities differed profoundly from the working of machines, yet failing to recognize the essential affinities between human and animal life, were accustomed to set these very widely apart, saying that the actions of animals are due to Instinct while those of men are the expressions of Reason and Will. These widely held doctrines obscured the very obvious fact that each man only very gradually acquires his adult powers of reasoning and willing; that he begins life as a relatively simple germ which evolves imperceptibly into the complex organism; and that, from infancy onwards through many years, the mental functions go through a parallel process of gradual development.

Only when Darwin, in the middle of the nineteenth century, convinced the scientific world of the reality of organic evolu-

tion and of the continuity of human with animal evolution, only then did it become clear that psychology might profit very greatly by using the genetic and comparative methods, by studying the evidences in young creatures of gradually unfolding mental functions, and by comparing the activities of our fellow-citizens with those of men of other cultures, with those of children and of animals, and with those of men suffering from various disorders and disabilities.

Very quickly all these possibilities were exploited ; and the rapid advance of psychology in the last fifty years has been due to this vast extension of its field of interest and activity, even more than to the introduction of experimental methods.

The genetic and comparative methods have sometimes been used in the mistaken attempt to find the supposed elements of mind and to reveal the supposed principles of composition of such elements. While repudiating all such attempts, we may with advantage begin our study by carefully considering the activities of animals ; not in order to explain the higher forms of mental life in terms of the lower ; but because animal activities, if only we can observe them and reflect upon them impartially, reveal in a relatively clear and simple manner some of the fundamental aspects of all mental activity ; and also because the mental organization of the animal (even of the highest species) is relatively simple and can with great advantage be used as a clue to the unravelling of the vastly more complex structure of the human mind.

When, in later chapters, we go on to study the mental life of man, we shall again avoid the old-fashioned practice of beginning with the study of supposed elements of mind and proceeding to put them together in the belief that it is possible in that way truly to describe the complex higher functions and the nature of mind. In dealing with phenomena so complex as human activities, we cannot dispense with analysis ; but we shall avoid the error of assuming that the parts and aspects we distinguish by analysis are units which first exist independently of one another, like the chemist's atoms, and then are compounded to form the complex wholes we seek to analyse.

We shall rather hold fast to the principle that each organism is, from beginning to end of its life, a natural unity ; that, as the bodily structure and functions develop by processes of growth and differentiation out of a relatively simple germ, so also the many parts and functions of the complex mental organization develop by similar processes of growth and differentiation from rudiments in the germ. And we shall find good reason to believe that, just as the development of the bodily structure and functions is determined in its main lines by heredity (though the processes of maturation require the constant play of environmental influences which shape them in detail), so also it is with the development of the mental organization and functions. If there is any important difference here, it is that the developing mental organization is more plastic than that of the body, more susceptible to moulding by influences from without and by efforts from within.

Instinctive and Intelligent Action

Two features of animal behaviour are of special interest to us. First, many animals may be observed to carry through long trains of complicated behaviour, achieving results which, though they are commonly advantageous to the creature (or to the group or species to which it belongs), cannot be supposed to have been foreseen and desired by the animal. Familiar instances are the storing of food for the winter by squirrels, the building of nests by birds, the brooding upon eggs, the feeding and protection of the young by many different animals from insects and fish to the higher mammals. The young squirrel cannot be supposed to foresee the coming winter and his need for a winter store of food. The young birds that build a nest for the first time cannot be supposed to foresee the coming of their young who will need the support and shelter of the nest. In such cases the animals have no experience that could lead them to such foresight ; and everything we know of their capacities forbids us to attribute such far-reaching foresight to them. Further, all members of the same species seem to perform such trains of activity

in very much the same way; such activities seem to be prescribed and prepared for in the very constitution that is peculiar to the species and common to all its members.[1]

Observation of a multitude of facts of this order led to the use of the term *instinctive*, to characterize such actions. In so far as the adjective served to mark an action as belonging to a peculiar class (the class of innately prescribed actions) that was a useful and well-justified usage. But usually more than this was implied. The instinctive act was said to be due to *Instinct*. 'Instinct' thus became a vague explanatory principle. Again this was justifiable if the word was used to mark the need of a theory, of some general principles of explanation, rather than as a mere cloak for our ignorance.

Random and casual observation had sufficed to draw attention to these peculiarities of animal behaviour. But more exact, sustained and systematic observation was required to reveal the second great feature of animal behaviour; namely, its adaptability to varying circumstances. And many naturalists were so bent on revealing the marvels of instinctive acts in so far as common to the species, that they paid little or no attention to this second aspect, equally important and equally demanding explanation, namely, the individual animal's adaptation (or modification in detail) of his instinctive action in accordance with the particular circumstances of each moment. Accordingly, there is to be found in the writings of naturalists (especially in the voluminous works of Henri Fabre) a vast number of illustrations of instinctive modes of behaviour marvellously suited to the needs of the individual or the species, wonderful in their nicety and complexity, and strikingly uniform or stereotyped in all members of the species. And it was not until recent years that this one-sided emphasis began to be corrected by a wealth of

[1] If it be urged that foresight of the goal of action is in each case innately provided, I admit that as a possibility. I insist upon the reality of short-range foresight innately provided; but I insist equally that we should assume only such degree and range of foresight as the facts of behaviour compel us to recognize.

careful reports of the adaptive variations of instinctive actions.[1]

The long prevalence of that insistence on the close similarity of instinctive action in all members of a species and of that neglect of the less obvious but equally important adaptive variations of instinctive action led to the unfortunate consequence that 'Instinct' and 'Intelligence' were set apart from one another as two distinct explanatory principles: instinctive acts and intelligent acts were regarded as of two distinct orders; and it became usual to ask of any animal activity—Is it instinctive or intelligent? or, worse still—Is it due to Instinct or to Intelligence? or even—Is the cause of it Instinct or Intelligence? We must avoid this ancient error from the outset by recognizing that all animal behaviour is both instinctive and intelligent; that, while every act of any animal is to some extent prescribed by the inherited constitution, that constitution itself provides the capacity for adaptation, for adaptive deviation from the pattern common to the species.

In animals of certain classes, notably the spiders and lower insects, the instinctive or inborn patterns of action are relatively precise, detailed, and adequate to all their needs and usual circumstances. Such endowment leaves little need and little scope for variation of the pattern according to varying circumstances. Accordingly we find that such animals seem to have little capacity for adaptive or intelligent action. We may say that their activities are predominantly instinctive and very little intelligent; or, in the current but *misleading* terminology, 'Instinct' rules their lives and 'Intelligence' plays but a very minor role.[2]

[1] See especially *Problems of Instinct and Intelligence*, by R. W. G. Hingston, London, 1928, the best book on insect life yet published.

[2] The dogmatic error that instinctive action is typically and always a mechanical sequence of movements following a fixed or stereotyped pattern is a chief bar to the progress of psychology and the parent of a multitude of other errors. I therefore beg the reader (whether he be a beginner in psychology or a professor of the subject as stereotyped in his way of thinking of instinctive action as any spider in his way of spinning) to pay particular attention to the adaptations revealed

An Instance of Typically Instinctive Behaviour

A fine illustration is the behaviour of the trap-door spider in constructing the movable hinged lid of its burrow. Dr. W. S. Ritter, a highly trustworthy observer, describes how each one of a brood of young spiders, taken from the parental nest 'immediately upon hatching' and placed in a dish of moist earth, proceeds to make its burrow. 'These young relatively immature spiders construct a miniature nest exactly on the pattern of, and almost as perfect as the adults' nest, though they have never seen the adults perform the task nor had an opportunity to examine a completed nest. . . . The baby spider begins by making a hole in the ground, the mouth of which is sharp-edged and almost a perfect circle. The diameter is just enough to permit the animal to go freely in and out, about three millimetres. . . . Lid-making soon begins and in the following way: A minute projection is made at some point on the edge of the hole's mouth, by the combined use of the two front pairs of spiders' appendages. To this projection additions are made by particles or pellets brought up from within the hole, probably from the bottom, deepening of the hole being thus combined with constructing the lid. Following every deposition and fixation of a load of earth by the anterior appendages, which implies that the animal comes to the place of deposit head-end up to the mouth of the tunnel, is a placing of the tip of the abdomen against the edge of the lid-to-be, and a moving of the tip over the surface. This performance is undoubtedly accompanied by a discharge of web-material from the web-secreting gland which is located in this part of the body. The two acts of bringing earth from the depths and depositing it on the expanding lid, and of discharging web-material on the earth, alternate with perfect regularity until the lid-mass has become broad enough to close completely the orifice of the tunnel. But a mere accumulation of materials, clay and web-substance, would not make the lid. Obviously there must be some

in the instance of typically instinctive action described on this page and in all the following instances.

fashioning of materials. This modelling of raw materials into the nicely fitting, freely working trap-door is *the really astonishing part* of the whole operation.[1] Each deposition of clay is immediately followed by a shaping operation, this being done chiefly by the same body-member by which the earth was brought to the lid and put in place. By this means the lid is given its proper circular outline and thickness. After the lid has become broad enough to reach nearly across the orifice, it is pulled down from time to time with sufficient force to do considerable toward levelling its own and the mouth's edges for producing that nice fit which is so conspicuous a feature of the completed product. Following each trial closure the lid is pushed open for further construction work.' The observer adds: 'The other special performance, even more startling than the first because less regularly done, consisted in pulling down the nearly finished lid, finding where the closure crack was widest, and then promptly pushing up the lid and refashioning it at the defective spot.' [2]

In this behaviour the instinctive aspect predominates greatly. The general nature of the goal to be achieved (namely, the finished burrow with hinged lid) and the general character of the movements by means of which it is to be achieved, these are prescribed and provided for in the constitution of each member of the species. Yet the intelligent aspect is not lacking. Each deposition of a particle of earth on the edge of the lid is a unique action guided in detail by the special relations of particle and lid. And especially the acts last described (those perfecting the shape of the lid) imply appreciation of the imperfections of its shape and adaptation of the acts to the correction of those imperfections. If, we may say, the instinctive pattern of action were perfect, both hole and lid would be made perfectly circular, and there would be no need for the adaptive acts by means of which its imperfections are rectified. Thus, in *typically instinctive behaviour, intelligent adaptation supplements the defects or inadequacies of innate prescription.*

[1] Italics mine. This is the part where adaptation most strikingly occurs. [2] *The Natural History of our Conduct*, N.Y., 1927.

The behaviour of all spiders is highly instinctive and but little intelligent, it would seem.[1] But the web-spinning spiders illustrate, perhaps even more clearly than the trap-door spiders, the supplementation of innately prescribed behaviour by intelligent adaptation. The pattern of the web and the mode of its construction are pretty closely prescribed in the innate constitution of each species; yet the making of each web requires the construction of a framework that must be attached to fixed objects at points whose spatial relations are different in each instance.

Insect Behaviour

The higher insects, the ants, bees and wasps, show us instinctive behaviour carried to the highest pitch of complexity. They lend themselves well to minute and even experimental observation; and we have an immense literature, rich in careful reports. Everywhere we see abundant illustrations of the fact that the general lines or patterns of behaviour are laid down in the constitution of the species; namely, all members of each species conform very closely to the general plan of life common to the species. That such conformity is the expression of innate constitution (rather than the consequence of example, imitation, or individual experience of any kind) we can confidently infer: for the insect emerges from the pupa-case (in which it has grown to the adult form in almost complete seclusion and inactivity) and forthwith proceeds to display many of the forms of behaviour characteristic of the species. And in many species the insect leads a solitary life from the moment when it begins to grow as a fertilized egg, a solitariness broken only by the incident of mating.

It is as though a human infant were to be suspended in a sack in a dark place until his twentieth birthday, exercising no activity beyond chewing, swallowing, digesting and

[1] The reader must not take this sentence to be an unwitting relapse into the error of opposing 'Instinct' and 'Intelligence'. It is a matter of proportion between the two distinguishable aspects of every action, the innately prescribed and the adaptive.

assimilating in his growing tissues the food placed within reach of his jaws by a parent, who, after performing this one service, leaves him entirely to his own resources. In his twentieth year the grown man suddenly bestirs himself, bursts the confining sack, emerges into the light of day and forthwith walks, runs, eats, builds himself a hut after the pattern traditional with his tribe, hunts game by the customary methods, stores surplus food, fights, finds a mate, and perhaps joins occasionally in a corroboree, playing his part as though he had been carefully instructed in the necessary formalities. And each of these things he does as well, or nearly as well, on the first as on subsequent occasions.

But within the limits of behaviour prescribed to the species by its innate constitution, *each individual insect shows a capacity for adapting his behaviour in detail to special circumstances.* In some species and in some individuals this adaptability is more clearly displayed, attains a freer range and greater effectiveness than in others. Consider the following instance.[1]

A Wasp builds a Cell

A solitary female mud-wasp or dauber, of a species common in the Carolinas, builds a cell by attaching to some surface successive pellets of moist clay. Having produced an oval chamber large enough to contain her body, she deposits in it a single egg; she then brings, one after another, a number of small spiders which she stuffs into the cell. When the cell is filled to the brim, she closes its orifice with more mud-pellets; and, having repeated this operation so as to make a cluster of some dozen cells, and having covered the whole cluster with a thick layer of clay, she flies away, never to return, never to see the offspring for whose welfare she has so assiduously provided.

When one of these wasps was building such a cluster, a

[1] The events here described were minutely observed and recorded by my son, K. D. McDougall, and partly followed by myself. Cp. 'Insight and Foresight in Various Animals', *Journal of Comparative Psychology*, vol. xi., 1931.

small hole was scratched by the human observer through the wall at the blind end of a nearly completed cell, during the absence of the builder. The wasp, returning with a pellet of clay, seemed disturbed and agitated; that is to say, instead of applying her pellet to the growing margin of the cell (as she had been doing in steady regular fashion) she fussed around the cell for a while, then entered it and placed her pellet on the

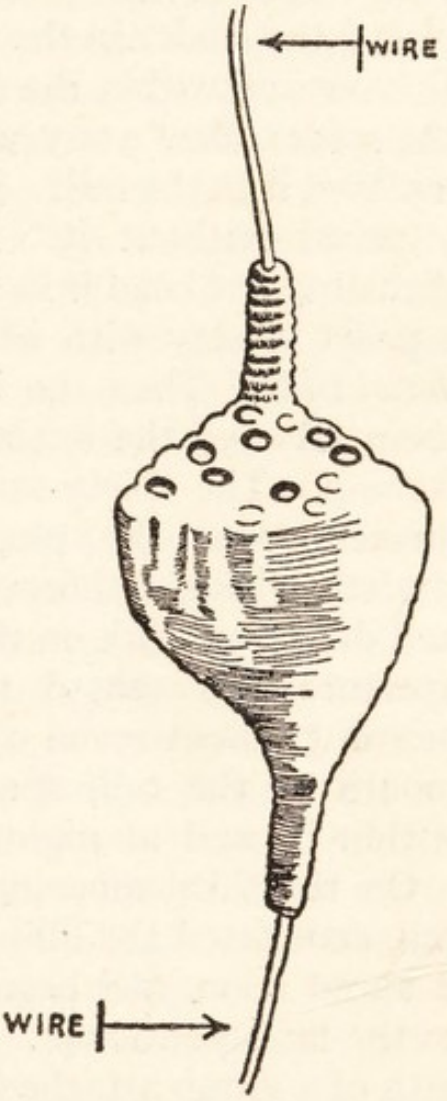


FIG. 1.—Pear-shaped cluster of clay cells built by a wasp about a hanging wire. The unusual position and shape of this cluster illustrates the wasp's capacity to adapt her instinctive activity of cell-building to special circumstances. Wasps of this species commonly build an oblong cluster of cells attached to a flat surface of rock or timber.

margin of the man-made hole; then she flew away, returned with another pellet, and placed it beside the last one; and, by repeating this with a third pellet, she completely closed the hole. She then returned to work on the margin of the cell. After a spell of such work, a second smaller hole was scratched by the observer in the side-wall of the cell. The wasp on returning seemed to inspect the new hole from the inside of the cell, but deposited her pellet on the margin of the cell.

She repeated this with a second pellet; but on bringing a third pellet, she carried it into the cell and, with it, completely plugged the hole *from inside.*

A single instance can never suffice in these matters: therefore I cite a second. The same wasp had half-filled another cell with spiders. The observer made a hole in the bottom of the cell and, through it, removed the egg and all the spiders. The wasp, returning with a spider, seemed disconcerted, but placed the spider in the cell. She then fussed about, climbing all over and within the damaged cell. Presently she removed the spider, flew away with it a short distance, returned and replaced it in the cell. Soon she removed it a second time and returned without it. She fussed about again, and, after thrusting her head into the hole, flew away and returned with a pellet of clay with which she neatly plugged the hole *from the outside.* Then she brought pellet after pellet, plastering them all over the exterior of the cell in apparently random fashion. The thirty-seventh pellet of this series was placed directly over the plugged hole. After the fortieth and sixtieth trips she thoroughly examined the interior of the cell and did some work on the repaired spot. She then closed the aperture and ceased work for the night. The following morning, about seven o'clock, she removed the plug from the mouth of the cell, spent the whole day in storing spiders within it, and at nightfall closed the mouth again.

On the third morning she again opened the mouth of the cell, completed the filling of it with spiders, and finally closed it about noon, and began to construct a second cell adherent to the first-mentioned. The first cell here mentioned was the fifth of a group attached to a stout piece of wire hanging in an outhouse. When a later cell of the group had been nearly completed (each cell having been made with mouth at the upper end), the wire to which the whole cluster was attached was cut and inverted, so that the unfinished cell was at an angle of forty degrees from the vertical, its unfinished open end downwards. Again the wasp, returning with a pellet, seemed disconcerted; after some fussing about, she laid the pellet on the upper closed end of the cell. But, on returning

with another pellet, she laid this *after some hesitation* on the unfinished margin of the cell, and so continued till the wall was completed. She then deposited in the cell a spider and presumably an egg. At this time the observer placed a small shelf three inches below the nest and, on the shelf, a number of torpid spiders taken from the nest of another wasp. The wasp at once found these spiders and began to store them in the cell, biting some, stinging others. After she had placed several of these spiders in the cell, the observer plugged the mouth of it with clay. Again the wasp was disconcerted, dropped her spider and made one ineffective bite at the plug. After much dallying she set to work again and plastered over the whole cluster of cells, giving it the shape shown in Fig. 1.

That the wasp laid a second egg in the sixth cell (from which the first egg had been removed) may be inferred from the fact that some months later it was found that each of the cells had been opened from within in normal fashion by the young wasp hatched from the egg.

We may feel pretty sure that this wasp had never previously dealt with a hole pierced in the wall of the unfinished cell; also that such incidents must have been rare in the experience of her ancestors. The same may be said of the sudden inversion of the half-built cell. The building of the cells is instinctive; the general plan and type of activity required is laid down in the constitution of the species: but the behaviour thus innately prescribed is not rigidly prescribed in all its details; it is flexible, is adaptable to the particular circumstances; and, in the instances here described, the adaptive capacity of the wasp is called out in fuller measure than is usually the case.

The more recent literature of instinctive behaviour is full of such illustrations of its adaptability. Without such adaptability the instinctive behaviour would often fail to attain its biological goal. Such adaptive behaviour is commonly called a mark or expression of 'intelligence'. Yet the insects, if we may judge from the errors they often make and the limitations of their adaptive power, are not very intelligent.

Wasps have been observed to seal up and desert a cell without having laid an egg in it ; and this both with and without a store of food within. Innate prescription leads to many useless, wasteful, harmful and even fatal instinctive actions which a larger dose of ' intelligence ' would rectify or prevent. Again the literature gives a wealth of illustrations.

In adaptations of instinctive action of the type we have illustrated, it would seem that the process of adaptation to the particular circumstances does not imply or require that the animal shall have had previous experience of similar circumstances. We may feel sure that the wasp which repaired the holes made in her cells had not previously performed or attempted a precisely similar task, that she had no prior experience of such a situation, of such a problem. We cannot positively assert that the wasp's previous experience of wandering to and fro and of using clay in the construction of cells was of no value to her, did not contribute to her efficiency in the execution of the repair. Yet it seems clear that the repairing activity was in the main the expression of a potentiality latent in the creature's inborn constitution.

The repair of the hole by the wasp was in a sense the solving of a problem new in the experience of the individual ; and it involved some special variation and adaptation of the activities by means of which she normally constructs the cell. *Some degree of such adaptive capacity, however slight, seems to be inherent in all instinctive capacity.*

The instances of animal behaviour we have considered in this chapter have been cited because they illustrate so clearly two features of fundamental importance : first, the goal-seeking nature of animal activity, the persistent direction of action towards the attainment of some goal, the production of some result ; secondly, the adaptation of such action in such ways as to promote the attainment of the natural goal in spite of varying circumstances peculiar to each occasion. These two features of behaviour are the fundamental objective evidences of mind, of purposive and intelligent guidance of the bodily movements.

APPENDIX TO CHAPTER III

The view (set forth here and in my earlier discussions of the problem) that all behaviour (and all mental activity) is both instinctive and intelligent is becoming widely accepted. But the conventional view which sharply separates 'Intelligence' from 'Instinct' is still widely current. And it has long been and still is so obstructive to all understanding of human nature that the final and complete refutation of it is the greatest need of psychology at the present time. Therefore I cite here three weighty and authoritative recent statements in support of the view here taken. Dr. Fr. Alverdes (Professor of Zoology in the University of Halle) writes, in his *Social Life in the Animal World* (London and New York, 1927):

'Many writers speak of the instinctive and intelligent actions of men and animals as though these two types of action differed fundamentally from one another. As against this view, it must be asserted that a large instinctive element enters into every form of intellectual activity; whilst no instinctive action ever runs its course altogether automatically and mechanically, but always contains in addition to its fixed and unchanging components a variable element more or less adapted to the particular situation. Every act, A, is, therefore, at one and the same time a function of a constant, C, and a variable, V; expressed as a formula this becomes $A = f(C.V)$. The constant is the instinctive element in the actions of men and animals; the variable, on the other hand, is the element which produces in some cases an appropriate, in others an unforeseeable response to a situation. It must, of course, be emphasized that the analysis of the action A into the components V and C is a purely abstract analysis. V and C must not be taken as two more or less opposed natural agencies (as it were two souls) pulling the organism, now in this direction, now in that, as they battle for supremacy; they are merely symbols for two different aspects of the same reality. The difference between instinctive and intellectual activity is this; that in the former the constant, in the latter the variable predominates. In instinctive action this C is greater than V($C > V$), in intelligent action C is less than V($C < V$).

'The purely instinctive, impulsive element in both instinctive and intelligent action is called the constant, for what is instinctive in every individual is determined by heredity. Neither animal nor man can transcend the limits of his native

store of instincts . . . whatever man or animal does or leaves undone has its roots in instinct, in impulse; whatever is not potentially existent in this constant subsoil no power on earth can charm into being.

'The variable factor contained in every act is most clearly visible in certain features of the behaviour of the higher vertebrates. Practice, experience, habit, also on occasion tradition—in short the whole past life of the individual—can greatly modify the course of subsequent behaviour. The reason is that in the intelligent activity of the higher animals $V > C$, whereas in any typical instinctive activity of insects, etc., $V < C$. In intelligent actions the variable produces on the one hand the suiting of the action to the given situation, and on the other hand its imprevisibility. We have to postulate the existence of a variable not only in the intelligent actions of the higher vertebrates, but also throughout the whole of their instinctive activities. Take the case of a bird building a nest; the variable appears in the way in which the individual bird sets about finding a suitable nesting-place, and then, by means of purposeful and co-ordinated bodily movements, collects blades of grass, twigs, and floating feathers, and weaves them fittingly into the structure of the nest. This variable shows itself further in the greater skill displayed by the older birds in building. The acts performed in the operations of nest building are by no means automatic, they are not mere "reflexes"; neither are they purely intellectual (where V would be greater than C). On the contrary, genuine instinctive acts, in which $C > V$, are everywhere involved. The fundamental impulse, C, invariably forms the constant basis which gives its "biological meaning" to the animal's whole procedure, and it is upon this foundation that all those individual purposive activities, which are determined by the variable V, repose. Exactly the same is true of the instinctive activities of insects, spiders, and so forth; however rigidly and unalterably these may appear to proceed, in every case $A = f(V, C)$. In the majority of human actions $V > C$. But in the purely instinctive acts of insects, which are frequently executed with "intuitive", "somnambulistic" certainty without either practice or pattern, C often greatly preponderates. It is this that frequently renders the actions of insects incomprehensible to human beings. For much that in man is ruled by tradition and can be performed by the individual only after long practice, in animals is conditioned by instinct, and faultlessly executed at the first attempt.'

The second authority I cite in support of the view of instinctive capacities expounded in this chapter is Professor E. C. Tolman. In a book recently published,[1] Dr. Tolman, who with a group of colleagues has for many years devoted himself to exact experimental studies of animal behaviour and who classes himself (for obscure reasons which his writings fail to make clear to me) as a behaviourist, reviews carefully all the large amount of laboratory work on animals relevant to this problem, and arrives at a view entirely similar to that set forth above. Dr. Tolman's terminology is so peculiar that any brief citations would hardly be intelligible to those who have not read his book.

A third recent authoritative exponent is Major R. W. G. Hingston, a naturalist who combines with a very large experience as an observer in the field a wide acquaintance with the literature. In his recent book Major Hingston illustrates with a wealth of instances the adaptable or intelligent nature of instinctive activity; and his instances are mainly from insect life, where so many writers have found forms of behaviour that seem to them to support the conventional view according to which instinctive action is fixed, stereotyped, invariable, utterly unintelligent.[2]

[1] *Purposive Behavior*, N.Y., 1932.

[2] *Problems of Instinct and Intelligence*, London, 1929. See also an article by Major Hingston, shortly to be published in the new journal, *Character and Personality*. There he writes: 'In man we see countless judgments expressed in intelligent behaviour, we see also the primitive instincts deeply and powerfully rooted. If we could make sufficiently precise experiments, we should, I believe, find traces of these two forces even in the unicellular creatures. Instinct and Intelligence are always closely conjoined. Their relative proportions may vary extremely, but they are never wholly disjoined.' 'I believe that in all living beings the two forces are united.'

CHAPTER IV

WHAT IS THE INNATE BASIS OF INSTINCTIVE BEHAVIOUR?

LET us now ask,—What exactly in the inherited constitution of a creature is implied by an instinctive activity, such as that displayed in the building of a cell by the mud-wasp? It is clear that this inherited somewhat is by no means simple. It involves the potentiality of a number of distinguishable functions or capacities: first, the capacity to seek, to select and to gather up suitable pellets of clay; secondly, the capacity to carry them to a selected spot; thirdly, to pile them together (spreading each pellet neatly into a ribbon) to produce the cell of fairly definite size and shape; fourthly, to interrupt this activity in favour of a very different one (namely, that by which the egg and the spiders are deposited within the cell) and, thereafter, to complete the cell by closing its mouth.

I have written 'capacity' to do each of these things. Now in each case the capacity implies suitable organs of locomotion and prehension, the wings, legs and jaws, with their muscles and all the motor nerves and centres (each motor centre a complex system of nerve-cells or neurones) which render possible these complex co-ordinated movements. It implies also the sense-organs, by impressions on which all these movements are guided. It implies also very complex connexions between the nerves of the sense-organs and those of the muscles (or, more properly, between the sense-organs and the motor centres or mechanisms, complex groups of motor neurones in the spinal cord by means of which all co-ordinated or orderly movements are effected).

The Reflex Theory of Instinct

Many authors have assumed that every instinctive activity can be explained in terms of some fixed system of connexions between sensory and motor nerves; that is to say, they have accepted what is known as the mechanical reflex theory of instinctive activity.

According to that theory, each particular movement made in the course of an instinctive activity is a response to some particular physical impression or stimulus falling on some sense-organ; the stimulus, it is supposed, causes the response by way of an explosive tremor which, having been initiated in the sense-organ by the stimulus, runs along a sensory nerve into the central nervous system, there spreads over to a motor nerve and so out and away to a muscle. And it is assumed that the essential innate basis of any instinctive action is an appropriate system of such connexions between sensory and motor nerves—only this and nothing more.

Now this account is perhaps true as far as it goes and as long as it does not profess to be a complete account and explanation. The instinctive activity does involve perpetual reception of sense-stimuli, and the spreading of consequent sensory excitations into and through the central nervous system and so out along motor nerves to muscles (to muscles of the viscera, bowels, stomach, heart and arteries, and to various glands, as well as to the so-called voluntary muscles of the head, limbs and trunk).

In two respects this reflex-theory of instinctive activity is very inadequate. First, it neglects to notice and does not explain the fact that the wasp's cell-building actions are guided, not merely by discrete sense-stimuli, but by some appreciation of the cell as a whole. Such appreciation is an activity which we cannot directly observe; we infer it from the observed fact that the wasp's movements are adjusted to, and in some sense determined by, the cell as a whole. The cell, begun at the end which is to remain closed, is first expanded and then contracted as it nears completion; so that its cavity assumes the form of a long oval suited to the

size and shape of the young wasp that is to develop within it. And, when the cavity has attained the requisite length, the building activity is for a time suspended in favour of the labour of stocking the cell; and thereafter is resumed and carried to completion by the closing of the cell, the making and stocking of more cells, and lastly, by the rounding off of the whole group of cells and strengthening of their attachment to their support. Further, as we have seen, a breach in the wall of the incomplete cell may be forthwith repaired by the wasp, i.e. while leaving open the mouth of the cell, she assiduously plugs any other hole. Therefore we cannot say that she merely goes on depositing pellets on the free margin of the wall.

In short we are compelled, if we are not blinded by some prejudice, to recognize that the wasp's actions are guided by appreciation of the cell as a whole, of its shape and parts and of the *relations* of the parts to one another. Many sense-impressions (simultaneous and successive), we must suppose, are gathered up in some *synthetic unity* within which they all play their parts in the guidance of action. This is the principle of *Gestalt* or configuration of which so much has been heard of late. The name is a novelty; but the principle has long been recognized by the more discerning students of mental life, though grossly neglected by many others. Such synthetic activity is characteristic of all our own sense-perception; and, since we see evidence of similar synthetic unity in the guidance of the wasp's actions by many simultaneous and successive sense-impressions and with reference to the spatial relations of the parts of the cell, we are justified in saying that the wasp *perceives the cell as a whole and in some measure distinguishes the parts in their relations to one another and to the whole.*

Thus the instinctive activity implies the inheritance of such complex organization as underlies synthetic perception, as well as the complex organization that is expressed in the many constituent co-ordinated movements of the total activity.

We must, then, recognize that the wasp's innate capacity

to build the cell implies an *innate ability* to perceive it, and also an *innate ability* to execute the task of construction under the guidance of perception ; two abilities that are in intimate functional relations with each other and constitute a single complex two-sided ability, perceptual and executive.

But the capacity to build the cell involves more than these two closely related but distinguishable abilities. It involves a *propensity* that becomes active only in its due time and on appropriate occasion.

Here we come upon the second defect of the reflex-theory of instinctive activity, namely, its neglect to take account of the facts which compel us to say that such activity implies, not only inborn ability, but also inborn propensity. The young wasp emerges from her cell full-grown; and presumably her innate organization is complete or nearly so, including that part which constitutes her two-sided ability to build a cell. But she does not at once exercise that ability. She has other capacities. Among these is a capacity to mate with a male of the same species, and also a capacity to find her proper food. These two capacities are brought into use and exercised during a period of many days before the capacity to build a cell becomes active. During this period the wasp's capacity to build her cell remains latent. But this latter capacity, when it comes in turn to be manifested, dominates the scene ; for many days the wasp's life is little more than a perpetual exercise (during all daylight hours) of this capacity. We seem compelled, therefore, to recognize that, in addition to the organization which is the two-sided ability to perceive and to act in the ways which result in the formation of the cell, this instinctive activity implies another distinct unit of organization, namely, an inherited propensity which remains latent until the appropriate stage of the wasp's life is reached, and then somehow is liberated, excited, or aroused, and becomes or generates an active tendency, an impulse, an urge that activates, or brings into play, the two-sided complex ability.

A crude analogy is helpful here. We may liken the wasp to a factory in which books are made, containing several

complex machines; let us say, a printing machine, a folding machine, and a binding machine. These machines represent the several distinct abilities of the factory, an ability to print, another to fold, a third to bind. But the presence of these machines within the factory does not mean that it is perpetually exercising all these abilities. At night all the machines are inactive. If they are to function, energy must either be liberated within them or supplied to them from some source outside themselves. The old-fashioned factory commonly contained its own sources of energy in the form of coal renewed from outside sources from time to time. Just so the animal contains its own stores of energy, renewed from time to time in the form of food.

In the factory several arrangements of the machines in respect of energy-supply are possible. Each machine may have its own boiler and furnace and work only when its own fire is lit. Or there may be a central power-house in which the latent energy of coal is converted into electrical energy or steam-pressure; and the electrical current or steam may be led to one, or two, or all three machines at various times, throwing each one into operation so long as the energy is supplied to it. The analogy between the factory and the animal may then be stated as follows: the machines represent the wasp's abilities; the generator of electric energy or steam-pressure is the wasp's propensity to build; the active but directed energy (the tendency of steam to expand, of electric potential to flow to lower levels) is the active tendency, urge, impulse, drive, or striving which activates the wasp's abilities, abilities which remain inert when not thus brought into play.

How, in the light of this analogy, shall we conceive the instinctive activities of the wasp? Fixing our attention upon its mating, its food-seeking, and its cell-building, we properly regard each of these three activities as distinct from every other and as implying a special organization. But in what consists the distinctiveness of each of these three major forms of activity? Certain abilities (e.g. the abilities to walk, to fly, to find her way about) are used in

all three activities. Other abilities are used only in the course of one or other of these activities ; e.g. the ability to mould the pellet of clay into a narrow ribbon is used only in the cell-building activity. But such involvement of an ability peculiar to itself is not the distinguishing feature of each major activity. Its distinguishing feature is rather the special result, end or goal achieved by each such complex activity. And this is determined in each case by the propensity. There is a propensity to mate, another to seek food, a third to build cells ; and each propensity, when it is active, brings into play the appropriate abilities in the order and combination required for the production of a particular result, the attainment of the special goal towards which the propensity is set. It is as though in our factory each of the three operations, printing, folding and binding, were performed not by one machine alone, but by the conjoint and successive operation of several machines, some of which are involved in two or more of the processes, while others are involved each in some one of the three processes only. And the distinctive nature of, and result attained by, each of the three processes depends upon the fact that there are three separate motors, one for printing, one for folding, and one for binding ; and each of these is geared to a selection of the machines in such a way as to bring them into play in an order and conjunction appropriate to the achievement of its special task.

A propensity 'geared' to certain abilities is, then, the innate basis of a train of instinctive activity directed to some particular goal, such as mating, feeding, or building. And where such a complex unit of organization matures in virtue of the momentum of heredity and operates effectively the first time it is brought into play, we properly call it *an instinct.*

An instinct is that special part of the creature's organization (a functional unit) which expresses itself in a train of instinctive action. In this sense we say that the wasp has an instinct that expresses its nature in mating behaviour ; another which manifests itself in food-seeking ; a third in cell-building.

What, then, shall we say of the energy that activates any one of these instincts, any one of these innate units of organization, at the appropriate moment in the life-history of the wasp ?

Shall we assume that each of the several instincts is activated by energy liberated within its own system ? Or do all the instincts of the organism draw upon a common source of energy ? Does each propensity generate its own current ? Or is there a central power-house, the propensities serving merely as distributors of the common energy ? There is something to be said in favour of both possibilities.[1]

However we conceive the source of energy and the liberation of it, we must recognize that the tendency is more than a stream of energy. Here our analogy breaks down. The electrical energy of the factory is mere energy, indifferent as regards its application. The energy that activates the instinctive abilities is energy *towards* ; directed energy ; energy directed to a goal. Here we confront a very obscure problem ; one which at present we cannot solve. It seems natural to seek the direction of the energy in the executive ability. But that will not do : for we may see an animal striving towards some one natural goal by means of very different executive abilities on different occasions. Presumably some special organization is involved. But we must be content to say that the organized system of the instinct comprises, in addition to the perceptive and executive abilities, a propensity which, when it becomes active, generates the specific tendency, energy directed to a special goal. And we must observe the facts with an open mind, even though we cannot in any deep sense explain them.[2]

[1] A third view that has long been vaguely held (it was persuasively presented by William James) is that the individual's own energy resources may be supplemented from some source outside his own organism. In terms of our analogy, the factory's own power-generators are supplemented at times by electric current drawn from a distance. But this is too speculative a possibility for discussion here.

[2] No doubt the propensity is itself a complex organization. For some evidence as to the localization of the nervous bases of the propensities see the Appendix to Chapter XXII.

The wasp, while building her cell, seems wholly dominated by the one tendency. She seems indifferent to other appeals, e.g. to food and to male wasps. She is concentrated on her task. The one tendency seems to have right of way and to make use of all her motor capacities and powers of adaptation. Hour after hour she flies busily to and fro, bringing her pellets of clay and working them into her cell. Such concentrated activity with great output of energy is characteristic of instinctive behaviour. Interruption may occur; but the creature returns to her task as the magnetic needle swings back to the pole after forcible deflection. And when the natural end or goal of that train of activity is attained, she desists, flies away and seems to have no further *interest* in the matter. It is not that the apparatus is worn out. It is not that the creature is exhausted. In respect of this directed activity, sustained until the natural end or goal is reached and then abruptly terminating, our mechanical analogy breaks down; and here again the reflex-theory of instinctive action is inadequate. Such persistence of activity until, and only until, the natural goal is reached is one of the objective marks of the teleological, purposive, or goal-seeking nature of the whole train of activity.

The only way we can in any sense explain the facts, or render them in any degree intelligible, is to regard the animal's activity as analogous to our own and to appeal to our own experience. We know what it is to be concentrated on a task, e.g. on building a house or hut or making a box, or solving a chess-problem. We know that, if we once become set upon achieving a task, attaining a certain goal, we are concentrated on it to the exclusion of other interests; or, if forcibly interrupted, we return to it; and we desist only when we have attained the goal and experienced the satisfaction of success. Then we may contemplate our completed work a little while, and turn away, never to give it another thought.

Here we see how we are driven to be 'anthropomorphic', to interpret the objectively observed facts in the light of our own experience of striving, of goal-seeking, if we would

in any sense understand them. To try to avoid such interpretation is the expression of a most foolish prejudice; for, *in proportion as we really succeed in such avoidance of the natural mode of interpretation, we close the door to all understanding of behaviour, animal and human.*

A very interesting complication of the building-process is the storing of the cell with the egg and with the spiders on which the grub may feed. This, as we have seen, is accomplished before the building-process is completed, when the cell still lacks its lid. Now this process requires much time. In the case described, it began one day and continued through the next and part of the third day. The wasp does not work at night; on each of the two evenings of this period, she plugged the mouth of the cell, using several pellets of clay; and on the following morning she re-opened the cell (to resume the task of storing it) by neatly cutting out the plug. Yet, when on the third day the cell had been filled with spiders, the mouth was finally plugged and not again opened. Here is a fact which clearly implies in some sense the function we call *memory*. The successive actions of the wasp constituting the train of instinctive behaviour are not isolated actions; each may be in a sense a response to a sense-stimulus (in the sense that sense-impressions play constantly some part in the whole process); but there is a wholeness and continuity in time of the whole train of activity; each action depends upon and implies, has some causal relation to, those that precede and follow it. As each of many simultaneous sense-stimuli contributes something to the synthetic whole of the perceptual activity of any moment, so all the many successive sense-impressions and movements are, all alike, taken up into a larger whole of activity that continues (even though it may suffer interruption) through a considerable period. We may not ignore or put aside these very remarkable facts because we cannot surely and easily explain them. Without attempting to go further, we must at least recognize here a function analogous to our own memory.

The Memory-Function in Instinctive Behaviour

Notice that the memory-function implied by the wasp's opening of her half-filled cell is an intrinsic and necessary part of the instinctive behaviour. Without it the goal, the completed cell containing the egg and an adequate store of food (spiders) for the grub, would not be attained, and all the long series of building activities would come to naught.

We may see an even better illustration of the intimate and essential role of memory in instinctive activity in the return of the wasp again and again to the cell she is building. Such return of an animal to a particular spot in which it is interested is exemplified by animals of many species, ranging from the common limpet to man. It may be broadly named 'homing'. It is most strikingly displayed by the bees, wasps and birds, and has been closely studied in many species.

We may dwell for a moment on the homing of the solitary wasp (Ammophila) who digs a hole in the ground, flies away, finds a caterpillar, drags it to her hole over some considerable distance, and deposits it there together with her egg. An overwhelming mass of experimental observation shows that such 'homing' is accomplished under visual guidance and only in virtue of acquired familiarity with the locality surrounding the hole. Before the wasp makes her hole, she acquires, by much wandering in a restricted area, a familiarity with the visual aspects of that area, which acquired familiarity or knowledge is absolutely essential to the success of the instinctive activity. We have in such cases clear evidence that the memory-function plays an essential role in much instinctive behaviour.[1]

We have already seen that the adaptive plasticity of instinctive action gives it good claim to be called intelligent. But many authors incline to see the only sure, or, at least,

[1] Cf. the discussion of homing in my *Outline of Psychology*, pp. 77–87, and the book devoted to this topic in which Professor Rabaud, of Paris, comes to the same general conclusion, *How Animals Find Their Way About*, N.Y., 1926.

the surest, mark of intelligent action, in profiting by experience. And in all cases of ' homing ' we have such profiting.

Here again, in these manifestations of ' memory ', we have phenomena which we can in any degree understand, explain, or interpret, only in the light of our own experience of recognizing and remembering. We do not know what ' memory ' is. We cannot explain it in terms of any wider class of phenomena. References to folded paper and creased trousers, or to channels worn by water in the earth, vaguely suggest that there may possibly be something analogous in inorganic nature. But there is much to be said for the view that ' memory ' in the widest sense is a function strictly pertaining to living things; that there is no true analogy to be found in the inorganic realm.[1]

We know that ' memory ' plays a vast role in our own lives; ranging from simple vague recognition to the most detailed reminiscences of remote events of our childhood; and we infer with confidence that, in so far as the memory-function is manifested in any activity, some change in our organization (a trace or a ' mnemic ' change) produced by some past activity has persisted and is playing a part in determining present activity.

Primary Mental Functions illustrated by Instinctive Behaviour

Our few instances of instinctive action illustrate the essential functions that we naturally distinguish as mental, for the reason that we find them in developed forms in our own experience or conscious activities and fail to find any sure analogies for them in the purely physical or inorganic realm. If, following the practice of common speech, we give the name *mind* to the sum of all such functions and to the ground in our organization of all such functions, we may say that the essential functions of mind (or the essential mental functions) are to apprehend the present condition and situa-

[1] This is the view expounded with a wealth of supporting evidence by Professor Bergson in his *Matter and Memory*. It is more briefly defended in my *Modern Materialism and Emergent Evolution*, London and N.Y., 1929.

tion of the organism and to strive to bring about some change, often by means dictated by past experience. To this it may be added that the change striven for is commonly one conducive to the welfare of the organism or of the species.

Many authors have attempted to reduce the essential functions of animals to some still simpler formula. The most widely advocated of these is to the effect that the organism strives to maintain, and to restore after disturbances, a condition of equilibrium. If this were acceptable, it would to some extent assimilate the organic to the inorganic world. But it is in flagrant opposition to many facts. If any such simplified formula is true, it is that every form of life strives to maintain itself and multiply its representatives to the maximal extent. Not the hibernating dormouse, but rather a cloud of locusts, a swarm of bees, or the nuptial flight of a myriad may-flies, is the true symbol of life.

CHAPTER V

BEHAVIOUR OF HIGHER ANIMALS

ALL the immense amount of study of animal life is of value chiefly in so far as it throws light indirectly upon the nature of man. If there were nothing in common between the animals and ourselves, if all their activities were of an order radically different from ours, natural history might be a fascinating hobby and even, in a limited way, a practically useful study. It is because we feel, however obscurely, the affinity between the animals and ourselves, the fundamental unity of all life, that all biological studies have a profound interest which the physical sciences cannot rival, even though we gape at the stories of immense numbers and magnitudes which they unfold. What do we profit from increased knowledge and control of the physical world, if we do not understand our own nature, its modes of activity and its possibilities, if we know not how to control our own actions, how to promote the intellectual life, how to mould the characters of our children, how to ennoble and beautify the race? Without increase of such knowledge, the progress of physical science will but serve to make us more efficient in blasting one another to fragments, and will send the whole race hurtling more speedily to perdition.

We have studied a single phase of insect life as illustrating most clearly the type of behaviour called by common consent 'instinctive'. Between the insects and ourselves is a wide gap, wide in respect of organization and of life-history, which we must bridge as best we can by studying animals nearer to us in the scale of life. Among the vertebrates, the great group to which the human species anatomically belongs, two families most deserve some attention; the mammals, because

they are closest to ourselves; the birds, because in many respects their mode of life has affinities with that of insects, affinities which serve to bridge the gap.

Behaviour of Birds

Birds resemble insects in that their modes of behaviour are prescribed in considerable detail by innate organization. In other words, their instincts are complex and but little plastic. Like insects, birds display long-sustained trains of instinctive activity every step of which conforms pretty closely to the pattern prescribed in the constitution of the species. The best illustrations are the cycles of activity in which two birds mate, build a nest, hatch and bring up their young. Even the assiduous feeding of the young is paralleled among many insect-species.

Yet birds are very much nearer to us than the insects; and we justly feel some confidence in interpreting the outward signs of their experience in terms of our own. A large proportion of their activities fall under the same general heads as our own—seeking and storing food, fleeing from danger, fighting, constructing shelters, courting and mating (in many cases followed by life-long devotion and mutual help of the mates), anxious care for the young, assertion of exclusive rights over a home-territory, self-display, vocal communications. We seem to see birds display, in the course of such activities, anger, fear, curiosity, joy or satisfaction, depression, pain, affectionate devotion.

Of all the instinctive activities of birds the building of nests is the most instructive from the point of view of our present problem, namely, the nature of instinctive activity and the relation of human to animal behaviour. Of all the many species of birds the great majority lay their eggs and bring up their young in some kind of nest. And the nest made by the birds of any one species is characteristic of the species, in respect of its location and the materials used, and of the general shape and pattern of construction; so that the expert, on seeing a nest, can name at once the species by which it has been made. And it must be remembered that

the nests made by some species (especially by the orioles and weaver birds) are very elaborate constructions: e.g. the bottle-shaped nest with a neat valve that prevents the eggs from rolling out of the neck of the bottle.

Since all these activities and expressions are closely connected with their instinctive abilities and propensities, the facts at once suggest that our own activities, expressions, and experiences must be similarly related to some similar foundation of inborn abilities and propensities.

It has been supposed, even by so great a naturalist as A. R. Wallace, that the specific type of the nest is a matter of social tradition, that the young birds make a careful study of the nest in which they grow up and retain a memory of it which, when their time for nest-building arrives, enables them to reproduce its pattern. But this is to overestimate very greatly the intelligence, the powers of observation and learning, of the birds. I cite here the conclusion on this matter of a great authority, one of the few naturalists who has studied, not only the nests of birds, but also (what is far more difficult and important) their nest-building. 'On the score of behaviour alone the evidence is now conclusive that birds do not build their nests from imitation or experience: they require no visible standard, plan, or copy; they need no experience of mate or tutor, but, like Santa Claus, they "go straight to work", and finish their task, without hesitation and commonly alone, whether it be in the gloom of a cavern or chimney, the glare of a tropical sun, or the bustle of a city street. Instinct alone furnishes the building impulse, and in spite of many fluctuations, whether due to experience, disturbance, or to any influence of the environment whatsoever, it holds the builders wonderfully true to their ancestral types.' [1]

We may confidently accept this verdict. But, in denying to the young birds sufficient intelligence to study and copy the construction of the parental nest, in attributing the constancy of the nest-pattern to inborn or instinctive capacity, we must not fall (as so many do) into the opposite error and

[1] *The Journal of Animal Behavior*, vol. i, No. 3, 1911, F. H. Herrick, 'The Nest-building of Birds.'

assume that the building of the nest requires no intelligence, is a series of mindless reflexes or mechanical responses to sense-stimuli. As in the case of the wasp building her cells, the bird adapts his building activities to a multitude of special circumstances, exhibits, as Herrick puts it, ' many fluctuations ', and, especially, manifests in high degree that form of intelligence implied by finding his way to and from the nest over considerable distances.

Herrick asserts truly that ' Instinct alone furnishes the building impulse and . . . holds the builders wonderfully true to their ancestral types '. In this sentence he recognizes the two aspects of instinct on which we have insisted in connexion with the insects : namely, on the one hand, the propensity to nest-building activity ; on the other hand, the ability to guide in detail their urge or tendency, so that it works out in the construction of a nest of the specific pattern. Both are inborn ; the ability implies a very complex organization that matures slowly as the bird grows up, but remains unused until the cycle of inner growth changes and outer circumstances conspire to arouse the latent propensity. An active impulse then activates the ability (or system of related abilities) ; the *ability guides the impulse,* with a strictly limited degree of intelligent appreciation of the location and materials used and with a corresponding degree of plastic adaptation to particular circumstances ; and the pair of birds work busily, perhaps for three or four days, until the nest is completed.

We are not warranted in believing that the birds foresee that the nest is to contain eggs or young ; it is highly probable that they have no foresight of these later phases of their cycle of activity ; yet they are working towards a goal, the completed nest. And we cannot understand their activity without assuming the instinct to be so organized that, at each stage of the nest-building process, their action is guided by *foresight* of the next step to be achieved.

We must be content to refer to only one other instinctive capacity of birds ; namely, their vocal utterances, especially those of the song-birds. Here again we have to do with a complex inborn capacity that slowly matures and exhibits a

specific constancy together with a limited amount of plastic adaptability. Here again we can validly distinguish the two aspects of the instinct, the propensity that generates the urge or impulse to sing and the specific ability that guides the impulse into the vocal expression proper to the species. The distinction receives in this case particularly clear warrant from the fact that in many species the males alone sing, while the females have the ability to recognize, to appreciate and to respond appropriately to the song. The male inherits both the propensity and the ability ; the female commonly inherits the ability only, though in exceptional cases she also breaks out into the specific song. Perhaps we should say that in the female the native propensity is present, but is commonly too weak to generate an impulse for the activation of the ability.

Bird-behaviour is, then, a cycle of instinctive activities each phase of which is the exercise, in plastic and adaptable fashion, of some innate propensity and some innate ability. And birds are near enough to ourselves to suggest that our behaviour differs from theirs in degree rather than in kind ; that the principles of interpretation to be applied are not radically different.

Behaviour of Mammals

When we pass to the mammals, and especially to those whose bodily structure is most like our own, we find strong support for the suggestion we have derived from the birds : for the resemblance between their behaviour and our own is still closer.

In the lower mammals the dominance of instinct, of innate organization, is obvious : all the goals that they seek are pretty closely prescribed by innate propensities common to the members of each species ; and the preceptual and motor activities employed in striving towards those goals express in the main innate abilities. One rabbit, or one rat, is very much like another ; there is little in the behaviour of any one such animal to mark it off from its fellows as an individual. All such mammals, when they are closely studied, manifest some power of adapting innately prescribed action to special

circumstances and some evidence of ' memory ' ; but in these respects they hardly surpass the higher insects and the birds. Like the insects and the birds, they will sometimes behave in the innately prescribed manner, when a little modification of it would bring them much more easily to their goal, or when the consequences are hurtful or even disastrous. They will even repeat such behaviour many times ; so that the observer is tempted to say (as many have rashly concluded of insects) : These creatures are merely machines ; they have no intelligence, no power of adaptation, and are unable to profit by experience.

Intelligent Behaviour of a Rat

Let us at once correct any such impression by considering an experiment which, better than any other yet recorded, exhibits the adaptability of the much-studied white rat and shows its power of learning to be much greater than had commonly been supposed.

A wooden box, with hinged lid projecting a little beyond the front wall and large enough to allow a rat to move freely within it, was the apparatus (Fig. 2).

The rat was fed in this box and quickly learned to lift up the lid and enter in search of food. A wooden catch or latch was then attached to the box, pivoted on a single screw, in such a position that the lid was held fast by it, but could be freed by a light push against the latch (L_1 in Fig. 2). The hungry rat, attempting to raise the lid, was at first baffled ; but he persisted in pushing and pulling at various points of the lid until he *happened* to move the latch. He then raised the lid. On repetition he quickly learnt to go at once to the latch and to push *or* pull it, as soon as he found the lid resist his thrust. Now a second latch (L_2) was attached, pivoted in such a way as to hold L_1 in position. Again the rat attacks the problem ; pushes and pulls at L_1 with teeth and paws ; but in vain.

Can he be taught by showing him how to move L_2 ? It has been commonly assumed that he cannot. There are difficulties in the way of teaching a wasp ; but it should be possible to teach a rat, if he is capable of learning. Let us try. After

he has struggled vainly for some time, we push his nose or his paw gently against L_2, thus releasing L_1; and leave him to his task. He quickly pulls down L_1, and obtains his food. After a few repetitions of this teaching-process, he quickly deals effectively with L_1 and L_2. A third latch, L_3, is then added, locking L_2 and L_1. Again the rat struggles in vain;

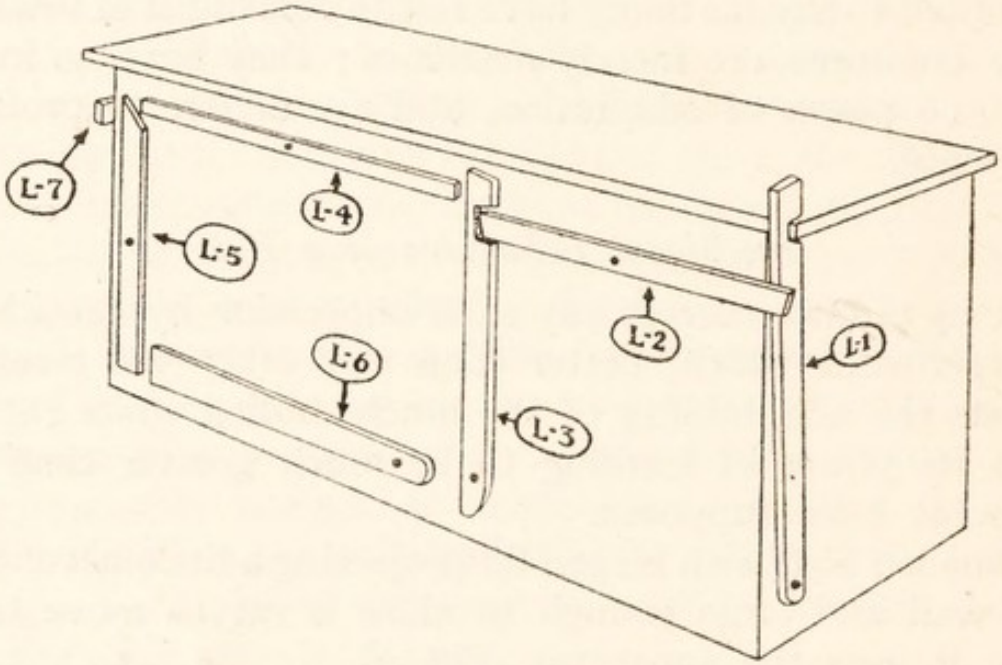


FIG. 2.—Drawing showing detail of puzzle food-box shown in the lower photograph on Plate opposite page 70. The drawing shows only the first 7 of 24 interlocking latches, the first of which (L1) holds fast the lid. The racoon learns, in the course of about a month's daily practice, to open the whole series of 24 latches and the lid in about 10 seconds.

A similar box on smaller scale with 14 interlocking latches was opened by a white rat in a few seconds after a similar course of practice. In each case the animal deals first with a single latch (L1); the other latches are then added in succession, a new one being added as soon as its predecessor in the series has been mastered.

again he is taught by the same gentle method; and again he quickly learns. A fourth and a fifth latch are added; and the rat seems to learn more quickly under guidance. The sixth latch (locking the series L_5 to L_1) he deals with unaided after some little varied effort; and then successively new latches are added up to the number of fourteen, when the box is covered with interlocking latches on all sides.

Here is the most interesting result of the experiment.

From the seventh latch onward, the rat needs no assistance, no guidance; he deals effectively with each new latch, mastering it within a very few seconds of the outset of his attack on the box. In the course of his dealing with the earlier members of the series of fourteen latches he has acquired such *understanding* of simple pivoted latches of this sort that they present no difficulty to him; he masters them almost immediately. His facility becomes so great that he opens the whole series of fourteen latches in about three seconds, repeating this again and again with sure deft movements and moving so rapidly that the eye can hardly follow. But sometimes he is a little careless, and fails to move a latch far enough: then he attempts to raise the lid and finds it fast; at once he runs back to L_{14}, rapidly reviews the latches, finds the one on which he fumbled, opens it and the remaining latches up to L_1, and so obtains his food.[1]

This experiment shows us that the rat can be taught, that he can learn to master latches and can acquire general understanding of such latches. But let us look at it from a wider point of view. The rat seeks his food instinctively; he has a *native propensity* to seek food. We have seen reason to distinguish in every instinct, on the one hand, an ability (or system of abilities) and, on the other hand, a propensity. Here we find support for this distinction. The rat's innate abilities for food-seeking are little more than the ability to run about exploring, pulling things to pieces, and, led on by sight, smell, or touch, to seize and devour his food. These abilities remain latent so long as his stomach is full; but, after a period of some hours without taking food, he becomes, as we say, hungry, an innate propensity is excited and, as he goes food-seeking, it activates the crude simple abilities.

Now our experiment leads the rat to extend and enrich his food-seeking abilities; they become enriched to include the art of opening latches. But, when he is not hungry, we cannot induce him to exercise this new ability. He runs about on the

[1] The experiments were made by my son Kenneth and myself, and are described in detail in an article 'Instinct and Intelligence in Rats and Cats', *Jour. Comp. Psychol.*, vol. vii, No. 2, 1927.

table where the box stands, exploring, sniffing, playing. We know he has that new ability within him ; but it will not come into exercise so long as the corresponding propensity is latent. But keep him for a day without food, and the propensity manifests itself as soon as he is placed on the table ; it manifests as an active tendency which powerfully activates the new ability, bringing it into vigorous and repeated exercise. The filled rat is just like the schoolboy of whom the master says : ' That boy has good abilities if only he would try ; but I cannot induce him to make an effort.' The schoolmaster's problem in such a case is to evoke an effective *motive* for endeavour. The filled rat is like the boy of good abilities who will not work because there is no effective incentive. The hungry rat is like a boy hungry for knowledge, or for praise or for a prize ; there is at work an active tendency, impulse, or urge, activating his abilities.

Whether we are dealing with child or rat, if we would measure an ability, or improve it, we must know how to bring it into exercise by supplying an incentive that will evoke a motive. A motive is a tendency ; such a tendency as we feel actively at work within ourselves when we are hungry, or curious, or angry, or afraid, or zealous to rival or excel, or desirous of pleasing or of doing a kindness. We speak of felt active tendencies as impulses or desires.

Abilities, Propensities and Tendencies

A tendency is an active energy directed towards a goal. A ' propensity ' is the name given in these pages (in accordance with old usage) to any part of the innate constitution whose nature and function it is to generate upon occasion an active tendency. The distinction between, on the one hand, ability and, on the other, propensity and tendency is of fundamental importance. Many psychologists ignore it ; and others deny it, saying that an ability is *ipso facto* a propensity or tendency, contains its own motive power, does not need activation from outside itself. Yet to understand the distinction is the beginning of wisdom and of practical efficiency in all management of men, whether oneself or others.

The validity of the distinction is shown by the fact that the same tendency may activate very different abilities. This fact may be illustrated by another experiment on the same rats that have acquired the ability to open latches.

The rat is placed in a cage, with open front, hung on a wall. When he is hungry, a small meaty bone is tied to one end of a string and a piece of lead to the other. The lead is placed at the back of the cage, and the string, running across the floor to the front edge, supports the bone freely dangling some fifteen inches below the floor. The rat hardly seems to notice this arrangement. It is certain that he has no acquaintance with strings and has never *used* one or anything of the sort. What a fool's experiment! How should a mere rat use a tool! Tool-using is by common consent the prerogative of man, the mark of his superior intelligence, his rationality. To obtain food by pulling on the string would be to use the string as a means to an end, would be to pull on the string for the sake of obtaining, or in order to obtain, the food. It would be to manifest a purposive activity in an unmistakable manner. And purpose is a vague something, which, though undeniable in man, no self-respecting psychologist would ascribe to a mere rat without the most compelling evidence.[1]

Well, the observer takes the bone in his fingers and lifts it to the level of the floor of the cage, just beyond reach of the rat. The rat reaches eagerly for it; and, when it is allowed to drop and dangle again, he is still *interested* in it.

It seems that the rat's food-seeking propensity has been aroused and is working strongly in him; the bone is an incentive which brings the propensity into play, evokes from it an active tendency or impulse. The rat leans out of his cage and seems on the point of falling out in his vain effort to reach the dangling bone. Then, after a few seconds, he seizes the string with his fore-paws and hauls in the bone,

[1] This very simple experiment is on the face of it so 'foolish' that, although an immense amount of experimental study of rats' behaviour has been conducted in numerous laboratories, no one had attempted it before my son, innocent of theories that block the progress of psychology on every hand, made it in 1926.

paw-over-paw. He repeats this many times, varying his method, but seldom failing to get the bone. Sometimes he takes the string in his teeth and runs backwards; and, if the string is short, this method sometimes succeeds. Most interesting is his procedure when a heavy piece of bone is attached and the string is so long that the bone lies on the floor, three feet below and four feet in front of the cage. First he hauls in the string hand-over-hand, dragging the bone across the floor; then, as the bone leaves the floor and he feels its full weight, he seizes the string in his teeth beyond his paws, lifts the bone with the big muscles of his back and neck, grips the string with both paws beyond his teeth, and repeats, thus lifting the bone step by step until it lies on the floor of the cage. Here we have the food-seeking tendency activating an ability hitherto latent, one quite different from that used in the box-experiment.[1]

Other rats succeed with the string by similar methods. But for some of them this problem is too difficult; they have the latent ability to haul in the string, no doubt; but the energy of the food-seeking tendency fails to activate it. For these blockheads we simplify the problem; and at once they exhibit the latent ability to haul in the bone. The bone is hung on a long string at the level of the cage-floor, but some fifteen inches distant from it; and a second string is run horizontally from the bone to and across the floor of the cage. With this arrangement no one of a number of hungry rats fails to haul in the bone within a very short time.

Shall we, according to the time-honoured custom, ask whether this performance is a display of 'Instinct' or of 'Intelligence'? It is a question that cannot be answered by a plain yes or no: for it is a question wrongly formulated,

[1] For details see 'Instinct and Intelligence in Rats and Cats', *Journal of Comp. Psychol.*, 1927. I cannot guarantee that the reader, if he should attempt to repeat any of these experiments, will obtain similar results, especially the training of a rat to open latches. Success in such experiments requires a certain touch, a sympathetic insight not possessed by every one. If you have learnt to regard the animal as a machine, you will probably fail, no matter how expensively equipped the laboratory in which you make your attempts.

one which implies a false assumption, the assumption that 'instinct' and 'intelligence' are distinct faculties. According to most definitions of instinct, the act of hauling in the food is instinctive; for it is done on first occasion without instruction and without prior experience of any similar situations. Yet it requires a little intelligence or insight, just enough to perceive the relations between the string and the food and the animal's own efforts or movements; and, as we have seen, some of the rats have not enough of such insight to haul in the bone when it dangles below the cage-floor.

If we use at all these difficult and dangerous abstract words, 'instinct' and 'intelligence', we shall have to say that, here as everywhere, instinct is shot through with intelligence. But it is better to say that, here as everywhere, animal action is prescribed in part by innate organization, yet is adapted in some degree to the particular circumstances of the moment, is, therefore, both instinctive and intelligent. And, since in this case the striving manifests itself in a variety of actions all clearly directed to the one goal, all serving as means for the reaching of the food, we must add that the activity is unmistakably purposive, a goal-seeking activity.

Here perhaps we may venture to try to make the meaning of the word 'intelligent' a little richer. We have been content hitherto to imply only the adaptive nature of any action. Let us add now that intelligent action is action adapted to special circumstances in a way that implies appreciation of the relations of the things dealt with, not of course all the infinitely many relations, but such *relations as are relevant to the attainment of the goal.* Thus the relation of the string to the bait is singled out from among all the many other relations that are indifferent to the goal-seeking; for only the appreciation of this relation could lead the rat to pull on the string attached to the bait, while neglecting other strings not so related.

Let us describe this last detail, which goes far to justify the adjective 'purposive'. Perhaps, you may be saying, the string merely excites in the rat a series of reflex movements;

perhaps, after all, the rat is merely a machine. Let us see. We place several dangling strings; they are all alike; but one supports a bone, while the others are unbaited. The rat hauls only the baited string. We then tie to the string, in place of the bone, a piece of wood of about the same size and weight. The rat hauls it up several times and then refuses to haul again; he loses interest in the string. We tie a bone again, and let him see and sniff it; at once he is *interested* again in the string and hauls up the bone. Clearly, he hauls on the string *in order to get the bone*; his ability to haul on a string is not self-activating; it is activated by the food-seeking tendency. If we saw a boy perform a similar feat, we should say that his purpose was to obtain the food and that his motive was the desire to eat it; we should say also that his *interest* in the string and in the task of hauling it in derives from his desire for the food, depends upon his hunger.

Man and Animal Compared

Just as we know of the rat described above that he has two very different abilities either of which may be activated by the food-seeking tendency (namely, his ability to open the latched box and his ability to haul in the baited string), so we may know of a youth that he has two abilities by exercise of which he can distinguish himself, can shine above his fellows; he may, for example, have the ability to walk upstairs on his hands, and the ability to do a marvellous sleight-of-hand trick, such as taking pennies from every point of your person. But both abilities may remain unused for months or years. He may have no motive to bring them into play. Then one day he is among a group of boys who begin to 'show off' under the stimulus of fair spectators: his latent propensity to shine, to excel, to display himself as strong or skilful, is roused by way of his perception of the situation; his two abilities, acquired by dint of long training, but long unused, are activated once more; the propensity generates an active tendency to 'show off', a motive which finds expression, works towards its goal of praise, applause, admiration, first by way of one ability and then of the other.

It is the same with all abilities, both of ourselves and of animals. A man may have the abilities to play a brilliant game of tennis, of golf, of chess, to solve mathematical problems and to sing one or more songs. But he does not perpetually exercise all or any one of these abilities. In each case a motive, an active tendency, is required to activate the ability.

Notice also that the same motive, the one desire, may activate all these very different abilities; and that any one of them may be activated on different occasions by different motives; the desire to shine in the eyes of others may activate them all successively; and any one of them may be activated by the desire to earn one's daily bread, or by the desire to enhance the glory of one's school or college. Again, two or more such motives may work simultaneously and may co-operate harmoniously in activating any one ability.

In these respects the man is more complex than the animal. In the animal each tendency is more closely bound up with particular abilities; yet not exclusively so. It is probable that the ability to open the latched box (when it has been acquired by the rat under the activation of his tendency to seek food) may be activated, on later occasions when the rat is not hungry, by other tendencies; e.g. by his tendency to take cover when alarmed, or by his tendency to explore all features of any novel situation. But the superiority of the higher animals to the lower, and of man to all animals, consists, not only in the possession of more and richer abilities, but also in just this respect, namely, a greater freedom in bringing various abilities into the service of any tendency. The rat that has learned to open a box in search of food might perhaps open it when seeking cover in alarm; but it has not been observed to do this, and it is doubtful whether it could achieve it. But a child of six that had learnt to open a similar box in order to find food in it might very probably open it in order to hide in it when alarmed. Though both the child and the rat had the ability to open the box and both were seeking cover, the child would be far more likely than the rat to bring this ability into the service of this tendency.

Behaviour of Racoons

If we go a little higher in the scale of the mammals and observe closely the behaviour of racoons, we get the impression that the racoon exhibits natively prescribed modes of behaviour very similar to those of the rat. Although the two species are not nearly related, they seem to be endowed with very similar instincts, i.e. similar propensities linked with similar abilities. The chief difference would seem to be that the racoon uses his fore-paws rather more freely and variously.

The racoon very quickly learns to find his food in a closed box similar to, but larger than, that used in training the rats. And, in a similar way, when latches are added, the racoon shows his superiority to the rat by quickly learning to master all the latches *without assistance*.[1]

What is the difference? In what does the superiority of the racoon consist? The common answer is that he has more *intelligence* than the rat. But what is intelligence? Is not 'intelligence' an abstract word which we use to describe in a general way facts of the order we are now discussing? Are we justified in making of *intelligence* an explanatory principle?

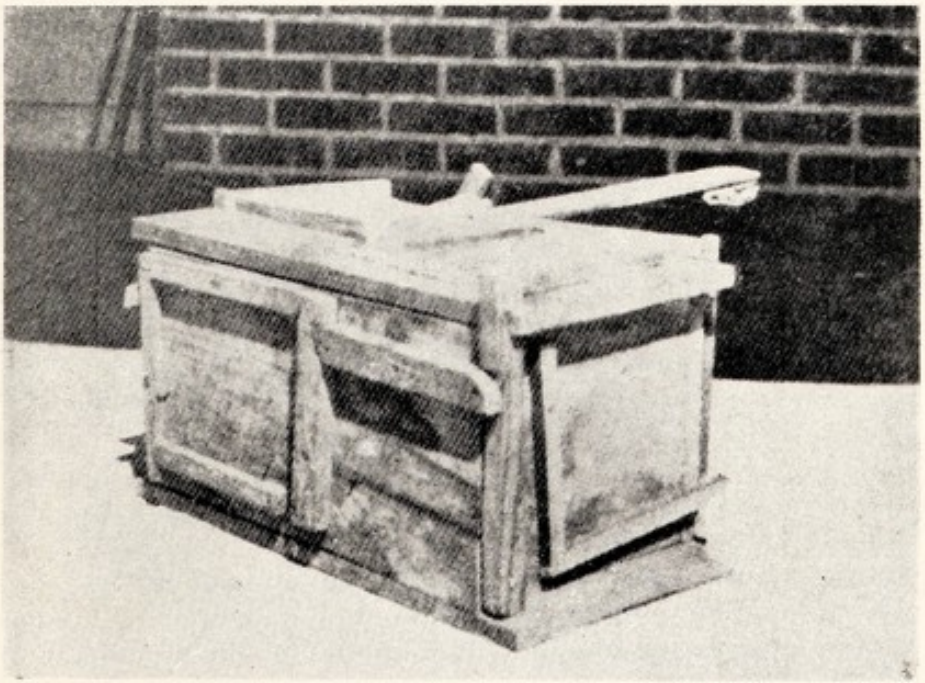
Is it, perhaps, that the racoon's food-seeking instinct has a stronger tendency? That can hardly be the explanation. In both cases the strength of the tendency seems to vary with the degree of hunger; and a hungry rat will strive and tussle with the latches even more vigorously and persistently than the racoon.

The superiority of the racoon is part of his native endowment. The species racoon is *more intelligent* than the species rat. Is then 'intelligence' a factor of the innate constitution distinct from and over and above the innate propensities and the innate abilities of the species? In most discussions of the problem some such assumption seems to be accepted. Yet we

[1] I remind you that the rats required assistance or teaching in learning to open the earlier latches of a long series. These and other experiments are described in an article by my son Kenneth and myself, 'Insight and Foresight in various Animals', *Journal of Comparative Psychology*, vol. xi, 1931.



A racoon hauling on a string to the end of which is tied a meaty bone. The string runs over a stick held horizontally above the level of the racoon's head, so that, as she hauls in, the bait does not come directly towards her, and during part of the process, recedes from her. Nevertheless, she solves this problem very quickly at the first attempt, and secures the food. She repeats the performance again and again until she seems no longer hungry.



The box with 24 interlocking latches opened in a few seconds by a racoon.

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have seen that adaptive power seems to be inherent in all instinctive activity, even the most minutely prescribed.

It seems probable, then, that the inherited *degree of intelligence* is not some third factor distinct from the abilities and innate propensities. The best-founded view would seem to be the following : *The richer and more varied the native abilities through which the native propensities express themselves, the more readily does the creature extend the range and variety of those abilities, building up, in the course of his instinctive strivings, abilities that are virtually novel.*

Thus the racoon's native abilities (manifested in his various instinctive activities) are richer and more varied than those of the rat ; he is by nature a better climber, a more efficient explorer, he seeks and finds a greater variety of foods in a greater variety of situations ; e.g. the racoon, like the rat, is almost omnivorous ; but he is more alert to spring upon and devour living prey such as beetles and wasps ; and he finds shell-fish by dabbling beneath the water of streams and ponds.

It would seem to be generally true that he to whom much is given (hereditarily) shall readily acquire more ; and he to whom little is given shall add but little and with difficulty to his native stock of abilities. This may seem a hard saying : yet Nature is hard. And it is better to recognize frankly her injustices that we may try to effect some compensations, rather than to blind ourselves to the unwelcome truth.

This view of the nature of *intelligence* seems to be borne out by observation of mankind. The better-endowed child seems not only to have a better start than the less well endowed ; but also he goes ahead more rapidly, increasing his lead. Hence the great truth that education is not a levelling process, but rather a differentiating process ; the more opportunities for education are multiplied and freely offered to all, the more surely will the better-endowed increase the interval between themselves and their less-gifted fellows.

The Higher Mammals

Among the higher mammals the care of the parents for the young is not confined to the first period of helplessness during

which the young depend upon the nursing of the mother. Something of the nature of family life becomes the rule. The mother extends her role to leading the young beside sweet pastures or to procuring food and laying it before them ; in many species the father co-operates in procuring food and in affording them protection. From such parental care the young derive great advantage as compared with the young of other species, which, launched on the world relatively mature, enjoy but a short period of growing-up.

Not only is the young mammal born in a very helpless condition, but also it remains relatively dependent for a considerable period. While the young wasp emerging from the cocoon is hardly distinguishable in form or behaviour from its parents, and while the chick soon after breaking from the egg is able to run about and pick up his own food, the puppy or fox-cub is almost quite helpless for some weeks and remains in the family group for a much longer period, only gradually attaining to independence. Yet even among the insects we see a correlation between parental care and mental development. Among the lower insects, such as the moths and butterflies, no food supply is provided by the parents ; and the grub, emerging from the egg, must fend for itself. On the other hand, the higher insects either provide a store of food for the grub (sealing it up in a cell with the egg, as in the case of the solitary wasps) or actively feed the grubs from day to day, as in the case of the ants and bees.

In a similar way, among the lower birds, the chick, emerging from the egg, must fend for himself ; accordingly he is so far developed that he can run about and pick up his food ; while, among the higher birds, the young remain almost helpless in the nest for many days after hatching, and are fed by the parents.

What, then, are these advantages of parental care on which all higher development of abilities seems to be so closely dependent ? Four such advantages are obvious. First, a large brain seems to be an essential condition of all higher mental development. And the brain is a tissue far more

complexly and delicately organized than any other. The maturation, the natural spontaneous development, of such organization requires a relatively long time ; that is to say, a large brain implies a long period of immaturity. This is true more especially of the cerebrum, or higher brain, which is involved in all the higher mental functions. And it is this part of the brain, the latest to be evolved in the race, that matures most slowly. In the higher mammals this part of the brain is more immature, less organized, at birth than any other tissue.

Why, then, should not the young mammal lead an active independent life guided only by the lower levels of the nervous system, the spinal cord and lower brain, pending the maturation of the cerebrum ? The answer seems to be that even its purely instinctive or innately prescribed activities require the co-operation of the cerebrum : such activities, if they were completely matured and exercised at any early stage, would quickly harden into fixed habits ; and this would be highly prejudicial to the full development of the various plastic possibilities, the various abilities, of the young animal. In other words, the higher animal requires a long period of immaturity, of youth, not only in order that the slow maturation of the cerebrum may complete itself, but also in order that the maturation process may go on under the constant influence of varied experiences and activities, which differentiate his native abilities. The various maturing abilities, thus enriched and differentiated, instead of hardening rapidly into fixed forms, long retain their plasticity, their susceptibility to all the processes of growth.

A third advantage given by parental care is that the native abilities, in addition to becoming extended and differentiated, become, during the period of playful experimental youth, exercised in the service of various tendencies ; whereas, in the creatures of little or no youth, the various abilities become set in the service of the particular tendencies with which they are most closely connected in the native constitution of the species and, therefore, are less readily brought into play by other tendencies.

A fourth great advantage of the long period of immaturity and dependence enjoyed by the young of the higher animals is that, through association with their parents, they learn from them. The young song-bird enriches his powers of song through parental example; the young carnivore from such example profits in seeking and dealing with his prey; the young herbivore learns where to find food, drink, and shelter, and learns what special dangers to avoid.

In the higher animals, then, in proportion as they enjoy a period of immaturity or youth, the natively prescribed forms of activity mature under the modifying enriching influence of active life under parental care and example. In the same proportion the nature of the inherited abilities and propensities is obscured. When a wasp emerges from the cell in which it has matured and proceeds to hunt one kind of prey in a manner common to its species, or to build a cell in the specific manner, we know that these abilities and tendencies are innately given. But when a bird, growing up amidst a flock of his fellows, begins to sing as they do, or to migrate with the flock, only careful experimental observation can determine whether the organization thus expressed in song or migration is wholly innate or is in part acquired.

Such masking of the innate abilities by modifications and enrichments acquired during the period of maturation goes so far in the highest mammals that opinions differ widely as to their nature and extent. On the one hand is the view that all the abilities displayed by the adult creature are wholly acquired, the native abilities displayed by their simpler relatives having somehow been lost to the race. On the other hand is the view that the higher mammals have gained rather than lost in respect of native endowment, that their constitution has grown richer, rather than poorer, in native abilities. Although it is not possible to adduce evidence that will completely and surely disprove the former view, there is much to be said in favour of the second. The question is of the first importance in relation to the human species. But, before turning to that topic, let us sum up our conclusions in respect of the innate basis of behaviour in animals.

Summary of Conclusions on Native Capacities

The innate constitution of each animal species is such that each member of the species displays tendencies to seek a limited number of natural goals ; and we infer a corresponding number of innate propensities. In the lower animals, especially in the insects, each tendency (the tendency of each propensity) expresses itself, works towards its goal, in ways common to all members of the species, with few and slight variations. Each such natively prescribed way of working implies an innate ability or system of abilities, sensory and motor, or perceptual and executive. In the lower insects (such as moths and flies) each propensity is closely and exclusively connected with special sensory and motor abilities ; so that its tendency is manifested only under special environmental conditions (such as the presence of the natural food or prey or building materials) and is exercised only in a narrowly prescribed series of movements. Such behaviour, narrowly prescribed by innate constitution, is by common consent spoken of as typically instinctive ; and the innate basis of any such train of behaviour (the propensity and its closely associated abilities) forms a functional unit of the creature's organization which may properly be called *an instinct* (e.g. an instinct to pursue, kill, and devour a particular kind of prey in a particular manner, or an instinct to find a flower of a certain kind and to deposit eggs in a particular position within that flower).

In the higher insects (such as wasps and ants) we find evidence of similar innate propensities and of more numerous and more plastic abilities ; but in these also certain abilities remain very closely associated with certain propensities ; we, accordingly, still unhesitatingly speak of each behaviour cycle (such as building a cell, or capturing prey of a particular kind) as expressing a corresponding instinct.

In the higher birds superiority of the kind which distinguishes the higher from the lower insects is carried to a higher point. Various innate propensities are clearly distinguishable ; but each expresses itself through a wider range of abilities ; and

some abilities are used in the service of various propensities ; while of other abilities it remains true that each one is closely associated with some one propensity only. Thus, in the pigeon, the abilities to walk, run, fly, coo, to distinguish and recognize individuals and places, and to find his way about over considerable areas, all these abilities are used in the service of his food-seeking propensity, as also of his migrating propensity, his nest-building propensity, and his mating propensity. But his ability to lay twigs together to form a nest is used in the service of one propensity only, namely, the nest-building propensity.

If we compare the weaving of a cocoon by a caterpillar or grub with the nest-building of a pigeon we see a great difference. The grub spins its cocoon by repeating a series of special weaving movements peculiar to this one propensity. On the other hand, the pigeon, in building his nest, expresses a similar innate propensity ; but this propensity expresses itself, not only through the special ability to lay twigs together, but also in a variety of other perceptual and motor abilities, such as are involved in finding its way about on foot and on wing, abilities used also in the service of other propensities. Therefore, in the case of the pigeon, although we recognize the innate propensity to build the nest, and speak of his nest-building as in the main an instinctive or natively prescribed activity, we cannot ascribe it wholly to the working of one native functional unit that works exclusively in this one form of activity. That is to say, the nest-building of the pigeon cannot be ascribed exclusively to the working of one instinct.

The instinct of the grub to spin its cocoon (involving both a special propensity and a special ability) is a relatively closed system. The corresponding propensity of the pigeon finds expression through various abilities which at other times and in other circumstances are activated by other tendencies.

The Controversy over Human Instincts

Just here has arisen the controversy over *instinct* in the higher animals and in man. In the higher mammals the setting

free of abilities from their special service to particular propensities goes farther than in the higher birds ; and in man little trace of such special relations remains. Hence, in these species, the higher mammals and the human species, it is difficult to point to any train of activity that seems to be the peculiar expression of one propensity and of abilities exclusively associated with that propensity,[1] i.e. of one instinct. Hence, the conception of instinct acquired by the study of insect life is no longer applicable in the full sense. In higher mammals each innate propensity is recognizable only through the general nature of the goal towards which it sets, towards which it impels, and from the attainment of which satisfaction results.

And in the human species especially, the native abilities, both cognitive and executive, become, in the long course of youthful development, so multiplied, differentiated, and enriched, and so much at the service of any propensity, that we cannot confidently define the nature and extent of any one native ability, or speak with entire propriety of the existence of any instincts. Now, the field-naturalists who have studied and described instinctive behaviour in its typical forms among the insects, not being psychologists, have fixed their attention on the stereotyped forms of movement in which at that level instinct mainly expresses itself. And many psychologists have been content to follow them in seeing, in such stereotyped patterns of movement, the essential marks of instinctive behaviour. Accordingly, since but vague traces of such movement patterns can be observed in human behaviour, they have asserted that human behaviour is not at all instinctive and that the human species has no instincts.

Others fixing their attention upon the general propensities towards goals common to the species (rather than upon innate abilities) and regarding these as of the essence of instinct, have maintained that the life of man is just as truly rooted in instincts as that of the animals.

To this latter group I myself belong ; and in many earlier writings I have expounded this view. Recognizing now,

[1] Or, in the language of our mechanical analogy of Chapter III, of one propensity and of abilities ' geared to ' this one propensity alone.

clearly as I believe, and only now for the first time, the crux of this difficulty and of this divergence of opinion, I propose to avoid the use of the term 'instinct' in defining the constitution of man, and to content myself with the term innate or native propensity. This change of usage does not imply any radical change of view. It implies a stricter usage of the words *instinct* and *instinctive* and a recognition of the questionable propriety of applying those words in the description of human nature and activities. I recognize that, in the fullest and most universally accepted sense of the word, instinctive action is peculiar to the lower animals, and that the extension of the word to the behaviour of higher animals and of man has led to unfortunate confusion and controversy which have obscured, rather than elucidated, the true relations between higher and lower forms of action.

This change of terminology does not imply the view that seems to be accepted by many of the critics of what is commonly called the *instinct-theory*, namely, that the human species has no native propensities and no native abilities, that the human infant is equipped for life with nothing more than an array of reflexes and a vague something called *intelligence*, a power of learning or acquisition. Rather, in my view, the definition of the native propensities and abilities of the human species remains a fundamentally important task of psychology. It may fairly be hoped that a consensus of competent opinion as to the propensities of man is not beyond our reach. The definition of the whole array of man's native abilities may be a task beyond our competence; but some steps in that direction we may achieve, and the attempt must long continue to fascinate the more adventurous type of explorer.

CHAPTER VI

THE COMPARATIVE METHOD APPLIED TO THE PROBLEM OF THE NATIVE ENDOWMENT OF MAN

WE can learn much about the mental activities of human adults without knowing the foundation of native endowment from which the adult mind evolves. But, so long as we lack such knowledge, much must remain obscure. And all parents, teachers, social workers, physicians, all who are concerned to guide the development of children, imperatively require the fullest possible understanding of the developmental processes and, therefore, the fullest possible knowledge of that which undergoes development, namely, the native basis of the mind.

The problem has been much discussed ever since the opening of the modern period. Descartes expounded and developed the ancient doctrine of *innate ideas,* and John Locke led the attack against it. Locke proposed to regard the mind of each new-born child as *tabula rasa,* a smooth waxen tablet, a structureless substance that may be moulded equally readily into this form or that by the impressions received through the senses. In the main, the philosophers, notably Leibnitz and Kant, have maintained the older view, namely, the view that much is innately given, that the innate basis is rich in potential capacities; while the empirical psychologists have for the most part accepted Locke's doctrine or something approaching to it. At the present time, although the problem is no longer stated in the same terms, opinions still differ as widely as in the days of Descartes and Locke.

I insist upon the urgency of this problem, not only because the solution of it is one of the greatest needs of our time, but also because there is manifest, in view of its obscurity

and difficulty, a tendency to put it on one side, as one which we may not hope to solve. Yet, so long as we have no generally acceptable and well-founded answer to this great question, psychologists will remain divided into hostile schools. It is, then, worth while to review and to weigh carefully whatever may be said on either side.

The Argument for the Tabula Rasa

On the side of Locke we have the great fact that at birth the human infant is almost entirely helpless: he can do little more than suck in his milk when put to the mother's breast; and he seems to have very little power of appreciating or interpreting sense-impressions. In other words, the infant seems to have very few abilities, executive and cognitive; and these few seem to be very simple, undifferentiated, and of little use to him at this stage of his life; further, a food-seeking propensity is the only one clearly manifested in the first weeks after birth.

But we have no warrant for the assumption that all the native abilities and propensities of the human species are fully matured at the time of birth. To make any such assumption is to put aside the great fact of *maturation*, a process we see illustrated abundantly in every part of the animal and vegetable kingdoms. The newly hatched thrush is as helpless as the human infant; yet in due time he runs, flies, sings, finds his food, mates, builds a nest and brings up his brood, all according to the pattern of the species; and we have overwhelmingly strong evidence that all these activities express, in the main, native abilities and propensities that mature spontaneously and are but little modified or enriched by individual experience and activity. We have not the least ground for supposing that the power and range of maturation is any less in the human than in other species. We see it amply manifested in the processes of bodily development, as, for example, in the process that provides the toothless jaws of the infant with an array of teeth: each of these thirty-two teeth matures so exactly according to the pattern of the species that an anatomist, finding an isolated tooth of

unknown antecedents, can confidently infer, not only its human origin, but also its place in the upper or lower jaw, and perhaps also the age and sex of the owner ; and this is true alike of races whose diet is of milk or curds, and of those that live mainly by masticating nuts and grain and other hard foods.

The Lockean doctrine of the *tabula rasa* was much favoured by the *theory of ideas* which Locke brought into fashion among British philosophers. For, according to this theory, all mental life is the play of ' ideas ', and all ' ideas ' are acquired by the individual by way of sense-impressions and by reflection on or about them. Sense-impressions rain upon the mind and mould it, as the seal, repeatedly applied to the waxen tablet, moulds it to a pattern which owes nothing to the constitution of the wax. The influence of this theory lives on, although the theory has by common consent been found hopelessly inadequate and misleading.

Closely allied with the *idea theory* of mental activity, and equally popular, was the theory of mental development which saw it as essentially a process of compounding of elements, of simple units, to form complex functions and structures. The older form of this theory described ' simple ideas ' as compounded from sensations, and ' complex ideas ' as compounded from ' simple ideas '. In more recent times it has been usual to translate this account into neurological terms, and to put, in place of the alleged mental elements, simple sensory-motor reflexes or very simple movement-abilities. In either the older or the more modern form, this account fitted readily with Locke's view ; for, if it were true, only these alleged elementary units (whether conceived as simple ideas, or as sensations, or as reflexes, or as simple nervous shocks) would require to be postulated as natively given ; all the compounding of them, it was plausible to suppose, was a matter of individual acquirement, according to the great *principle of association.*

It is now generally admitted that this theory of mental development by the compounding of elements was fundamentally at fault ; that, just as the bodily organs and functions evolve by growth and differentiation from those of a

relatively simple cell, so also do the mental organs and functions. It is realized that a bare isolated sensation or other mental element is not anything that can properly be supposed to exist or to come into existence anywhere, but rather is something that we conceive as such through a process of illegitimate abstraction. And it is now known that even the simplest reflex abilities are differentiated gradually from the common fund of movement-capacities, rather than given from the first as distinct units.

The foregoing arguments in favour of Locke's doctrine are all that can claim to be strictly cogent. The rapid success and continued popularity of that doctrine were due to certain emotional prejudices that are widely spread. In the first place, there was something vague and mystical about Descartes' theory of innate ideas; and it was put forward by him as one of the chief supports of religious belief. Therefore, in the long struggle that ensued between science and religion, science was inclined to favour Locke's view as against Descartes'. Of similar influence has been the more modern struggle between science and philosophy: while philosophers in the main supported Descartes' view in one form or another, men of science were inclined to favour Locke's doctrine; for it seemed more in accord with the empirical principles of modern science.

Again, Locke's doctrine consorted well with the liberalism, the principles of democracy and human equality, with which science, as the great agent of human progress, has been closely allied in the modern period. It was repugnant to the sentiments of justice and benevolence to admit differences of natural endowment between men and races: for such differences were apt to be construed as of the nature of superiorities and inferiorities which, while raising some few men to power and influence, would condemn others to humble stations and menial tasks.

To educationists, also, Locke's doctrine made a strong appeal. For it involved the corollary that the great abilities displayed by some few men are wholly due to the superiority of their education and that, if only the educational processes

could be sufficiently improved and widely applied, all men might be made the equals of the best. The doctrine thus exalted the functions of the educator, making them seem but little less than god-like.

Lastly, a natural weakness inclines us to Locke's doctrine: it is the proud boast of the man of science that he and his like have greatly extended the bounds of the intelligible and the explicable within the realm of nature and have correspondingly reduced the inexplicable and the mysterious. Now, in spite of much effort and much achievement in the study of heredity, the inheritance by each creature of the constitution peculiar to its species remains inexplicable and mysterious; the scientist is, therefore, naturally disposed to minimize the extent of the native endowment of men and animals: for the more that is natively given by heredity, the greater is the mystery of inheritance and the harder the task of explaining the facts. And this mystery reaches its climax in the endowment of mental capacities of the human species. Hence, a strong prejudice against admitting as innately given any more than we are forced to admit by the most indisputable and direct evidence.

Under these combined influences some moderns have carried to an extreme the tendency to deny all native endowments to the human species beyond those manifested by the new-born infant, a few motor abilities (not altogether inappropriately described as reflexes) and the ability to respond to sense-stimuli with vague 'sensations' together with some indefinite susceptibility to the compounding of 'reflexes' and 'sensations'.[1]

The Evidence of Innate Capacities

Let us now see what is to be said on the other side. We have already insisted on the great fact of maturation, as richly illustrated in all the realm of life and certainly no less in human growth than in that of animals.

[1] This view is carried to an even more extreme point by Dr. E. B. Holt in his recent book (*The Learning Process*), where he seems to deny the facts of heredity *in toto*.

We may equally insist on the reality of heredity, in spite of our inability to explain it. We must frankly recognize the mystery constituted by the bodily growth of men and animals, but more especially by the native mental endowment of such creatures as the higher insects and birds. The burden of this mystery is already so great that we need not scruple to add to it a little by accepting without prejudice the indications of a mental endowment of mankind far richer than that of any animal species.

More specifically, the superiority of the mental endowment of the human species is a plain fact. The most enthusiastic educator will hardly maintain that man's superiority to the gorilla is wholly due to more advantageous environment and greater educational opportunities. It is no less clear that men differ widely in respect of their native capacities. Some children and some men seem easily to excel their fellows in some one kind of achievement ; others seem to attain, without special effort, excellence in many lines of endeavour. The most striking and indisputable instances are the youthful prodigies who, while still little more than infants, acquire the art of reading with a small fraction of the time and effort required by the average child, master strange languages, play or compose difficult music, or perform arithmetical feats far beyond the capacity of the average adult.

All the immense amount of work done in recent years in the way of ' intelligence testing ' bears out these indications. For, though the results of a ' mental testing ' may be misleading in the case of any individual (owing to special disturbing factors), well-devised and much tested tests, applied to very large numbers of children and to the same groups of children at intervals of years, show that the child's position in the scale of achievement is largely, though not wholly, independent of the kind and degree of educational advantages he may have enjoyed.

And, if further evidence of the same general truth is required, we find it in the results of tests of ability in animals. In the course of prolonged experiments with rats, I have again and again found it possible to obtain, by means of selective

mating, breeds of low and of high ability in respect to a particular task, breeds in which the high or low degree of ability of the parents is reproduced in their descendants for as many generations as have been tested.

The Study of Native Endowment

Rather than turn blindly away from facts of hereditary mental endowment because we cannot explain them, let us try to ascertain as fully as possible the range of innate capacities and to define more exactly their nature; for, though we may continue unable to understand the transmission of them, such knowledge must be of great value, for both theory and practice.

Experimental study of animals may throw much light on this great problem; but hitherto only the merest beginnings of such study have been made. We have to rely in the main on many careful studies of human capacities and on the comparative method. Our best guide here is Professor Charles Spearman, who for many years, with the assistance of a group of fellow-workers, has concentrated his efforts upon this problem, using a great array of testing methods and drawing conclusions from the wealth of data by the aid of refined mathematical procedures (especially the use of correlation formulae). Only a most inadequate indication of his tentative conclusions is here possible.

His first conclusion is that all intelligent thinking is both a knowing and a striving, or, in technical terms, is an activity that is both cognitive and conative. That is to say, all mental life is more than a passive sentience, a mere receiving or suffering of sense-impressions. Stimulation of the senses does produce sentient effects, does modify our total state of mind; and of many sense-stimuli the effects go no farther than this. But, when we make use of our sense-impressions as guides to action, the effect goes farther; we are stirred by them to an activity, we become aware of something, we interpret the sense-impressions as signs of some thing. And it seems that there are fundamental forms of such responsive activity which may be exercised jointly. The first and

simplest is mere thinking of some object, bare apprehension of some thing. The second is the becoming aware of relations of the object, which, of course, implies that parts are distinguished as related to one another. In the third fundamental form of activity, we become aware of some relation between objects and forthwith think of some other object or objects related in a similar manner.

These three fundamental functions are not to be thought of as special abilities, but rather as implicit in and pervading all mental activity, though exercised explicitly as recognizably distinct functions only by the developed human mind. But 'Not a cognitive operation can be performed from the loftiest flight of genius down to the prattle in the nursery, but that it resolves itself wholly into these same principles, with their ensuing processes. And all this is no less true of the so-called "practical" doings which common opinion naïvely supposes to constitute some separate domain'.[1]

If we provisionally accept this conclusion, regard these three principles as characterizing the operations of every mind, as primary functions of mind wherever and however manifested to us, we still have before us the problem—What is peculiar to the innate constitution of each particular mind? Here we take up again the thread of our comparative study. Professor Spearman's further conclusions, drawn from his very extensive experimental studies of human beings, fit very well with the indications we have already found in studying animal behaviour.

In our study of instinctive behaviour we saw that the typically instinctive action expresses two distinguishable features of the native endowment; on the one hand, a special ability, simple or complex (as the ability of the wasp to recognize and master the prey natural to her species); on the other hand, a propensity, which, on being roused from its dormant state, generates an active tendency: and the tendency is, in some sense, an energy; and not merely energy in general or a special kind of energy, but an energy which is

[1] *The Nature of Intelligence and Principles of Cognition*, London, 1923, p. 354.

directed to a goal, which works towards that goal and is brought to rest only on the attainment of it; an energy which activates the ability and brings it into the service of the tendency as a means towards its end or goal.

Now, we find, Professor Spearman, by aid of his very different methods, arrives at a similar view and illustrates it in a similar way, drawing an analogy between the various abilities and an array of engines or machines in a factory, and, again, between the energy which seems to be required to activate these abilities and the energy which (as steam pressure or electric current) activates the machines in the factory.

The comparative study of men and animals suggests, then, the following view. The various families of animals differ greatly in the nature of their instinctive propensities. But in allied families the propensities show broad similarities. The several species of any one family of animals (as the wasps, or the song-birds, or the carnivorous mammals) have very similar propensities; but the species differ widely in respect of the innate abilities through which these propensities express themselves. Further, every ability is to some extent plastic and modifiable; hence the more numerous and the more complex the abilities possessed by any species, the more plasticity of behaviour do its members show, the more are they able to profit by experience, and the more scope have they for the exercise of the three fundamental cognitive functions.

The simpler the constitution of any species and the fewer its abilities, the more closely is each ability functionally linked with some one propensity; whereas, in animals of more richly endowed species, various abilities are readily brought into the service of several propensities. Thus, in some of the lower insects, the ability to fly is used by the mating-propensity only in the single nuptial flight. Again, the Yucca moth has the complex ability to find the Yucca flower, to gather its pollen in a pellet and thrust it into the pistil; and this ability is used only in the service of the reproductive tendency in a narrowly prescribed fashion. On the other hand, the honey-bee has the abilities to find

many flowers, to extract honey or pollen from them and either to feed her booty to the larvae or to the queen, or to store it away in the comb for winter use. And the bee's ability to build with wax is used, not only to construct the comb, but also to strengthen or repair its attachments; and it is used also in the service of a propensity very different from that which prompts her to construct or repair the comb, namely, the propensity to cover up the corpse of some intruding animal too large to be thrown out of the hive.

We see a superiority of a similar kind on comparing higher with lower vertebrates, or higher with lower among the birds or mammals. Thus, such a mammal as the rabbit has the ability to find its way about (what may be called a topographical ability): but this is used only in the service of its propensity to return to its burrow after grazing. On the other hand, the dog uses a similar ability, not only in returning home, but in many other ways, as, for example, in hunting, in finding stored food, in paying visits to his friends.

Or consider the ability of vocal utterance. In the lower vertebrates, if present at all, it seems to be confined to the service of some one propensity, such as the mating or the combative propensity, or appears only as the warning cry of fear among the lower gregarious species; whereas in the higher birds and mammals it (the vocal ability or system of abilities) becomes the servant, one mode of expression, of many propensities, as in the varied twittering of the higher birds, in the hostile, the alarmed, and the plaintive utterances of the dog, and in the chatterings of monkeys expressive of wellnigh every kind of instinctive excitement.

The Native Endowment of the Human Species

Let us now bring together the results of our comparative survey and focus it upon the great controversial problem of the nature and extent of the native endowment of the human species.

Innate in each of the great animal groups are certain fundamental propensities; few in the lower groups, more numerous in the higher. In each group each fundamental

propensity, such as that to seek food, or a mate, or shelter, works through native abilities, and is determined in its particular modes of expression by such abilities, abilities to recognize certain objects and situations and to deal with them in ways conducive to the welfare of the individual or of the species.

While within each great animal group (such as birds or mammals) the many species are endowed with very similar propensities (roughly speaking we might say that all the species of each such group or family have the same propensities) they differ widely in respect of the nature, number, and complexity of the abilities through which their propensities manifest themselves and attain their natural goals. In any lower species, abilities are relatively few, and each ability is closely linked with some one propensity in such a way that is used only in the service of that one propensity: whereas any one of the higher species is endowed with many more abilities, and none of these is exclusively linked with any one of the propensities; but, rather, each ability may serve all the propensities in turn, according to the demands of the situation of the moment.

Perhaps it should be added that in the higher species the abilities are more plastic than those of the lower types: but this greater plasticity is probably due in the main, perhaps wholly, to the slower maturation rendered possible by parental care. For the combination of slow maturation and parental care provides a period of youth, that is to say a period of active immaturity, a period during which maturation progresses while at the same time the young creature, leading an active life under parental protection, effects many adaptations, or learns much; all learning being either further differentiation and specialization of abilities or readjustment of their functional relations with the propensities.

Now biologists are at one in regarding mankind as the most highly evolved species of mammal; they agree also in holding that the differences between the human species and the great apes (the mammals nearest to man in the scale of life) are of the same nature as (though much greater in degree

than) those which separate the apes from the lower mammals. If, then, these generally accepted principles are sound, we must expect to find that the human species has all or most of the propensities common to the rest of the mammals and, perhaps, in addition to these and peculiar to itself, some special propensities differentiated at a late stage of evolution. Also we should expect to find the human species richer in native abilities, abilities more plastic than those of animals and more readily brought into the service of any one propensity or of all propensities.

Thus comparative study leads very clearly to the rejection of Locke's doctrine of the *tabula rasa*. To accept that doctrine would be to assume that the relation of the human species to other species of mammals is utterly different from the relations of those species to one another ; it would commit us either to rejecting altogether the evolutionary origin of the human species, or to assuming that the evolution of the human from some ape-like species was a process radically different from the evolution of the higher mammals from the lower. Further, denial of the richness and complexity of man's native endowment would leave us committed to the proposition that all the rich endowment of native propensities and abilities of the higher mammals (acquired by them through long ages of evolution and constituting their superiority to lower forms) has been swept away from the constitution of the human species to be replaced by a single vague abstract entity, namely, ' Reason ' or a ' high intelligence '.

If the ' intelligence ' of man were in all respects a novelty, if it showed nothing in common with the capacities of the animals, this Lockean doctrine would be plausible. But, even though we may reserve judgement on the question whether the endowment of man includes something specifically different, something of a new kind or order, we cannot blind ourselves to the fact that the behaviour of the animals implies many of the functions which in ourselves we recognize as modes or aspects of intelligent activity. Discrimination, anticipation, memory, imagination, judgement and, perhaps,

some slight reasoning, are manifested, though in relatively simple and lowly fashion.

The native endowment of the higher mammals, then, has not been swept away from the human species to make room for an endowment of an altogether new order. Rather, the native endowment of the human species is that of the higher mammals carried to a higher pitch of differentiation and plasticity with, possibly, some specifically new additions.

APPENDIX TO CHAPTER VI

On the Application of the Method of Correlation

The foregoing chapter on the native basis of the mind's structure is founded mainly on the comparative study of human and animal activities; but it is in general agreement with, and is therefore supported by, the analysis of mental functions achieved by the special methods of mental testing and the mathematical handling of the statistical data obtained by a great variety of mental tests. The method chiefly relied upon is the *method of correlation*. Briefly and crudely it may be described as follows: apply to a hundred men or children, as nearly alike as possible in respect of age, sex, and previous experience, a series of 'mental tests'. The tests may be infinitely various; the more numerous and the more various, the better. The essential requirements of a good test are: (1) that the conditions of its application shall be easily standardized and the instructions given the subjects well within their comprehension; (2) the performances required of the subject (or better, their degrees of merit or excellence of performance) shall be such as can readily be measured with accuracy and stated in numerical terms. In respect of performance in each test the 100 subjects may then be ranged in the order of merit. Suppose one test requires the subjects to memorize and reproduce a verse; a second requires them to memorize and reproduce a piece of prose; a third requires them to solve a mechanical puzzle; a fourth requires them to find their way out of a maze; a fifth puts before each subject a series of simple pieces of reasoning and requires him to say of each one whether the conclusion does or does not logically follow from the premises; a sixth requires him to mark as quickly and accurately as possible every letter 'T' on a page of print; a

seventh requires him to strike out on a page of print every 'T' that is not immediately followed by a vowel.

Suppose now that your hundred subjects are children, all from one school, and that their reputations for 'brightness', 'cleverness', or 'ability' are well known to you, their teacher. You will naturally expect that, if you add together the scores of each child in all the seven tests and then arrange these totalized scores in order of merit, the 'bright' children will be found near the top of the list, the dull children near the bottom, and the averagely 'bright' children in the middle region. And, in spite of an anomaly here and there, your expectation will surely be verified in a general way. You have merely verified experimentally the reputations founded upon general behaviour and performance in school; though each anomaly stands as a problem for special inquiry and explanation (an inquiry that may well prove to be worth while).

Suppose now that, instead of lumping together the performances of each child in all the tests, you compare the children in respect of performance in each of the tests. At once you reveal new evidence and new problems concerning their abilities.

As regards the first two of our seven tests, you will find that the order of merit of all the children is nearly the same in the two tests: the two lists show a high degree of correlation. And the same will be true of the last two tests. But how will the lists for the first and the fifth tests be related? You cannot confidently predict in the light of common sense and common experience. Nor can the expert psychologist surely predict the result. Only experiment can decide. And in this case the experiment will show that between the fifth and the first list there is very much less close correlation than between the first and second lists: some of the children who stand high in the first list may stand quite low in the fifth; in fact this may appear to be the rule rather than the exception. Suppose that comparison of the lists shows the facts to be as suggested: we find that, whereas the two memory-tests give closely similar lists, the reasoning-test gives a list that is very different. The two memory-performances are closely correlated: the reasoning-performance is not closely correlated with either of them. What conclusions can we draw? First, we generalize the conclusion (and of course only confirmation by similar testing of a much larger sample of the human species will justify this) and say: the two kinds of memory-performance naturally go together in

respect of degrees of excellence; but excellence in memorizing and in reasoning do not go together, or not in the same close fashion as the two forms of memorizing. From this we infer, first, that in some sense and degree the two memory-tasks are tests in the main of one function or factor; one which plays the dual role of determining degrees of excellence in both performances; secondly, that the memorizing and the reasoning tasks bring into play complex functions which in the main are different in the two cases.

Some such conclusion is about as far as we can go without the help of mathematics. Mathematicians have devised formulae which enable us to state accurately the degree of correlation between any two lists, such as our lists expressing the orders of merit of our hundred children. When these formulae are applied to the lists obtained by various widely different mental tests, we find all degrees of correlation between the lists. Here, then, is a method of analysis of the mental functions; a method that, possibly, may enable us to distinguish the truly elementary or primary and distinct mental functions and, perhaps also, elementary and distinct units of mental structure or organization.

Professor Spearman has been the pioneer and chief exponent of this procedure, this method of penetrating into that jungle of functions and structures which has defied the efforts of many of the greatest intellects of all time. It is found that, in the sense defined above, almost all test-results are positively correlated in some degree.[1] For example, the correlations between all pairs of the seven tests defined above might well range from + ·95 (in the case of the two memory-tests) to, say, ·20 (in the case of the reasoning-test and either of the memory-tests). Spearman first proposed, as the explanation of such facts, the famous *theory of two factors*, two factors which determine the degree of merit of performance in each test; first, a factor peculiar to each test, which he proposed to call a *special ability*; secondly, a factor common in various degrees to all performances, a factor largely responsible for the positive correlations, a *general factor* which he proposed to call *g*.

He further interpreted these conclusions by proposing to

[1] Complete correlation (or exact correspondence of the orders of merit) in respect of two tests is by convention expressed as of value = + 1·00, lesser degrees of positive correlation by figures ranging down from ·99 to 0; and negative correlations by figures ranging from 0 to − 1.

regard each ' special ability ' as a structural unit, and the general factor as expressing, or as constituted by, a quantity of an energy which is involved in and essential to each operation. And he illustrated this interpretation by likening each ' special ability ' to one of many machines in a factory and the ' general factor ' to the supply of energy which drives or operates all the machines.

This suggests a very simple view of the structure and functioning of the mind : first, an array of abilities (structural units) all independent variables (that is to say, varying in the degree of their development and efficiency independently of one another and each functioning independently of all the rest) ; secondly, an energy-supply (call it a nervous or mental or intellectual or psycho-physical energy or what you please) on which they all draw in turn as each one in its turn comes into operation.

But a very little reflection shows that such a view is too simple to interpret the facts of correlation. When we find a high correlation between two tests, such as the two memory-tests, we clearly cannot attribute this wholly to the ' general factor ', *g*. It seems obviously more probable that, in memorizing the verse and in memorizing the prose, we bring into play in both cases a group of closely related abilities, and that those concerned in the one task are not very different from those concerned in the other ; that is to say, they are of similar nature, function, history, and origin, and hence function with nearly the same degree of efficiency. This perhaps becomes most obvious if we consider the case of two tests, one which requires the memorizing of one verse of a poem, and the other the memorizing of the next verse of the same poem. If we applied two such very closely allied tests to our 100 children, we should (if the testing was carefully conducted with whole-hearted voluntary co-operation from all the subjects) find a very high correlation between the two, perhaps equal to + ·98. Under the most favourable conditions we cannot expect perfect correlation : for the human being is very complex ; a certain time must elapse between the two testings, and in that interval the children may change in various ways ; one may have become bored, or sulky, or offended by the experiments, another may have seen through the window a scarlet tanager or a dog-fight, or have been exhausted by a fit of coughing or by an attack of *petit mal.*

But suppose that we did unexpectedly find a perfect correlation (i.e. = + 1). Could we infer that each child had brought into

play the same identical abilities in the learning of the first and the second verse? Clearly not. We could infer only that the abilities employed in the two cases were so similar in history, origin, and degree of development that they function with very nearly the same degree of efficiency; that, in short, the abilities involved form a natural group whose members are closely allied in nature.

Reflection on such facts of correlation thus leads us to a view of abilities very like that to which we were led by the comparative study of human and animal behaviour; namely, the view that the multitude of abilities of any individual are organized in many groups; these in turn in systems of allied groups; and these again in wider systems; all these systems having been formed by processes of gradual growth and differentiation of innate abilities.

Professor Spearman himself, as well as various critics of his work, seems to be moving in the direction of such a view. Professor T. L. Kelley, another vigorous worker in the mathematical handling of mental-test data, has been the principal exponent of the interpretation of the correlations by the assumption of 'group factors'.

In a recent article,[1] after arguing that the general factor, *g*, is not conclusively demonstrated, and that the correlations attributed to it by Spearman may express merely the influence of sex, race, and degrees of maturity, he sums up as follows: 'Five independent group factors were also established in more than a single population: these factors have to do with *verbal* material, *number* or quantitative concepts, *memory*, *spatial concepts*, and *speed*, respectively. Two additional factors were found in some of the populations to which a larger number of tests were applied: one of these may be termed *ebullience* or *vivacity*, and the other is a second spatial factor which has to do with the *manipulation* of *spatial relations* as distinguished from their apprehension and retention.'

It is, then, satisfactory to find that the mathematical treatment of mental-test data is working towards a view of the organization and functioning of the mind in harmony with that to which we are led by consideration of the facts of animal and human behaviour in the light of introspective observation and

[1] In the volume *Foundations of Experimental Psychology* (Clark Univ. Press, 1929), p. 880. See also his *Crossroads in the Mind of Man*, N.Y., 1928.

analysis. Here I would cite with entire approval the criticism of the correlational mental-test work made by a mathematical expert, Professor E. B. Wilson,[1] to the general effect that the conclusions hitherto reached by this method must be regarded as tentative first approximations, and that what is chiefly needed is not so much more refined mathematical or testing methods as more insightful psychological understanding and definition of the functions concerned.

If what we have said of the native propensities is not wholly false, it follows that their functioning must enter into all mental testing, conditioning achievement in various complex ways. These conative or striving factors have hitherto been but very inadequately taken into account by the mental testers. Spearman has laid down the general law that the quantity of mental energy is constant throughout a series of operations—except in so far as it varies. But nothing is more clear than that it does vary from moment to moment and may vary very widely, ranging (during waking life) from a maximum, in moments of tense excitement, to a minimum, during extremes of boredom and fatigue. It is with these energy factors that we are chiefly concerned in these pages, and much remains to be said about their organization and functioning. We cannot at present derive much help in this task from the results already achieved by the mathematical method, and it would be a foolish and unduly timid policy to rely upon that line of work alone. The mathematical method is and will remain only one among the many methods by which the secrets of the mind must be attacked, by which science will push forward into that dense jungle. And it must always follow, rather than lead, the attack. If I may push the military analogy, I would say that its function is rather to clean up, define, co-ordinate, and consolidate the positions won by the line of skirmishers.

[1] Cf. his review of Professor Kelley's 'Crossroads' in *Journal of General Psychology*, 1929.

CHAPTER VII

THE INNATE PROPENSITIES AND ABILITIES OF MAN

IN the light of the well-founded conclusions of the foregoing chapter we may try to define concisely the native endowment of man. Our comparative survey suggests the guiding principle that the innate propensities of man are those common to all the higher mammals, together with some few that are peculiar to him or are so slightly developed in other species as to be not surely recognizable. Thirty years of wrestling with the empirical evidence have convinced me that it bears out this suggestion, this deductively reached hypothesis. The following list does not claim to be exhaustive or beyond improvement ; it is, rather, tentative and approximate. We recognize in the human species the following innate propensities.[1]

1. To seek (and perhaps to store) food (food-seeking propensity).

2. To reject and avoid certain noxious substances (disgust propensity).

3. To court and mate (sex propensity).

4. To flee to cover in response to violent impressions that inflict or threaten pain or injury (fear propensity).

5. To explore strange places and things (curiosity propensity).

6. To feed, protect and shelter the young (protective or parental propensity).

7. To remain in company with fellows and, if isolated, to seek that company (gregarious propensity).

[1] For convenience of later reference a short name is appended in brackets to each propensity of the list.

8. To domineer, to lead, to assert oneself over, or display oneself before, one's fellows (self-assertive propensity).

9. To defer, to obey, to follow, to submit in the presence of others who display superior powers (submissive propensity).

10. To resent and forcibly to break down any thwarting or resistance offered to the free exercise of any other tendency (anger propensity).

11. To cry aloud for assistance when our efforts are utterly baffled (appeal propensity).

12. To construct shelters and implements (constructive propensity).

13. To acquire, possess, and defend whatever is found useful or otherwise attractive (acquisitive propensity).

14. To laugh at the defects and failures of our fellow-creatures (laughter propensity).

15. To remove, or to remove oneself from, whatever produces discomfort, as by scratching or by change of position and location (comfort propensity).

16. To lie down, rest and sleep when tired (rest or sleep propensity).

17. To wander to new scenes (migratory propensity).

18. A group of very simple propensities subserving bodily needs, such as coughing, sneezing, breathing, evacuation.

This list of native propensities is not put forward as final and correct in all respects. It may be that I have brought together under one head two or more similar tendencies: e.g. it may be that the thirteenth in our list is properly two or more propensities, one to take possession, one to store or hoard; it may be that under the fifteenth head are brought together several distinct propensities. It may be that the seventeenth in our list is not really a propensity native to the species. It may also be that in the human species, long sheltered from the severities of natural selection, the native propensities are less uniform than in animal species; individuals, and perhaps even races of mankind, may be peculiar in lacking one or more of the propensities common to the rest of the species.

But in spite of these uncertainties and of differences of

opinion among authorities, which require us to regard this list as subject to revision, there is no room for doubt that such inborn propensities are the very foundation of all our mental life, that they provide the driving forces, the hormic energies, manifested in all our activities from the simplest to the most complex.[1]

The Innate Abilities

When we turn to the problem of defining the native abilities of man our task is more difficult. We are in constant uncertainty as to whether we have to deal with a single ability or a complex of abilities; for all the abilities, developing gradually during the active life of the child, become in various degrees (in many cases in very great degrees) modified and extended. And, while in the animals (especially the lower animals, as we have seen) certain abilities function in close connexion with certain propensities,[2] *such connexions in man are loose and variable, one aspect and condition of his great general plasticity.* Further, as we shall see in later chapters concerned with mental development, new abilities are formed by growth and gradual differentiation of pre-existing abilities; and the new abilities, even when fully differentiated, continue to function as parts of larger systems of which the parent ability remains, in each case, an essential feature. Thus the abilities which enable me to distinguish and recognize Tom, Dick, and Harry, respectively, are specialized differentiations of the ability which first enabled me to distinguish any human being from objects of all other classes.

We cannot, then, in the present state of science, hope to do more than point to some major groups of innate abilities. Such groups of abilities of allied nature may be conveniently spoken of as complex abilities, without implying that each

[1] The problem is discussed in more detail in my *Social Psychology* and my *Outline*.

[2] I remind the reader that such a complex unit of organization, consisting of a propensity 'geared' closely and exclusively with some highly specialized native ability or group of abilities, constitutes an instinct in the strict sense of the word.

such group is a true unity, either in its functioning or in respect of its hereditary transmission. It seems probable that the abilities of each such group, closely allied in nature, are also phylogenetically allied, that is to say, have been differentiated in the course of evolution from some one primitive ability.

We have distinguished, on the one hand, executive or motor abilities, and, on the other, perceptual or (more broadly) cognitive abilities. This distinction is not an absolute one. It may well be that every ability is both cognitive and motor. The simplest motor ability functions under the guidance of sense-impressions, if only those from the motor organs themselves. And every cognitive ability seems to have some natural mode of expression in bodily movement or other bodily changes. But we must recognize that in some abilities the executive or motor aspect, in others the cognitive aspect, greatly predominates.

Among predominantly motor native abilities are those of locomotion, standing, walking, running, those of manipulation, holding, bringing to the mouth ; and, most important of all, the abilities of vocal utterance.

In respect of locomotor abilities, a principal superiority of man is the specialization which enables him to stand, walk and run upright. This extends his range of vision and sets free his fore-limbs for work of finer kinds.

Man's manipulatory ability (or group of abilities) constitutes another very considerable superiority ; especially his ability to oppose thumb and fingers in a nice fashion : for this becomes differentiated through exercise into many finer forms of skill. The reality of the native basis of all manipulatory abilities is brought home to us by the fact of natural right-handedness (closely associated with the special nervous basis of speech in the left side of the brain) and the closely allied fact that a small proportion of men are innately left-handed.

We do not know how far towards perfection the maturation-process, unaided by exercise and learning, would bring these abilities. But that they are native abilities we cannot doubt,

in view of two facts ; first, that in many animal-species the corresponding abilities mature according to the pattern of the species with a minimum of exercise ; secondly, that men show great individual differences in respect of the degrees of excellence attained by these abilities. One man remains clumsy in certain forms of movement, in spite of all training and cultivation ; while another easily excels others and, through cultivation, can attain degrees of skill far beyond the reach of other men.

Of the innate motor abilities the group least generally recognized is the one which subserves articulate speech. Speech is one of the great distinguishing superiorities of the human species, and the basis of many other superiorities.

It is one of the mysteries of nature that the great apes, so similar to man in many respects, are divided from him by their almost complete lack of articulatory abilities. They have larynx, tongue, teeth, and lips not very unlike man's ; but, in spite of the possession of the essential bodily organs of speech, they remain almost dumb, even under the utmost human efforts to cultivate their rudimentary articulatory abilities.

This great difference between men and apes is undoubtedly due in part (though not wholly) to man's inheritance of articulatory abilities more various and effective than those native to the apes. It is true that each human language is a traditional growth developed through long ages and transmitted in the main from generation to generation by social rather than by biological inheritance. But we may infer with confidence that, if a group of young normal children were brought up entirely by dumb adults, the group would develop a rudimentary language of some sort by use of which their native articulatory abilities would become further differentiated and enriched.

Among native cognitive abilities those of the eye and ear are those in which man manifests great superiorities.

Man's appreciation of the finer shades of speech and of the whole range of musical impressions is founded in a complex group of auditory abilities ; a group which has been partially

analysed in the laboratory. The reality and importance of the native basis of these abilities is brought home to us by the great differences between men in respect of ' fineness of ear ', by wide differences in ability to distinguish and recognize the pitch of tones and their various relations. The same is probably true of the differences we find between a naturally good linguist and the man who finds it impossible to speak any foreign language passably well ; and that between a man sensitive to the music of words and one wholly obtuse to it.

Very important among cognitive abilities are those of the topographical group, those concerned in the appreciation of spatial relations of all kinds. We are probably justified in distinguishing three main subgroups of such abilities, those connected (1) with hearing, (2) with the limbs and trunk and skin, and (3) with the eye, respectively. The first sub-group seems to be rudimentary in man ; in this respect he is probably inferior to some animals.

The second sub-group, the avenues to which are the sense-organs of the skin and of the muscles (and connected parts, the tendons and joints) is of high importance and is in functional relations with various motor abilities. In fact in this field the distinction between cognitive and motor abilities can hardly be made.

But in the human species the eyes are the great organs of spatial perception ; and there can be little doubt that the visual topographical abilities of the human species far surpass those of any animals, with the possible exception of certain birds of prey.

This superiority is based in part on the structure of the human retina with its fovea, or central spot of acutest vision ; also on the conjoint use of the two eyes, which gives binocular vision and delicate perception of relations of depth or distance ; and it is closely associated with motor abilities of the eyeballs.

It has been usual to discuss our powers of spatial perception and understanding as though they in some sense were a unitary function. There seems to be no sufficient foundation for such a view. It would seem rather that, in so far as a

human adult becomes able to conceive space abstractly as a whole, this results from a synthesis or integration of a number of native abilities much developed and differentiated through use. Such integration by abstraction of a number of allied abilities to form a higher unitary function is one of the distinctive achievements of the human mind, one by which the superiority of the human adult mind in large measure is built up in the course of individual development. In all such processes of developmental integration the language abilities play a role of the first importance.

The Native Basis of Athletic Excellence.

Let us now ask, in the light of the foregoing considerations—What is the innate basis of facility in acquiring athletic skill? It is clear that, if a man is to become a first class tennis-player or golfer, he must have some native superiority that renders possible the attainment of such excellence. No amount of training could make an ape a fair performer in either game; and no amount of effort and training can make the man of average endowment of this kind into a player of the first rank, no matter how highly endowed in other respects he may be. It would not suffice that he should have normally developed bodily organs and such 'high intelligence' as may enable him to become a fine mathematician or linguist or musician.[1] We may say with some confidence that the athlete of high rank must have inherited locomotor and manipulatory abilities in more than average degree: his athletic excellence, attained relatively easily yet at the cost of much practising, seems to be the expression of a synthesis of these abilities, all greatly enriched and differentiated by training.

If we can say so little of the native basis of athletic ability, it is no wonder that we can say little of the native basis that renders a man capable of great achievement in the higher forms of human activity. All such higher activities are

[1] One of the brightest and most versatile intellectuals of the present day, whom I have known since he was a small boy, has always been, though physically strong and vigorous, markedly clumsy in all his movements.

synthetic functions in which many native abilities, developed and enriched by much exercise, co-operate. But, though it is at present impossible to define such native abilities more nearly, we may feel sure that future research will make progress with this problem.

Native Abilities in the Infant.

It is perhaps worth while to refer to some vague indications of complex cognitive abilities in the young infant. We know that many animals have the native ability to recognize the members of their own species and to distinguish one sex from the other ; and that others have the native ability to recognize the forms of prey specific to their kind (as among the solitary wasps, where each species preys only upon one kind of animal, caterpillars, spiders, grasshoppers or what not). In some such instances the olfactory sense subserves such recognition ; but, in other cases, such recognition depends clearly upon special auditory abilities (as in the case of song-birds), and in others upon special visual abilities (as in the case of birds of small vocal powers but of variegated plumage).

In the mammals the more special native abilities are much obscured by the slow maturation of their youth ; but they are implied by the peculiarities of their instinctive life, especially those that subserve recognition of fellows, of enemies, of prey. In man the facts are still more obscure ; but the behaviour of young infants implies some native abilities that subserve recognition of the human face and voice and their major emotional expressions. It is on the basis of such special native abilities that so many human beings develop their cognitive abilities in these directions to astonishing degrees of discriminative subtlety.

The infant shows evidence of the early differentiation of such abilities. ' Long before the thirtieth week little children distinguish human faces definitely from one another, first the faces of the mother and nurse, then the face of the father, seen less often ; and all three of these from every strange face.' [1] And very early the infant will respond appropriately

[1] From Preyer's famous book on infancy.

to facial and vocal expressions. Thus I have a note to the effect that one of my children, in her fifth week, smiled again and again in response to her mother's smile. Shortly after this she ' often studies her mother's face long and earnestly '. At the end of the third month she responded in distinctive fashion to the voice of her mother at a distance and ' watches faces and people for long periods, especially the little boys playing ; has just begun to watch people on far side of the room '. Early in the fourth month : ' When her mother speaks to her in pitiful tone, J's lower lip twitches and tears come into her eyes. This evening amidst much noise in the nursery, several of us began to whine pitifully, and J, who was happy and smiling, began to cry aloud.' Of another child I have the note at the end of second month : ' first began to smile ' ; and, in third month, ' he now frequently gazes at faces, and smiles when one silently bends over him with smiling face '.

Imagination and Symbolization.

The exercise of the abilities of all animals seems to remain on the perceptual plane ; [1] that is to say, the various abilities are brought into play almost exclusively through impressions made on the sense-organs. Man is distinguished by his much freer use of *imagination* : he can think of a multitude of objects and events with which he has no immediate physical relations, objects and events remote in time and space ; and all such thinking implies the exercise of his cognitive abilities independently of sense-stimulation.

We cannot at present say whether this superiority (which is at the same time a weakness in that it opens the door to many possibilities of error) is wholly a consequence of his possession of more numerous and richer native abilities or implies also some other general peculiarity of his constitution.

Another very obvious superiority of man is his free use of symbols. The use of words as signs of objects is only one special form of such use. In the widest sense, every instance

[1] With partial and doubtful exceptions in the great apes and perhaps other higher mammals.

in which the perception of some part, some aspect, or some quality of an object provokes the reaction appropriate to the object as a whole, every such reaction is an instance of this function, the use of symbols. In this wide sense of the word, animals exhibit this symbolic function in lowly fashion. The cry or the odour of another animal may provoke the reaction appropriate to the approach of the mate, of a fellow-member of the species, of an enemy, or of the natural prey : as when a cat, on hearing the squeak of a mouse behind the wainscot, crouches in tense preparation for a spring ; or the hen nightingale is attracted by the sound of the male bird's song ; or when the dog recognizes his master in the dark by his odour, or by the sound of his voice.

The very free use of symbols by man would thus seem to be a development of this primitive use of symbols, a development rendered possible by his freer use of imagery and by his articulatory abilities ; it does not seem to imply any special native ability.

We may properly raise (though we cannot answer) a similar question in respect of all the higher functions, those in which the human adult displays most clearly his superiority to the highest animals, especially the functions of comparing, of judging, and of reasoning.

The simplest view, and, therefore, the one we should adopt as a working hypothesis, is that all these human superiorities are consequences of a richer endowment of native abilities and, perhaps, of a greater supply of energy and of more effective direction of that energy.

It is no doubt very unsatisfactory to leave our review of this great problem involved in so much uncertainty and vagueness ; but it is better than to deceive ourselves and to cloak our ignorance by the use of words that mean little or nothing, as we do if we postulate a *faculty* corresponding to each distinguishable form of higher function, or speak of one species or individual as differing from another in the possession of a ' higher intelligence '.

CHAPTER VIII

NATURAL MAN AND SOCIAL MAN

WE have reached the conclusion that man has more native abilities than any other species and that these are the main ground of man's higher powers and achievements. It may seem to the reader that this greater wealth of native abilities is a very inadequate basis for the immense superiority of the average man to the highest of the animals. But we must clearly realize that the vast and undeniable superiority normally attained by man is for the most part due to his acquiring, in the process of growing up in a social group, a great part of the traditional skill, knowledge, and wisdom possessed by the group. In other words, the superiority of man is very largely a matter of social, rather than of biological, inheritance.

When the human species had attained such native abilities as made possible enduring social groups and the accumulation of traditional skill, knowledge, and morals, the basis for immense further advance was already present. And there is good reason to believe that the progress of mankind during many centuries (certainly throughout the historic period and probably also throughout a long prehistoric period to be measured in thousands, perhaps hundreds of thousands, of years) has been, predominantly and almost exclusively, a progress in tradition (traditional skill, knowledge, and morals) rather than in native endowment.

Among the highest and most social animals there is but little accumulation of traditions. Each animal lives by applying as best he can the native propensities and abilities proper to his species; he profits little from example and instruction; the experience of his elders and of foregoing

generations is not transmitted to him as accumulated traditional skill and knowledge, save in very slight degree.

The main factor in raising the human species to the new plane of social tradition was the articulatory ability, the native basis of speech: for it is this which renders possible the formation of language, a traditional accumulation which greatly facilitates the formation of many other traditions. What would be the course and the extent of the development of a well-endowed infant growing up apart from all human influences we cannot confidently say: for no such instance has been adequately studied and described. But it seems clear that such a child, though he would soon surpass in many ways the achievements of all animals, would remain, in respect of skill, knowledge, morals and general understanding, extremely limited.

An approximation to such a case was that of Helen Keller, who at the age of nineteen months became completely blind and deaf, and who, except for a few words uttered before this date, remained without language until nearly seven years old. During this period the child constantly enjoyed the companionship of parents and of other children; but their means of communication with her were very limited. Among many features of great interest the following are noteworthy in the present connexion. (1) The child seems to have retained from this period memories which she was later able to put into words. (2) When, about the beginning of her seventh year, instruction in finger-language was begun, she soon grasped the function of names and very quickly learned to use a large number of them. (3) In spite of continued blindness and deafness, the child grew up to be a woman of high intelligence and refined moral sensibilities, revealed in her many literary compositions. The last fact shows clearly that the higher powers of the mind can attain a high development on the basis of tactual and manipulatory abilities, that these abilities can serve as the basis of a system of symbols and meanings hardly, if at all, less rich than is commonly developed from the basis of visual, auditory, and articulatory abilities.

Such a case may incline us to fall back upon the view long current in our Western civilization, the view which has been fostered by the Christian churches; namely that, though the human body is very similar to the bodies of animals, almost every detail of structure and function being closely analogous or homologous with details found in animals, the mind of man is in some way radically different. The philosopher, Descartes, gave new precision and authority to this view, setting up two dogmas: first, that animals are merely machines; secondly, that man is a similar machine to which wonderful mental powers are joined in some utterly incomprehensible fashion. Our Western science, although it has accepted the doctrine of the continuity of organic evolution (including the evolution of the human species), has suffered and still suffers from the influence of the Cartesian dogmas. Accepting the proposition that the animal body is a machine (a mechanical system) it has struggled and still struggles vainly to reconcile this dogma with the obvious fact that man is more than a machine, a thinking reasoning being, one capable of choice and volition, of guiding his actions and choosing his means towards his desired goals, and even of choosing between incompatible goals.

One desperate expedient, still popular in our academies, is to extend the machine-theory to man, to turn a blind eye upon all the evidences of purposive intelligent control of our bodily processes, and to set 'consciousness' outside the pale of science as a mysterious and useless by-product of the body's functioning. And those who cannot stomach this preposterous doctrine have continued in the main to accept in one form or another the second Cartesian dogma; namely, that man's superiority to the animals is due to the endowment of the human species with powers of an order radically different from any possessed by animals.

In this matter the East has been wiser than the West. The Eastern sages, especially those of India, have always taught that the animals are our little brothers; their true insight has been untroubled by the dogmas of mechanistic science and by those of Christian theology, dogmas which,

though in constant conflict, have worked together to exaggerate the gulf between human and animal nature.

It is difficult, but of the first importance, to realize in how great a degree the development of each man's higher nature is a process of absorption of traditional skill, knowledge and morality. The fact is brought home to us most readily by considering the part played by language in the development of each one of us. Every word the child learns to understand and use is the product of a long course of social evolution and embodies, as it were, a vast amount of human experience. Nouns, the names of things, lead the child to distinguish within the flux of sense-impressions certain patterns that become the signs or symbols of enduring things, things which the experience of the race has shown to be of lasting interest to man. Class names lead him to discover the essential similarities between things of any one class and the differences between things of allied classes. Verbs lead him to recognize the accepted types of action and process. Adjectives and adverbs help him to single out the abstract qualities of things and processes. Prepositions establish for him the conventionally recognized relations of time and space, of sequence and causality, of togetherness and separation. By these artificial aids his observation and interpretation of the world about him is immensely facilitated and enriched. And then conjunctions of words in sentences impart to him a vast amount of knowledge which his own unaided observation could never attain.

Further, words, having selected for him various aspects and qualities of things and events of which they are the conventional symbols, greatly facilitate judgement, rendering judgement explicit and fixing its results in memory as established propositions. Thus they render possible reasoning, which is essentially a complex process of achieving judgement by the aid of established propositions.

Thus the intellectual superiority of man consists very largely in his use of a developed language as an aid to such powers of thinking as he possesses. Language is a highly

complex tool, invented and elaborated through a multitude of steps, by thousands of generations of human effort, a tool which the child slowly learns to use with increasing skill. The intellectual superiority of the man who uses a developed language is comparable to the superiority in warfare of the man who uses with skill and knowledge a finely tempered steel sword, a machine-gun or an aeroplane. A man so armed is vastly superior in combat to a primitive savage. But his superiority is not part of his native endowment ; it depends upon his use of a slowly evolved tool and upon his acquisition under social guidance of the skill and knowledge necessary for the effective use of the tool. Add to these advantages of the individual those that accrue from the traditional knowledge of military science and organization, and we have a sufficient explanation of the fact that a very small army equipped with all the resources of modern civilization can overcome a vast horde of primitive warriors.

The same is true of the moral superiority of civilized man, his self-control and consistent pursuit of worthy goals or ideals. Here again the individual displays a superiority which in the main is something he acquires by assimilating the slowly evolved social tradition. His superiority, if in any degree intrinsic or native, consists mainly in the possession of such native abilities as facilitate the assimilation, again a process in which language plays a role of vast importance.

No wonder, then, that the study of language and languages has long been the chief part of traditional education ; that such study has long been held to be the main road to culture ; that, until recent years, the schools of Europe required every boy who aspired to be a man of culture to devote himself for many years almost wholly to the study of languages ! For language is the chief instrument for both the intellectual and the moral development of the individual, the principal means by aid of which he participates in the traditions of the race.

There seems to be no sufficient ground for assuming that, in respect of the propensities that form the native basis of character, the average man is greatly superior to the well-

bred dog of good disposition. What renders him capable of attaining the level of morality that we regard as distinctively human is the superiority of intellectual equipment that enables him to assimilate the moral tradition of his society. The best of men is not born with a conscience or a character ready-made as an organ or faculty of the moral life. The development in the individual of conscience and character is a long and delicate process, the elucidation of which is one of the chief tasks of the psychologist. It would seem probable that, apart from the influence of society in moulding the characters of its members, the behaviour of all men would be as crude, as ruthlessly self-seeking, as unrestrained by any moral considerations, as the behaviour of most other mammals.

If we try to depict the behaviour of natural man, of men and women growing up in groups which in some way had been cut off completely from all their traditions, we shall have the picture of gregarious mammals living in small family groups. Each group would be ruled by a polygamous male, the husband of several wives and father of many children. Some co-operation between the parents in the care of the offspring would be, as with other mammals, the only respect in which such natural men would display the rudiments of morality. They would no doubt show, as compared with the highest animals, a greater flexibility of behaviour in striving for their natural goals ; a wider range of anticipations of coming events ; more tenacious memory ; and a greater power of planning a course of action in accordance with memory of past events and with anticipations of the probable results of each step of action ; and their actions would more frequently be directed towards goals remote in space and time.

CHAPTER IX

THE MIND IN ACTION

WE have attempted to define the native basis of the mind. We have seen that it is a complex organization comprising a great number of functional units which mature spontaneously, just as muscles and glands and other tissues of the body mature. Maturation of any organ or tissue, if it is to proceed in normal fashion, requires the normal environment of other tissues, and also a normal environment of the whole organism : for the organism is a whole of which every part is subject in some degree to influence from every other part ; and the processes of maturation are processes of active growth, with much give-and-take between the various parts and between the organism and its environment. But though the maturation-processes are in large measure dependent upon environmental conditions, those conditions may depart widely from the normal, and yet maturation may result in an organism which, in respect of all its organs and their relations to one another, conforms closely to a prescribed pattern, the pattern of the species.

Thus all of the hundreds of muscles of the human body (some 500 are commonly distinguished) spontaneously take shape in their proper positions and acquire their proper attachments to the bones ; so that in every human being (with very few exceptions recognized as gross abnormalities) maturation of the muscles results in a muscular system which differs from that of any other man only in trivial details. Nevertheless, if maturation is to proceed normally, some exercise of the muscles is required ; and special exercise of one muscle, or of one group of muscles, may result in its excessive development.

If we regard the system of innate propensities and abilities as the muscles of the mind, we must recognize that although, like the muscular system of the body, the system is natively given and matures naturally in virtue of the momentum of heredity, it also is subject to modification through exercise, and in a higher degree than the muscles of the body. It is as though any one muscle could be, not only developed to unusual size and strength, but also differentiated into a number of partially independent muscles that acquire new attachments and new functions, according to the forms of exercise induced by the influences of the environment.

In other words, in the muscular system of the body, structure (natively prescribed) determines within narrow limits the form and function of each muscle (a normal degree of exercise and supply of nutriment being given); whereas, in the growing organization of the mind, these limits are very much wider, and to a very great extent the modes of functioning determine the course of the development of structure. This plasticity of the native organization of the mind is greatest in early life and progressively diminishes; for every unit of structure, in proportion as it becomes adapted by exercise for specialized functioning, becomes less plastic, less capable of acquiring other modes of functioning, and, perhaps, less capable of differentiating or of budding off new functional units. Hence, in spite of its very great plasticity, our mental organization, as it progresses, becomes set along the lines prescribed by its modes of functioning; and, if we live long enough, exploiting all our reserves of plasticity, we approach a condition in which those reserves of potentiality are exhausted.

Thus all mental activity is or involves mental growth, depends upon plasticity, and results in a differentiation of organization. We cannot properly separate growth from activity: for, in the mental organization, even the maturation-processes are greatly modified by the activities. Yet we must recognize great differences in respect of the degree to which the plastic function is involved in various activities. At one end of the scale are the routine processes; in these

we repeat, with but slight variations, the modes of activity that are expressions of well-established structure: as when the expert typist copies a piece of printing made up of familiar words in sentences of familiar form; or as when we sing a familiar song or play on the piano a well-practised piece. At the other end of the scale are activities of the kind involved in solving a puzzle, or in acquiring an art such as type-writing or algebraic calculation.

In the activities of the routine type, plasticity, adaptation, growth, development are at a minimum. It is in activities of the second kind that we are most truly active, that the peculiarities of mental activity are most fully and characteristically displayed. The whole process of development, in so far as successful, is creative; it creates new ability or, at least, extends abilities already possessed; it enriches and differentiates in some degree, however slight, such parts of the mind's organization as enter into the activity.

Automatic Activities.

In extreme types of routine activity when we repeat, under conditions as nearly as possible unchanged, something that we have often done before with a facility that leaves nothing to be desired, the process becomes quasi-mechanical or, as we say, automatic; it runs of itself, we need to make no effort and to pay little attention; and afterwards we can recollect the process but vaguely, if at all. It seems to be in this sort of way that a typically and completely instinctive action is performed, as when, for example, the mud-wasp lays her pellet of mud on the growing edge of the nest.

Yet it is a mistake (and a common one) to regard such actions as purely mechanical events; in several respects they are of the distinctively mental type.

First, the movements are guided by perceptual activities that imply cognitive abilities of greater or less complexity and involve the synthesis of many sense-impressions and relations between them; as, for example, in playing a familiar air on the piano, our movements are guided by perception of the tones and their relations.

Secondly, the element of plastic adaptation is perhaps never quite lacking. The sequences of words which the typist copies and the movements by means of which he copies them are not exactly the same on successive occasions; the least change of position of the paper, of the machine, of his head, body or limbs, requires corresponding adaptations of the process. And, in a similar way, the wasp spreading her pellet of mud does not find on any two occasions exactly the same conditions; there are slight differences to which she adapts her actions.

Thirdly, let there arise some disturbance of the usual circumstances of the routine performance, and the adaptive plastic power is called further into play; the action is at once raised higher in the scale between purely automatic and distinctly creative action. Thus the wasp building the cell adapts her actions to such disturbances as the hole made in the cell-wall; and the typist, coming upon some unfamiliar word or sentence-construction, perceives it attentively and effects the unfamiliar movement-combinations.

Fourthly, the routine activity is an expression of some propensity in action; all the successive perceptions and movements are parts of one train of activity sustained by a tendency directed to some particular end or goal; the wasp's actions by the tendency to complete the cell; the typist's by the tendency to show his skill, to earn his daily bread, or to do a service to another. In each case the agent is trying to achieve a result, striving towards a goal.

Fifthly, in routine activities that proceed smoothly we have little sense of effort, little sense of striving, of trying, of endeavouring; but the least hitch in the process brings this aspect into prominence.

Creative Striving.

It is when we confront a serious difficulty in working towards a strongly desired goal that the striving aspect becomes most accentuated. We may be trying to score in the football-field by making a long run at the utmost speed; we may be trying to recognize some natural-history specimen

by examining it intently ; we may be trying to solve a chess problem, imagining the various moves that will achieve checkmate ; we may be sitting perfectly still in profound thought, trying to find the answer to some problem in mathematics, or economics, or morals, or in any other field of intelligent endeavour. Whether we progress steadily in a straight course, or dodge to and fro, trying now this way, and now that, there is one feature common to all such experiences, namely, we are trying hard, exerting our powers of striving.

Although our modes of striving are so various, ranging from intense bodily activity to intellectual activity that involves a minimum of bodily expression, we find the same words suitable for describing this striving aspect common to all such activities. We say we are trying, striving, endeavouring, paying keen attention, making an effort, working hard, doing our utmost, exerting ourselves, concentrating all our energies : in technical terms, we are manifesting *conation.* When we are suddenly incited to effort, when some tendency is suddenly brought into play, we feel, we say, an *impulse* to do this or that. And, if we find it impossible to take appropriate action, we nevertheless experience the working of the tendency as what we call *desire* ; we contemplate the goal towards which we are impelled, the object towards which the tendency sets, and, in contemplating it, we are aware of the tendency towards it. These experiences of striving, of impulse, of desire, are experiences of activity common to, and indicative of, the strong working of all tendencies.

So long as the tendency is manifested in bodily activity, in overt striving, this peculiar aspect of experience is merged intimately with other aspects and does not stand out prominently. It is when for any reason we are compelled to postpone or suspend action that the aroused tendency asserts itself most clearly in consciousness. In such cases we use a number of words to express it ; we say we long, or crave, or wish for, or have an appetite for, or an inclination, or urge, or impulse towards, that goal towards which we tend.

Thus common speech indicates that in all such activities,

outwardly so unlike as many of them are, there is a core of sameness. This core of sameness, this mode of experience common to all forms of effort, of intense striving, common to the working of all tendencies, is conveniently designated '*conative exxperience*' (from the Latin word *conatus*, meaning an effort, a striving towards a goal).

And the whole train of activity making for the goal is called *a conation*. We may say that any one of our propensities, when it is brought into play, normally generates a conation, a striving, an active felt tendency. The distinction between the propensity (or latent tendency) and the active tendency, striving, or conation, is analogous to that between potential and free or active energy in chemistry and physics.

Unfortunately it would not be true to say that this terminology is used by all psychologists: for many do not admit the distinctive nature of such conative experience, and some fail altogether to recognize striving or conation as a fundamental aspect of mental process. The Germans have long used the word *Trieb* to denote what we are calling an impulse, a striving, a conation, an active tendency. Of late years the word 'drive' has been widely used as an almost exact translation of the German word *Trieb*. But the words *Trieb* and 'drive' denote also latent tendency or propensity; and it is highly desirable that our terminology should distinguish between the latent and the active tendency. Yet, this is a minor disqualification. The main thing is that, whatever words or names we use, we should frankly recognize the true nature of the process or activity implied by all these nearly synonymous words; namely, a tendency making towards a goal, a purposive striving. The usage here adopted, after much consideration of this problem in terminology, is as follows:

A *propensity* is a disposition, a functional unit of the mind's total organization, and it is one which, when it is excited, generates an active *tendency*, a *striving*, an *impulse*, or *drive* towards some goal; such a tendency working consciously towards a foreseen goal is a *desire*; but, as we shall see in later chapters, there is abundant evidence that mental

activity often goes on outside the field of consciousness, or below the level of consciousness, subconsciously; such subconscious activity none the less manifests indirectly its essential similarity to conscious activity, especially in this—that it is a goal-seeking activity.

Each propensity, then, generates, when it is stirred, stimulated, aroused, or excited, an active tendency which may operate at any level in the scale of consciousness or awareness, from the most acutely self-conscious level to one of which the most skilled and the most willing efforts of introspection, or of retrospection, fail to render any account. Let us now take note of other marks or peculiarities of striving.

Conative Persistence and Unity

The activities directed to any one goal, sustained by one conation, form a train or succession that hangs together; that is to say, they form a natural unity or have, as we say, *conative unity*.

If, while you are writing out a telegram, some one asks you some simple question, requiring a plain yes or no, you may reply with very little interruption of your writing. If you have clearly formulated the words for your telegram, your hand may continue its movements without disturbance; though your mind is momentarily occupied in taking in the meaning of the question and forming the appropriate reply. If you are called to the telephone, the interruption is more serious; yet, as soon as you have answered the call, you naturally revert to the completion of your telegram. Longer tasks, such as writing a letter, an article, or a book, are liable to many interruptions, voluntary or involuntary. And in all such cases we are apt to return to the uncompleted task and to take up the activity anew at the point at which it was dropped.

These instances illustrate a very fundamental law of striving; namely, a tendency once set in action towards a goal has a certain persistence and power of asserting itself over against all distractions, until its goal is reached. We see this law of striving clearly manifested in animal behaviour.

The wasp persists with the building and storing of her clay-cell until the task is accomplished; as we have seen, if her work is interrupted by darkness, she resumes it in the morning; and if it is interrupted by the naturalist (destroying part of her construction) she repairs the damage and resumes the building-process. In a similar way the racoon, engaged in opening the long series of latches to her food-box, is often interrupted by some unusual sound; she pauses, looks round alertly for a moment, and resumes her task.

The migrating bird may continue his flight towards his distant goal for many hours and even days; though, in many cases, the flight is interrupted by frequent pauses for rest and feeding. But, though animal behaviour illustrates this law of conative unity and persistence, animals in general are very much inferior in this respect to men; and in the child we see a steady progress from the state in which, as with the animal, the tendency or striving can bridge only a slight gap, up to that of the resolute man who seldom fails to finish any task to which he has set his hand, no matter how violent and prolonged the interruptions that occur.

Such reversion to the unfinished task implies that the tendency continues to be in some sense active within us even while we are diverted from the task and are thinking of other matters. And this subconscious working of an unsatisfied striving is evidenced in many other ways. Subjectively it may manifest itself as a mere uneasiness or restlessness or dissatisfaction; we feel obscurely that something is lacking, that we want something undefined. Many of us have this experience when we have been interrupted in some task and have not reverted to it and completed it.

A common occasion of such experience is the forgetting of some simple errand. For example, I go from my study to another room in order to fetch a certain book. Before I have found the book, I am diverted from my aim by conversation; and I return without the book, but with an uneasy feeling. In the light of previous experiences of the same kind, I interpret this feeling as a sign that I have left undone something I had set out to do; it seems to be due to

the continued obscure working within me of the unsatisfied tendency.

Again, you may strive in vain to recall a forgotten name; you desist from the effort and proceed with some other task with a slight uneasy feeling. After an interval of minutes, more rarely of hours, the forgotten name pops up into consciousness apropos of nothing, and you recognize it at once as the name you had vainly striven to recall: the tendency has continued to work subconsciously.

This great fact of conative persistence has recently been brought under experimental investigation. Laboratory psychology, since it tends to develop its own technical terminology, has preferred to describe the facts under the head of *perseveration* or *secondary function*. Among other things, it has been shown that a train of action which has been broken off before completion is remembered more readily and completely than one which has attained its goal: as it is also more apt to recur to mind spontaneously.

But hypnotic suggestion is the great method for experimental study of subconscious striving; and it is in abnormal conditions that conative persistence manifests itself most strikingly. It is not too much to say that by far the greater part of all the bizarre and perplexing phenomena of functional disorders (especially those classed as symptoms of the *psycho-neuroses*) are manifestations of conative persistence. We shall, therefore, discuss this topic in special chapters after reviewing the principles of striving as revealed in normal life.

Here let us notice that animal behaviour illustrates conative persistence, not only in the steady drive of the animal towards its natural goal (as in the wasp continuing all day at her task of cell-building, the racoon working steadily upon the train of latches on his food-box, the dog making steadily for his home) but also in the evidences of a continuing restlessness when some natural tendency has been aroused and circumstances have prevented the working out of the striving to its goal; as when your dog, seeing from a window a friend or an enemy go by, runs to the door and, finding it closed,

wanders to and fro in agitation, only gradually settling down again to a state of calm. Our daily experience affords a multitude of illustrations of the same principle; as when the delivery of a telegram to some member of the household arouses an impulse of curiosity which, out of politeness, we hold in check: we try to dismiss the matter from mind, but, in spite of our good intention, the impulse continues to be active and disturbs us at our work; until perhaps at last we get up, saying—'I must find out what that was'!

Law of Satisfaction and Dissatisfaction

Any tendency towards a goal having been aroused, the striving process reaches a natural termination when, and only when, that goal is attained. Such attainment is accompanied by a feeling of satisfaction, the sort of pleasant feeling we express by saying—'Well, that's done!' And, while we strive successfully towards our goal, we experience something of this feeling, especially at moments when we become aware that we have made a definite step of progress. On the other hand, so long as we are making no progress, we have an unpleasant feeling, one of unease, of strain, of dissatisfaction or displeasure; a feeling that grows stronger when we encounter some special difficulty checking our progress, and waxes to a maximum if we are finally checked and have to desist from our unfinished task, owning our inability to accomplish it.

These *feelings* are strong in proportion as the striving is strong or intense. In the trivial routine tasks of daily life they are so slight as to be scarcely noticeable; yet, if we are interested in noting them, they may be observed. A failure to find in my pocket the pencil I am seeking, or a futile effort to remember a name or an address, is faintly unpleasant, is attended by some slight displeasure; and success is pleasant or attended by a faint pleasure or satisfaction; and the stronger my desire and effort to find the lost object or recall the forgotten fact, the more intense are the resultant feelings. If the lost object or forgotten detail is of major importance, if our desire for any goal is very strong, our striving very

vigorous, the attendant feelings are proportionally intense, and we describe them as intense pleasure or satisfaction or as acute distress or pain or even agony.[1]

A general objection lies against the word *pleasure* as well as against the word *pain* and all nouns proposed as substitutes, such as unpleasure, displeasure, etc.; namely, any noun so used favours a natural weakness of our minds which consists in thinking about abstractions, such as qualities and relations, as though they were independent entities. Fallacious thinking of this sort (such reification of the pleasant and unpleasant feeling qualities of experience) underlies the ancient doctrine of *psychological hedonism* which obstinately teaches, in plain opposition to a multitude of facts, that there are two motives only of all activity, the desire to obtain pleasure and the desire to avoid pain.

The Strength of Propensities and the Intensity of Striving

There can be no doubt that each propensity can be evoked in very different degrees, generating strivings or desires of corresponding degrees of intensity, ranging from one so slight as to fail to issue in any overt action or any marked disturbance of the course of mental life, to intense activity of the whole organism.

It is equally clear that some of the native propensities can generate more intense conations (stronger impulses, drives, tendencies, urges, strivings, desires) than others; that is to say, the upper limit of intensity is widely different for the several propensities.

[1] The traditional terminology uses the words *pleasure* and *pain* to denote these modes of feeling. The word pain is ambiguous; for it is used also to denote a class of sensations or sensory qualities, those of the kind excited by violent stimulation of many tissues and also by stimulation of certain special sense-organs in the skin. The Germans have the word *Stich-empfindung* for this sensory-quality or group of allied qualities. And their word *Schmerz* (which so happily rhymes with Herz) has the same twofold meaning as our word *pain*. In spite of this twofold meaning of the word *pain*, popular speech recognizes the important difference between the two meanings by aid of the terms 'physical pain' and 'mental pain'.

When it is said of any propensity that it is very strong or powerful, the statement refers to the upper limit of intensity of striving. It is roughly true that in this sense the propensities of hunger or food-seeking, of sex or mating, of fear or escape, of anger or combat, are very strong; while the propensities to examine and explore the unfamiliar, to seek company, to submit and follow a leader, are relatively weak. It is sometimes claimed for this or that propensity of animals that it is the most powerful of all; the claim to such pre-eminence is perhaps best founded in the case of the food-seeking propensity.

How do we measure and compare the strengths of propensities and the intensities of conations? The laboratories have only very recently begun to devise methods for effecting such measurements; at present we have to rely in the main upon very inexact methods.[1]

In comparing propensities in respect of the maximum strength of their tendencies, the accepted criterion is that of prepotency. When, for example, we see very timid animals, such as deer or birds, come during a hard winter to seek food in situations which at other times would provoke them to strong efforts to escape, we infer that the former tendency is prepotent over the latter. And when we hear that shipwrecked men have slain and eaten one of their number under the stress of hunger, we have similar evidence of the great strength of this tendency in the human species when evoked in maximal degree. In such a case we have to do with a conflict of tendencies in which one may seem so greatly prepotent as not only to override opposed tendencies, but also to prevent the evocation of tendencies from other pro-

[1] Cf. the recently published *The Measurement of Animal Drives*, by C. J. Warden, N.Y., 1930. In this book Professor Warden describes a method by aid of which it seems possible to effect fairly trustworthy comparative measures of the strength of various 'drives' of the white rat, thus bringing the study of striving within the scope of science narrowly defined as measurement. One conclusion of no little interest is that in the female rat the maternal 'drive' is the strongest of all those experimentally measured and compared, including hunger, thirst and sex.

pensities by situations which (but for this inhibiting dominance of the prepotent tendency) would surely evoke them; as when a fire in a theatre excites a panic, and the fear-impulse, evoked in maximal degree, renders men blind and deaf to appeals for aid from women and children.

In general we estimate the strength of a propensity by the intensity of the striving it generates under the most favourable circumstances. We are directly aware of the greater or less intensity of our own striving; if we pay any attention to the question, we know immediately whether we desire feebly or intensely, whether we are very keen to obtain or attain, or are but languidly interested. Such immediate judgements of intensity are vague and sometimes at fault.

Less directly we judge of the intensity of a conation in ourselves by noting the degree to which it dominates the course of our thinking. If our thinking dwells insistently upon some one kind of goal, if it recurs to it spontaneously again and again, if we find it difficult to dismiss that object from our minds, we rightly judge that we are keenly interested, that a strong tendency is at work in us. And we involuntarily reveal objectively in our actions and conversation the working of any strong tendency. Thus, if we are in love, our thinking reverts frequently to the object; we cannot easily keep it out of our conversation; and, in the presence of the object, our attention is riveted upon it. In a similar way, when we are very hungry, we think and even dream about food. A polar explorer has well described this effect of a persistent intense conation: 'The effect of this hunger upon the waking mind is to concentrate the thoughts upon every variety of savoury food that the individual has known. Its effect in sleep is to lead to a succession of food dreams which carry the dreamer from one paradise of the gourmand to another, until he awakes to find the craving for food; he thinks food, dreams food. Jealous eyes watch every crumb of the ration which falls to the floor.' [1]

Degrees of intensity of striving are objectively expressed

[1] Major R. E. Priestly, *The Psychology of Exploration* 'Psyche,' vol. ii, 1921.

also in the facial play and the general tension and alertness of the body: when striving is intense, the facial and bodily attitudes and movements clearly reveal a general excitement; movements, even though restrained, are alert and vigorous; and, even though no movements be made, some or all of the muscles are in a state of tension, and visceral organs, especially heart and lungs, work in appropriately modified fashion. When, on the other hand, striving is feeble, the muscular system is relaxed, face and body express listlessness. A feeble tendency may need to be re-inforced by voluntary effort before it can overcome our natural inertia; whereas, when any propensity is strongly evoked, voluntary effort is required only to control and direct our spontaneous activity, to avoid futile and rash action, and to choose the most effective means and lines of action towards the desired goal.

Such general excitement (such suffusion of the whole organism with free energy) resulting from evocation of some propensity in full strength, is even more obvious in the animals than in ourselves; for in them its expressions are not kept in check by any effort of self-control, as they so often are in ourselves. Even the highly disciplined dog will clearly show his excitement, though his master's command may inhibit the full natural expression of his impulse, his impulse to attack, to pursue, to seize his food, to seek his mate.

The strength of a propensity (as measured by the intensity of the strivings it engenders) is not a fixed quantity. The various propensities mature slowly, reach their maximum strength in the young adult, and then slowly decline; until in the very old all striving becomes feeble as desires die away. The aged man ceases to look towards the future and awaits death in passionless reminiscence. Although this seems to be true of all our propensities, it is most obvious in the case of the sex or mating propensity, which matures late and dies away relatively early. Physiology is beginning to throw some light upon this and many other allied facts, especially in its discovery of chemical factors, hormones, or internal secretions of various glands, which profoundly

influence the nervous system. The psychologist welcomes whatever increase of understanding may come from this and other allied sciences. But, though for the medical psychologist the knowledge of such factors is of high importance, psychology is primarily concerned to formulate the laws of striving as manifested directly in the experience of each one of us and indirectly in bodily behaviour. I shall therefore say little of these chemical and other influences of various bodily organs; yet, in respect of the working of our tendencies, their importance is so great that we must not neglect to take notice of them.

These bodily influences are clearly of importance, not only in the general maturing and waning of our propensities that make the great trajectory of life; but also in minor cycles. In many of the animals certain of the tendencies wax and wane in annual cycles. This is eminently true of the sex-tendency of almost all species, and also of the migration-tendency of many. But the tendency which waxes and wanes most generally, in short perpetually recurrent cycles, is the food-seeking tendency; and it is in this case that the chemical factor is most obviously of prime importance. During a short period without food, the continuing metabolism of the body brings about a chemical condition under which the food-seeking tendency is readily and strongly evoked by the sight or odour of food. A good meal quickly alters this condition, and renders us indifferent to food; until after some hours the same condition gradually returns and we are again ready to desire food at the slightest provocation of the senses. But more than this—in the state of hunger the desire for food may arise in us and become strong apart from the perception of food. And the same is true of the animals: although we cannot safely ascribe to them *desire* in the full sense of the word (for that implies an explicit thinking of food) we can say that, in the hungry animal, the hunger-impulse stirs spontaneously within him and drives him abroad in search of food.

When a propensity generates a striving in some such cyclic fashion independently of external sense-impressions,

we speak of the conation as an *appetite*, extending this name from its common usage (denoting the spontaneously arising impulse to seek food) to all such strivings. In the spring and autumn many birds manifest an appetite for migratory flight ; and in many species the mating propensity generates an appetite, that is to say a strong urge to mating which, at the appropriate season of the year, arises without assignable external provocation.

An Illustration of Appetite

As an illustration of the working of the mating-appetite, I cite from a recent article a description of the behaviour of male seals in the breeding season.[1] ' During a great part of the year these seals lead a pelagic existence, their attention given over to the capture of fish. Sexual activities at sea are impossible. . . . In May and early June the males of the Alaskan fur seal arrive at the Pribyloff Islands, where each individual takes up a position on the breeding grounds and fiercely defends it against his rivals, there to await the coming of the females. About the middle of June the females begin to appear. As they land they distribute themselves among the males. . . . The *entire energy* of the breeding adult males during their stay on land, from early May until about the 10th of August, is given over to the sexual function in its two aspects of battling with other males and impregnating the females. . . . Throughout this breeding season of three months or more the digestive function of the males is wholly suspended, and sleep is almost eliminated. . . . All the bulls, from the very first, that have been able to hold their positions, have not left them from the moment of their landing for a single instant, night or day ; nor will they do so until the end of the rutting season. . . . Of necessity, therefore, this causes them to fast, to abstain entirely from food of any kind, or water, for three months at least ; and a few of them actually stay out four months, in total abstinence, before going back into the water for the first time after

[1] ' Primate Basis of Human Sexual Behaviour,' by G. S. Miller, *Quarterly Review of Biology*, December, 1931.

" hauling-up " in May ; they then return as so many bony shadows of what they were only a few months anteriorly ; covered with wounds, abject and spiritless, they laboriously crawl back to the sea. . . . Such physical endurance is remarkable enough alone ; but it is simply wonderful, when we come to associate this fasting with the unceasing activity, restlessness, and duty devolved upon the bulls as the heads of large families. They do not stagnate like hibernating bears in caves ; there is not one torpid breath drawn by them in the whole period of their fast.'

This surely is a striking picture of the dominance of one overpowering appetite rooted in one propensity whose operation is essential to the survival of the race. Whereas, in most animals, even the sex-appetite is postponed to the food-appetite when the latter is evoked in the highest degree, in these seals the sex-appetite predominates completely during its season, and, as the author says, the animal's *entire energy* is directed into the channel of sex activity, the mating propensity being supported by the pugnacious or anger propensity. There are psychologists who persist in asserting that all sex-behaviour is the working of a few mechanical reflexes, while others explain it as a seeking for the sensations of pleasant quality assumed to result from the stimulation of ' erogenous zones '. Still others assume that the last and all-sufficient word on sex has been said when it has been pointed out that some internal secretion plays a part in the generation of the appetite. If these principles, separately or in combination, may seem adequate to explain the tepid sex episodes of some men, they are surely inadequate to the monstrous appetite of the male fur seal, an appetite which, during some three months, continuously dominates him, deprives him of all rest and sleep, and keeps him alert and active, to the exclusion of all other propensities (including hunger itself), which impels him to the breeding islands some weeks *before* there is a female on or near them, covers him with wounds and scars, and reduces him to a mere bag of bones that hardly retains sufficient reserves of energy to crawl back into the sea.

Concentration

When any strong propensity is brought fully into play, striving is intense ; not only does the organism put out much energy in the pursuit of its goal, but also the whole organism seems to be in some sense involved, its energies seem to be *concentrated* in this one line of activity ; it seems to be indifferent to all other appeals, to everything that is irrelevant to its pursuit. When my dog, ordinarily obedient to my call, hits the trail of a rabbit, he becomes blind and deaf to me ; at least, my calls and gestures have no perceptible effect in restraining or diverting him from his intense concentrated activity. When timid birds are fighting or courting, you may often approach them closely without alarming them. When the cat is stealing upon his prey, he is not easily diverted or driven away. Under the strong impulsion of the fear-tendency, men, striving with utmost energy to escape the burning theatre or the sinking ship, may be so dominated by the one strong urge that all the rest of their nature seems as though for the time being in abeyance. The mother, seeing her child in danger, can think of nothing else, can only strive to save it at any cost. The male seal fasts for three months during the mating season.

It may be stated as a general law that the more intense is any particular striving, the more does it dominate the whole organism to the exclusion of all other forms of activity. We have illustrated this from the realm of simple strivings springing directly from the native propensities. But the same is true of our more complex activities, those springing from more complex and highly organized sources. The athlete, striving for victory in the sprint-race, is, for those few seconds, as blind and deaf to all irrelevant appeals as the hunting dog ; the chess-player, deeply absorbed in his problem, may not hear a knock on the door or the irrelevant question addressed to him ; Archimedes sat concentrated on his geometrical problem while the city was stormed and captured by the enemy.

Concentration, then, means exclusiveness of the activity

directed to some one goal. It seems to mean literally concentration of the active energies of the brain in those channels concerned in the striving, and to mean also a consequent draining 'dry' of all other channels. In all such concentration we see manifested in its highest form a peculiar function of living things, namely, the function of raising energy to higher levels of potentiality or efficiency, in opposition to the degradation of energy that characterizes the processes of the inorganic world.

It is often said loosely that we can think of only one thing at once. It is not true. We can think of many things at once, so long as they all are relevant to, are connected with, our dominant activity. The true statement is that we can strive whole-heartedly only for one object, towards one goal, at one time. And the more intense the striving, the wider is the range or span of the mind, the more relevant details, the more objects and relations, can it grasp and deal with, make use of as means to its goal. The keenly interested general, or football-captain, or chess-player, surveys the field and takes in at a glance, not merely this piece and that, but rather the whole situation comprising both his own and the many pieces of his adversary and the whole complex system of relations between them. At the same time he is blind to all irrelevant objects, aspects, and relations; his mind is closed to other appeals; he is oblivious of the beauty of the sunset, of the suffering of the wounded, of his own danger, pain, hunger, and fatigue.

Such conative unity and continuity, such bringing of the available energies of the mind into one stream, broad and deep and strong in proportion as striving is intense, is achieved in the highest degree by the mind which is highly developed and integrated, that is to say, richly differentiated and harmoniously organized. All sound training, and all self-discipline, promote such organization and such effective concentration of energy directed in one broad stream towards its goal. But in some degree concentration characterizes all mental activity.

Both in common speech and in psychology, these facts of

concentrated activity are commonly called facts of *attention*. We speak of degrees of attention, of slight, keen, or sustained or concentrated attention. And this is good usage so long as we do not make of attention an independent agency or faculty. To say that you attend, that you are keenly or feebly attentive, that you pay attention, that your attention is more or less concentrated on the task in hand; all these are innocent and appropriate expressions. But if you allow yourself to say that attention does this or that or the other, then you are guilty of misusing an abstraction, in the way which poets alone are licensed to follow. It is very well for them to tell us that 'hope spurs us on', that 'pity sheds a tear', that 'suspicion frowns', or that 'attention furrowed his brows'. But in science we must try to be more concrete, more discriminating and more exact. Attention is the last of the 'faculties', 'left blooming alone'; disconsolate survivor of the obsolete system of abstractions known as 'the faculty psychology'.

Co-operation of Tendencies

In the lower ranges of life the rule seems to be that the striving of each moment springs from some one propensity. But in the higher animals we may see evidences of the conjoint operation and reciprocal modification of impulses springing from different propensities. Thus the mother-carnivore, while seizing and devouring her prey, is mindful of her young and shares her booty with them; the mother-hen, scratching for food, calls her chicks as she scratches the earth. In man, as he becomes able to grasp various aspects of a situation and various probable consequences of his actions, such possibilities of co-operation are more fully realized. His higher mental development opens the door to a wide range of co-operations of tendencies and also to many conflicts.

Tendencies springing from different propensities, if they set towards and find their satisfaction in a common goal, merge into one striving or conation which derives its energy from these several sources; such striving is proportionately intense and sustained. Thus a man's efforts to attain success

in the practice of his profession may be sustained by tendencies springing from several propensities; at one moment one of these, at another some tendency of a very different source, playing the predominant part. The medical man confronted by a patient suffering acute pain is motivated by the compassionate desire to relieve the sufferer; but this is only one of the several tendencies, the several *motives*, that constantly co-operate in various degrees to keep him energetic, alert, careful and considerate in the practice of his art. He desires also to distinguish himself, to be known as a skilful and trustworthy practitioner to whom his fellows will look with confidence and admiration; he desires to advance medical science; he desires to secure for himself the comforts and luxuries of civilized existence; he desires also to secure similar advantages for his wife and family. And he is fortunate and happy in so far as these several powerful motives, tendencies springing from several distinct and very different propensities, co-operate harmoniously and successfully in sustaining his efforts to restore the health of his patients.

In this matter of co-operation, one propensity stands in a peculiarly intimate relation with every other one; namely, the anger propensity. It seems to be the universal law of this propensity (both in men and animals) that it is called into play by thwarting or obstruction of any other active tendency. In the animals the anger-impulse, aroused by a rival claimant to the nest, the young, the territory, the food, or the mate, may seem to displace completely the obstructed tendency; during the stress of combat the combative impulse may seem to operate in isolated purity. But this is not always the case; the mother-ape may cuff or bite her troublesome offspring; but she does not strike or bite it with the viciousness of her angry reactions to other creatures; the impulse is restrained and modified by a different tendency.

In man, with his greater range of insight and foresight, the energy of the anger-impulse may combine in very subtle ways with all the other tendencies to re-inforce and sustain them.

Conflict of Tendencies

While some tendencies are capable of harmonious co-operation, generating a single conation in which their energies are combined, others are naturally opposed, so that, when simultaneously aroused, they inevitably conflict with one another. We may occasionally see unmistakable evidences of such conflicts in the behaviour of animals ; as when horses or other cattle are impelled by hunger or curiosity to approach some object lying on the open field, and then are frightened by some sudden movement or sound coming from the object : they suddenly swerve and retreat ; then perhaps halt, turn about and again approach in a cautious fashion, ready to start away again at the slightest repetition of the sound or the movement. Such simple conflicts of tendencies can easily be induced and studied in the laboratory, and are well deserving of such study.

In man, conflict of tendencies plays a much greater role ; it is responsible for a vast amount of waste of energy, is the ground of all the many functional disorders known as *psycho-neuroses* and an essential, if not the sole, causative factor in some of the most disastrous mental diseases. The realization of this wasteful and destructive role of mental conflict was the essential first step in the great modern advance of psychiatry and mental hygiene. That the soul of man was liable to deep and distressing conflict has long been known. But it was only in the last years of the nineteenth century that the role of mental conflict in human life began to be revealed in all its depth and range and disastrous consequences. We owe this new insight, with its promise, already partially fulfilled, of great benefits to mankind, chiefly to the genius of Professor Sigmund Freud. The various schools of psycho-analysts, widely divergent as are their doctrines, all have, as their common basis, the recognition of conflict within the soul as the great enemy of human happiness and efficiency.

It is not too much to say that the chief aim of all education, of all training, of all discipline and moral influence, should be so to influence the growing child that he shall become

a harmoniously and strongly integrated personality: for only such a person can avoid the enduring conflicts that cramp and hamper the free working of man's natural tendencies, conflicts that waste his energies in fruitless strife of one part of his nature against another, rendering him unhappy and inefficient and, in the worst cases, making him a doleful burden to his friends or an enemy to society.

Liability to such disabling conflicts is the price man pays for his power of sustained effort directed to distant goals or ideals. Hence some of the most richly endowed natures are peculiarly liable to suffer the pains and penalties of conflict; hence the kernel of truth in the saying that genius is akin to madness. Here also we have the key to the paradox that man, in spite of his vastly superior intelligence, his great powers of self-direction, and his ability to adapt his environment to his needs, lives less happily than the animals, suffers more intense and more enduring pains, and often feels himself an outcast and a rebel against Nature's scheme of things.

Motives and Motivation

In a foregoing paragraph I have used the important word *motive*. A motive is a tendency working upon the level of self-conscious reflective action. We do not speak of the motives of an animal, because no animal seems to be capable of such activity. If, as is probable, the animal is in some degree conscious, it would seem that, when he is impelled to action directed towards a goal, he is conscious in a vague way only of the immediate goal of each step of action, vaguely anticipates the consequence of each next step as the prior step is achieved. Whereas man foresees more clearly and over a longer range both his goal and the various steps that lead to it. Yet in man, also, clear and full anticipation or foresight of the goal and of the means to it is by no means the rule. Often our goal is but very vaguely foreseen; and often, as we set out, the steps by which we shall achieve our goal are even more obscure to us than the goal itself: like the animal, we may define each step only in the course

of action, working by a process of trial and error and solving each difficulty as it arises.

Animal action in face of difficulties is often described by the phrase ' trial and error ' ; with the implication that the *trial* is utterly blind. But our own experience of groping towards our goal (even when each step is in the dark and we cannot surely foresee its effects) shows us that such groping is not utterly blind. In every case we have some foresight, some anticipation of our goal, however vague. And it is a fair presumption that the same is true of animals. It is impossible to understand or interpret their behaviour, unless we make this assumption. Yet, because of the vague unreflective nature of their foresight, we cannot properly speak of their motives. The word *impulse* is here in place ; but since this word carries the implication of sudden brief activity (and therefore is inappropriate for the description of long-sustained trains of activity, such as that by which the wasp builds her clay cell) the more general words, *tendency*, *striving*, and *conation* are more suitable, marking as they do the essential similarities between the lower and the higher forms of action.

Purpose

At this point we may consider the meaning and proper usage of the difficult word *purpose* and of its adjectival forms *purposive* and *purposeful*. We frequently use the word *purpose* in an almost purely objective sense ; we define a man's purpose in terms of a goal towards which he is set, yet we have to add or imply that this is *his* goal ; and this in turn implies the subjective fact that the man inclines, tends, trends towards that goal, or that he desires or intends or wills to achieve it ; and this in turn means that he has consciously adopted that goal and that some tendency (or several tendencies) within him is set towards that goal.

The word *purpose*, then, denotes a unique relation between a subject and an object, namely, a developed form of the conative relation, the relation of consciously and deliberately seeking or striving for. We may contemplate an object as a

possible and desirable goal without forming a purpose to attain it. For example, you hear of some prize offered for competition ; if it seems to you desirable, that means that the contemplation of it as possibly coming into your possession arouses some propensity, stirs to activity some tendency within you. But to be moved in this way is not to form a purpose. Though you may strongly desire the prize, you may see clearly that it is beyond your reach. Or there may be *reasons* which forbid you to compete, reasons of dignity or honour or lack of time or energy ; which means that your desire conflicts with other standing desires or purposes already formed. If, after deliberation, you decide that the prize is worth striving for and you resolve to work for it, the desire to win the prize becomes transformed into, is raised to the higher level of, a purpose. A *purpose*, then, is a desire accepted and approved after self-conscious deliberation. In its fullest sense it is the enduring consequence of an act of volition. It is more than a desire : for desire is episodic ; desire is the working of conation during contemplation of the desired object ; it terminates as our attention passes to other matters. But the purpose, once formed, endures, holds as we say. It may go into storage for a long period during which we never think of that object as a goal. But, when the appropriate time for action comes, the fixed though latent purpose manifests itself anew in desire and striving, in effort self-consciously directed towards the goal. Purpose in the fullest sense is desire fixed by self-conscious judgement and resolve. *Purposeful action* is action of this highest type. But, wherever action is directed towards a goal foreseen, however imperfectly, there we may properly speak of *purposive action.* And when the actions of animals show objective evidences of being of the same general type, we may properly extend the adjective ' purposive ' to them.

CHAPTER X

THE ROLE OF PLEASURE AND PAIN

WE have already discussed the conditions that give rise to pleasant and unpleasant feeling. All successful or prosperous striving, we found, makes for pleasant feeling; all thwarted or baffled striving, all failure, makes for unpleasant feeling; and the complex feelings (alternatively called 'derived emotions') are predominantly pleasant (or unpleasant) according to the balance of success (or failure) of the complex tendencies at work in us at any given moment.

But is feeling merely an indicator, a sign, a conscious reflection of the balance of success, or failure, of striving? Has it no function, no role to play, no influence on the course of our activity? The answer is clear: feeling, though it is not the initiator, prompter, and sole sustainer of striving, does influence striving, does modify its course and direction, sometimes profoundly.

When we come to study the difficult and still obscure problem of learning, we shall see that feeling, although it does not set our goals (as the hedonists assert), teaches us how best to achieve them, teaches us how to choose our means, how to adapt our actions for the more effective striving towards our goals. At this stage of our study we are concerned only to state concisely the fundamental laws of the feeling function. These laws are two: (1) Pleasant feeling re-inforces, sustains, supports the striving process which gives rise to it, reacts upon it to intensify it, augments the energy of striving; and it favours the repetition of similar striving whenever, on a later occasion, we find ourselves in a similar situation. (2) Unpleasant feeling checks and weakens striv-

ing, diverts it into other channels, leads us to modify our line of attack, to choose other means for working towards our goal ; and it makes against the recurrence of striving along the same lines when any similar situation recurs.

The reader, especially the reader trained in the physical sciences, may at once raise the question—But how can feeling exert these effects ? It must be frankly recognized that, in the present state of science, no answer can be given to this question. It may be that eventually we shall be able in some sense to explain the facts. On the other hand, it may be that these are ultimate laws of the nature of things, generalizations that cannot be ' explained ' in terms of any wider generalization. However this may be, the two laws stated above seem to be valid empirical generalizations. To refuse to accept the generalizations until we can ' explain ' the facts, would be to obstruct the advance of knowledge. We may see a parallel in Newton's law of gravitation. That was an empirical generalization which has been found extremely useful. If men of science had refused to accept the generalization because they could not explain gravitation in terms of some still wider, deeper principle, science would have been gravely retarded. If any of the modern attempts to ' explain ' gravitation should turn out to be correct—well and good ! That will not mean that Newton's generalization was not useful and well justified. And thus it is with the laws of feeling. They may be ultimate, or they may be reducible ; but they seem to be true generalizations. Of course, we have not examined every instance of feeling. Nor had Newton examined every instance of gravitation. We can only assert that, in every instance we examine, the law seems to hold good.

There are four main lines of evidence. First, the testimony of universal experience, as embodied in common speech and in literature. ' Nothing succeeds like success ' ; ' encouraged by success ' ; ' inspired by hope ' ; ' their goal was now in sight and they pushed on with renewed energy, fatigues and disappointments all forgotten ' ; ' they were wild with joy ' ; ' they jumped for joy ' ; ' they threw up their hats and cried hurrah ' ; ' he was so pleased he didn't know what to do with

himself ' ; ' he could not contain himself for joy ' ; ' he worked vigorously, for he enjoyed the work '. These and a thousand similar expressions in common use all testify that pleasant feeling, whether in the form that accompanies the prosperous working of some simple tendency, or in the more complexly conditioned form we call ' joy ', makes for increased output of energy.

Secondly, observation of animals points to the same truth. Your dog greets you on your return home with what we do not hesitate to call signs of pleasure ; [1] or, if after much begging on his part, you put on your hat to take him for a walk, you see a similar outburst of energy ; he barks, leaps up on you, dashes wildly to and fro, and ' cannot contain himself '. In a similar way, young tame rats, returned to their familiar cage after an absence, will hop and run to and fro.

> ' 'Twas in the prime of summer time,
> An evening calm and cool
> And four and twenty happy boys
> Came bounding out of school :
> There were some that ran, and some that leapt,
> Like troutlets in a pool.'

This description seems valid not only for all boys, but for all animals under comparable circumstances.

Thirdly, laboratory experiment, though in this sphere it is severely handicapped, bears out the generalization. In long-continued tasks in which the output of energy per unit of time can be measured (such as adding long lists of figures, or repeating a muscular effort with the registering apparatus known as the ergograph) it has been repeatedly found that the output rises as the subject wittingly approaches the end of his wearisome task : the pleasant feeling of approach to the end of the task seems to be the only assignable ground of this spurt, of this augmented output of energy.

[1] One sluggish old dog well known to me displays energetic behaviour only on the occasions of the return of his mistress after absences of some considerable duration. On these occasions he runs to and fro with an almost youthful exuberance, a pathetic but instructive illustration of the principle here discussed.

Fourthly, each man's immediate experience of pleasant feeling and resultant increase of energy. Ask yourself—Is it not true that, when you are pleased, you feel more energetic ? When you see a clear prospect of success in whatever striving you are engaged upon, of attaining whatever you strongly desire, are you not encouraged, does not your energy flow more abundantly, are you not immediately aware of enhanced vigour ?

The same four lines of evidence support the law that unpleasant feeling weakens effort, discourages us, and diverts our striving into other channels. They support also the second clause of both laws, namely, that pleasant feeling makes for repetition, unpleasant feeling against repetition, of any particular line of action which induces such feeling.

In regard to unpleasant feeling, the facts are obscured by two complications. First, that kind of sensation which we call roughly pain, undoubtedly prompts us to action ; we shrink from pain-inducing contacts, flee from them and strive to avoid them. But this seems to be because all such contacts naturally evoke the fear-impulse. Physical pains from which we cannot escape by any shrinking, fleeing or other escape-behaviour merely depress our energies ; for the repeated baffling of efforts to escape is very unpleasant.

Secondly, the first effect of increase of resistance to our effort is to augment our output of energy ; as when you find the object you strive to lift or move heavier than you had expected, or as when you encounter a special difficulty in the course of an intellectual striving. This is the phenomenon of increased zest from difficulty. Further, in the normal man, this phase of reaction with increased zest of striving is followed by the awakening of the anger-impulse, the energy of which re-inforces his striving : he says—' I *will* master the darned thing ! ' Only when this second phase also fails to effect progress towards our goal does unpleasant feeling come in to weaken our striving and divert it to some new line of attack.

These complications partly explain the lack of consensus of opinion on this question. But this lack is largely due also to the fact that so many psychologists make two false ap-

proaches to this question. They begin by assuming that feeling is in some sense a function or an attribute of bare sensation ; and they think in terms of some such theory as psychophysical parallelism. Any such approach forbids them to inquire frankly—What are the grounds or causes of feeling and what are its effects upon the course of our activity ? Nevertheless, although most authors who have discussed this problem fail to state or adhere to any consistently thought-out view, many have recognized in one or more passages the essential truth of the view here expounded.[1]

Expression of Feeling

Expressions of pleasant feeling are the various bodily consequences which flow from the augmentation of energy brought by the feeling : the bright eye, the glowing face, the expanded chest, the straightened back, the quick elastic step and the loud hearty cheerful voice. But are there no specific expressions of pleasure over and above these general signs of enhanced vitality ? Almost without exception the many writers who have struggled with the obscure problems of laughter have assumed, as too obvious for question or discussion, that laughter expresses and is indeed a specific expression of pleasure. Many years ago, when I was young and bold, I ventured to question this universal assumption ; and the more I have examined the question the clearer it has become that laughter is not primarily an expression of pleasure, although it commonly produces pleasant bodily effects ; that

[1] Thus the late Professor A. Lehmann wrote : ' It can hardly be doubtful that unpleasant feelings are accompanied by considerable disturbances of the central organ, while pleasant feelings . . . often augment the mental efficiency beyond the normal . . . in all probability pleasure and unpleasure are accompanied by central changes which augment or diminish, respectively, the efficiency of the centres concerned.' Alexander Bain asserted : ' States of pleasure are concomitant with an increase, and states of pain with an abatement, of some, or all, of the vital functions.' And K. Lange, another great authority, wrote : ' While he who is sad acquires the appearance of age, with his slow movements, his bent attitude, his sunken features, the joyful man appears youthful, owing to his quick and vigorous movements, his singing and loud talking.'

it is rather an instinctive reaction to the mishaps and deficiencies of our fellow-creatures, a reaction whose function and biological *raison d'être* is our protection against the depressing effects of the sympathetic pains which (but for our propensity to laugh at the minor distresses of our fellows) we should so frequently suffer.[1] It is true that laughter, like shouting, singing, whistling, jumping, running, waving one's arms, clapping one's hands and many other modes of movement, is often included in the general exuberance of movement produced by the sudden access of energy that comes with keen pleasure. All such movements, the laughter movements included, are incidental non-specific consequences of the access of energy that comes with strong pleasant feeling : in each case the excess of energy liberated in the nervous system merely spills over into one motor unit or ' mechanism ' after another, producing movements which, though more or less co-ordinated, are strictly random and purposeless, are not incidents and expressions of striving towards any goal.

Such movements constitute what is properly called gambolling ; and gambolling is the purest or, strictly, the only pure form of play. Animals of many species gambol ; and all the play of animals seems to be of this pure form. The running and skipping of lambs, the playing of kittens and puppies, the friendly ' fighting ' of young dogs, the skittish behaviour of the colt and the calf, much of the singing and twittering of birds, much of their wheeling to and fro on the wing, of their dancing and strutting, seems to be of this nature, an overflow of energy into motor mechanisms evolved for serious uses.

Human play, save in quite young children, is rarely of this pure type. It commonly takes the form of playing a game. To play a game is to complicate play, or gambolling, by setting some goal to be reached ; thus rendering the playful activity purposive : as when two boys come ' bounding out of school ' and one says to the other ' Race you to that tree ', and the race is on.

Pure play does, then, like purely playful laughter which is

[1] This new theory of laughter is developed in my *Outline* and also in an appendix to my *Social Psychology*.

but one form of play among many others, express pleasure ; but it is no more a specific expression of pleasure than is any other exuberant movement.

If we turn to the animals for a lead in our search for some specific expression of feeling, they, as in so many other problems, give us a useful clue. Why does the dog wag his tail ? The popular answer to this riddle runs—To show his pleasure, or —Because he is pleased. The second answer is, I think, strictly true. The former is more open to dispute. It implies that the dog's wagging of his tail is in some sense, however lowly, a purposive activity, comparable to his search for prey or for a mate. The greatest of nature poets has described how

> The lamb, while from her hand he thus his supper took,
> Seemed to feast with head and ears ; and his tail with pleasure shook.

In this case the shaking of the tail (which, I believe, constantly accompanies the onset of the lamb's feeding) might fairly be regarded as a non-specific expression of pleasure, as the only exuberance of movement compatible with the activity of sucking : for it is difficult to see any biological utility in the shaking. But the wagging of the dog's tail does seem to be of social utility, to have a function, namely, the function of announcing his pleasure to his fellow-creatures ; it is his way of saying ' Pleased to meet you '. Now the smile of man seems to play exactly the same role, subserve the same function ; to be in short a specific expression of pleasure, rather than a mere incident of exuberant activity. We may suppose that man's remote ancestor expressed pleasure by wagging his tail, and that, as his tail shrivelled up, some substitute for that expression was required ; hence, man having assumed the erect posture, the smile was evolved as the most handy means of expressing his pleasure to the world. Indeed the chimpanzee seems to have achieved in imperfect form and degree a similar evolution. His face is capable of assuming an unmistakably pleased expression which is not very unlike the human smile.

The question of specific expression of painful or unpleasant feeling is even more obscure. Non-specific expressions are

all facial and bodily attitudes and modes of movement that naturally result from defect of energy—drooping eyes and mouth, head sunk on sagging shoulders, sluggish and feeble movements. It may be suggested that the frown is the specific expression of unpleasant feeling. But it is difficult to distinguish any such specific expression from the expressions of anger and disgust. And here, so far as I can see, the animals give us no clear indication.

CHAPTER XI

THE BLENDING OF FEELING WITH EMOTION

KNOWING, striving and feeling, these seem to be three distinguishable but inseparable aspects of all mental activity. Can we be mentally alive and yet wholly inactive, merely receiving impressions or passively experiencing ? Sometimes we do seem to come near to such passive experience. One lies inert, almost asleep, not clearly aware of oneself or one's surroundings ; perhaps with what we call a vague sense of well-being or comfort, or of discomfort. Perhaps there are sounds about us ; certainly there are pressures on the skin that change from moment to moment, and various processes going on in our bodies, breathing and beating of the heart, the flow of the blood through all our organs. All such physical changes can and do affect our sense-organs in some degree, however slight, both those of the surface and those of the interior of the body (the latter impressions are commonly classed together under the comprehensive term, *coenaesthesis*). And, if we direct attention to any part of the body, we readily discover ' sensations ', if only a buzzing in the ears, a vague field of light, a sense of pressure or tension, a tickling or a slight pain, the respiratory movements of the chest and abdomen.

When we are most nearly passive, all such impressions remain a vague unanalysed flow or slow trickle of experience ; we do not interpret them, we read no meaning or significance into them. The buzzing of the fly remains a mere sound ; hardly even that, merely a feature in the complex, a feature distinguishable but not distinguished. Such passive experience is sometimes called *anoetic sentience.*

Let any one of these impressions be such as to evoke a

tendency, and you become mentally active, you become attentive to it in some degree, you become aware of it as *something* and you tend to do something about it. If it is a fly that settles on your hand, you may become aware of the tickling sensation and perhaps of its locality, and may make a movement that drives away the fly. If it is a vague tension in the body that grows more intense, you may turn over into a more comfortable position. If it is a repeated tapping on the door, you may become vaguely aware of some disturbance ; then you may become aware of it as a sound or as tapping, to which your response is a feeble inquiry—What's that ? And then perhaps you become aware of it more definitely as a call to action, to get up and see what is the matter.

In each such case, as you become mentally active, you become aware of something more or less defined, you tend to act, and you feel, however faintly ; and the feeling is commonly describable as pleasant or unpleasant. The action may be nothing more than a directing of attention, an action expressive of the impulse to ascertain more clearly the nature of the impression ; and the feeling may be the mere unpleasantness of not being able to locate and define it ; followed perhaps by the feeling of satisfaction in recognizing the significance of the impression, perhaps the recognition of some sound as meaning a mere creaking of the door, or a routine morning call, or the arrival of an eagerly expected visitor.

We cannot speak of knowing, striving, feeling as three phases of mental activity, but only as three distinguishable and inseparable aspects of the one activity ; for they occur together in intimate interplay with one another. Nor can we properly speak of them as three faculties, if by ' faculties ' we mean powers that can be independently exercised. They are three modes of mental functioning which seem to be ultimate ; that is to say, we cannot regard any one of them as capable of being analysed into constituents or as generated by any conjunction of still simpler or more elementary functions.

But, though these three aspects are inseparable and characterize every phase of mental activity, the three vary greatly

in intensity or prominence from moment to moment. When we are making a strong effort, whether bodily or mental, the striving aspect is intense and prominent. When we attain, or make good progress towards, the goal towards which we strive, pleasant feeling is prominent. When our striving is checked and thwarted, the whole activity is unpleasant ; and it is the more intensely unpleasant, the stronger our desire and striving and the more complete the thwarting. When we are engaged with some familiar mildly interesting matter, as when we read a novel, chat with a friend or listen critically to familiar but not very good music, the cognitive aspect is most prominent. The adjective *intense* is entirely applicable to the striving and to the feeling aspects. Whether it is at all applicable to the cognitive aspect is a question not easily answered.

The Qualities of Emotional Excitement

Some authorities have taken the view that what we call emotion is another mode of experience or mental functioning comparable with those other three. But that seems to be an error. To experience emotion is to be excited, to be moved to activity of some sort ; and the more intensely excited we are (i.e. the more strongly we are moved to action) the more emotional is the experience. When the fly settles on your hand and you dislodge it by some slight movement, we hardly call the experience emotional. But, if you are trying to sleep, and the fly comes back again, your excitement may become more intense ; you are moved to more vigorous efforts, you locate the fly with care and make swift and carefully directed slaps, feeling distinctly displeased at each failure. And, if the game goes on, you may become still more strongly excited and moved. You rise up in wrath determined to swat ' that damned fly ' ; and when, after a vigorous chase, you have finally squashed it, you are quite intensely pleased. With this rising intensity of your general excitement your state has become distinctly emotional.[1] All

[1] The critical reader may well ask at this point—What, then, is the relation between unpleasant feeling and angry emotion ? On this very interesting and difficult question, see p. 155.

through your chase you are actively knowing and striving; and at the same time you are feeling pleased or displeased in various degrees, according as you approach or fail to approach your goal; and, in proportion as your excitement waxes more intense and your various bodily organs become more active, the vague complex of bodily sensation that was present from the first becomes intensified. This complex colours the whole experience, serves as a background or undertone; and, according to the kind of activity to which you are stirred (i.e. according to the nature of the propensity evoked in you and the bodily organs thrown into more intense activity by its impulse) the whole state of emotional excitement takes on this tone or that.

In the case of the pursuit of the fly, your excitement may readily be recognized as a state of anger. But, if on looking at the tickling object you see it to be a wasp or a hornet, your excitement may well be of a different kind: instead of the impulse to pursue and swat it, you may be moved by an impulse to run away to a safe place. Or, if the object is cognized or recognized as a tarantula or a poisonous snake, the excitement may be quite intense and of that peculiar quality we call fear. The distinctive quality of each such emotional experience seems to be given it by the complex of relatively intense bodily impressions resulting from the many well-marked bodily adjustments which the impulse naturally evokes, evokes just as naturally as, and more inevitably than, it evokes your movements of pursuit or retreat.

Among the more important of such adjustments are changes in the respiration and the beating of the heart, in the degree of contraction of the muscular walls of thousands of small arteries and of the whole intestinal tube, and changes in the secretions of many glands (the tears, sweat, saliva, and gastric juice) including many internal secretions.

Whether you are stirred to attack or retreat, internal bodily adjustments, equally with the movements of the limbs and eyes and speech-organs, are natural expressions of the tendency excited within you; the main difference is that over the former, the visceral adjustments, you have little voluntary control, and

they are but little subject to modification by training and experience; whereas the latter (the movements effected by the so-called skeletal or voluntary muscles) may be in large measure controlled, and they are apt to be much modified by training and prior experience.

If, on any occasion when some propensity is strongly excited within you, the situation is a familiar one with which you can deal by some well-directed activity, your energy flows out in such activity, you vigorously act or plan to act. Such overt outwardly directed activity, involving well-defined cognition and well-directed striving, seems to drain off into these channels the greater part of the energy released; and, in consequence, the emotional disturbances of the internal organs and their reflex effects on consciousness are proportionately slight. On the other hand, if there is no obvious line of effective action, nothing to be done about it, the liberated energy of the impulse finds its way more freely into the internal organs, producing greater disturbance of their functioning; hence, under such conditions, the emotional quality of the experience is more prominent. This is the element of truth in the statement, made by many authors, that emotion is experienced only when and if action is checked. The statement greatly overstates the element of truth and obscures the facts. Yesterday I was walking alone in an English beech-wood, a place than which none could be safer or more peaceful; suddenly a rabbit, than which no creature could be less dangerous, started up from the undergrowth about my feet; and, absurd as it may seem, I experienced instantaneously a faint shock of excitement which had quite recognizably the quality of fear. Many persons can, if they are frank, cite similar instances of instantaneous undeniable fear under conditions where action is quite unrestrained.

The Primary or Simple and the Blended Qualities of Emotional Excitement

The evocation of each propensity liberates energy which flows most naturally into some system of channels peculiar to its tendency, channels of bodily adjustment and action.

If, during such excitement or by retrospection, we observe our state, we become aware of it as one of general tension or alertness; and, if liberation of energy is copious, we call it one of excitement. In most such instances the excitement has some quality that enables us to apply to it one of the many names by which we refer to such states of excitement, such names as fear, or anger, or lust, or curiosity, or compassion, or scorn, or contempt, or pride, or elation, or disgust, or horror, or any one of a large array of such names.

If the occasion is such as to evoke strongly some one of the native tendencies, while leaving the others unstirred, we have little difficulty in finding an appropriate name. On such an occasion we may be said to experience one of the primary emotions.

If, on the other hand, the occasion is such as to evoke simultaneously and strongly several native tendencies, the excitement is no less emotional; but we may find it difficult to describe it by aid of any one word. For the emotion is complex in proportion to the number of tendencies at work in us.

In some cases the quality seems allied to both of two primary qualities of emotion and may be described, not quite accurately perhaps, as a blend of those qualities.[1] When, for example, we confront some overpowering natural phenomenon, a cataract or a thunderstorm, or enter a gloomy gorge or vast cavern, most of us experience an emotion which we recognize as allied in quality to both fear and curiosity. This introspective or retrospective analysis of the experience is borne out if we also notice that, while we tend to shrink away from the object, we at the same time are held in contemplation of it, tending to observe and explore it. There are many names by aid of which we seek to describe, with varying degrees of success and accuracy, these complex or blended emotions; awe, gratitude, reverence, hate, reproach,

[1] The problem and principles here raised are not unlike those we encounter in the sphere of colour theory; as when we seem to recognize in the purple quality affinity to both red and blue qualities.

horror, shame, humiliation, triumph, admiration, embarrassment, these are some of the names so used.

When the situation works upon us in very complex fashion, evoking in turn and simultaneously many tendencies (as when we listen to the music of Wagner) we may be aware of intense excitement which is undeniably emotional; but we may be quite at a loss for words with which to describe the subtly varying tumult.

In another work [1] I have analysed a number of such blended emotions. It is obvious that such analysis can be successful only in so far as we have already distinguished and defined the primary emotions. And since I find that many obviously complex emotional excitements can be satisfactorily displayed as blends of the primary emotions we have distinguished above, in respect of both their qualities and their tendencies, I regard this as strong evidence that the prior task has been in the main correctly accomplished.

Let me cite here a single example of the application of this principle. The matter is of some importance, since the continuing chaos of opinion about emotion is a reproach to our science and a serious bar to progress.

I have attributed to a native propensity (common to the human and to other mammalian species) the tendency to submit, to bow down, to abase oneself, before a display of overwhelming power, to follow and obey and accept as leader any person that displays such power. And I find in myself a subdued excitement of peculiar quality when I find this tendency working in me. Now we have no name that clearly and adequately points to and singles out this quality and this tendency. Hence, some psychologists who have no quarrel with the general principles of my treatment refuse to recognize this primary tendency and quality. How can there be 'an emotion', or 'a primary emotion', unless we have for such emotion a name that can be found in all the dictionaries? I reply that language was not made with a view to psychological analysis, and we have no warrant for

[1] An *Introduction to Social Psychology*, 22nd Edition, London, 1931.

accepting its indications as indisputable and final criteria. Nevertheless we have many words that do imply the tendency and function which I refer to a native propensity of self-abasement or submission. First, we have the words ' humble ' and ' humility ', both of which describe a quality which we recognize as a leading trait or characteristic of some personalities, and as one which is lacking in others ; and this trait, humility, seems to be satisfactorily accounted for as the expression of a propensity to submission, a propensity which is delicately responsive and strong in the humble personality, either because he has inherited it in exceptional strength, or because special influences exerted upon him (especially the training and moral influences to which he has been subjected) have been such as to call out and develop by much exercise this propensity—or for both reasons.

On the other hand, if we do not recognize the propensity to submission as native to the human species (as it undeniably is native to many animal species), the facts of humility as a personality trait remain utterly obscure ; after we have recognized that the trait is manifested in very different degrees of strength by various men and races, nothing more can be said or done.

The words ' docile ' and ' docility ', as also the words ' suggestible ' and ' suggestibility ', refer to traits which are certainly closely allied to humility and seem to be satisfactorily accounted for as manifestations, under special circumstances, of the same native propensity.

Further, there is a variety of complex emotional excitements denoted by well-established names in all of which it is possible to detect both the tendency and the emotional flavour of the submissive propensity. And of each of these well-recognized forms of emotional excitement it is true to say that it remains unanalysable and a bare fact not intelligibly related to any other fact, so long as we do not recognize that propensity. Such excitements are denoted by the following words : respect, gratitude, awe, admiration, adulation, reverence, shyness, embarrassment, devotion, worship (especially hero-worship). It is true that the meaning of each of these words

remains somewhat vague and variable; and can never be made clear and definite by any objective demonstration, any pointing to the thing it denotes. Yet it remains true that each of them, as used in common speech and in literature, does convey a meaning with considerable success. And it is true also that the facts of this order (to which these and many similar words point) are the most important of all facts, far more important than any of the facts dealt with by the physical sciences; important in two senses, first, that they are the very substance of the higher life of mankind; secondly, that, so long as we have no scientific understanding of these facts, we can have no social sciences, no scientific understanding of the social, political, economic, religious, artistic life of mankind.

Consider for a moment one great class of such facts, the religious experiences and activities of men. Vast quantities of books have been written on this topic, and many more will yet be written. Yet if it be true, as I maintain, that the submissive propensity plays an essential role in all such experiences and activities, it follows that any and every attempt to throw light on their nature, their history and genesis in individuals and societies, can be only very partially successful, so long as this propensity remains unrecognized as a part of the native endowment of mankind.

Complex Feeling

It is generally agreed that feeling pleased and displeased are the two most primitive ways or modes of feeling; and the substantives, 'pleasure' and 'pain', have long been used to refer to such simple feeling-aspects of our experience. The word 'pain' is ambiguous: for it is commonly applied also to certain qualities of sensation that are excited through various sense-organs when these are violently stimulated. An alternative word 'unpleasure' is therefore widely used. But we do better perhaps to avoid as far as possible these substantival words, and to speak of feeling pleased and displeased rather than of having feelings of pleasure and unpleasure or of pain. But, in so far as we must use substantives,

the words ' pain ' and ' painful feeling ' seem to me too well rooted in our language to be cast out.

There is ambiguity about the word ' displeased ' ; for this word is commonly used to imply a mild degree of anger. The ambiguity points, however, to a subtle problem and, perhaps, to a truth. It raises the question—What is the relation between feeling displeased and angry emotion ? We cannot be content to say that the former is merely a mild degree of the latter. For it is possible to feel intensely displeased or pained without experiencing anger or showing any of its symptoms. The phrase ' more in sorrow than in anger ' points to this fact and also to the intimate relation between painful feeling and angry emotion. The relation is that the conditions that give rise to these two kinds of experience are very similar, and, for this reason, they are frequently combined. The failure of our striving is the essential condition of unpleasant feeling. Thwarting of our striving by the intervention of another person is the essential condition of the rise of angry emotion. One's feeling may be painful without anger. So also we may experience anger without unpleasant feeling ; as when our angry impulse swiftly attains its goal, breaking down the obstruction that provokes it. Anger is objective, it is directed upon an object ; or, if no definite object is present, it seeks an object upon which to vent itself. That is to say, the grounds of anger are objective ; our anger is provoked by and directed upon some person or other object that obstructs our activity. Painful feeling, on the other hand, is subjective, and that in two senses : first, the grounds of painful feeling are subjective ; the failure of our striving is due to our own inadequacy ; we cannot see our way to our goal, or some opposed impulse is excited in us and checks and thwarts us from within. Secondly, painful feeling is subjective in the sense that it does not project itself upon an object, as angry emotion does.

Leave this subtle problem, on which much more might be said, and consider now the fact that one's feeling may be a blend of pain and pleasure. In a simple creature which was always dominated by a single impulse, a single conation, a

whole-hearted striving towards one goal, pain and pleasure (unpleasant and pleasant feeling) would alternate with the failure and success of its striving. And this is probably true of animals and young children. But the adult human being is very complex; in him many impulses may work simultaneously with varying degrees of harmony and conflict. And while one tendency is attaining satisfaction, another may be baffled and checked. He then experiences, not two feelings, one of pleasure and one of pain, but rather a complex feeling that has something of the nature of both. Such is the 'sweet sorrow' of parting lovers; and such is the painful delight we find in scenes of great beauty, in great poetry, in tragic art and in the finest music. Such things please us intensely by reason of their rich harmony; at the same time they provoke a hunger of the heart which can never be appeased and which, therefore, brings an element of pain into the complex feeling.

Have we, then, no names for these complex feelings? We have a number of such names, but they are commonly regarded as names of emotions. The most important, the most definite and commonly used, of these names are *joy*, *hope*, *anxiety*, *despondency*, *despair*, *regret* and *sorrow*. These are names of complex feelings which have been called *derived emotions*; I have discussed them elsewhere under that heading. But that usage tends to perpetuate the prevalent confusion between feeling and emotion; and it is, perhaps, better to keep to the term 'complex feeling'.

The confusion is not easily avoided; for the word emotion is a wide and loose one. If we can use it, as often it is used, to imply a state of high excitement in all its aspects, then its meaning includes the feeling which inevitably accompanies the strictly emotional aspect of the total excitement, as it includes also the striving and the knowing aspects. But for such comprehensive usage we have the good technical term *affect*;[1] and so we may with advantage distinguish the

[1] I propose to use the word 'affect' in this broad sense, a usage for which there is good precedent, although some authors would have the word mean only feeling in the strictest sense.

emotional and the feeling aspects of each affect. In doing this we recognize that, while the feeling is subjective, the strictly emotional aspect is cognitive ; for it signifies, or serves to make us aware of, the state of our bodily organism and the nature of the impulses at work in us.

Complex Feeling Dependent upon Striving

Complex feeling, like simple feeling, depends upon, is a function of, derives from, the striving or conation at work at the moment. Consider hope. ' Hope springs eternal in the human breast.' And why ? Because desire springs eternal, and hope is a function of desire. If we desire nothing, we hope for nothing ; but, if we desire to attain any particular goal, we also hope to attain it, so long as we are not certain of attainment, and so long as we do not encounter or anticipate difficulties that will surely frustrate our desire.

If we strongly desire to attain a goal and if the road to it lies straight and open before us, we do not hope ; rather we go forward energetically, with *confidence* ; and, when we attain it, we experience intense pleasure or joy or joyful satisfaction. It is when some shadow of uncertainty lies upon our way that we hope. And when the shadow grows darker, we become anxious. If it deepens still further, so that attainment seems improbable, we despond. And if attainment seems definitely impossible, we despair. All these complex modes of feeling, then, are functions of desire looking forward to its goal ; hence they have been called *prospective emotions of desire.*

In what way, then, does hope differ from desire ? Hope is desire qualified and complicated and re-inforced by the pleasant feeling that arises upon anticipating success. And despondency is desire qualified, complicated, checked, and weakened by the unpleasant feeling that comes from anticipation of failure.

If this be the true account of these states, why is hope so commonly spoken of as a great force, as something that sustains us and re-inforces our efforts ? Is it not in this respect comparable to fear or anger or self-assertion ? Does

it not, like these, contain or imply an independent impulse or spring of energy? The answer is—No, not in the same sense. Anger or fear or any other of the primary emotions is an expression of the working of a specific tendency, the impulse of some propensity, directed towards a goal of a particular kind. But there is nothing specific about hope; hope may arise in the course of the working of any tendency towards its goal. Hope is commonly spoken of as a re-inforcing energy for two reasons; first, because it is confused with the energy of the desire which it qualifies; secondly, because it is a complex blend of pleasure and pain in which pleasure predominates over pain. In hoping, we are enjoying by anticipation the pleasure of success; and this pleasure, according to the fundamental law of pleasure, sustains and intensifies striving or desire.

Notice how, when the shadow of uncertainty deepens, hope gives place by imperceptible graduations to anxiety, and then to despondency. The desire remains as the essential ground of all these states of complex feeling; but, in anxiety, pleasure no longer predominates over pain; and, in despondency, pain (the pain of anticipated failure) predominates and exerts its universal effect, weakening, checking or diverting our striving.

The bright glance and vigorous movements of hope express, then, not any specific impulse or energy, but the re-inforcement of the active tendency at work in us, the pre-existing conation, by the pleasure of anticipated success. The relaxed muscles, the drooping mouth and lowered lids of despondency, express the checking of the outflow of conative energy by the anticipated pain of failure.

Retrospective Complex Feeling

In Man, who 'looks before and after and longs for what is not', and who longs also for what has been but can no longer be, desire not only works forward to its goal, but also may be fixed upon goals that have ceased to be possible because the possibility lies in the past. Such desire is coloured by the pain of thwarting and we call it regret or regretful

desire. Just as hope or anxiety is the form assumed by every desire so long as that desire looks forward; so regret is the form of every desire that looks backward. The pain of regret is intense in proportion to the intensity of the thwarted desire.

What then of sorrow? Sorrow, like hope, has been almost universally regarded as a primary emotion. But sorrow, in any strict usage of the word, denotes a special form of regret. If a little girl falls down and loudly weeps in physical pain, we do not properly speak of her sorrow. But if she lets fall and breaks her beloved dolly, then the word 'sorrow' is not altogether inappropriate. And when at a later age she weeps at the death of her beloved child, we feel that the word 'sorrow' is entirely applicable. For sorrow is tender regret; it is the painful thwarting of the desires of love; and love is a sentiment, a complex growth of the kind we have to consider in a later chapter.

Here, in connexion with sorrow, a further word may be said about joy, which so commonly is placed alongside sorrow as a primary emotion opposite to it in nature. Joy, like sorrow, has or expresses no specific tendency of its own; like hope, it is perfectly general. Clearly it is allied to pleasure. But is it merely pleasure of a high degree? No, in any nice usage we should not speak of joy when a hungry man, or boy, or dog, greedily gobbles his food, though his activity may be very pleasant. Joy is allied to sorrow in this respect; as sorrow implies the preformation of a sentiment of love, so also, in a similar way, joy implies the preformation of love or of other sentiments. The fulfilment of the desires of love is pure joy, joy of that kind to which the term is most completely appropriate. But other sentiments also can engender joy; ambition, or the religious sentiment, or any other strong sentiment, becomes the source of joy when its desires are fulfilled. Yet love is the sentiment the desires of which give rise to joy and sorrow in their purest forms. We know that this is implied when the poet writes:

> Joy, gracious lady, joy that ne'er was given,
> Save to the pure and in their purest hour.

Or when another writes :

> Sorrow's crown of sorrow is remembering happier things.

Depth of Feeling

In connexion with joy and sorrow we must take notice of the facts implied by the phrase ' depth of feeling '. Few psychologists have mentioned the facts, yet they are very real and are well recognized both in literature and by common speech.

Depth of feeling is not merely a matter of intensity of feeling or of emotional excitement. A man may be intensely excited, and at the same time express and proclaim great pleasure or sharp pain ; and yet we may feel sure that his feeling is shallow, lacks depth or profundity. While of another man, who, under similar circumstances, shows, perhaps, less intensity of excitement and of feeling, we assert with confidence that his feeling is very deep. The feelings of some men seem to be in all cases somewhat shallow ; of others we predicate depth of feeling as a constant trait of their personalities. And in our own immediate experiences we recognize the difference between deep and shallow feeling.

What, then, are the grounds of depth and shallowness of feeling ? The answer seems most clear in relation to joy and sorrow. Clearly, there are deep joys and shallow joys ; deep sorrows and shallow sorrows ; and, in both cases, the difference seems to be not one of intensity, but rather one of extent of reverberation through the personality. And the difference between joy and mere pleasant feeling (or between sorrow and mere unpleasant feeling) is of this same nature : joy is pleasant feeling that has its roots spread widely and deeply in the structure of the personality ; and sorrow is unpleasant feeling similarly grounded and hence ' reverberating '. This distinction between deep and shallow feeling can be understood only in the light of the theory of the sentiments, which belongs to a later chapter. Here it must suffice to say that a sentiment is a system of propensities and abilities ; some sentiments are relatively simple organizations differing from instincts chiefly in that, while the instinct is wholly

innate, the sentiment owes something of its organization to the experience of the individual. Other sentiments are much more complex, have extensive ramifications, and are very important parts of the total personality.

In the developed human being, feeling attends, far more often than not, the play of tendencies organized within some sentiment. And the law of depth of feeling seems to be that feeling is deep or profound in proportion to the extent of the system within which it plays its role. The principle may be illustrated by comparing two instances of feeling. An acquaintance makes some disparaging remark about a neighbour whom you mildly esteem and respect and whose merits you are expounding. In the other case a person whose judgement you highly value makes a similar disparaging remark about some person to whom you are deeply attached (the son who is 'the apple of your eye', your chief pride and hope, or the mother to whom you are bound by a thousand ties of gratitude and loving admiration). In both cases the remark provokes a painful feeling of low intensity; but in the former case your feeling has little depth; while in the second case it is very deep. This, in briefest and baldest statement, seems to be the principle we must invoke if we would understand what the poet means when he speaks of 'thoughts which do often lie too deep for tears'.

All Excitements Involve both Feeling and Emotion

In distinguishing emotion and feeling as two modes of experience, we are indulging in permissible abstraction; we abstract two aspects of concrete conscious activities, aspects that are prominent or intense in proportion to the intensity of our activity or striving. In every phase of activity both of these aspects are present; when our striving is at a comparatively low level of intensity and progresses smoothly towards its goal, our energy flowing out in well-organized channels of expression, both the emotional and the feeling aspects are of so slight intensity that we are apt to overlook them, finding difficulty in recognizing them introspectively. Under such conditions, feeling is merely a faintly pleasant

tone of the whole activity, varying in intensity from moment to moment, and occasionally complicated by a touch of unpleasant feeling as we suffer some check or encounter some difficulty; and the emotional quality of the whole activity is perhaps not recognizable. But the more expert we become in introspective observation, the more certainly do we recognize these aspects in all our activities. And the more strongly our motivating tendency or tendencies are at work, the more accentuated are these aspects. Consider so simple commonplace an activity as writing the following note: Dear B., I expect to be in town on Monday next, and, if I do not find you in your office, shall call to see you about eight o'clock. Yours, etc. Nothing could be less expressive of feeling and emotion. Yet, if the person addressed is the object of your passionate devotion, or of your long-pent-up hatred or revenge, the activity of writing these few words may involve a vivid play of emotion and of deep and complex feeling, any adequate verbal expression of which would require the skilful use of a large vocabulary. Now, my point is this: you do not write such a note without some motive, some desire to achieve some end; and that desire, whatever its nature, is an excitement which is not wholly devoid of emotional and feeling aspects. Suppose your purpose is to collect from B an old-standing debt. The predominant emotional quality of your activity may well be one of anger or vexation at the elusive tactics of your debtor; and the feeling quality may vary from hope to despondency as you write the few words. But the intensity of both emotion and feeling may be at any level of intensity according to the urgency of your need for the money and the strength of your desire to secure the payment. At one time you may write at white heat; on another occasion, in the coolest possible manner; but if your motive is the same in the two cases, differing only in strength or urgency, your emotion and feeling on the two occasions may well differ only in intensity.

It is, then, a profound mistake to treat of emotion and feeling as rare incidents occurring only at violent crises in our lives. They constantly accompany and qualify all our

activities ; although it is only when our energies are evoked in more than average volume that they attain to such intensity as to be easily noticed and recognized, either by the subject or by an interested observer. It is worth remarking also that, as it is said, the onlooker may see more of the game than the player, the interested observer may detect unmistakable signs of a play of emotion and feeling of which the subject who is the seat thereof may in good faith deny all knowledge.

Aesthetic Experience

The feeling and emotion involved in the appreciation of beauty, the beauty whether of art or nature, are distinguished as aesthetic. If we are asked to define beauty, we can readily point to beautiful objects ; but a general definition is not easy. We might venture on the following : Beauty is that in an object which provokes us to delighted contemplation of it without prompting to other activity. An object that is beautiful may have other qualities that prompt us to action other than purely contemplative activity : a beautiful child may evoke our compassion or our anger ; but tendencies thus evoked play no essential role in the appreciation of beauty. At best they contribute to the total intensity of our excitement and of our interest in the object, and in that way may enhance the energy of our contemplative activity. But, if they are too strongly evoked, they will disturb and conflict with our appreciation of beauty.

But some conative energy must be evoked by the object, or we should not contemplate it and should find no pleasure in it if we did. The most fundamental problem of aesthetics, then, is—What is the nature of the conation which works in us as we appreciate beauty and which attains satisfaction in and through the activity of contemplation ?

I do not profess to be able to suggest a complete answer to this question, but something may be said. There is one familiar emotion which is commonly evoked by beauty : not only do we enjoy beauty, find joy or some kind of satisfaction in it, but also we admire the beautiful object ; and commonly, if it is a work of human art, our admiration extends, if only

implicitly, to the creator of it. Now *admiration* seems to be the name we properly give to our state when any object evokes in us at the same time both curiosity and the submissive tendency; the emotional quality seems to be, or to result from, a blending of wonder and the submissive emotion.

Perhaps it is true that whatever we admire seems to us in some degree beautiful, and even the more beautiful the more strongly we admire it. Our admiration may be evoked by a great engine in action, a dynamo or printing press, and, if so, we incline to call it beautiful. Its power evokes our submission, its complexity and strangeness evoke our wonder. In contemplating a noble action, one of pure generosity, we are affected in a very similar fashion, and we incline to call beautiful both the act itself and the character from which it proceeds.

If the object admired is not only beautiful but also grand, overwhelming, tremendous, it may evoke also some degree of fear; and this adds to, rather than detracts from, its beauty. Our fear is sublimated in the configuration of emotion and lends its energy to the whole activity; our emotion is no longer simple admiration, but partakes of the nature of awe, and we speak of the object as sublime.

On the other hand, the admired object, if it is very small, delicate and fragile, may evoke in us the protective tendency; our admiration then is coloured with the quality of tender emotion, as in the contemplation of a perfect rose.

In a similar way other emotional impulses may be involved, notoriously the sex-impulse. In each such case it is essential that the adjuvant impulse shall not predominate, that in the configuration its energy shall be held in check and sublimated. The storm that grows so violent as to fill us with terror and drive us cowering to cover ceases to seem beautiful; and if a representation of the nude evokes too strongly the sex-impulse, the beauty of the object is impaired or destroyed. In a man contemplating the beauty of the woman he loves, the power of admiration to hold in check the sex-impulse is re-inforced by the tender protective impulse.

But is there no specific impulse evoked by beauty? Take

the case of a well-shaped vase or a simple repeating design. It pleases us, and, if it holds us a moment in contemplation, we may pronounce it to be beautiful. Now, in such simple instances, one thing is clear—the object is pleasing to us in so far as it presents a system of relations that evoke in us a smoothly flowing stream of perceptive activity adequate to the object ; in face of such an object contemplative activity is pleasant because successful, because it progresses towards and attains its goal with ease, without checks and thwartings.

The more complex the design (the richer its system of relations, so long as they are well within our powers of apprehension) the more pleasant is the perceptive activity. If the pattern contains irregularities that are meaningless, if parts of it disappoint and thwart the expectations which its main features evoke, or if its complexity is too great to be seen through (i.e. if the relations presented are so complex that the perceptive abilities of the observer are inadequate to them), then the activity of perception is unpleasant and we call the object ugly or displeasing.

These simple principles are perhaps most clearly illustrated by music. A mere rhythmic succession of sounds is pleasing ; and it is the more pleasing the greater its complexity up to the point at which our perceptive activity is baffled. When to the rhythm harmonious relations of tone are added, the activity is again more pleasing up to the point at which our abilities become inadequate to the work of apprehension.

There is a type of music and a way of appreciating music which seem to involve little more than the carrying of this principle to a very high pitch of perceptive activity. It is the classical or intellectual type of music and of musical appreciation. Even in the most intellectual and unromantic appreciation of such music, it is probable that some emotional excitement is involved. And frankly romantic music evokes in the romantic hearer a wealth of vivid emotion. But take the case of the most intellectual music and the most intellectual hearer. His highly developed perceptive abilities are fully exercised in apprehending the vastly complex system of relations that is unrolled as the music proceeds. His

appreciation and the ground of his pleasure seem to be very similar to those of the mathematician reading a well-constructed piece of mathematical demonstration. Here probably is a partial explanation of the fact that musical and mathematical ability are so often combined in one person. Both the mathematician and the intellectual musician may pronounce their respective objects to be beautiful; and this seems to be because the activity of comprehension evoked is, in both cases, a very full and progressively successful activity. In both cases, perhaps, the rich, successful and, therefore, highly pleasant activity is accompanied by a glow of admiration for the artist who has created the thing of beauty. And it remains a question whether, in the absence of any such stirring of admiration, the object would be called beautiful. But, whether the answer to that question be yes or no, the further more fundamental question remains—What is the conative energy subserving the most purely intellectual appreciation of the beautiful object?

One answer is that it is the nature of the mind to seek harmony, to evolve order, to reduce chaos to system; and that the contemplated object is found to be pleasing and therefore beautiful in proportion as it lends itself to, evokes, and promotes such ordering activity. Allied with this is the answer that man is endowed with a special intellectual tendency, some instinct not present in any animal. It is a view elaborated by Professor Graham Wallas [1] and by Dr. N. D. M. Hirsch.[2] I remain unconvinced by their arguments.

Recognizing that intellectual activity is essentially a grasping of relations, a relating activity, we must nevertheless, it seems to me, seek the activating energy of all intellectual activity in the native propensities; and in the intellectual appreciation of the aesthetic object that is most nearly pure, most nearly free from admixture of emotion, we may, I think, plausibly find the conative root in the impulse of curiosity, which seeks merely fuller apprehension. Is it not true that novelty is half the charm of simple beautiful things; that,

[1] In his *Art of Thought*, London, 1926.

[2] In his *Genius and Creative Intelligence*, Cambridge, Mass., 1931.

as soon as we have completely explored them, as soon as we are thoroughly familiar with them, we cease to notice them and no longer find pleasure in them? Is not this true of decorative designs, of music, of architecture, of personalities? The very simple may cease to be beautiful to us; we may know it to have beauty but without feeling that it is beautiful.[1] Hence the need for great complexity, or for novelty, or for change, in objects of purely intellectual aesthetic quality. Even the beautiful landscape that is always the same soon becomes insipid. It is largely the perpetual changes of light and shade and colour and detail that maintain the charm of a familiar landscape.

There is, of course, a complication in the case of the thing we grow to love. It remains interesting to us in virtue of the sentiment that grows up about it (cf. Chapter XIV); hence, however simple its nature, whatever beauty it has continues to appeal to us. Further, a wealth of pleasant associations may be formed about the familiar object. And in this way even an old pipe which I have smoked in various strange and beautiful places may have for me a charm and a value that make it almost beautiful.

The beauty of landscape is peculiarly complex. It is, I think, essentially emotional. It owes much to sentiment and associations. A sunset over the sea may seem very beautiful to many of us. Here there is little in the way of complex and harmonious relations; but there is richness and variety and gradation of colour. And, above all, there is vast space which is forced on our attention by the array of cloud. A field of colour similarly distributed at close quarters would fail to produce a similar effect; and, if the artist's brush can in some degree reproduce the effect, it is because he knows how to suggest the effect of vast spaces filled with brooding silence, suggestions of the Eternal Being that fill us with awe and a sense of our own littleness. But I confess that the overwhelming effects of landscape seem to require the postulation of racial memory for their full explanation. And when psychology shall have said its last word on beauty, may it

[1] 'I know, not feel, how beautiful they are.'

not still remain a mystery that the world should contain so much that can work upon us in the fashion implied by the word ' beauty ' and that we are capable of responding to it appropriately, of being raised, refined, ennobled by the contemplation of it ? Here is the greatest marvel of man's adaptation to his environment and the greatest challenge to all attempts at naturalistic explanation.

There is a banal way of approaching these aesthetic problems which consists in assuming that every ' sensation ' is intrinsically pleasant or unpleasant, that pleasure and unpleasure are, as it is said, attributes of the sensations. According to this view, the beauty of an object arises from its exciting in us a mass of pleasant sensations. This is to ignore the essential factor, the activity of apprehension. This view seems to have a certain plausibility only so long as we consider very simple sense-impressions, colours, tones, tastes, odours, touches. But even in these cases, though perception may be pleasant and we call the object pleasing, we hardly call it beautiful ; and it is pleasing because, and in so far as, it is such as to call into effective play our powers of perception. If a man cultivates his powers of discrimination, his abilities, in these fields, he may derive very considerable pleasure from their exercise. The connoisseur of wines who, on tasting a mixture of two ports, says at once ' There are two wines here ! ' may well find a good port very pleasing and might even pronounce it beautiful.

Is there, then, no such thing as a beautiful colour or tone or taste or touch. pure and simple ? I would say—No. Perceiving that is adequate and undisturbed is always pleasant; but the beauty of any such simple impression depends upon its setting, upon the relations between it and other things which give it significance, meaning, power to interest us, to provoke us to activity, to striving that aims at complete apprehension.

CHAPTER XII

DISPOSITION, TEMPER, TEMPERAMENT AND CHARACTER

THE four words of the title of this chapter are in common usage and good standing. Their popular usage is very vague and uncertain ; but in literature, which consists so largely of psychological description and analysis, they are used with more consistency. It must be confessed that psychology, so far from clarifying the topics implied by these words, has reduced them to one vast confusion and has made the words themselves wellnigh useless. I rēnew here, in concise form, my earlier efforts to introduce a little system and order into this obscure field.[1]

The confusion current in psychology may be illustrated by the practice of a writer who made claims to some precision in the use of language. The late Dr. Charles Mercier, psychiatrist, logician, psychologist, and brilliant writer, published a little volume entitled *Human Temperaments*. He concluded his preface with the words : ' The following pages attempt a description of some common types of character.' The confusion between temperament and character, thus formally instituted, has been faithfully maintained in a great many subsequent discussions and still prevails. Among American psychologists, always strongly influenced by German authorities, the confusion is due in part to the unfortunate lack in the German language of any word corresponding in meaning to the English word ' character ' :

[1] Cf. especially two articles—' The Chemical Theory of Temperament applied to Introversion and Extroversion ', *Journal of Abnormal and Social Psychology*, 1929 ; and ' On the Words Character and Personality ' in the new journal *Character and Personality*, 1932.

for the German word 'Charakter' means something quite different; it is used in a sense nearer to that in which the word 'character' is used by English-speaking biologists in such phrases as 'transmission of acquired characters', namely, to imply whatever renders an organism (or a species) distinctive, different from other organisms (or species). But the confusion is also largely due to the fact that the psychology of the nineteenth century, dominated by an intellectualistic tradition, ignored in the main the affective side of personality, concerned itself almost exclusively with 'sensations' and 'ideas', and was content to leave the problems of character-formation to the moralists, the clergy, and the schoolmasters.[1]

This long-continuing confusion is the more regrettable in that an outline of a true doctrine of temperament was made by the ancients and was one of the earliest successes of psychology.

In the following pages I follow the best literary usage in attempting to fix and enrich the meaning of our four words.

Disposition

In the literary description of a person it is common usage to say that he had a kindly, a timid, an irascible, a lustful, a gluttonous, an inquiring, a sociable, or a fastidious disposition. And such descriptions commonly imply that the person concerned was disposed by native constitution to behave frequently and on slight provocation in the manner implied by the adjective. In the light of our discussion of the native propensities of the human species, we may go further; we infer that in the person described as of the dis-

[1] The completeness of this neglect by psychology of a most important part of its proper field is well illustrated by J. S. Mill's proposal to found an independent science of Ethology, and the similar proposal of Charles Mercier to found such a science and to call it 'Praxiology'. In 1905 I proposed in my little volume, *A Primer of Physiological Psychology*, to remedy this split of the field of psychology into two unrelated parts by defining psychology as the science of conduct or of behaviour, a definition which has now been widely accepted, although its usefulness has been impaired by the extravagances of the school of 'behaviourists'.

position characterized by any one of these adjectives, the corresponding propensity is unusually strong relatively to other propensities.[1]

Of many persons no such relative excess of any one propensity can be predicated. This does not mean that such persons have no disposition ; it means rather that they are of well-balanced disposition, or have a constitution in which no one propensity is markedly or unusually strong. A man's disposition is, then, the sum total of his propensities. In the main, the strength of his several propensities is constitutional or innately given ; but, no doubt, any propensity may be strengthened through much exercise, if the circumstances of his life, especially of his early life, are such as to call it very frequently into play. For example, a person who constitutionally is not unusually timid may nevertheless become so if he lives under conditions that frequently bring his fear propensity into play.[2] That there are such differences of native constitution we can hardly doubt : some children seem natural gluttons ; others more than averagely curious, or timid, or fastidious, or tender, or self-assertive, or docile. And, most obviously of all, in some men, like the notorious Casanova, the sex propensity seems to be of unusual strength, dominating in extreme degree the course of their lives ; while in others it never, even under the most favourable circumstances, engenders any tendency of such strength as to be of much influence on their conduct or their imagination. In other men in whom, perhaps, the sex propensity is by native constitution of normal or average strength, it is unduly stimulated in youth by indulgence in lewd conversation, in erotic literature, in public displays designed to excite the propensity, and in lascivious imaginings, until it becomes a source of tormenting desires and reckless behaviour, a disturbing force over

[1] The word 'disposition' as used in common speech clearly points to the native basis. To say of a man that he is of timid disposition means not only that he is a timid person, but also that his timidity is constitutional rather than acquired.

[2] This sentence requires the qualifying clause ' without sublimation '. On *sublimation*, see p. 307.

which the man has but little control. The literature of morbid psychology, of biography, of fiction, provides many vivid descriptions of the struggles, the humiliations, the torments and despairs of men in whom the sex propensity has been of undue strength, whether natively or in consequence of excessive stimulation and indulgence of its desires.

Another propensity that seems to be of undue native strength in some persons, and in others to become hypertrophied through excessive stimulation and uncontrolled indulgence, is the self-assertive propensity; in such persons it gives rise to all the manifold forms of egotism, crude or subtle. Vanity, overweening pride, morbid self-consciousness, ruthless ambition, these are but a few of the protean forms of egotism.

A man's disposition is, then, the sum of his native propensities modified in various degrees in their relative strengths by the course and circumstances of his life, according to the fundamental principle that use strengthens any function, while disuse allows it to remain relatively undeveloped or to undergo actual decay or atrophy.

Temper

The native propensities vary from one man to another, not only in respect of the strength or urgency of the tendencies which they engender, but also in respect of the way these tendencies work towards their goals.

In one man a tendency, once aroused and set towards some specific goal, continues to work most persistently; he is not easily distracted from his line of activity, and, if forced to desist, he surely reverts to his task and knows no rest until it is accomplished. Such a man is properly said to have or to manifest a steadfast or persistent *temper*. Another man who in respect of disposition (the relative strengths of his propensities) does not differ appreciably from the former may show extreme instability of conduct. He may set out energetically towards his goals; but, if his efforts do not bring immediate success, he soon turns aside: he is easily diverted to other lines of activity and does not readily or surely revert to his

unfinished task. His impulses and desires, though they may be urgent, are not persistent. Of such a man we properly say that he shows a fickle temper.[1] The steadfast and the fickle tempers are perhaps the two varieties most easily and commonly recognized.

But there would seem to be two other ways in which men differ in respect of the mode of working of the native tendencies within them. In some men all the propensities seem to engender tendencies of great force or urgency, without excessive or disproportionate strength of any one propensity: while in other men of similarly well-balanced disposition all tendencies seem to have but little urgency; such men take all things calmly, they never become intensely excited. The former are properly said to be of *urgent, energetic,* or *fiery temper*; the latter of *placid temper.* It is true that in speaking of a fiery temper we often have in view the great intensity of the anger frequently displayed by the person in question; but that is only one manifestation of the energetic or fiery temper; and such temper may be validly distinguished from the irascible disposition of the man who is quite unduly liable to anger. There occurs in some men a combination of irascible disposition with a general weakness or lack of urgency of all tendencies; such a man is weakly irritable.

Note also that degrees of steadfastness (or position in the scale between extremes of steadfastness and fickleness) are independent of degrees of urgency (or position in the scale between extremes of fieriness and placidity). The man of steadfast temper may be either fiery or placid. And the

[1] The word *perseveration* was used by Professor G. E. Müller to describe the fact that some of the subjects of his celebrated experiments on memory found themselves liable, in very much greater degree than others, to the spontaneous recurrence to consciousness of the facts or objects which they had committed to memory; a recurrence often irrelevant to the activity of the moment and quite undesired or involuntary. The word has been extended to cover a number of phenomena seemingly of allied nature. Whether all or any of these are manifestations of conative persistence can be determined only by further carefully planned experiments, using the methods of correlation.

fickle man may be of placid temper; but, just as often, perhaps, he is of fiery temper, his every impulse working with great intensity when first excited, but quickly subsiding and giving place to others.

The third mode in which the native tendencies show individual peculiarities is in respect of the degree to which their working is affected by pleasant and unpleasant feeling. In some men all striving is much influenced by feeling, the feeling evoked by degrees of success and failure, either actual or merely anticipated. At every little success, or every prospect of success, they are intensely pleased and their striving is correspondingly intensified: and every failure, or prospect of failure, they find acutely unpleasant; they are correspondingly downcast and discouraged by it, their efforts weakened, checked or diverted. Hence such men are constantly running up and down the scale of the blended feelings (or derived emotions) from confidence through hope, anxiety and despondency and back again, with every change in the prospects of success or failure. They are expressively and properly described as of *mercurial temper*.

At the other end of this scale of *affectability* are men who, whether they be steadfast or fickle, urgent or placid, are but little subject to the influence of feeling. They are not easily discouraged and enervated by failure or the prospect of failure; and they are not much stimulated, encouraged, or 'pepped up' by successes or by the prospect of success. They strive steadily at an even intensity of effort. They are properly said to be of *even temper*.

There are, then, three respects in which men's tendencies show peculiarities of their mode of working; these seem to be independent variables and give three corresponding scales of temper, the scale of persistency, the scale of urgency, and the scale of affectability; that is to say, in respect of temper a man may occupy any position in any one of the three scales independently of his positions in the other two scales. Therefore, in order fully to characterize a man's temper, we should have to assign him a place in each of the three scales.

The Physiology of Disposition and Temper

If the reader inquires—What facts of brain-structure or of chemical constitution are implied by peculiarities of disposition and of temper?—very little can be said by way of answer. Converging evidence of several kinds points to the mid-brain, the masses of nervous tissue (vaguely known as the basal ganglia) situated at the base of the brain and anatomically and functionally intermediate between the spinal cord and the cerebral hemispheres or great brain, as the main seat of the nervous tissue which subserves the native propensities. The most decisive part of this evidence is that afforded by surgical operations upon the brains of animals. It has, for example, been shown in several species of birds and mammals that, if the great brain is completely removed, leaving intact the rest of the nervous system, including the basal ganglia, the animal, while incapable of all intelligent adaptation and all learning of new reactions, may continue to display some or all of the propensities natural to the species, though in an imperfect manner. If, on the other hand, the tissue of the mid-brain is also removed, the animal is reduced to something very like that which it has so often been asserted to be in its normal state, namely, a reflex machine.

Alongside this evidence we may put the fact that, in the lowest vertebrate animals, the great brain (or cerebral hemispheres) is extremely small (the brain consists almost entirely of nervous tissue which is homologous to the mid-brain of the higher vertebrates); yet these lower vertebrates, while displaying but slight powers of intelligent adaptation, have the fundamental propensities common to all their kind. The advance of physiology may some day add greatly to our meagre knowledge of the nervous basis of the native propensities.[1] But psychology should not postpone to that still-distant date its recognition of the propensities and its study of their nature and functioning by its own methods. Nor need it postpone such recognition and study until the mathematical method of correlation shall have been applied to

[1] Cf. Appendix to Chapter XXII.

establish the reality of these fundamental components of human nature ; as some of the exponents of that method seem to assume.[1]

When we turn to consider *temperament,* we find that physiology has more help to give, can tell us something about chemical substances that profoundly affect temperament. Perhaps it is this solid materialistic basis that secures for the problem of temperament a hospitable reception in the minds of many psychologists who resolutely ignore the facts and problems of disposition, temper and character.

Temperament

We cannot do better than follow the lead of the ancient philosophers who recognized that temperament is in the main determined by the humors of the body. But we are under no compulsion to accept the four temperaments which were established in the European tradition by the authority of the Roman physician, Galen. The traditional recognition of these four temperaments, the sanguine, the phlegmatic, the bilious, and the choleric, though it is still the fashion to expound them, should be regarded as merely a first very rough approach to the very complex problems dealt with under the four headings of this chapter. Each of the four words, sanguine, phlegmatic, bilious, and choleric, inevitably confuses factors which properly fall under the heads of disposition, temper, and temperament, and, perhaps, also under character. In so far as sanguine means ' hopeful ' or ' optimistic ', it points to a quality of temper ; but, as commonly interpreted, it seems to imply also qualities of disposition and of temperament in the stricter sense of the word here advocated. And the other three words seem to involve and perpetuate similar confusions.

Accepting, then, the traditional doctrine in so far as it properly determines the general meaning of the word tempera-

[1] It is one thing to recognize the value of that method and the desirability of applying it wherever possible. It is another thing to refuse to recognize any factors of human nature not established by the use of that method.

ment, we may define temperament as the personal qualities that are determined by the chemical influences of the bodily metabolism exerted upon the general working of the brain or nervous system.

But here again we must distinguish. There are certain internal secretions, hormones or secretions of endocrine glands, that seem to work in specific fashion as sensitizers of this or that propensity. The propensities of hunger and sex afford the clearest illustrations. The chemical condition of the blood that results when food is not taken for some considerable time seems to sensitize the food propensity ; makes it very ready to generate the food-seeking impulse ; produces, in other words, the appetite for food. The sex glands secrete into the blood some substance that exerts a similar effect upon the sex propensity, generating an appetite for sex activity. There is no such clear evidence of hormones playing a similar role in the functioning of the other propensities ; but, wherever we observe evidence of a cyclical accentuation of a propensity, or recurrence of an appetite (as in the case of the migratory propensity), we have good ground for postulating such a factor.

These chemical factors acting as specific sensitizers of propensities should, perhaps, be reckoned as factors of disposition rather than of temperament. The true chemical factors of temperament seem to affect the working of the nervous system in a more general fashion, working probably in the same way on all its parts.

Fatiguability as a Factor of Temperament

One such general chemical factor is *fatigue*, or, more strictly, the presence in the blood of the products of metabolism of muscle and nerve tissue (and probably of other tissues also in less degree), products which produce symptoms of fatigue by slowing and clogging the working of the brain. During strenuous activity such products are thrown into the blood more rapidly than they are excreted from the body by lungs, skin, kidney, etc., and hence accumulate ; and they seem to

work upon all parts of the nervous system to clog or slow its workings.[1]

Now there can be no doubt that men differ widely in respect of their susceptibility to, or resistance to, fatigue. Of two men who work on a given task equally vigorously at the outset, one may show marked signs of fatigue much sooner than the other. The problem is much complicated by factors of motivation, of disposition, temper, and character; yet we can hardly doubt that one important factor is susceptibility to fatigue in the strictest sense; and this must be reckoned a true factor of temperament. In its turn this may well be complex; it may be in part a matter of the efficiency of the excretory processes; in part, perhaps, a matter of rapidity of the anabolic or assimilatory processes of the tissues. And again the whole problem is complicated by influence of local fatigue factors. In spite of all complications we may, I think, validly aim at assigning to each individual his position in a scale of *general fatiguability*, or of resistance to fatigue.

Thyroid Secretion as a Factor of Temperament

Some of the internal or endocrine secretions, unlike those chemical factors which, like the sex-hormone and the hunger-exciting substance,[2] are specific sensitizers of the corresponding

[1] Mosso showed, many years ago, that, if the blood of a tired dog be led into the vessels of one that is fresh and lively, the latter at once shows symptoms of general fatigue. As long ago as 1901 I argued that the fatigue substances, waste products of metabolism, as well as many drugs, especially strychnine, caffeine, alcohol, chloroform, ether, etc., produce their effects upon bodily and mental activity chiefly by altering the processes of transmission at the synaptic junctions of the nervous system. In recent years the evidence in support of this view has grown stronger. More recently a colleague (Miss M. Smith) and I have produced some experimental evidence pointing to the secretion of some substance which operates as an antidote to general fatigue, a substance which may be regarded as a fatigue antitoxin. I mention this in order to illustrate the complexity of the problems we are here lightly touching.

[2] It may be that the food appetite arises on the deprivation of some chemical factor, rather than on the addition of a positively exciting substance to the blood.

propensities, seem to modify the working of the whole nervous system (and perhaps that of other tissues also), and to be in this respect very similar in their action to such drugs as alcohol and strychnine. The best known of such secretions is that of the thyroid gland. This substance, thyroxin, has been isolated and its chemical constitution ascertained, and physicians have large experience of its effects when medicinally used.

In certain cases there is some morbid deficiency of this secretion. If the deficiency is very marked, the patient is very sluggish in all his activities; and, if the patient is a young child, all the processes of mental and bodily growth are so seriously retarded that, if no remedy is applied, he remains an imbecile dwarf. Fortunately, such defect can now be remedied by administration of thyroxin through the mouth. If it is taken in suitable amount, all the symptoms vanish, the patient regains a normal liveliness (which continues only so long as the drug is taken) and the growth and maturation processes resume their normal course.

On the other hand, excess of thyroxin in the blood (produced either by excessive activity of the gland or experimentally by way of the mouth) produces the opposite symptoms, namely, those of a general excessive activity or irritability of the nervous system: not one tendency only is brought into undue activity, but every kind of excitement is unduly intense; the patient lives at too great a rate, and, in spite of a voracious appetite for food, becomes emaciated and exhausted. All of these symptoms subside as soon as the excess of thyroxin in the blood is removed.[1]

Other Chemical Factors of Temperament

Here, then, is one great factor of temperament; and we cannot doubt that there are other chemical factors that have a similar general influence on the metabolism and functioning of the nervous system. There is a small gland at the base of the brain (the pituitary gland) whose internal secretion is no less

[1] In cases of hypertrophy of the thyroid gland, surgical removal of part of the gland commonly succeeds in removing or alleviating the symptoms.

powerful in its influence over growth than that of the thyroid gland. Excess of it in youth produces the excessive growth of the giant ; and defect of it results in a dwarfish development.

A more pronounced factor of temperament is the internal secretion of the small mass of glandular tissue that lies upon the upper end of the kidney, the suprarenal capsule. This consists of two parts whose powerful secretions are of different functions. One of these seems to play the role of a general sensitizer, a mobilizer of the energies and substances required in all violent and sustained emotional activities. Any emotional excitement seems to excite the gland to increased secretion ; and the secretion in turn accentuates the symptoms of the emotional excitement : it causes the liver to throw into the blood, at an increased rate, the sugar which it contains stored in the form of glycogen ; and thus provides the muscles with an abundance of fuel ready for combustion ; it accentuates the working of heart and lungs, contracts the small arteries of the skin and bowels, and dilates those of the muscles and the brain and, in these ways also, favours sustained intense activity of these organs. These and other similar secretions also influence one another, forming a system which has been likened, somewhat fancifully, to an interlocking directorate ; the delicately balanced operations of the system are essential to the normal functioning of mind and body or (if you prefer) of the mind-body.

Introversion and Extroversion

There is one peculiarity of temperament the recognition of which is of high importance both for the normal conduct of life and for the understanding of the incidence of nervous and mental disorders. Namely, men differ greatly in respect of their *expressiveness*. In some persons every slightest stirring of any tendency expresses itself outwardly in movement and gesture, in facial play, in voice, in pallor or flushing, in emotional symptoms of every kind. In others, who perhaps are of similar disposition and temper, whose propensities are no less strong and whose temper is no less energetic, the excitement resulting from any effective evocation of this or

that or of several propensities finds but little outward expression; in them rather the excitement works inwardly, provoking them to think, to ponder and deliberate, before venting itself in outward action and expression.

To some extent these differences are a matter of training and self-discipline; in other words, of character formation. Yet there can be no doubt that, though modifiable by the formation of character, the peculiarity in question is in the main a matter of native constitution. Whole races of men differ markedly in this respect [1]; and children of the same parents brought up in as nearly possible identical fashion and environment may stand at opposite ends of the scale of expressiveness at all of life's stages; the one is throughout life an expressive person, readily making himself understood, and in fact having the greatest difficulty in concealing his slightest emotional stirrings, while the other remains from childhood to old age a shut-in personality, finding difficulty always in giving adequate expression to his emotions, and seeming, in consequence and by contrast with his more expressive brethren, cold, reserved, awkward, repressed, even when he is deeply moved and when he consciously desires to express his sympathy, friendliness or love.[2]

Now there is one great experimental fact which in itself goes far to show that differences of the kind we are discussing, degrees of freedom or ease of emotional expression, are a matter of temperament in the strict sense defined above. Namely, if you take a person of the inexpressive temperament, one who is an extreme example, who stands at the very bottom of the scale of readiness of emotional expression, and

[1] As pointed out in my little book on racial psychology (*Is America Safe for Democracy?* N.Y., 1921). The Indians and the Negroes of North America present an extreme contrast in this respect. More recently Professor C. G. Seligman has argued that the Japanese are a naturally expressive race whose natural freedom of expression is restrained by a severe traditional discipline. My own observations in Japan have led me to the same conclusion.

[2] I refer the reader specially interested in this question to the contrast I have drawn between two of my sons (in my *Outline of Abnormal Psychology*, p. 435).

administer to him successive small doses of ethyl alcohol, you push him step by step up the scale of expressiveness, until, when he has absorbed into his blood a reasonably large dose, he is ready to fall on your neck at the slightest provocation and to weep, or laugh, or rage, or display himself and assert his powers and opinions with the utmost freedom, a total absence of his usual reserve. These facts are no new discovery of the laboratory. They were known to the ancients; but it seems to have been reserved to myself to point out their illuminating bearing on the ancient doctrine of the temperaments.[1] *In vino veritas* is the phrase in which the ancients concisely stated the truths I am labouring to expound.

As just now indicated, if this experiment is made with a person of the inexpressive or shut-in temperament, a considerable quantity of the drug is required to produce a high degree of freedom of expression; but, if the same experiment is made with a person of the expressive type, one who, in his normal condition, stands near the other end of the scale, a smaller quantity of the drug suffices to bring him to the same condition of excessive lack of restraint, the condition commonly called ' maudlin emotionality ' or mild intoxication.

In these facts we have a strong suggestion that the temperamental peculiarity under discussion, namely, the position of any person in the scale of expressiveness, is largely determined

[1] Cf. my article ' The Chemical Theory of Temperament applied to Introversion and Extroversion ', *Journal of Abnormal and Social Psychology*, 1929. Also my contribution to the volume *Physiological Action of Alcohol on the Human Organism*, where in the chapter on the Nervous System I have shown reason to believe that alcohol, chloroform and ether act primarily on the synaptic junctions of the brain, blocking the brain-paths in the order from above downward, those of the highest levels of the cortex being first affected, their inhibitory influence on the lower levels being thus suspended. In recent years it has been found that another chemical substance, namely *sodium amytal*, seems to have a closely similar influence on the brain; and, since this does not yet fall under the ' prohibition ' law and is only gradually absorbed from the stomach, it is found useful in medical practice when it is desired to bring a too-shut-in patient to a state of greater responsiveness.

by the degree to which the blood normally contains a substance (presumably an internal secretion from one or more tissues) which acts upon the nervous system in much the same manner as does alcohol or sodium amytal.

The words *introversion* and *extroversion* have been given wide currency among psychologists by the writings of Dr. C. G. Jung on types of personality.[1] If we were to accept Dr. Jung's powerful suggestions, we should take each of these words to imply a complex conjunction of qualities among which two would stand out most clearly: 'introversion' would imply the inexpressiveness we have discussed above, but also a high degree of self-centredness, of ego-centricity as Jung calls it, or, more simply, of egotism; while 'extroversion' would imply, among other things, the opposites of these qualities. Now I recognize fully Dr. Jung's proprietary rights in the words 'introversion' and 'extroversion'; yet degrees of expressiveness are so clearly implied by his use of the words, and the words are so well suited to express extreme degrees of inexpressiveness and expressiveness, that I venture to urge they should be used with this narrower connotation and wider denotation. A strong reason for this simplification of their meanings is that Jung's usage seems to involve at least one assumption which seems to be without foundation in fact, the assumption, namely, that inexpressiveness is closely correlated with high degree of egotism. This seems to me an error. Hitherto, no exact investigation has been directed to this question.[2] But a review of one's acquaintances seems to indicate that a high degree of egotism very commonly goes with natural freedom of expression, at least as commonly as with lack of expressiveness. In other words, there seems to be no high correlation between these qualities; nor does it seem possible to suggest any ground in the nature of things for such a correlation.

[1] Though the words had been used in similar senses by much earlier writers.

[2] In the course of a research into this problem one of my colleagues, Dr. W. L. George, reports (in an article not yet published) a lack of all positive correlation between inexpressiveness and egotism.

I suggest, then, that the term *introvert* may best be used to denote the persons who are constitutionally inexpressive; *extrovert* to denote those who are constitutionally blessed with a high degree of facility of emotional expression. Or, putting it less factually and more theoretically, the introverts are those in whom reflective thought inhibits and postpones action and expression; the extroverts are those in whom the energies liberated upon the stirring of any propensity flow out freely in outward action and expression. Or, again, more physiologically, the introverts are those in whom the freedom of interplay between the neurone systems of the higher cortical levels strongly inhibits the direct outflow of energy from the affective centres of the lower brain; while the extroverts are those in whom those same energies flow out freely in the most direct efferent channels to muscles and viscera, being but little inhibited by the activities of the higher brain-levels. This antithesis between thought and action seems to be one manifestation of a very general principle of the energizing of organisms; namely, where energy is freely used in one kind of activity or function it is at the expense of other activities and functions; the latter are kept at a low level of energy-supply.

There is no reason to suppose that all men may be separated into two well-defined groups, the introverts and the extroverts; the probability (indicated both by common observation and by general principles) is that, in respect to this quality of temperament (as in respect to others also) all men may be ranged in a continuous scale ranging from one extreme to the other, and that their distribution in this scale would be found to approximate to a normal curve of distribution.

It is probable that there are many chemical factors contributing to determining that manifold complex of qualities which is temperament. Of these a few only, though perhaps the most influential, have been roughly defined in this section. We are only at the beginning of our understanding of temperament. In these pages I am chiefly concerned to prepare

the way for progress by putting an end to the prevailing confusion of temperament with disposition and with character.

Character

The confusion and obscurity that still pervade all the psychology of the affective life are most extreme in that part which is of the highest practical importance, namely, the psychology of character and of character-formation.

It is unfortunate that German psychologists, in so far as they use the word *Charakter*, commonly adhere to the sense in which it is used by biologists, as in the phrase ' inheritance of acquired characters ' ; in this usage the word means ' peculiarities ', whatever qualities, traits, functions, or organs are distinctive of an organism or of a natural group of organisms ; and in this sense the word is used in English biology. Yet in German literature [1] the word occurs with the more special meaning of the English word ' character ' as used to point to a special aspect of developed personality ; namely, that in a man which gives, or, rather, is the ground of, consistency, firmness, self-control, power of self-direction or autonomy. A looser usage is also frequent in English ; as when a man is said to be ' a character ' or ' a queer character ', meaning that he is a highly peculiar or distinctive personality. And, in a third loose popular usage, the word means good, well-organized or well-knit character. In these pages (as in my *Social Psychology*) the word is used in the first of these three senses. This usage seems to be the best established ; we properly attribute to one man weak or bad character and to another good or fine or noble or strong character.

It is a matter of common agreement that *character* (in this special sense) is something that slowly grows or is gradually formed within the child and youth, and that the process is greatly influenced by the persons and the organized society with which his life is bound up. The vast importance of the process is also generally recognized, as shown by the existence of a voluminous literature wholly concerned with

[1] Cf. p. 187.

character and character-formation. Yet how few could give any precise or illuminating reply to the questions—What is character? How is it formed? Of what does it consist? To the questions—What does it do? What is its role or function in human life?—more definite and more satisfying replies would reveal a fair consensus of opinion. Character, it would be agreed, gives stability, consistency, harmony, predictability to conduct; it is that in a man which makes him trustworthy, dependable, keeps him steadily set towards his major goals in work and play, gives him strength of will and purpose, renders him capable of making the 'hard choice' in difficult situations, and of abiding by his decision. Yet it cannot be identified with mere persistency or with obstinacy. We do not say that a mule or a donkey has strong character because he refuses to budge. Strong character is not merely the opposite of docility or of adaptability; the man of fine character may be unbending in certain respects and yet infinitely teachable and adaptable. Nor is it identical with energetic temper; a most fiery and energetic man may be conspicuously lacking in character. Again it is not identical with well-balanced disposition or with any particular variety of disposition. Even further, if possible, from the truth is the common identification of character with temperament: the introvert and the extrovert, the sluggish and the quick or irritable, the fatiguable and the resistant, and all other varieties of temperament seem to be almost equally compatible with strong or well-formed character. Disposition, temper, and temperament are, as we have seen, in the main factors of the inborn constitution (although susceptible of modification in some degree in the course of life), while character, absent in the infant, is something that grows up within us and which in large measure, especially in its later and higher stages, we make for ourselves.

English writers agree in the main that character is something very real and of the first importance; that it is acquired in various degrees; that its development can be promoted but little by instruction, though greatly by personal influence; that the first years of life are, in this respect, more important

than all the rest; that the battle of life is the one great school of character. And they agree in regarding the mimic battles of the school playground as making strongly for character development.[1]

In America the considerable literature of character seems to have been written mainly by authors who fall into two classes. There are those who vaguely conceive character as something that is imparted by instruction in the Sunday School. On the other hand are the authors who, having been taught that man is a bundle of mechanical reflexes, laboriously arrive at the inevitable conclusion that character is a myth; like the yokel contemplating a giraffe at the Zoo, they exclaim: 'There ain't no such animal!' And yet the giraffe obstinately refuses to be explained away.[2] And in America, as in England, the layman persists in recognizing character (in the English sense of the word) as something of great value intimately connected with what he calls his 'self-respect'.[3]

In Germany also, in spite of the lack of a word equivalent to the English 'character', there has grown up in recent years a considerable literature under the head of *Charakterologie* and *Charakterkunde*; and the best of this (notably the writings of Dr. Ludwig Klages and of Dr. Hans Prinzhorn) is largely concerned with the problems of character development in the English sense of the word.[4] And it would seem that, though in German science the word *Charakter* has retained its biological meaning, men of letters have used it in

[1] An opinion embodied in the famous dictum of the Duke of Wellington: 'The battle of Waterloo was won on the playing-fields of Eton.'

[2] An exception is Dr. A. A. Roback, who, in his volume on Character, arrives at the conclusion that character is essentially the power of inhibiting our impulses.

[3] For example, the anonymous American author of a recent magazine article describes his life as a clerk in a great commercial company and tells us that the conditions of his work were such as to undermine his self-respect, 'intolerable conditions that in time would surely have led to the disintegration of my character'.

[4] Though they continue to use the word *Charakter* in a broader looser sense.

a sense very close to the English *character*. Goethe's famous lines afford the clearest instance :

> Es bildet ein Talent sich in der Stille
> Sich ein Charakter in dem Strom der welt.[1]

In spite, then, of the confused and backward state of this part of psychology, there is a considerable convergence of opinion and usage that justifies the use of the word ' character ' to point to something within us that expresses itself in volition, in the higher forms of action and control of action, something which, since it gradually takes shape within us in the course of the battle of life and since it is liable also to disintegration, must be a complex organization.

The question at once arises : What is it that enters into this organization ? What is the raw material that becomes organized into character ? To this question a psychology that describes the mind as consisting wholly of ' ideas ' can find no answer ; and one which recognizes no forms of action other than simple and complex reflexes is equally at a loss. The native propensities are the chief part of the raw material which becomes organized to form character. The process of organization is of two stages. The first stage is the formation of sentiments. The second stage is the building of the sentiments into an harmoniously co-operating system. *Such a system of sentiments is character.* The strength of character is a matter of the degree of harmony and integration attained by the system, and perhaps also of the degree to which the whole organization is solidified by exercise. The following chapters, which discuss the organization of the affective life, are essentially concerned with processes of character-formation.[2]

The Futility of the Search for Types of Personality

The modern attempts to set up a certain limited number of types of personality, two or four or sixteen, or what not, are

[1] Cf. *Persönlichkeit, Einführung in die Charakterkunde,* von L. Klages, Potsdam, 1927. Klages here cites with approval these lines of Goethe's and also the following from the same source : ' The chief mark of character is decisive willing without regard to right or wrong, good or bad, truth or error.'

[2] Cf. also p. 379

modelled on the ancient outworn doctrine of temperaments and inevitably involve similar confusions. We shall make no solid progress in this sphere of obscure problems of the affective life before we learn to discriminate in the way here proposed. Under each of the four headings, disposition, temper, temperament, and character, we have to recognize a multiplicity of factors ; and, in the concrete total personalities that make up the human race, many factors of these four distinguishable groups are combined in an infinitely various manner. How, then, can we hope to define a small number of distinct types or categories into one or other of which every person may be neatly fitted ? The search for such types has no reasonable basis, but flies rather in the face of obvious probabilities ; the literary skill and scientific prestige of a Jung, a Kretschmer, or a Spranger, do but give colour and standing to a hopeless quest along mistaken lines.

Here again we may with advantage apply the comparative method and our knowledge of animals. Whoever is an animal lover and closely acquainted with horses, cows, dogs, pigeons, or even the barnyard fowls that stand so low in the scale of intelligence, is aware of well-marked individual peculiarities that cannot be defined in terms of intelligence or of abilities. And the various breeds or strains of domestic horse, dog, and pigeon are characterized by similar peculiarities of mental constitution. Each of these domesticated races is, in its varieties, breeds, and strains, very comparable to the human race with its major divisions and subdivisions.

The Arab horse is famous for his high intelligence ; but, apart from this, the breed is as distinctive in mental constitution as in bodily form. And the same is true in only less degree of the Kentucky pacer, the English hunter, the Percheron, and many other breeds. Among dogs the difference between breeds in respect of their affective nature is even more marked and more widely familiar. The English bulldog, the Scottish collie, the fox-terrier, the airedale, the old English sheepdog, the Belgian police-dog, the Aberdeen terrier, and a dozen other breeds, show their distinctive affective qualities. When we attempt to characterize these breeds, or individuals

among them, we are at a loss for suitable terms of agreed meaning, just because this branch of psychology is still in utter confusion. The adoption of the distinctions implied by the four words at the head of this chapter at once enables us to introduce order into the chaos. Perhaps no animal can be said to achieve the development of character ; yet when we find a dog devoted to his master and his home and manifesting enduring likes and dislikes for his human and his canine acquaintances, we have to credit him with the rudiments of character.

It is easy to point to instances of peculiarity of disposition in all the animal groups mentioned. Some breeds of fowls are well known as good mothers, while others cannot be relied upon to brood steadily or to look after their chicks. The game cock is more pugnacious than other breeds. In some dogs the hunting propensity is very strong, in others very weak. Some are markedly pugnacious ; some are very timid ; some very submissive and docile ; some very curious or inquisitive ; some very affectionate ; some are very gregarious, and others relatively solitary by nature. All these are peculiarities of disposition.

Differences of temper are equally easy to note and define. An energetic or fiery temper is common to some breeds of horses and of dogs, such as the Arab horse and the fox-terrier ; and in them it generally accompanies an affectionate and but little pugnacious disposition. The bulldog is of placid but tenacious persistent temper ; the collie is mercurial or highly affectable.

Peculiarities of temperament among animals are perhaps less clearly marked ; but we may, I think, recognize in dogs very different degrees of extroversion or expressiveness : the dignified reserved mastiff may be said to be introverted ; while the fox-terrier, whose emotional stirrings are freely expressed from moment to moment by eyes and ears and tail and whole muscular system, is a pronounced extrovert. Professor Pavlov, in the course of his prolonged experimental studies of dogs, has described profound individual differences that seem to fall under this head. And differences in respect

of general rate of metabolism and of resistance to fatigue seem no less clearly marked, differences which also fall under the head of temperament.

All these and many other peculiarities of the affective life of animals of any one species cannot be fitted into any scheme that pretends to set up a limited number of distinct types. The combinations of such peculiarities are infinitely varied. And if this is true of animals, much more is it true of men.[1]

[1] Cf. pp. 369, 370.

CHAPTER XIII

ORGANIZATION OF THE AFFECTIVE LIFE

NO part of psychology is so neglected as that which deals with the organization underlying all forms and expressions of mental activity. For the most part psychologists have concerned themselves with observing and describing the course of mental process and the bodily behaviour in which it finds expression, seeking, of course, to generalize such descriptions in the form of general laws.

A few only have seen clearly that a man's mental activity is the working of a vastly complex organization, an organization which, from rudiments given in the germ, develops into ever more complex form. If few have clearly seen and stated this fundamental truth, fewer still have made any serious attempt to infer the nature of this organization, and to trace its increasing complexity from infancy to adult life. Many even repudiate all such attempts, regarding them, for reasons which they fail to make clear, as improper. Yet it is certain that psychology cannot become a widely useful science, the indispensable foundation of all the social sciences, until it shall have successfully grappled with this task of inferring the mental organization or structure and tracing its development.

It is true that one school of American psychology goes by the name of *Structuralism*.[1] And this name might well lead you to suppose that the school was specially concerned with the task here defined. But it has no such aim or programme. It is concerned to describe what it calls ' the structure of consciousness ', that is to say, to render an analytic description of the stream of conscious activity in terms of distinguish-

[1] Of this school the late Professor Titchener was the leading exponent.

able units or elements and of their relations to one another in the complex stream regarded as compounded of such elements.

The school of *Gestalt* or configuration, which of recent years has acquired much influence and prestige, is mainly concerned with this same task, the task of describing ' the structure of consciousness ' ; but it describes it in a different and less fallacious manner. It differs from the American school of structuralism chiefly in that it approaches the task with more realistic, more adequate, principles, especially the principle that each phase of conscious activity cannot properly be described as a sum of distinguishable parts, but is rather a whole, all the parts of which are in active relations with one another, each contributing to the nature of the whole and in turn owing something of its own nature to the whole system within which it functions ; just as any part of a complex field of electric energy is a function of the whole field.[1] The

[1] That the *Gestalt* psychology does not adequately recognize the vastly complex organization underlying our mental activities and does not accept the description of it and of its growth in the individual and the race (of its ontogeny and its phylogeny) as a main task of psychology is well illustrated by Professor Koffka's *The Growth of the Mind*. This excellent book is wholly concerned to describe the activities in and through which growth takes place, and much that is true and important is said of such growth processes ; but no attempt is made to describe that which grows, the organization which through every activity is developed into greater complexity. Some very slight acknowledgement is made of human instincts and of mental dispositions of other kinds. But, beyond this, the book concerns itself wholly with problems of function and not at all with structure. The same one-sided tendency is manifest in Professor Köhler's *Gestalt Psychology* and in his other publications. One may go farther and assert that these authors show a veiled hostility towards recognition of enduring structure ; for it would seem to be their ambition to account for every mental activity as the play of forces in a field of energy without reference to any underlying structure. The difference between their programme and mine may be illustrated by reference to a parallel difference between the functioning of a telephone disk on the one hand and a gramophone on the other. Both instruments emit complex sound-waves ; the telephone disk is of homogeneous structure and does not require to be taken into account in explaining the forms of the waves it emits ; for it plays but a very subordinate role in the

Gestalt psychology is superior also in that it seeks dynamic principles; likening the field of consciousness to a field of electric energy rather than to a grouping of static particles.

Among the few psychologists who have endeavoured to build up some account of the structure of the mind was the German philosopher, Herbart. As in the psychology of the English association-school (Hartley, the Mills, Bain, Spencer et. al.) his one unit of composition of the mind was ' an idea '. Both schools described the mind as a mass of ' ideas '; but, whereas the Associationists were content to describe ' the ideas ' as merely linked one to another by ' bonds of association ', Herbart described the ideas as organized in systems and subsystems, all ideas of similar function becoming grouped together within a subsystem; and these again as grouped together, according to their degrees of affinity, in larger systems, the so-called ' apperceptive masses of ideas '. Herbart's psychology, recognizing, as it did, the fact and the importance of the highly complex organization or structure of the mind, contained sufficient truth to render it vastly superior to its rival, the Association Psychology; a fact which educationists, looking for guidance to psychology, were quick to appreciate.

But Herbart's psychology remained fundamentally defective in that it was ' intellectualistic '. It is true that it sought to be dynamic; but the only forces it recognized were ' the ideas ' themselves; each ' idea ' was a force, or exerted a force, a tendency to rise into consciousness. Since these forces were exerted by ' ideas ' while still below the threshold

determination of those forms. The disk of the gramophone, on the other hand, has a highly complex structure, which plays a role of primary importance in the shaping of the sound-waves emitted by the instrument. Roughly and crudely it may be said that *Gestalt* psychology likens mental activity to the functioning of the telephone disk, whereas, in my view, the working of the gramophone provides a closer analogy. The latter would be less inadequate if we could imagine the disc to be so constituted that, on each occasion of its functioning, its structure undergoes some orderly increase of complexity constituting an extension of its potentialities.

of consciousness, Herbart's psychology had the further merit of recognizing that a vast amount of mental activity goes on subconsciously, 'beneath the threshold of consciousness', without directly expressing itself in the field of consciousness. Its defect was that it did not in any manner or degree recognize the propensities and their active tendencies, the all-important dynamic factors, which cannot in any way be identified with 'ideas'. In our terminology, Herbart dealt only with *abilities* and ignored the *propensities* from which the former derive the energies that activate them.

The whole vast organization of the mind has two distinguishable but not independent or separable aspects or sides; on the one hand, the intellectual organization; on the other, an organization that underlies all our striving and feeling and emotion, all our affective life. Common speech and common sense recognize these two sides of the mind's organization, calling the former *intellect* and the latter *character*. They recognize also that both intellect and character are of slow growth; that they develop side by side in intimate reciprocal influence and yet with a certain independence of one another. This relative independence appears clearly when we reflect that in one man intellectual development may reach a high pitch in spite of grave defects of character; while another may be of fine character, though his intellect remains comparatively undeveloped. This relative independence of the two sides of our nature is revealed again by the fact that, in the decline of personality due to extreme old age, vice, or disease (such as general paresis), one side may be affected earlier and more profoundly than the other; as when the victim of alcohol or of opium (e.g. S. T. Coleridge) continues to display intellectual powers of undimmed brilliance at a time when his character has gone far towards dissolution.[1]

[1] In this matter, as in many others, common speech embodies a stroke of insight and points the way to psychological understanding; namely, it designates the behaviour of the drunkard or the drug-addict as dissolute.

Affective Organization in Animals

In seeking to define the native basis of the mental organization we relied largely on the comparative method and sought light from the study of animals. In this equally difficult problem of the acquired organization and its development, we may with advantage follow the same method.

We begin, then, by asking—What kind and degree of organization of the affective side of the mind can be discerned in animals? It is too commonly assumed that all the behaviour of animals is purely instinctive, is the expression of innately given and spontaneously maturing organization. Yet there is much clear evidence that this is not true of the higher animals. Wherever an animal *learns* to react vigorously in a distinctive manner to some particular object (or class of objects) there we have an instance of the process we are seeking to understand. Consider the following striking instance.[1]

'I came on a nest of wild ducks in a marsh as the young birds had just emerged from the eggs. The mother duck flew off and disappeared in the sedge. . . . I stood by the nest for some hours and watched the young birds. The greatest number were already active and displaying an interest in their surroundings. They began to try and get out of the nest, and I took them one by one in my hand and placed them in the water. . . . They showed not the slightest fear of me, nestling from time to time on my feet. . . . After a time I moved away some distance to watch what would happen. The mother bird returned and alighted near by. The little ducks rushed towards her as she called. I could observe her. She was chattering with emotion. Every feather was quivering with excitement. The great terror of man was upon her. After a short interval I advanced towards the group again. The mother bird flew away with a series of loud warning quacks. The little ones scattered to cover, flapping their short wing stumps and cheeping with beaks wide open in terror.

[1] The instance was observed by the late Benjamin Kidd and described in his *Science of Power*.

With difficulty I found one of them again in hiding. It was now a wild, transformed creature, trembling in panic which could not be subdued.'

Charles Darwin described similar facts,[1] and indeed they are abundant; many wild animals learn to flee from man and from other enemies by way of social transmission. In such cases the young animal on first encountering man (or other enemy) shows no fear (no active aversion with symptoms of general emotional excitement); but the fear-behaviour of its older fellows in presence of man provokes in it (by way of primitive passive sympathy) the fear-reaction; and thereafter the perception of man suffices to evoke again this same reaction; the young creature has learnt to fear man.[2]

Now what has happened within the duckling? As Kidd says, the duckling, after the one infection by fear in the presence of man, is 'a transformed creature'. In what does this transformation consist? I suppose that in reply to this question any class of American high-school seniors would shout with one accord—'Conditioned Reflex!' And they would be both right and wrong. This pair of words is too often thoughtlessly emitted as a sufficient answer to half the problems of psychology. It is hardly an exaggeration to say that the two most ominous agencies of the present age, Russian Communism and American behaviourism, are built upon a misinterpretation of Professor Pavlov's justly famous experiments on 'conditioned reflexes'. The word 'reflex', as used in this connexion, is a very misleading and question-begging term.[3]

[1] On the Galapagos Islands (in *The Voyage of the Beagle*).

[2] I know perfectly well that many of my readers will jump to various unjustified conclusions, such as that there is no such thing as instinctive fear, etc., etc. I can only beg them to try to think straight. Also I would particularly commend the incident described above to that majority of psychologists who continue to ignore or doubt or positively deny the principle of primitive sympathy. Such obstinate refusal to accept overwhelming evidence inclines one to despair of the future of psychology.

[3] Not being acquainted with the Russian language, I do not know whether my criticism of the term 'conditioned reflex' applies in any degree to its Russian original. M. Hachet-Souplet has proposed in his

The fundamental ' conditioned-reflex ' experiment of Pavlov (type of all others) is now so widely known as hardly to need description. A hungry dog is so arranged in a quiet place that the rate of flow of saliva from one of the glands about the mouth can be measured. While all is quiet, the flow is very slight ; when a tasty piece of food is placed before the dog, the flow is much accelerated. Other sense-impressions, such as the sound of a bell, produce no such effect. But, if food is repeatedly presented and on each occasion a bell is struck at the moment preceding the presentation of (and the dog's perception of) the food ; then, after a certain number (varying much with various dogs and circumstances) of such repetitions, it is found that the bell-stroke suffices, in the absence of all food, to provoke the flow of saliva.

The common interpretation of this experiment assumes that the excitation of the salivary gland is a mechanical reflex process, and that somehow (by a process not yet understood but capable in principle of purely physico-chemical explanation) the training or conditioning process opens a new route in the nervous system. Let us call F the sensory area stimulated by sight of the food, B that stimulated by the bell-stroke, and S the efferent nerves leading to the salivary gland. Then, according to this common interpretation, before the

little book, *De l'Animal a l'Enfant* (Paris, 1913), to speak of such redirected propensities (of which Pavlov's ' conditioned reflex ' is the accepted type) as ' instincts dérivés '. This seems to me less objectionable, because less misleading, than the term ' conditioned reflex ' ; yet it is better to keep the true and original sense of the adjective ' instinctive ' by confining it strictly to innate factors of our constitution. In the book mentioned, M. Hachet-Souplet describes numerous instances of such ' instincts dérivés ' and of the process of establishing them in animals by training under conditions less artificial than those employed by Pavlov. He rightly regards this process as fundamental in all simple training of animals, while distinguishing it from processes of education of the higher kind. He writes : ' Every act impressed by training (or drill, *dressage*) is a derivation, more or less removed, of acts springing from hunger or from fear, or from both. That which is characteristic of such an action (*instinct dérivé*) is that it is attached to impressions (the trainer's voice or gesture) substituted for those which, in the state of nature, provoke the animals to action.'

experiment begins, some nerve-path of low resistance connects F more or less directly with S; whereas between B and S no such connexion obtains. The training process *somehow* induces the formation of a new nerve-path of low resistance connecting B with S.

It can hardly be denied that any such interpretation is over-simplified. It neglects an important part of the relevant facts; especially it neglects the fact that the secretion of saliva is part only of a much wider, more complex system of reactions to the exciting sense-impression, namely, all that system of reactions naturally incidental to food-seeking. The salivary secretion is the only part of the total response to which the observer pays close attention; for this is the part which lends itself to exact quantitative observation. But there can be no doubt that in some degree the dog's food-seeking propensity is excited, and that the secretion of saliva is only one incident of the complex behaviour that is the normal expression of such excitement. Hence we may infer that, in the 'conditioned-reflex' experiments, we have to do, not with a simple reflex and its complication by the opening of some new sensory inlet, but rather with some adaptation or, if you like, 'conditioning' of a propensity. If we let P stand for the food-seeking propensity, then the simplest possible interpretation of the setting up of the 'conditioned reflex' is that whereas F is connected with P before the experiment, B becomes connected with P in the course of the training process.

Thus interpreted the 'conditioned-reflex' experiment falls directly into line with the instance of animal learning cited above (that of Kidd's ducklings) and with a multitude of allied instances; in short, it becomes the prototype of a process vastly important in the progressive organization of our affective life. We saw that the young ducks, having on a single occasion been excited to fear (by way of primitive sympathy) in the presence of man, thereafter show fear of man; they have acquired the 'fear of man'. Or, in other words, the fear propensity, which, before the incident, was not excited by the presence of man, after the incident is liable

to excitement on perception of man. In the duckling the induction of fear (by way of primitive sympathy) in the presence of man 'conditions' the fear propensity to man; just as in the dog the excitement of the food-seeking propensity in the presence of the bell-stroke 'conditions' that propensity to the bell-stroke.[1]

The Re-direction or Conditioning of Propensities: a Fundamental and Widespread Form of Profiting by Experience.

We may see around us evidences of the great role of such 'conditioning' of propensities among all the higher animals. *Every instance in which an animal comes, through experience, to discriminate and to react habitually in distinctive manner to any object or class of objects would seem to be an instance of such 'conditioning'.* Consider a few instances of a familiar type.

A dog is struck with a whip on several occasions, and learns to fear the whip; after a few repetitions, the mere brandishing of the whip suffices to make him cower, to inhibit his exuberance and induce the unmistakable signs of fear.

You utter some distinctive call while feeding your chickens (or other animals) and very soon the utterance of the call suffices to bring them up eagerly seeking for food (if they are hungry).

You tease a chained dog (or monkey or any other animal), provoking his anger on repeated occasions; thereafter the mere sight or sound of you suffices to provoke his aggressive propensity; he greets you with every symptom of anger; and continues to do so on later occasions, even though you make the most ingratiating approaches, bearing gifts. Again, two lonely animals of two different gregarious species are shut up together in a pen or cage or paddock. At first they seem indifferent to one another; but, after a time, they become

[1] There can be little doubt that the two instances of 'learning' here brought together are essentially similar. I postpone to an appendix of this chapter the discussion of the difficult question—How is the 'conditioning' effected? Is it a purely mechanical process? Or is the process in some fashion and degree intelligent and purposive?

close companions: in the absence of members of the same species, each animal's gregarious propensity responds to the stranger and finds its satisfaction in his company. Here, probably, we have an instance of a spontaneously growing appetite for companionship.

Notice that in all such cases the 'conditioned response' may be re-evoked after considerable intervals of time; the new state of affairs set up within the organism persists, the propensity continues to be accessible to, and responsive to, the object towards which it was originally indifferent.

In all such cases the mode of response remains unmodified, the propensity continues to express itself just as it does in purely instinctive action; we cannot properly speak of a new or an acquired propensity, not even of a modified propensity. The novelty, the acquired modification, is the responsiveness of the innate propensity to the particular object (or class of objects). This new responsiveness implies (in terms of structure) some new connexion between the propensity and the cognitive ability through which the object is perceived.[1]

[1] There is good warrant for the assumption that the new connexion we infer as underlying this new responsiveness is a direct connexion. I insist on this with what may seem tedious explicitness; because we have here the resolution of an old and very obstinate confusion. The association psychology dealt with such instances as that of Kidd's ducklings in some such terms as the following: the mother's agitated flight and cries suggest to the duckling the idea of danger, and this idea, occurring in immediate conjunction with (or succession to) the idea of man, the two ideas become associated; hence thereafter the idea of man suggests or reproduces the idea of danger, and the idea of danger prompts the ducklings to seek cover. A somewhat improved interpretation in terms of association of ideas would run: through the experience, the idea of the mother's cry of fear becomes associated with the idea of man, so that thereafter the sight of man suggests the idea of man and this suggests the idea of the mother's cry, which prompts to flight and concealment. Both accounts leave unresolved the problem of the connexion between the 'idea' and the bodily activity that results. In order to meet this difficulty the association psychology evolved the theory of ideo-motor action: it was said that 'an idea' is not merely a cognitive fact but also a tendency to bodily movement, that, for example, the 'idea' of danger is a tendency to scuttle to cover. Our account finds no difficulty here, because we have fully recognized the fear propensity as an inborn feature of the

In the instance of Kidd's ducklings, a single excitation of the fear propensity in the presence of man sufficed to establish the new connexion between the perception of man and the fear propensity. More commonly a number of repetitions of such experience is required before the new responsiveness is completely and effectively established. And in general, we may say, repetition of such experiences confirms and strengthens such acquired links. On the other hand, any such acquired responsiveness is liable to die away through disuse; for example, in the case of the wild ducklings, if the human observer could have continued to sit quietly in the neighbourhood of the hiding ducklings, it is probable that eventually they would have emerged from cover, and (in the absence of any recurrence of the mother's fear-exciting behaviour) would have 'grown accustomed' to his presence, would have moved about in proximity to him, at first with some timidity, but, after a time, without any signs of fear. Further, the oftener

creature's constitution, as a disposition natively linked with certain cognitive abilities (such as that which is excited by the mother's cry) and ready to become linked with others, such as that concerned in the perception of man. Thus, while still making use of the principle of establishment of association through use, our account improves upon the traditional associationist account in two ways: first, in recognizing not one class only of structural units, namely 'ideas', but rather two great classes, abilities and propensities; secondly, in assuming that any inborn propensity may become (through individual experience) functionally linked or associated with any ability. Thus we are not committed to the assumption that, in the duckling, when it scuttles away at the sight of man, the 'idea' of man revives the 'idea' of the mother's cry or the 'idea' of danger (or any other 'idea'); we assume rather that the perception of man directly evokes the fear propensity in virtue of the acquired link of association, the link connecting the ability with the propensity.

On the other hand, our account differs from the behaviourist account (founded on the over-simplified conception of the 'conditioned reflex') in that, while the latter links to the conditioned sense-impression (sight of man) a merely mechanical reflex movement, our account recognizes that what is thus linked is a propensity, a complex disposition which, on being excited, generates not a mechanical movement but a train of complex goal-seeking behaviour which adapts itself more or less successfully to the special circumstances of the moment in the manner we call intelligent.

their fear propensity might have been excited in the presence of man, the slower, the more difficult, would be this process of 'growing accustomed' to man, this eradication of 'fear of man'. Further, this eradication could be accelerated if the fearsome object, the man, were to scatter food before the hungry ducklings, thus bringing into play a different and opposed propensity. Some repetitions of this experience would suffice to link this other propensity effectively to the sight or call of man. Even animals so low in the scale as fishes will acquire either of these modes of response to man; that is to say, in them also, but only through many repetitions, either the fear propensity or the food-seeking propensity may become linked to the ability by aid of which man is visually recognized, i.e. discriminated from objects of other kinds.[1]

What is the Difference between an Instinct and a 'Conditioned' Propensity?

In discussing instincts of the most typical form (such as we infer in birds from their behaviour) we said that an instinct consists of an innate propensity intimately linked with one or more innate abilities (cognitive and executive) which determine what kind of object shall bring the propensity into play and in what precise forms of behaviour the propensity shall express itself. For example, the swallow has the instinct to feed its young by catching insects on the wing and placing them in the open mouths of its nestlings; this instinct consists of the parental propensity linked to the special innate abilities which enable the bird to perceive and to catch the appropriate insects and to feed them to the young.

The abilities thus natively linked with a propensity to constitute an instinct are commonly very highly specialized in the lower animals, less specialized in the higher. Thus, while in insects the propensity to feed and protect the

[1] While the fish or the duckling will hardly distinguish one man from another, but, through contact with one man, becomes 'conditioned' to all men (to all members of that class of objects), the dog shows his superiority by readily distinguishing the individual man and becoming 'conditioned' to him alone.

young is called into play only by their own young, the parental propensity of birds may be brought into play by the young of other species; as when, a cuckoo's egg having been hatched in a robin's nest, the parent birds feed the young cuckoo as assiduously as their own young in spite of its difference in size and shape and other qualities.

In many mammals the innate abilities through which the parental propensity may be brought into play are still less specialized; for we see them readily adopt, and treat as their own, young creatures of very different species. [1]

[1] The facts of adoption afford the strongest evidence of the reality of the parental propensity and of its truly altruistic nature. Two false views of parental behaviour are refuted by them: on the one hand, the conventional view of the psycho-analysts that maternal behaviour and love are expressions of the sex instinct (a false identification of which the only ground is the fact that both propensities play essential roles in the perpetuation of the species); on the other hand, the hedonist theory, according to which the mother mammal suckles and cares for her young merely in order to get rid of the uncomfortable tension of full milk-glands and to attain the pleasure of relief from such tension. This theory is obviously inapplicable to the assiduous parental care displayed by birds of both sexes; but no doubt the perverted ingenuity of the resolute hedonist may yet find a plausible explanation of these facts also, if he can be brought to consider them. It is worth while, therefore, to cite some instances of adoption; for this question of the reality of the parental propensity is fundamental to the understanding of all altruistic activity and of many other social phenomena. As I have put it elsewhere, the parental propensity is an essential factor in the development of all morals and of all higher forms of intelligence.

'Animals prevented from pairing and breeding often try, nevertheless, to satisfy their brooding instincts. Unmated guillemots are always to be found on the cliffs monopolized by this species for brooding, and they pounce upon any eggs temporarily abandoned by the parent birds and brood for a little while. In Paraguay female mules, though sterile, sometimes steal foals from mares; they mother these foals, tender them their dry udders, etc., but the foals, of course, quickly perish . . . these (childless apes) will appropriate the offspring of another female (sometimes belonging to a different species, or even the young of cats and dogs), thus gravely imperilling their lives, the would-be mother having, for one thing, no milk to offer. Generally speaking, certain mammals, and also certain birds, show a striking tendency to adopt and tend any young thing, more or less regardless

Two Principal Processes of Affective Organization

A sheep has a propensity to feed and shelter the lamb; and this may be evoked by any young lamb that approaches her at the appropriate time, commonly by the lamb to which she has given birth. But after she has fed and sheltered the one lamb for some little time, her maternal propensity

of its size. The parental instinct is, therefore, awakened by whatever is young, awkward, or in need of help, and not by any special smallness of the animal. This instinct shows itself most clearly in individuals prevented, by one cause or another, from breeding' (*Social Life in the Animal World*, by Fr. Alverdes, p. 73).

In a recent number of *Natural History* (vol. xxxii, no. 2) Mr. H. C. Raven describes the behaviour of a young female chimpanzee which he has made a member of his family. One day on shipboard Meshie had released a cageful of monkeys in the chamber in which her own cage stood. 'With a flashlight I looked in Meshie's cage, for she had not come out as usual when I called her. She sat crouched in the corner and looked up pitifully. Then I saw she was holding a baby monkey in her lap. I scolded her and called her to come out. She came, walking on her hind feet and holding the baby against her body. I was surprised to see what appeared to be mother instinct so far developed in a baby chimpanzee. *She carried* the half-grown baby monkey a whole day before it was put back with the others.' I may add that this carrying of the young (clinging to the lower abdomen and generally supported by one hand of the mother) is the common practice of chimpanzee mothers. Thanks to the kindness of Dr. R. N. Yerkes, I have had the opportunity to observe in the Yale Anthropoid Institute in Florida the behaviour of a chimpanzee mother with her young one, at the time when the baby was just beginning to walk. Whenever the mother moved about, the baby clung to her abdomen. When she sat on a low shelf, the baby was allowed to sprawl about near her feet. Again and again, as the baby endeavoured to stand up, the mother reached out and gently raised it to the standing position or lifted it to her lap. The tender care expressed by these movements of that black paw was infinitely touching and seemed, indefinitely more than all other performances (such as sitting at table and using cup and spoon), to bridge the gap between man and beast, or at least to form one firm buttress for such an evolutionary bridge. There, in action before our eyes, was the rudiment of all human morals and the parent of all higher achievement of mankind. I would add further that Professor Yerkes, out of his large experience, confirms the statement of Alverdes that the mother-ape deliberately teaches her baby to walk.

becomes specially directed upon this one lamb ; she repudiates other lambs that may approach her and seek her udders.[1] The mother-sheep's behaviour towards her lamb becomes, then, something other than the simple working of instinct or innate propensity ; in so far as the propensity becomes specially directed upon the one lamb, we have to do, not with a pure unmodified maternal instinct, but rather with a very simple rudimentary maternal *sentiment*. In repulsing other lambs and welcoming her own, the sheep virtually says : ' This is my own little lamb ; he is more to me than all other lambs.'

This process of specialized direction of maternal propensity upon some one object out of a whole class of similar objects is carried much farther in the human mother. In her also the maternal sentiment in its simplest form is merely a concentration of the protective or maternal propensity upon a particular infant. Such a very simple sentiment, regarded as a unit of structure, closely resembles an instinct, but differs from it in two respects : first, whereas the instinct responds to all objects of a given class, the sentiment responds to one particular object only (or some restricted group within the larger class) ; secondly, this specialized direction of the propensity is acquired through individual experience. Or, more technically, the sentiment, like the instinct, consists of a propensity linked to a cognitive ability through which it is brought into play : but, in the instinct, this linkage is innate and the ability is of a highly general type which subserves the recognition, not of individuals as such, but rather of all members of a certain class as such ; in the sentiment, on the other hand, a similar propensity has become linked through individual experience with a specialized cognitive ability that subserves the recognition of a particular individual (or group of individuals having some distinctive feature in common).

Let us notice at once that this centring of a propensity upon

[1] It seems that, on the death of her lamb, she can be induced to adopt another if the skin of the dead lamb is bound upon the changeling ; but it is necessary to keep the skin thus bound for several days. These facts seem to imply that the sheep recognizes her lamb by aid of its individual odour.

some special object does not necessarily result in its becoming inaccessible to other objects of the class; though this may result in various degrees.[1] The mother who is devotedly attached to her own infant is not necessarily incapacitated for maternal response to other infants; yet in various degrees this does occur; and the woman of strong maternal propensity is more likely to engage herself in wide philanthropic activities, if she has no children of her own who will specialize the propensity in sentiments of love for them.

We see the principle of specialized and exclusive direction (or conditioning) of a propensity illustrated most clearly by the sex propensity. In the normal man this propensity may be excited by a large proportion of women of suitable age; but it is very apt to become centred upon some one woman as one constituent of a sentiment of love; and, when this sentiment has been formed, the man becomes relatively insensitive to the attractions of other women. Yet the degree to which this consequence results seems to vary widely and to be an individual peculiarity of constitution. One man, acquiring for some woman a sentiment which is little, if anything, more than the centring of his sex propensity upon her, becomes totally indifferent to other women and pines and fumes and grieves, perhaps even commits suicide, if denied this one and only charmer; whereas another man, whose sentiment for his beloved is perhaps of a richer composition, readily finds consolation elsewhere if she proves obdurate.

If it be suggested that this more or less exclusive centring of a propensity upon some one object, which we see illustrated by many human sentiments, is due to the influence of social traditions or to the influence of an egotistic sentiment which claims exclusive possession of whatever object is regarded as 'mine own', the answer is that the same principle is illustrated by the simple sentiments of some animals. Many birds, having once found a mate, adhere exclusively to that mate in life-long comradeship. The male pigeon, once mated, shows himself relatively indifferent to other hen-birds; though in most cases he is not entirely resistant to seduction under

[1] As in the mother sheep.

favourable circumstances, especially if deprived for a time of his own mate. Is it derogatory to the dignity of man, to remind the reader of the drama of Alexander Hamilton as so vividly depicted on the silver screen ? Surely we may see here, in this great man's lapse from his own ideal, an illustration of a common weakness ! Yet another point of affinity between man and his little brothers !

I have used the word ' sentiment ' to denote such instances of the specialized direction of some propensity upon some one object. In the human being the word is unquestionably appropriate. When the human mother's maternal propensity is centred upon, is specially concentrated, in enduring fashion, upon her own child, we properly speak of her sentiment of love for that child. If her maternal propensity is naturally strong, she will have been moved to tender emotion and protecting helpful actions by other children long before she became a mother ; she will in all probability have played with dolls and, perhaps, even have acquired a sentiment, a specialized direction of her propensity, for some one doll. But we cannot properly say that she had a sentiment of love for every child ; she was rather ready, prepared by nature, to form a sentiment for any child that might repeatedly evoke her propensity. And, after the sentiment of love for her own child has been formed, she may be even more sensitive than before to the appeal of other children ; or, on the other hand (and this, as we saw in the case of the sex propensity in men, seems to be a matter of individual idiosyncrasy), the concentration of the energy of her maternal propensity on her own child may render her relatively indifferent to other children.

One great difference between the human and the animal makes us hesitate to apply the word sentiment to the simple affective organizations acquired by animals : namely, in the human the acquired organization of the kind we are considering not only is apt to become extremely complex (while in the animal it remains relatively simple) but also it is far more enduring. The human mother's love for her child is apt to endure as a source of dominating motives throughout her

whole life ; whereas the animal mother's attachment to her offspring is apt to fade away as soon as they cease to evoke her maternal propensity by their instinctive appeals to it : the mother-bird becomes indifferent to her young as soon as they cease to clamour for food ; the mother-lion or cat ceases to protect and cuddle and lick and feed her young as soon as they can fend for themselves. Thus the rudimentary sentiment of the animal remains very close to instinct, very similar in its dependence upon specific appeals to it from its object.

Nevertheless, we do see among animals in some small degree that endurance of acquired affective attachments which in the human being is so much more prolonged. The mountain-sheep may often be seen closely accompanied by last year's lamb now as large as herself and as well able to feed and fend for itself. The litter of young of a pair of carnivores in some cases remain with the parents, forming a family group, long after the cubs have ceased to suck or to need other parental care. Occasionally two animals (even of unlike species) become enduringly attached to one another. And the dog's latent possibilities of this sort are not infrequently developed by the initiative and guidance of his human master into an enduring attachment which we can hardly refuse to call a sentiment of devotion or love. It is in this, far more than in any development of intelligence, that human companionship seems to raise the better type of dog almost to the human level.

The organization of the affective life goes very much farther in man than in the animals, yet follows the same two principles we have found indicated there ; namely, the linkage of the native propensities to new objects and the concentration of the energy of the propensity upon the object.

There are, then, two fundamental processes of affective organization ; first, *the energy of a propensity becomes concentrated upon some one member* (*or special group of members*) *of that class of objects to which the propensity responds instinctively* (or in virtue of innate organization), the 'unconditioned' objects of the propensity : this may merely give the 'conditioned' object a preferential position among objects of its

class, in that it evokes the propensity more surely, more readily, more intensely than do other objects of its class (as when the mother responds with maternal emotion and behaviour more surely, readily and intensely to her own offspring than to other children). Secondly, a propensity becomes responsive to an object of a new kind, an object to which it was natively inaccessible (as in the case of the duckling acquiring the fear of man). Either process may occur independently of the other ; but the second often is accompanied in some degree by the former.

A Third Process of Affective Organization

Perhaps we should distinguish a third process of affective organization as equally fundamental ; though it is, perhaps, not manifested by lower animals. Consider the case of parental adoption.

If to a litter of kittens, kittens of about the same age from another litter be added, the mother-cat will treat them as she treats her own : she simply does not discriminate. If young puppies be placed among her litter, she may, or may not, ' adopt ' them. If she adopts them, what happens within her ? At first she shows, perhaps, indifference or even some hostility or aversion ; but, after a little while, she allows them to suck and extends her maternal solicitude to them. This may be regarded as a typical case of ' conditioning '. The maternal propensity is evoked by her own offspring in the presence of the strangers ; and, in consequence, becomes ' conditioned ' to, or habitually responsive to, them also. But now suppose that, instead of adding puppies to her own litter, you first take away that litter. She shows some disturbance ; perhaps goes about vaguely seeking her young. You then place in her nest-box, whence her litter has been removed, two or three young puppies. At first, perhaps, she does not treat them maternally ; but after a little while she settles down, suckles them, and shows protective solicitude towards them, perhaps ' adopts ' them ' whole-heartedly '. In this case we seem to see at work a third principle, namely, *an object resembling in certain respects the instinctive or natively given object of the propensity may,*

under favourable conditions, evoke that propensity and become its habitual object.

The higher the animal in the scale of 'intelligence', the more capable is it of this third process of affective organization, namely, the re-direction of its propensities to objects resembling the native objects of those propensities. For responsiveness to resemblances or partial similarities is of the essence of 'intelligence'. And in man this susceptibility is very much greater than in the animals. In him it develops into the power of explicit recognition of similarities; yet it continues to function also in primitive fashion as a mere susceptibility to affective excitement in virtue of resemblances, near or remote, to objects that have already the power to evoke such responses.

Hence in man, and still more perhaps in woman, this third principle operates very extensively. The mother-cat (or other animal) will 'adopt' only small young things closely resembling her own offspring, young puppies, ferrets, or other four-legged furry helpless crawling sucklings; she will hardly 'adopt' young birds or lizards or frogs. But the woman (or the little girl) of strong maternal propensity is susceptible to the appeal of almost any young helpless creature; she readily 'adopts', not only a baby ape or monkey, but also a kitten, a puppy, a lamb, a young bird, and even (though less readily in proportion as the need for protective care is less clearly manifested) a turtle, a toad, or a young crocodile; and, more subtly still, a plant, or even an inert but delicate object such as a piece of porcelain or other work of art. In each such case of 'adoption', the protective propensity, having first been evoked at some favourable moment by some aspect or behaviour of the object in respect of which it resembles the 'natural object', is the more readily evoked again by the same object; until it becomes highly and peculiarly and habitually responsive to that object in all circumstances.

APPENDIX TO CHAPTER XIII

The Process of 'Conditioning'

The building of 'conditioned reflexes' is commonly regarded as capable of a purely mechanistic interpretation, although no such interpretation has yet secured general acceptance. If we confine our attention to the simplest instances and facts of conditioning, a mechanical or quasi-mechanical interpretation seems plausible, especially if we accept the hypothesis of inhibition by drainage.[1] Thus, in the classical experiment of inducing the conditioned salivary response to the sound of a bell, the bell-stroke excites the exploratory propensity of the dog (his impulse of curiosity); after a very short interval, while this system is still suffused with energy, the food is offered and excites a stronger propensity, evokes the stronger impulse to seize and devour the food. The latter inhibits the system excited by the bell-stroke, draining its energy into its own system and giving it outlet through its own efferent channels to glands and muscles. With repetition of the process the path of drainage from the one system to the other becomes established; and henceforth the excitation process initiated by the bell-stroke issues not in exploratory activities but in the activity of striving for the food. In the foregoing account all mental factors are ignored and the propensities are regarded as mechanistically operating energy-systems.

Certain facts brought to light by the work of Pavlov and his colleagues, as well as other considerations, throw doubt upon the validity of any such mechanistic interpretation, even of the simplest cases. One such is the fact that in some cases a single incident suffices to establish the 'conditioned reflex', as e.g. in the case of Kidd's wild ducklings.

Another such fact is the extinction of a 'conditioned reflex'. If, for example, the bell-stroke has been 'conditioned' to the salivary response in the usual way, and then the bell is sounded several times without the presentation of food, the response becomes weaker (less saliva is secreted) and, after some ten or twelve repetitions of this procedure, the dog ceases to respond

[1] The reader interested in this problem should consult my article, 'The Bearing of Professor Pavlov's Work on the Problem of Inhibition', *Jour. of General Psychology*, vol. iii.

to the bell with the salivary secretion (or with other expressions of the food-seeking impulse) : the acquired response is ' extinguished '. It looks *as though* the repetition of the bell-stroke preceding the appearance of the food had led the dog to *expect* the food ; and *as though* the repeated *disappointment* of the expectation resulted in the dog's ceasing to expect the food to follow the bell-stroke, just as would happen in ourselves under similar conditions. So strong is this suggestion of an anthropomorphic interpretation that, although Professor Pavlov (followed by the crowd of behaviourists who found their view of human nature entirely upon the validity of the mechanistic interpretation) does not permit himself this weakness, one of his colleagues and disciples has recently departed so far from his master's principles as to write : ' In virtue of the fact that the metronome strokes sounded repeatedly and immediately before the feeding, they have acquired a special, a new meaning (*Bedeutung*)—they have become a signal of the food (*Nahrungs signal*) and call forth corresponding responses.' And in reference to the process of extinction he writes : ' From these experiments the significance of a conditioned stimulus is clearly shown to be that of a " signal ", a signal for the inception of a particular form of activity ; so long as the conditioned stimulus rightly signals the coming of the food, it remains effective ; but if the food does not follow on it, then its significance as a signal is lost and it remains without effect. This capacity of the brain-cortex exempts the animal organism from a purposeless and chaotic activity.' [1] If for the formation of the simplest ' conditioned reflex ' it is difficult to offer any plausible explanation in non-mental and mechanistic terms, much more is this true of the ' extinction ' process. Whereas this process falls at once under the general and fundamental psychological law that disappointed or unsuccessful strivings are discontinued.

The suddenness of acquisition of a conditioned response in other cases, whether under natural or experimental conditions, is another good ground for accepting the mentalistic interpretation. As we shall see in a later chapter, the suddenness of learning has long been accepted as a mark of insight, of intelligent appreciation of the circumstances which have to be dealt with. Yet it must be confessed that when, as in some cases, many repetitions of the conditioning process result in a gradual acqui-

[1] Dr. J. S. Rosenthal in *Character and Personality*, vol. i, 1932.

sition, increase and fixation of the conditioned response, the mechanistic interpretation seems plausible. In my opinion the evidence justifies the following view. There are, as I shall argue in a later chapter, two forms of learning, a mechanical or quasi-mechanical habit-formation, which depends largely upon repetition and little, if at all, upon insight or intelligent appreciation of the circumstances or relations concerned; and there is an intelligent learning which involves the apprehension of relevant relations. In the 'conditioned-reflex' experiments the 'unconditioned stimulus' (the food) evokes not a mere mechanical reflex, but a purposive striving for the food. When the circumstances are favourable and the animal a relatively intelligent one, the learning process is predominantly of the second type; when, on the other hand, the relations (in the typical case, the time relations between the two impressions) are such as are not readily grasped by the animal, the learning process is more of the former or quasi-mechanical type. In every case probably processes of both types are blended in various proportions.

There are other features of the 'conditioned-reflex' experiments which seem to require this interpretation. For example, if two signals, A and B, are used, consisting of metronome beats at two different rates, say 100 and 50 per minute respectively; and if the former, A alone, is immediately followed by presentation of food; then, after some repetitions, both A and B evoke secretion of saliva; but, on further repetition of both A and B, the secretion following B diminishes and eventually ceases to appear. If, when this stage has been reached, B is sounded and two minutes later is followed by A, A evokes secretion but in smaller quantity than when it is not preceded by B. The previous sounding of B somehow diminishes the response to A.[1] Dr. Rosenthal tells us that B sets up in the brain-cortex an 'inhibitory condition', one that persists through the interval of two minutes. Now physiology knows nothing of such an enduring 'inhibitory condition'; it is completely nonplussed by the facts and has no faintest suggestion of an explanation to offer. Psychology, on the other hand, is familiar with such instances; we know well what it is to perceive a signal of negative significance, that the road is clear or that the cupboard is bare or the cup is empty. Such a signal renders us indisposed to accept without reserve a signal of the opposite kind following

[1] Rosenthal, op. cit.

shortly after the other ; we accept it, if at all, doubtfully, our response is not ' whole-hearted ' but hesitating and tentative.

Here, then, is another instance of behaviour for which we have no faintest suggestion of a physiological explanation, but a perfectly good psychological explanation. Must we sternly refuse to have any truck with the latter ? Some purists will reply—Yes, if we accept the psychological explanation we shall cease to prosecute the search for a physiological one and thus close the road to a possible increase of knowledge. But any such answer (and it is often implied) is mistaken. It is certain that such acceptance neither should nor will prevent or hinder the search for physiological explanation. If physiological explanation is in principle possible, or if (as seems to me more probable) the explanation must ultimately be psycho-physical, it is in the highest degree probable that the acceptance of the psychological explanation will point the way to the fuller understanding that lies in the future.

This interesting problem is further complicated by the following fact. If, in the dog conditioned as above described, the signal B precedes the signal A, not at an interval of two minutes but at a very short interval (one or two seconds), the secretion evoked by A is then more copious than if A is not preceded by B. Here is a paradox. The phenomenon seems to be closely allied to, or essentially identical with, the similar phenomenon described by Sir C. Sherrington as occurring in the spinal cord and by him called ' positive induction '. The only physiological explanation of this phenomenon yet offered [1] is in terms of drainage of energy : we may fairly suppose that the signal B, though it does not evoke the food-seeking propensity, does not, nevertheless, remain entirely without exciting influence upon the dog ; we may fairly suppose that (as with almost all sense-stimuli that have no special significance) the signal B evokes for a brief moment the exploratory propensity, and thereby excites or liberates energy within a system of neurons concerned in exploratory activity ; when, then, the signal A follows immediately upon B, it falls upon a brain already active in some of its parts rather than upon a wholly quiescent brain ; and the food-seeking system being excited, its efferent channels drain to themselves some of the energy of the already-excited exploratory

[1] By myself in a review of Sherrington's *Integrative Action of the Nervous System*, Brain, vol. xxx.

system ; and, for this reason, the signal A provokes a larger nervous outflow along its efferent channels and, therefore, a more copious secretion of saliva than if it is not preceded by B. Here we can offer also a parallel psychological explanation, as follows : the signal B brings the animal from a state of somnolent inactivity to a state of alertness, a state of looking out for *something* (undefined) to happen ; when, then, A immediately follows upon B, it works upon an animal already alert and expectant of something ; whereas, if an interval of two minutes elapses before A follows B, the animal's mental reaction may be explicated by the words—' Nothing has happened after B, and, as usual, nothing will happen, no food will appear.' Hence, when A follows after such an interval that the positive exciting effect of B has died away, the response to A is less vigorous than if B had not preceded A.

The reader should notice that, while the psychological explanations suggested above are anthropomorphic, in the sense that they interpret the dog's behaviour in the light of our own experience of our own behaviour in similar situations, they are not anthropomorphic in the bad sense. Consider two forms of the latter. First, an interpretation might be offered in terms of Reason and Will : the dog forms the empirical generalization —all bell-strokes are followed by food ; and, taking this as his major premise, reasons thus : this is a bell-stroke : therefore this will be followed by food. Hence I will make ready for the reception of the food by secreting some saliva—presto—by bringing my will into play I secrete saliva ! Perhaps the most uncritical dog-lover would feel such an interpretation to be a little fanciful.

A less extravagant interpretation of the non-permissible anthropomorphic kind would leave out all mention of reasoning and will, but would insist upon conscious expectation of the food as an incident of the train of events that leads to the secretion of saliva. Stating this in terms of ' ideas ' it might be said that the sound of the bell has become associated by repetition with the ' idea ' of the food, and therefore evokes or reproduces this ' idea ' ; and this idea in turn produces the flow of saliva. This is the sort of old-fashioned psychological interpretation against which the behaviourists rebelled. How, they asked, can ' an idea ', a mere shadowy, intangible, immaterial, mythological, quasi-real entity, cause or produce anything so real and substantial as a flow of saliva ?

Now it is highly probable that nothing that can properly be called 'an idea' of the food intervenes as a necessary link in the chain of causation. Yet it is probably true, nevertheless, that the trained dog, on hearing the bell, expects food. We must recognize that, contrary to the teaching of old-fashioned psychology, expectation may take place on the perceptual plane without 'ideation', without free representation of an expected object.[1] I may hopefully expect, or desire, or look forward to, my next meal without forming any picture of it; or, as I see the food on the table, I may expect to eat it without forming any picture of the processes of mastication and deglutition. And presumably the dog can do likewise. The food, when it is presented to the hungry but un-conditioned dog, does not merely stimulate a salivary reflex: rather it stirs to activity his food-seeking propensity. The salivary secretion is merely one small detail in a complex system of bodily processes in which this propensity naturally expresses itself, all the processes incidental to striving for food. Now, the coming into play of this propensity is *ipso facto* the expectation of food; to seek food, to strive for it, to desire it—all these are so many ways of saying that food is expected, looked forward to. The essence of the expectation process consists, not in any detailed representation or 'idea', but rather in the striving forward toward a goal that lies still in the future, a goal that may be vague and utterly undefined, a mere something unpictured and unnamed.[2] Now, when the dog has been 'conditioned', when the so-called 'conditioned reflex' has been established, the bell-stroke (without the food) suffices to bring the propensity into play, and in doing so it provokes the dog to expect food (probably on the perceptual plane of expectation only).

The essential teaching of the 'conditioned-reflex' experiments is this: the training process, consisting of one or many successions of two sense-impressions, A and B, brings about a change in the organization of the animal such that the propensity

[1] This fact is excellently insisted upon by Professor E. C. Tolman in his recent book, *Purposive Behaviour*, a book which, though it is said by its author to present a behaviouristic psychology, agrees largely with the principles of the hormic psychology expounded in these pages and in my earlier works.

[2] And, it may be added, no psychology that ignores striving can begin to account for the difference between, on the one hand, expectation and, on the other, mere representation or actual recollection.

P, at first accessible to B only (in virtue of innate organization), is rendered accessible also to the impression A; and repetition strengthens and confirms this new detail of acquired organization.

CHAPTER XIV

THE SENTIMENTS

LET us now turn to consider the processes of affective organization in man in the light of what we have learnt of such processes in animals. In animals they go but a little way to modify innate organization; in man they result in acquired organization of great complexity, in a vast system of acquired but enduring likings and dislikings, sympathies and antipathies, respects and contempts, admirations and scorns, friendships and enmities, loves and hates. All such instances of acquired affective organization fall into one or other of two classes, *sentiments* and *tastes*.[1] In the foregoing chapter we saw how, in the highest animals, such as the domesticated dog, affective organization may reach a point that almost justifies the application of the word 'sentiment'; as in the case of a dog's enduring devotion to his master. But it is only in the human species that such organization reaches a point that fully justifies the use of this word. Let us consider its usage more nearly.

In common speech we use the word 'sentiment' very loosely. 'Them's my sentiments' is the natural conclusion of an impassioned harangue; but we would not use it in

[1] It is clear that an adequate theory of the sentiments must be the main foundation of all social psychology. American social psychologists and sociologists have recently produced a voluminous literature concerning what they call 'social attitudes'; the term is used to cover a multitude of facts of many kinds, including almost every variety of opinion and belief and all the abstract qualities of personality, such as courage, obstinacy, generosity and humility, as well as the units of affective organization which are here called 'sentiments'. I cannot see how progress in social psychology can be made without a more discriminating terminology.

concluding a cool closely reasoned argument. When you freely express your sentiments you are letting the world know what you like and what you dislike, stating your enduring predilections and aversions; and the more violent or overpoweringly strong likes and dislikes we are apt to call passions. The *passions* of mankind have long been spoken of as of some little importance, passions of love and hate and revenge and, perhaps, of ambition or power; and we speak of passionate devotion to a cause. Ribot, the leading French psychologist of the last generation, wrote a treatise on the passions of the soul; but, like his predecessors, Descartes and Spinoza, he failed to seize the essential feature and continued to confuse passions with emotions, concluding that passions are a special class of emotions, namely, those that are very intense and recurrent; that passions are, in short, hypertrophied native tendencies, the true types of which are gluttony and drunkenness and dipsomania. Thus, for Ribot, the passion is a relatively rare and quasi-morbid formation.

The psycho-analysts also have seen that the native tendencies of men undergo, in the course of individual development, various enduring redirections and fixations upon special objects; and they have specialized the word *complex* to denote such formations. But for two reasons their doctrine of complexes remains very inadequate for the reduction to order of a great realm of facts, the facts of organization of the affective tendencies through experience. The one reason is that they have never made any serious attempt to define the innate tendencies or propensities; they have been content to recognize the fact that the sex propensity is a great source of energy, energy which may be variously redirected through the experiences of the developing individual; and they have supplemented this recognition only by postulating some undefined social and egoistic tendencies, variously called 'ego-instincts' (by Freud) or 'the will-to-power' (by Adler). The second reason is that, their attention being fixed upon pathological phenomena, the vast field of facts of normal organization of the tendencies remains outside

their purview, or, if noticed at all, is interpreted in fragmentary and partial fashion, as an extension of the field of pathological phenomena into the lives of persons of normal development.

The theory of the sentiments is the theory of the progressive organization of the propensities in systems which become the main sources of all our activities ; systems which give consistency, continuity and order to our life of striving and emotion ; systems which in turn become organized in larger systems, and which, when harmoniously organized in one comprehensive system, constitute what we properly call *character*.

The word ' sentiment ' is as nearly as possible synonymous with ' passion ' ; but is more suited to our purpose than ' passion ' : for the latter word implies violence or intensity of excitement ; and many sentiments are essentially similar to the most pronounced passions, except only in that they have nothing to do with violent excitements. Love and hate are the typical sentiments ; and though both love and hate may be passionate, in other cases they are calm and even cool. A cold dislike for a man is a mild form of hatred ; and a calm affection for one's native place is a form of love. It seems best, then, to use the word ' sentiment ' as the more general term, and to reserve the word ' passion ' for those sentiments which generate violent emotions and impulses of great intensity.

Malebranche, a disciple of Descartes, was the first to point the way to an understanding of this topic. But no progress was made until Mr. A. F. Shand published an article on the subject in 1896. In my *Social Psychology* (1908) I seized upon Mr. Shand's hints and developed a theory of the sentiments, which, however, proved (on the publication of his *Foundations of Character* in 1914) to be very different from his.

Common speech confuses sentiment with emotion, and yet it hints at a true distinction. Animals display strong emotions ; when a dog barks furiously at a stranger, we do not say that he manifests a sentiment, though we suspect

in him emotion. But if he is strongly attached to his master, if he defends him from attacks, if he pines (perhaps even to death) in his absence and welcomes him with wild demonstrations on his return, we feel it is not inappropriate to say he has a sentiment of devotion, or even of love, for his master. If he licks his master's hand and gazes into his face, we might be inclined to say that he is feeling and expressing an emotion of love and also expressing his sentiment of love. And if he flies savagely at a person who assaults his master, we might again say that he is expressing his sentiment of devotion; but we should hardly suppose that he is expressing or experiencing at the moment an emotion of love. This gives us the clue to the true distinction between the sentiment and the emotion. Emotion is a fleeting experience; sentiment is an acquired disposition, one gradually built up through many emotional experiences and activities; it is an organization (or a part of the total organization) which, once formed, endures and which, though subject to further growth or decay, may endure throughout life.

Any object that repeatedly evokes in us a particular tendency with its characteristic emotional excitement becomes the object of a corresponding simple sentiment. If a man repeatedly disgusts us by his coarse behaviour, we, after few or many repetitions of such rudeness, experience disgust at mere thought of him, or at sight of him even when he is on his best behaviour. If a man repeatedly evokes our gratitude by kindly and generous acts, we acquire a sentiment of gratitude for him; and the most direct evidence of the existence and working of this new formation is the fact that we can hardly think of him without some touch of that emotion. If a man repeatedly provokes us to fear and anger, we habitually think of him with some blending of fear and anger. In each case the emotional reaction becomes habitual. We infer that the propensities concerned have become linked with (associated with, or organized into a system with) the ability (or system of abilities) concerned in recognizing or otherwise thinking of that person.

The confusion between emotion and sentiment is per-

petuated by the fact that we use the same name for the emotion and for any sentiment which engenders that emotion. Especially is this true of the two words ' love ' and ' hate '. A nice usage would confine the names to the sentiments. Every sentiment in which is organized the protective propensity (with its tender impulse and emotion) is naturally called ' love ', no matter how complex it may be, no matter how many other propensities may be organized in the same system. And every sentiment in which the propensities of fear and anger are organized is properly called hate ; though we might with less propriety give the name ' hate ' to sentiments of which the propensity to disgust is the chief affective constituent.

The essential nature of a sentiment, the scheme or plan of it, is, then, a mental system in which a cognitive ability (in the older terminology, an ' idea ') has become, through the individual's experience, functionally linked with one or more native propensities, linked in such a way that, when the ability comes into play (i.e. when the corresponding object is perceived or otherwise thought of) the propensity also is brought into action and engenders its peculiar emotional tendency directed upon the object.

The centre of any such system (of any sentiment) is the cognitive ability or disposition corresponding to the object of the sentiment ; and this may (and in the case of any strong and enduring sentiment is likely to) grow into an extensive system of abilities (a system of knowledge or ' ideas ' concerning that object). Each sentiment is a unique formation, which, whether it be relatively simple or highly complex, is a structural and functional unit of the total organization we call the mind. The distinctive feature of each sentiment is the cognitive ability (or system of cognitive abilities) which is its centre or nucleus. If I have three children, Tom, Dick, and Harry, and acquire a sentiment of love for each one of them, then these three sentiments of love existing in me may be of very similar constitutions ; yet, numerically and functionally, they are distinct formations. Even if the three sentiments be identical in respect of the propensities

organized within them, each is nevertheless unique in respect of its object. In so far as Tom and Dick are distinct persons to me, I make use of distinct cognitive abilities in recognizing or otherwise thinking of the two boys. The distinctness of the two very similar sentiments for Tom and Dick respectively is clearly shown by the fact that the two sentiments may undergo in the course of time divergent courses of development: my love for Tom might even be destroyed by some line of regrettable conduct on his part; while, during the same period, my love for Dick continues unchanged, and my love for Harry grows stronger and richer or more complex.

Any sentiment, once formed, may long remain latent. We hear some malicious speech concerning a person we have not seen for years, and we say: 'He may be a queer sort of man, but he used to be very kind to me and I won't hear a word against him.' But disuse weakens, and use strengthens, a sentiment. And when we are in constant contact with the object of a simple sentiment, the sentiment can hardly fail to become more complex through incorporation of more propensities. The incipient sentiment makes the object *interesting* to us (of positive or negative *value*) and we do not remain indifferent to any of its influences or actions.

The more complex the sentiment, the wider is the range of the emotions it may engender and the greater the complexity of the configurations of conscious activity that spring from it. And into these configurations may enter, in addition to a wide range of blended emotions, all the complex modes of feeling, joy, sorrow, hope, anxiety, despondency, despair, etc.: for from the sentiments spring strong and enduring desires, especially the desires that look forward and backward with long range.[1]

[1] The variety and complexity of the emotional reactions that may be determined by a complex sentiment render the word 'attitude' inappropriate and misleading as an alternative to the word 'sentiment'. We may properly speak of an attitude of expectant attention, of deference or respect, of reserve, of caution, of aggression, and of many others; and we may recognize the mental 'attitude', even

The growth of sentiments brings order and consistency into our affective life. When we have acquired sentiments, we experience, in addition to the emotions sporadically evoked by the events of the passing moment (fleeting excitements such as the animals know), those profounder affective stirrings which hold us steadily set towards remote goals. Sentiments give steadiness and consistency to conduct; and especially is this true of dominant or master sentiments.

A master sentiment, a sentiment of the kind to which the term 'passion' is appropriate, may determine the trend of a man's whole life and activity, constantly growing stronger through use and manifesting itself perhaps in his last hour as 'the ruling passion strong in death'. It is in such cases that we realize most vividly the fact that sentiments play a dominant role in human life and are the source of almost all our motives, of all sustained and well-directed effort. Consider the widowed mother's sentiment of love for her only child. How it shapes her life! How it supplies her with motives that override all others! How it determines every decision that in any way affects him, and keeps her active to her last day on his behalf, perhaps sustaining incredible labours and bearing, without complaint, severest hardships! At first it is perhaps a very simple sentiment, consisting merely in the concentration of her maternal impulse upon the care of the helpless infant. Even at that stage it may engender a variety of intense experiences, such as would not occur in the absence of the sentiment; not only tender emotion, but defensive anger on his behalf, reproach when he is naughty, joy when he prospers, and, if he falls sick or is otherwise en-

though it be not clearly expressed in bodily behaviour. But since a sentiment, such as strong love for a person, may engender not only the tender impulse and emotion, but also anger, fear, curiosity, and almost every other kind of affective response, simple or complex, including the whole range of complex feelings from joy and hope to sorrow and despair, how inappropriate would be the designation 'social attitude'! For the word attitude literally means some particular expressive position of body and limbs; and, when used metaphorically of the mind, it can only mean some particular actual, incipient, or potential reaction.

dangered or injured, hope, anxiety, despondency, despair and sorrow. Gradually, she comes more and more to rely upon his companionship, her desire for social contact seeks and finds its satisfaction in him almost exclusively; her gregarious propensity has become organized within the sentiment. Then, in every stirring of emotion, whether intense or slight, it is his sympathy she seeks; a sympathy which, when manifested, enhances all her enjoyments and lessens all her sorrows and disappointments. As he grows in strength and beauty and capacity, she yields to his domination; her sentiment of love incorporates her submissive propensity and becomes one of adoring worship. As she grows older and the man in his vigour shows but little need for her care, her tender impulse is still repeatedly evoked and kept active within the sentiment in the form of gratitude for his care for her. His career is her main interest, his success or prosperity the object of her strongest desires, her highest pride; his indifference to her, his failure or wrong-doing, the occasions of her bitterest pain and shame. If he turns out badly, she still hopes and strives, finding excuses and extenuations; and if he ends upon the gallows, she is there to put her arms about him through the prison-bars, sustaining and comforting him all she can to the last moment.[1]

The one sentiment, growing through many years in strength and complexity, generates a great range of emotional experiences and sustained efforts of the most varied kind, all having in common one feature only, that they all are concerned directly or indirectly with the one object and (except in so

[1] It seems a little absurd to dwell on such facts in a work of sober science, when many great artists have described them so much more effectively than I can hope to do. My excuse is that facts of this order are of prime importance from every point of view, and the interpretation and understanding of them should be the most important part of psychology; yet this part remains almost ignored by the majority of psychologists; and when the facts are dealt with, as by the psycho-analysts, they are apt to be distorted and misinterpreted in a woeful manner. If the reader has had or can find opportunity to see the screen-play, *The Sin of Madelon Claudet*, I would ask him to ponder it in this connexion. It is the story of a master-sentiment, excellently told.

far as errors of judgement lead to choice of inappropriate means) are directed to promote the welfare of that object. If we attribute all these experiences and efforts to the maternal instinct,[1] or to a ' conditioned reflex ' or to a ' social attitude ', is not our account hopelessly inadequate, even if it be less erroneous than the attribution of them to a perversion of the sex instinct ?

The Principal Types of Sentiment

I said above that every sentiment within which the protective or parental propensity is organized may properly be called a sentiment of love ; and that all sentiments in which the propensities of fear and anger are incorporated may with equal propriety be called sentiments of hate. But these names must not mislead us into supposing that all sentiments of love are of identical composition. Each sentiment is a unique formation, a structural and functional unit of the total organization of the mind. Its uniqueness corresponds to the uniqueness of its object ; and even when two senti-

[1] Many critics of my *Social Psychology* have complained that I explain every human activity as the working of some instinct. This charge has a certain truth ; and yet is essentially false and arises from a failure to understand the nature of the sentiments and the immense role assigned to them in human life. The truth contained in the charge is that I did in that work and do now (still more emphatically and confidently after wrestling with the problem for a further period of nearly a quarter of a century) regard the native propensities or conative dispositions as the mainsprings of all human and animal activity, the main sources of all the energies manifested in bodily and mental striving. Nevertheless, my *Social Psychology* taught (and I here again insist) that few of the activities of the adult man spring directly from his native propensities ; the great majority derive their energy only indirectly from those sources by way of the sentiments within which the propensities are organized. I would revert to the crude analogy between the animal organism and a power-driven factory containing a multitude of delicate machines. It is true that the engine in the power-house is the source of the energy by aid of which every operation, however delicate, is accomplished and without which it could not be accomplished ; yet to say this is not to say that every operation is performed by the engine in the power-house. Yet that is the error of which my critics accuse me.

ments acquired by one person are of very similar history and composition (as in the case of a parent's love for two children, perhaps a pair of identical twins) they are yet distinct and independent formations; each has its own unique history, and the further history of the two may differentiate them widely (cf. p. 223). The same is true of hate and of sentiments of every kind. As I do not love any two persons in just the same way, so also I do not hate any two in quite the same way.

Though very many of our sentiments for persons may properly be classed under one or other of the two heads, love and hate, yet there are many other such sentiments which cannot be classed in either category, even if they might perhaps be said to be, or to involve, likings or dislikings, according as they incline us towards or away from their objects.

When we learn to look up to another person, when the strength or capacity or achievements of any man habitually evoke in us the submissive propensity, we acquire for him a sentiment of *respect* that colours all our thoughts and feelings about him and plays a part in determining all our conduct towards him. And if he also habitually evokes our curiosity or wonder, by reason of the fact that his powers and achievements surpass our comprehension, we may properly be said to have acquired a sentiment of an allied but more complex kind, namely one of *admiration*. And if the same man also evokes our enduring gratitude, the sentiment is still more complex and may be called one of loving admiration.

If, on the other hand, a man's smallness, or meanness, or his general lack of capacity or efficiency, repeatedly provokes us to 'look down' on him, to feel ourselves superior, exalted by contrast with his weakness, we acquire for him a sentiment of *contempt*. Again, if we find a man 'sympathetic', i.e. if we find that he shares our emotional reactions, if he responds to our expressions and to the events and personalities of the day with similar expressions, we find satisfaction in his company, his companionship becomes the main goal of our gregarious propensity; we have formed a

sentiment of *friendship*. And this commonly, though not necessarily, becomes complicated with admiration or, at least, respect, and perhaps also gratitude or compassion; when the sentiment acquires something of the nature of love; and is correspondingly richer and stronger, the source of more varied and complex emotions, of stronger motives and of more intense satisfactions and distresses.

The variety and complexity of sentiments is inexhaustible. Here I can only indicate the fundamental principles and main types of sentiment.

Hitherto we have considered only sentiments for persons. But anything that can be thought of as a distinct object may become the object of a sentiment. One might even go so far as to say that only in so far as an object becomes the object of a sentiment does it acquire for us individuality and stand out from the confused background of the world in general as a distinct and unique object. We acquire sentiments for inert things; a book, a coat, a pipe, a violin, a picture, a chair, a house, a garden, a home. In so far as we like or dislike each such thing, that thing is the object of a sentiment, however feeble and simple and obscure. When after many years I surrender to a Salvation Army official (under my wife's urging) a much worn golf-jacket, it is with a faint pang of regret, almost of sorrow, which testifies to the reality of my sentiment. In all such cases we tend to personify the object, applying, perhaps, epithets strictly appropriate only to persons. And the more the object has played a role in our activities, as a pen, a car, a golf-club, a boat, a shot-gun, the more does it take on for us these personal attributes.

Sentiments for Collective Objects

Not only concrete objects, but also collective objects may and do frequently become objects of sentiments that play a leading role in the lives of many men: our church, our school, our gang, our party, our nation, all these collective objects may become objects of sentiments of very varied composition

which may be named respect, gratitude, admiration, love, or, comprehensively, loyalty or devotion. Of all group sentiments one of devotion to the family is perhaps the most nearly universal, a fact recognized in the popular dictum that blood is thicker than water. If a man has learnt to love each member of his family, and if that family is a compact group which subserves the interests and welfare of all its members, he can hardly fail to love the group as such, to strive to preserve it, and to promote its prosperity, its reputation, and its power. The simplest and least selfish form of family sentiment is perhaps little more than the fixation of the protective or parental propensity upon the family group as such; and perhaps it takes this simple form in some humble motherly women. But since each member of the family group is identified by the world with that group, is part-object of the praise and blame, the admiration or respect, the scorn or contempt, which the group incurs, the self-regarding sentiment of each member is apt to be extended to the group. He who is proud takes pride in his family; and he who is ambitious is ambitious for his family; his daughters must make good matches, and his sons must distinguish themselves, or he will have no peace of mind. In such cases there is a blending of the two objects, the self and the group, in the mind and a consequent fusion of two sentiments into a larger system. These are subtle processes which I cannot pretend to elucidate; but, however obscure, they are very real and of great influence in our lives.[1]

Similar sentiments are formed for larger groups such as the clan, the village community, the tribe, the school, the profession, the church, the nation.

This topic, a main part of any Social Psychology that knows its business, is a large one.[2]

[1] Cf. p. 235.

[2] I refer the reader to my *Group Mind* (London and N.Y., 1920), where the immense and beneficent role of the group sentiments is discussed at some length. See also the last paragraph of this chapter.

Sentiments for Abstract Objects

No less important, but more subtle and difficult to understand, are the sentiments we form for abstract objects. This also is a vast topic comprising most of what used to be discussed under the head of Moral Philosophy. Here I can only point to it as one awaiting exploration. The abstract objects which most commonly become objects of sentiments are the qualities of personality and conduct, such abstract objects as honesty, courage, strength of character, generosity, fair play, cruelty, meanness, ruthlessness, fickleness. Sentiments of liking or disliking, of love or hatred, of admiration or contempt, for such objects are of the essence of morality, of the moral tradition that is the most precious possession of any people.

It is, of course, only in so far as we are capable of conceiving such abstract objects that we can learn to like or dislike them ; and, conversely, only in so far as we form such sentiments do words which denote such objects acquire meaning for us. The acquirement of meaning and the formation of the sentiment are but two aspects of one process of growth and organization, a process which is advanced on every occasion on which we recognize and emotionally react to any such object. If this statement seems to you obscure, ask yourself the question—What meaning could the word 'cruelty' have for me if I had never reacted emotionally to any instance of cruel conduct ?

There are two principal ways in which such sentiments are acquired. First, the actions of his fellow-creatures repeatedly evoke in the child emotional responses of the most varied kinds ; some evoke his gratitude, his admiration, his sympathetic compassion. As he learns by the aid of language to distinguish and recognize the qualities of such actions, those qualities as such evoke in him the emotional responses which at first were evoked only by concrete actions directed to his own person. In similar fashion, harsh, cruel, deceitful or unjust actions evoke repeatedly his anger, his fear, his disgust, his scorn or contempt ; and these become

his habitual responses to all actions of those qualities, whether directed to himself or to others. Probably in all cases there is a stage of this process in which the quality is recognized as a quality of persons; such and such persons are recognized as kind, or generous, or just; and others as unkind, mean, or deceitful. And as a further stage the qualities are detached or abstracted from the persons who display them and themselves become capable, however encountered or thought of, of evoking the appropriate habitual responses.

The second way in which these moral sentiments, these likings and dislikings for moral objects, are formed, strengthened, and refined is through sympathetic contagion from the persons about the growing child, especially all persons to whom he looks up, whom he in any degree respects or admires. The emotional reactions of such persons to actions and personalities evoke by direct emotional contagion similar reactions in the child contemplating those same actions and personalities; and thus he learns to like and admire and reverence those qualities which are held in high esteem by those whom he respects, and to dislike or scorn or despise those qualities which they condemn. In this matter the influence of some one or few persons for whom the child has acquired strong and warm admiration may be decisive. But in most cases, perhaps, the decisive influence comes in the main from the group, the family, the school, the church, the college, all members of which have certain moral sentiments in common, a common hatred for lying, stealing, and cruelty, a common admiration for courage, justice, honesty, and fair play.

The Sentiment of Self-Regard

Every one recognizes the immense importance of *self-respect.* The older moralists dilated at length upon what they called *self-love.* The self is an object which in one way and another one learns to distinguish from other objects, to conceive more or less clearly and adequately. The process is long, subtle, and complex, and has been discussed at length in

many books; but, owing to the unfortunate convention which has assigned the study of our intellectual development to the psychologists and that of our moral development to the ethical philosophers, this remains one of the backwaters of psychology.

The intellectual and the moral development proceed as two aspects of one process; and of that process the formation of a sentiment for the self is a central part. *Self-regard* seems to be the best general name for all such sentiments; in their composition and organization they differ widely from one man to another, and it is therefore but natural that we have an array of different names for such differing sentiments. Self-respect, self-esteem, self-love, pride, ambition are the names of distinctive types of self-regard. Selfishness, egoism, egotism, vanity, conceit, humility, megalomania, swelled-head, bumptiousness, pushfulness, masterfulness, aggressiveness, these are some of the qualities of personality determined in the main by the composition and mode of working of the sentiment.

This sentiment is the main source of some of our most vivid emotional experiences, of our most intense and sustained efforts and of our most acute satisfactions and sufferings. 'I could have died of shame' is a common expression which, in its exaggeration, recognizes an important truth. Some primitive men, it is authentically reported, have lain down and died of shame. And many a highly civilized man has been impelled by shame or fear of disgrace to take his own life.[1] How powerful, then, must be the motives that spring from this sentiment! What an unfailing source of energy is the self-regard of the keenly ambitious man, who, sustained by the desire of personal distinction from youth to old age, scorns all delights and lives laborious days, sacrificing perhaps, in this mad pursuit, the happiness of his wife, his children, and himself! What other pleasures can compare with those that come from the praise, the applause, the admiration, the adulation of the great public? What pain

[1] Among Japanese gentlemen this has long been a frequent and socially approved practice.

so severe as the mortification of failure, of disgrace or of universal contempt?

A normal sentiment of self-respect seems to combine in its system, as its most essential constituents, the propensities to self-assertion and submission. The tendencies of these two propensities, working in nicely balanced fashion, keep one another in check, and bring about appropriate attitudes and efforts in all social situations; dominance and self-assertion towards one man; deference, imitation, admiration, submission to another. And just because the self is an object with which we are almost constantly concerned, the tendencies of its sentiment become, through frequent use, highly sensitive and very strong.

Though self-respect of this kind is the most normal form of the sentiment, self-regard takes many other forms. And since this sentiment is the most difficult to understand, the most subtle in its workings, and plays the most powerful all-pervasive role in the higher life of man, it is worth our while to consider briefly some of its forms which, like caricatures, bring out clearly by accentuation some features of its growth and work.

Pride and ambition are two allied aberrant forms of self-regard. In both of these we recognize as a distinctive feature a hypertrophied self-assertive propensity functioning uncontrolled. The difference between them seems to be that, in pride,[1] the tendency constantly attains satisfaction, is frequently the ground of elation; whereas, in ambition, it works as a consuming hunger, an insatiable desire for ever-greater dominance or ascendancy over one's fellow-men, and may take the form of efforts to attain and exert power in secret, the exercise of power being both goal and reward, apart from all public recognition.

Vanity is a third form of the sentiment, allied to pride

[1] The word 'pride' is also used of that kind of emotional reaction which comes on successful achievement recognized by the world, as when we say of a boy who wins a game of tennis, 'He takes pride in his victory.' Here we are dealing, not with a sentiment of pride, but rather with the gratification of the self-assertive tendency, a complex affective state, a form of joy that is perhaps best called *elation*.

and ambition in that it is a form of egotism, a spring of uncontrolled self-assertive impulses; it differs from them in that the tendency seeks and finds its satisfaction in trivial personal superiorities, in a pretty complexion, or white hands, fine clothes, or small social triumphs.

Extensions of Self-Regard

It is a peculiarity of the sentiment of self-regard that it readily extends itself to whatever objects express one's personality, or can in any way be regarded as parts of one's larger self. A man's clothes, his house, his garden, his car, his dog, his horse, his books and pictures, and more especially all of his possessions which he has not only selected but in some manner or degree has created, all these are things in which he may 'take pride' in so far as other men admire them; or take shame, in so far as they are looked down upon or lightly esteemed by others.

Of all such objects, a man's children are those to which his self-regard is most surely extended; for they are the most intimate parts of his larger self, the parts most inevitably regarded by himself and by the world as expressing his personality. Not only do his children inherit in some degree his own nature and that of the wife he has chosen, but also he moulds their development for good or ill; and he is thus in a double sense responsible for what they are. Even if a man has no love for his child, he still cannot dissolve the relation between them or repudiate his responsibility for what his child is and does; hence, even though he have little or no love for his son, he is elated when that son distinguishes himself and mortified when his son is disgraced. The phrase 'a chip of the old block' expresses our common recognition of these facts. And if a man also loves his child, then that child is the object of a highly complex sentiment of a dual nature; his love and his self-regard, centred upon the one object, supply motives which commonly co-operate harmoniously.

As we have already seen, the self-sentiment is also commonly extended in some degree to other groups than a man's

own family; namely, to whatever groups he is 'identified with', both by himself and the world; his school, his college, his professional group, his church, his party, his nation. Hence the paradox, the most important of all truths for social psychology, that these egoistic tendencies of a man's self-regard impel him to strive for the welfare of the group to which he belongs; they find satisfaction in its prosperity and are painfully thwarted by its failures and shortcomings. And here again a man's sentiment for his group may be, and not uncommonly is, of the same double nature as his sentiment for his child; that is to say, it is both an extension of his self-regard and a love; he is not only proud of being an Englishman or an American, but also he regards his nation with affection, admiration, gratitude, holds it to be a thing of value, deserving of his self-sacrificing effort.

Some Complex Emotions and Feelings Dependent on Sentiments

Some of the complex emotions are dependent on sentiments, in the sense that they can be evoked only through objects for which sentiments have been acquired. Of these jealousy, reproach, and shame are the most important.

Jealousy is not itself a sentiment; it is rather a complex play of painful, because conflicting, emotions and tendencies; it is provoked only when an object of some sentiment of love or devotion is involved in some particular situation that threatens to remove the object from our exclusive possession or to impair the reciprocity of that object. But even an animal, such as the domestic dog, is capable of jealous behaviour in relation to the master for whom he has a sentiment of devotion. The torturing quality of jealousy is due to the fact that the triangular situation which provokes it, perpetually evokes resentment against the loved object, and also perpetually thwarts and wounds one's self-esteem. It is thus *ispso facto* a state of acutely conflicting tendencies.

Reproach is the emotional reaction to which we are normally excited by anger-provoking behaviour on the part of one we love. The outburst of anger, which would be our reaction to provocation by a person to whom we are indifferent, is

peculiarly modified, softened and controlled ; the provocation coming from a creature we love, our angry reaction is damped down by the tender impulse habitually evoked in all contacts with the loved one, until it is a caress rather than a blow. Instead of bellowing out some oath or harsh expletive, we say ' How could you do it ! ', or ' Look here, that's a bit rough on me, don't you think ? ' The classical instance of reproach is the perhaps legendary story of Sir Isaac Newton's reaction when he found his little dog had destroyed papers containing the fruit of long labours—' Oh ! Diamond, Diamond, thou little knowest the damage thou hast done ! '

The emotional quality of such a reaction is quite distinctive ; and yet its affinity to both tenderness and anger is unmistakable for those who have some facility in introspection.

Shame and *mortification* are forms of emotional reaction similarly dependent on a sentiment for the self. They are always and inevitably painful emotions : for the self-assertive impulse, working within the sentiment of self-regard, strives vainly towards its goal, thwarted at every turn. And where the self-sentiment takes the form of pride or ambition, the more painful is the thwarting of the hypertrophied self-assertive tendency.

In Chapter XI we had occasion to touch on certain complex modes of feeling that depend upon or are generated only in and through sentiments. The principal types of such modes of feeling are, we saw, *joy* and *sorrow* ; and we saw that the most typical varieties of joy are experienced as the tendencies of love progress towards or attain their goals, while sorrow results from the thwarting and baffling of those same tendencies.

Grief is an emotion allied to sorrow. It differs from it in that the tender impulse and emotion play but a minor role or none. A man whose lifelong ambition is finally thwarted will suffer the pangs of grief. But, perhaps, where the tender element is wholly lacking, the feeling is most properly called *chagrin*.

On the other hand, where a strong sentiment that contains no element of tenderness, a sentiment such as pride

or ambition, prospers and attains the satisfactions it craves, the feeling is perhaps most properly called *elation*, or, in its milder forms, *complacency*.

The highly complex sentiments formed by the blending of extended self-regard with some form of love or devotion to the object engender correspondingly complex, intense and variable modes of feeling.

CHAPTER XV

TASTES

ARE all likes and dislikes sentiments? No—sentiments are centred upon, directed upon, objects. But we acquire likes and dislikes for particular kinds of activity, and these are properly called *tastes*. We say that we like or love cards [1] or golf or skating, or we say that we dislike or hate such activities. The words love and hate so used are perhaps inappropriate; they involve a childish over-statement or misstatement which perpetuates a confusion between sentiments and tastes, a confusion which I am here concerned to resolve. In this confusion we have one of the principal grounds of the persistence of the false doctrine known as psychological hedonism.

Broadly, we may say that sentiments are likings and dislikings for objects, while tastes are likings and dislikings for particular modes of activity. Broadly speaking again, we may say that, while our sentiments determine the major goals towards which we strive, our tastes determine our choice of means, the kinds of activities and instruments we use, the roads we prefer to follow, in pursuing those goals.

The distinction may best be made clear by considering an instance in which a taste and a sentiment co-operate in determining a particular line of sustained activity. Take the case of a youth who, on entering college, has a strong desire to distinguish himself. The desire springs from, is a function of, his sentiment of self-regard. He is indifferent to the means for the attainment of his strongly desired goal, and is ready to try hopefully any one of many possible lines of activity through which his goal may be attained; scholar-

[1] Obviously it is not the cards, but the card-playing, that we like.

ship, athletics, debating, glee-club singing, editing or writing for the college paper, all these are fields of activity through which he may attain his goal. He tries several of these avenues, and finds himself efficient and making good progress in one of them, say debating. He then concentrates his energies along this line of activity ; and for two good reasons which are distinct though commonly not clearly distinguished : on the one hand, he sees that this line of activity offers the best prospect of attainment of his goal, namely, distinction, recognition, fame. And this alone might suffice to sustain his efforts along this line. On the other hand, in so far as he finds himself an efficient and successful debater, he will enjoy debating, experiencing frequently the satisfaction of successful activity. Thus, in accordance with the fundamental law of feeling (that we tend to persist in and renew the forms of activity that are pleasant because successful) he acquires a taste for debating. When this taste has been acquired, his motive for debating is still his desire for distinction springing from his sentiment of self-regard ; but the choice of this means (debating) towards his goal is confirmed by his acquired taste.

Suppose also that on trying several lines of athletic activity, he finds himself making good progress towards proficiency in one game, say tennis, while relatively ineffective or unpromising in others. He concentrates on tennis and, in so far as he continues to be successful in that game, he enjoys it and acquires a taste for it ; while acquiring a *distaste* for any other line in which he proves clumsy, in which he suffers the pains and disappointments of failure. If, under social or other pressure, he continues for a time to strive to master a game (say golf) in which he makes but poor progress, the stronger will become his distaste for that particular kind of activity.

Now consider a further evidence of the separateness between the taste and the sentiment which have co-operated most intimately in sustaining the youth's efforts to become an outstanding tennis-player. Leaving college, he becomes a successful lawyer, a line of activity along which he attains

the goal of his ambition and at the same time indulges his taste for public speaking and debate. For twenty-five years, perhaps, he has been too busy to play any game. But now his physician tells him he must take exercise out of doors and urges him to play golf twice a week. At once the old taste and the old distaste assert themselves. He has a new motive for playing games, namely, his desire to preserve his health ; but the choice of the game he will play (as the means to his end, health) is determined by his old taste for tennis and his distaste for golf : he takes up tennis again, and, in so far as he is again reasonably proficient and successful, his taste is revived and perhaps strengthened. Or, if now his old skill is much impaired, and is not readily reacquired, if he keeps driving the ball into the net or out of the court, his taste will soon fade ; and in all probability it will give place to a positive distaste.

Sentiments, then, are structural and functional units of the total organization of the mind ; each one is a cognitive-affective system centred upon some object. And the sentiments supply the motives of all sustained activities, namely, desires concerning their objects. Tastes, on the other hand, are not in themselves sources of desires ; they determine, not our goals, but only our choice of means. If a taste is to be indulged, there must be some motive springing from some source other than the taste itself.

Suppose a man who has a taste for golf. He will hardly be moved to indulge it unless he has some motive for playing, desire to preserve his health, or to forget his business worries, or to cultivate certain acquaintanceships. The indulgence of his taste is a means to some such goal.

Although tastes play a considerable part in determining our choice of lines of activity, their role is a minor one. They stand very far behind the sentiments in importance as factors of conduct. Hobbies are the great field for the indulgence of tastes. But even the activity which is the practice of a hobby in the purest form requires to be sustained by some motive, some desire which is not rooted in the taste itself but springs from some other source, commonly a sentiment. The

man who attempts to make of his life a continued cultivation of, and indulgence in, tastes is the epicurean ; even if his tastes be of the most refined kinds, his activities are apt to pall, and he fails to find the happiness he expected : for the essential condition of happiness is activity springing from strong sentiments harmoniously organized to form a well-balanced character.[1]

Man cannot live by tastes alone. When a man retires from his bread-winning profession, he is well advised to cultivate a hobby. But it is well that the hobby shall not be merely the indulgence of a taste. If it is nothing more than that, the practice of it is likely soon to pall, to lose its zest for lack of adequate motivation. The good hobby is an activity in which a taste is indulged and, at the same time, the desire of some sentiment attains satisfaction. For example, a business man, on retiring, takes up carpentering as a hobby. If he can make furniture for his home, for his wife and for all his married daughters (furniture appreciated by them), his hobby may well be a great success. Or he takes up poultry breeding ; then, if he can supply his family with super-eggs and super-chickens for the table, well and good. And if he can take prizes at the local poultry show, so much the better. But the mere taste for pottering about a poultry-yard will not carry him far on the road to happiness, no matter how freely indulged.

The subtlest problems of taste and sentiment arise in the sphere of aesthetic activity, where tastes and sentiments commonly co-operate most intimately. Here also their roles can be distinguished. In most cases the music-lover has a sentiment for music as a great and beautiful art and also a taste for practising some form of the art or at least a taste for hearing music.[2] Yet in some men the taste plays the greater role, in others the sentiment. A man who has a

[1] Walter Pater's story of *Marius the Epicurean* vividly illustrates my argument.

[2] We must not forget that the appreciation of music is not a passive reception of impressions but an activity which in many cases is a most strenuous one.

strong taste for rattling off jazz tunes on the piano may have very little or no sentiment for music. On the other hand, a man may have developed but little taste for practising or for hearing music; and yet may have a strong sentiment for it, which, perhaps, if he is a rich man, he may manifest by endowing a school of music or a home for indigent musicians. It is no doubt roughly true that the patrons of art are men in whom the sentiment predominates over the taste; while in the practitioner the taste for his special art is commonly developed to a high pitch.

Finally, there occurs the peculiar case of the man who, having acquired both a taste and a sentiment for music, suffers an impairment of hearing that seriously distorts all sounds. This condition destroys his taste for music, while leaving his sentiment unchanged.[1]

I have defined character as the system of the sentiments. It is a nice question whether we should add to this definition the words 'and tastes'. Certainly tastes must be included in the total complex organization which we call 'character'. There can be no objection to the extended definition—character is the system of sentiments and tastes. But the extension is not, perhaps, necessary: for tastes are developed in the main in the service of, and as instruments and subsidiary modifications of, the sentiments.

[1] Here I speak with authority as an instance of this unusual kind.

CHAPTER XVI

SUBCONSCIOUS WORKING OF TENDENCIES

IT has often been said that the discovery of 'the subconscious mind' is one that ranks among the great discoveries of all time, one that has raised psychology to a new plane, making it vastly superior to the psychology that recognized conscious mental processes only. There is some truth in this claim; but how much truth and how that truth may be properly stated and explicated remain questions about which the opinions of experts still differ widely.

Some authorities, while recognizing *subconscious processes*, regard them as peculiar to states of mental disorder and would relegate all discussion of them to treatises on psychopathology or medical psychology. Others claim that their role in normal life is very great; they liken our mental life to an iceberg only one-tenth of which appears above the surface, while the much larger part remains submerged, hidden from our observation, and only to be inferred from evidences of its influence on that part which is open to direct inspection, yet playing a dominant and all-important role; as when the iceberg drifts against the breeze. And they think it necessary, in explaining the simplest and most ordinary events of our daily living, to postulate powerful subconscious activities. In trying to find the truth, we may safely assume that it lies somewhere between these extreme positions.

At the outset we must repudiate certain forms of speech which, though in very common usage, are very misleading. These involve such terms as 'the subconscious mind', or 'the subliminal self', or 'the Unconscious'; all of which are frequently written with capital letters, as though to

emphasize the difference and the remoteness of the alleged subconscious mind from the so-called conscious mind. All such language, implying as it does that in each of us two minds exist as two distinct entities or organizations separated by a barrier that is only bridged or crossed under extraordinary conditions, all such language is to be deprecated. It is true that in certain rare instances, those known as cases of *dual personality*, such language has some justification. But these rare pathological cases, though very instructive, cannot be accepted as revealing a state of affairs common to all mankind; they result rather from the realization, under special circumstances, of a possibility latent in all of us.

In opposition to all such doctrines and implications, we insist that the mind of the normal man is a single organization, although the activities of this organization reveal themselves to our direct inspection (or introspection) in very different degrees. In some cases we seem able to render an introspective account that seems relatively full and adequate; in others, the vital essentials of the total process seem to elude our best efforts, and we can but infer them, or postulate them, as being necessary for the explanation of some bit of experience or behaviour that otherwise remains utterly unintelligible; it may be some bodily action that bears every objective mark of intelligent purpose; it may be some momentary feeling or enduring mood; it may be some conclusion, perhaps obviously based on a large body of evidence; and in each case our utmost effort of retrospection fails to discover, as immediate antecedent of the event, any conscious thought or intention related to it.

Above all, the motives of our actions and of our judgements are apt to remain in many cases very obscure. And it is in relation to the problems of motivation that the postulation of subconscious activities is most urgently required, if we are to gain any understanding of our inner life, with increase of our power to direct our own conduct and to influence effectively the lives of others.

The more striking instances of subconscious activity are

rare, and, in some cases, occur as symptoms of disorder. But the experience of perfectly normal people furnishes abundant illustrations, if our minds are alert to notice their significance. There are numerous well-authenticated cases of the production of verses that came ready-made to consciousness (Coleridge's ' Kubla Khan ' is perhaps the most famous) ; and of the solution of some problem that enters consciousness suddenly in completed form, perhaps after long search for it has seemed to be fruitless. There is good ground for the statement that all creative production, especially of the higher kinds, issues from a vastly complex train of activity which in large part is subconscious.

Dreams as Evidence of Subconscious Activity

Dreams afford the most familiar illustrations, though their very familiarity is apt to disguise for us their significance. The ordinary dream, which on waking we recollect and perhaps recite, is a story that comes ready-made to consciousness. When the dream seems chaotic and meaningless, we may plausibly dismiss it as a mere fortuitous concurrence of images. But in very many cases it is easy to show that the dream is more than this, that it has significance and relevance to our waking life ; that it reveals or illustrates, often symbolically and allegorically (as a moving picture on the screen might do), the inner situation of the dreamer. Now, when we see a ' movie ', we do not regard it as a fortuitous concurrence of images ; we infer with confidence that it was produced by the purposive activity of a mind that designed it and desired to produce something of the sort. And with equal confidence we can infer that our dream, whose significance we discover only by analysis and in the light of reflection upon our past experience and present situation, is equally a product of an activity within us that was essentially a mental activity, although it took place in the main outside the field of consciousness and revealed itself only in the appearance in consciousness of the completed product, the dream.

Let me give a very simple illustration. An English officer,

who, during the Great War, had served several years at the front without receiving promotion or other recognition of his services, dreamed that he went to a tea-party at Buckingham Palace to meet the King and Queen. To his chagrin the other guests were regaled with various delicacies, but nothing was offered to him. The dream seemed to him utterly silly and without significance. It was only when I (scenting the possible significance of the dream) prompted the dreamer to undertake a candid self-examination, that his inner state of brooding discontent and resentment (hitherto strongly repressed from both the world and himself) was revealed and acknowledged; a state of long-continued conflict that had engendered the symptoms of neurasthenia. Thus the dream was an allegorical representation of the inner state of the patient; yet the patient, though the allegory was constructed by a mental activity within him, could not recollect the process of construction and was not even aware of the significance of the allegory until he had made some search for it.

What was true of this simple dream is true of very many, probably the great majority, of all dreams; namely, they have some significance which is not immediately clear to the dreamer; they reveal some tendency at work subconsciously, because repressed, and repressed because repugnant in some way to the dominant tendencies of the dreamer. Hence the great value of dream-interpretation in throwing light upon the inner life and, especially, upon obscure tendencies that work subconsciously. It is for this reason that most of the psycho-analysts (as also many physicians who repudiate the more speculative theories of the psycho-analysts) find the examination of dreams a most important aid in exploring the mental state of their patients; for dreams reveal, to him who knows how to read them, the nature of the conflicts to which nervous and mental disorders are so largely due, conflicts of which the sufferer knows nothing beyond the pains and disabilities which they engender, vague distresses, chronic headaches, uncontrollable impulses, obsessive thoughts,

losses of memory and of sensory powers, hallucinations and delusions, and general defect of self-control.[1]

Day-dreams

Day-dreams are only less instructive than the dreams of sleep ; for they also express tendencies of the dreamer which, for the most part, remain obscure to him, which in many cases are unacknowledged and unrecognized by him, and which remain unsatisfied and perhaps wholly unexpressed in action. Day-dreams, or fantasies, are expressions of tendencies that fail to attain satisfaction in action. In general they express such tendencies more directly and frankly than do the dreams of sleep ; though, in patients suffering from deep-seated conflict and repression, day-dreams may be even more obscure, more fantastically symbolical, more difficult to interpret, than the dreams of the normal sleeper.

Children, of course, are the great day-dreamers ; and careful study of their day-dreams has shown that, in a great proportion of all instances, the day-dream is compensatory. The child has some strong secret longing, some desire to distinguish himself, some craving to live wild adventures on sea or land, or to do great things for, or against, his companions or relatives ; and either he has never found the courage and the opportunity to act, or his first endeavour has been rudely checked by failure, ridicule or punishment. Then the tendency, unsatisfied but still set towards its goal, finds some partial satisfaction in day-dreams which depict the child as the hero of the situation he most longs to realize, the leader of a band of robbers, the queen of a group of fairies or other imaginary companions, or merely the

[1] If it be asked—Why are dreams in so many cases obscure ? Why do they take the form of obscure allegories ?—the answer seems to be that during sleep the highest functions of the mind, those concerned with abstract objects and symbols, such functions as all verbal reasoning, are at rest (or, if you like, the highest levels of the brain are at rest) and the mind functions on a more primitive plane, the plane of thinking in pictures, the plane proper to young children and primitive persons in general.

winner of some scholastic or athletic prize or of some social distinction.

The day-dreams of children are relatively innocent; for in the main they express tendencies that are thwarted rather than repressed. It is when the tendency is more or less repressed, owing to some sense of its guilty or reprehensible nature, that its fantasies become morbid. In such cases the day-dreams are apt to become more insistent and less controllable, to encroach more, to take more and more the place of action and endeavour in the real world. The patient shrinks more and more from the battle of life; his dream-world becomes more satisfying, more important, more real to him, than the world without; he has crossed the vague uncertain boundary that separates healthy imagination from morbid fantasy. In that most frequent and disastrous of all the mental disorders, namely, *dementia praecox* or *schizophrenia*, this condition becomes confirmed; the patient lives apart in his dream-world, loses all emotional rapport with his fellows, and interprets such impressions as he continues to receive from the world about him in terms of the world within.

In studying the subconscious working of tendencies, we are not confined to spontaneously occurring instances, dreams, symptoms of disorder and the rare instances of genial creation; several methods of experimental study are available.

Automatisms, Motor and Sensory

A considerable proportion of perfectly healthy persons can produce what is known as *automatic writing*. The right hand, holding a pencil, is allowed to rest on a writing-block, while the subject reads a book or converses with a friend. Presently the hand moves, scribbling on the paper. The scribblings from the first may form words or sentences; more commonly, on a first attempt, they are indecipherable. With practice the scribbling assumes more definitely the form of writing; words, sentences or long connected passages are written down. The subject, though he may be more or less clearly aware that his hand is moving, remains ignorant of the words written or of the meaning of the sentences; and,

on reading the script, he has no sense of having been active in the production of it. The script has been produced by a subconscious activity, yet may bear all the marks of expressing a train of thinking or of productive imagination. Whole volumes have been written in this way; and some of them have been published and have found a public. Like dreams, fantasies and disorder symptoms, these automatic scripts commonly express some tendency of the personality that has been denied normal expression, often some religious or artistic aspiration, or some repressed anxiety or dread.

In some cases the automatic expression is vocal rather than written; the subject finds himself uttering words or sentences without understanding their connexion and meaning. In one curious case of this sort (which I have reported elsewhere) [1] the subject, a perfectly normal man, not conscious of any special interest in or aspiration towards poetic production, found himself uttering, as he lay half-waking in the mornings, lines that seemed to be detached lines of verse. On writing down these lines and arranging them as one might sort the pieces of a puzzle, he found that they made verses and short poems of a dashing romantic kind; and their quality was such that he had no difficulty in finding a market for them in respectable magazines.

Crystal Visions

Another form of automatism is the hallucinatory image or train of imagery. Such imagery is a common symptom of disorder; yet it may be experimentally produced in some healthy subjects by aid of a 'crystal'. The subject gazes vacantly at a sphere of glass or crystal, or at any other small brilliant dark surface. Presently, a cloud of mist seems to dim the surface; then the cloud resolves and he sees, like a coloured picture on the screen, some scene that unrolls itself, as it were, before his purely receptive gaze. Such *crystal visions* seem to be closely comparable to the dreams of sleep; yet commonly the subject is sufficiently wide awake to be

[1] In my *Abnormal Psychology*, Case 10, p. 257.

able to describe the scene as it develops and to answer questions about it. Like dream-pictures, the crystal vision, telling perhaps a connected story, is thrust ready-made into the consciousness of the gazer; he has no sense of having produced the story and has had little or no control over its course.

Hypnotism and Hypnotic Suggestion

All forms of automatism or subconscious working of tendencies may best be studied by aid of hypnotic experiment. *Hypnosis* is a dream-like state, closely allied, on the one hand, to normal sleep and, on the other, to somnambulistic trance and to ordinary sleep-walking. It varies in depth from a very light state (sometimes called hypnoidal) in which the subject merely feels restful and perhaps a little drowsy, to one in which he seems to be in a profound sleep, or trance. In a very large proportion of normal persons a light degree of hypnosis can readily be induced; in most of these the state can be deepened, in various degrees, on successive occasions of experiment; and in a few persons a very deep state can be induced at the first attempt. All stages are characterized by an increase of the *suggestibility* which, in some degree, is common to us all even in our most wide-awake moments.

The Nature of Suggestion and Suggestibility

Suggestion (in the technical sense of the word) is the name given to any process by which a subject is induced, by the personal influence of another (or others) to believe some proposition without rational grounds for such belief, or to accept and obey instructions without other motive than the simple impulse to obey; that is to say, the subject is induced to believe or to obey without any such motive as fear of consequences or desire of reward of any kind, and without any rational ground of belief or of obedience such as we commonly have when, voluntarily taking part in some experiment, we accept and carry out instructions to the best of our ability.

It may seem at first sight, that, according to this definition, the word 'suggestion' covers two very different processes, the one a purely intellectual process leading to belief, and the other a process leading to action. But the distinction implied in any such criticism is a false one. *There are no purely intellectual processes in the sense implied.* Every intellectual activity is motivated, even if it be only by the desire to ascertain the truth; and if, as is commonly the case, there enters into the motivation a desire for a conclusion of a particular kind, that motive will inevitably influence our intellectual activity in the way of selection and emphasis of parts of the evidence, and will incline us to a conclusion of the desired kind. The personal influence which is of the essence of suggestion may, then, be described as the induction of a bias in favour of believing and obeying the source from which the suggestion comes. Notice that the bias is a conative factor; it may be a desire, more or less clearly conscious, or a mere impulse or tendency whose nature and working remain very obscure.

Bias towards particular actions and beliefs, induced through such personal influences, plays a great part in our daily living. The forensic art of persuasion subtly combines suggestion with logical argument and emotional appeal; and the more distinguished the orator (the more impressive his voice and bearing and the greater his reputation or prestige), the more strongly does he work upon us suggestively. Notice that the belief or action suggested is not necessarily opposed to reason: suggestion may sometimes successfully oppose evidence and reason, but it works most powerfully where it is subtly blended with valid argument and evidence of the senses.

There are vast regions of human affairs where the knowledge and the logic and the powers of observation of the best of us are very inadequate as guides to belief and action; and in these regions we are inevitably liable to suggestion. We wish to know which brand of cigarettes or of tea is the best, or which offers us most for our money. What difficult questions! Only a body of scientific experts could hope to find

true answers to such questions, answers truly based on rational grounds. No wonder, then, that our streets are lined with pictures of handsome young millionaires smoking various brands of cigarettes, and of elegant ladies preparing to drink this tea or use that soap. The more sumptuous and the more numerous the advertisements of any article, the stronger the suggestive influence; for they give vaguely the impression of a vast and wealthy corporation ransacking the world and sparing no pains or expense in the effort to provide us with the choicest tobacco, tea, or soap.

The personal influence that works suggestively comes not only from individuals: a crowd, a community, a corporation is imposing by reason of mere numbers, of its unmeasured power, its unknown possibilities. Only the experienced speaker, made confident by many successes, can face a large audience without trepidation; and even such a one, though he may quickly establish his ascendance, is not immune to the suggestive influence of the mass: when it applauds, he believes himself a great man; and when it votes in favour of his proposals, his desire to act upon them is confirmed.

Whatever quality of a person (or group of persons) makes him seem to you powerful or, as we significantly say, impressive, whatever lends prestige (whether mere size, an air of confidence, of energy, of competence, a piercing eye, costly apparel, social position, past achievements or great reputation known to you) adds to his power of exerting suggestion upon you. On your side, whatever contributes to render you weaker than the personal source of the suggestion (ignorance of the matter concerning which suggestion is made, youth, inexperience, isolation, physical or mental inability of any kind) favours your susceptibility to suggestion from that source. For all such personal factors contribute to evoke in you an attitude of deference, respect, admiration, humility, towards that other person; and all these are complex conative tendencies of which the tendency to submit and to obey is a main constituent.

If, on the other hand, you feel yourself in every way superior to the other person, if you look down upon him with scorn

or contempt, he will have no suggestive influence upon you; you will have no inclination to follow his lead, to defer to his opinion, to accept his advice, to obey his commands or believe his statements.

All this seems but common sense, acceptable and adequate to the facts. But, as soon as we observe an instance of suggestive influence that goes a little beyond the usual, the average man looks upon it as a strange mystery and demands some strange and mysterious formula, some doctrine of 'an unconscious mind' or of 'The Unconscious'. Consider a simple instance of the kind that serves to connect the suggestions of daily life with the more striking suggestive effects obtained in hypnosis.

An Hypnotic Experiment

A medical man or other person who is reputed to have special knowledge of the human organism (let us call him H), addressing a crowd of laymen, asks one of them (let us call him S) to stand up before the audience. H stands before S and asks him to look him steadily in the eye and, at the same time, to clasp his hands together firmly on his chest. H then, in a tone of confidence, assures S that his hands are firmly locked together (which is true and obvious) and that he cannot separate them. S, to his surprise, finds that he cannot relax and separate his hands. This suggestion will not succeed in every case. Its success is a matter of the degree of 'suggestibility' of the particular subject to the particular operator in the particular circumstances of the moment. Slightest features of the method of approach, of the tone of voice, of the expression of the face of the operator, may make all the difference between success and failure.

When H asserts that the subject cannot relax and separate his hands, he cannot know positively that the assertion is true; the truth of it is contingent upon his own skill in evoking and playing upon the submissive impulse of the subject. But, if the suggestion succeeds, the way is prepared for the success of more difficult suggestions, both in that subject and in the onlookers: for S, unable to relax his

hands, feels that H has a surprising and uncanny power over him; or, more accurately, his attitude towards the operator is rendered more deferential, more submissive, more obedient; and a similar effect, in fainter degree perhaps, is produced in most of the onlookers.

S is then asked to stand against the wall and told that he cannot move away from it. Or he is asked to close his eyes and told that he cannot open them. If these or similar easy suggestions succeed, he may be asked to sit in an arm-chair and told that he feels drowsy, that all his limbs are heavy, that his eyes are fast shut, that he is passing into sleep. After a few minutes of such repose in relaxed comfort, S will probably seem to be asleep; in that he will make no response to any remarks addressed to him by any one other than H; and his arm, if it is lifted from the chair by a bystander, will fall limply back. S, in short, seems shut off from the world of sense-impressions, as in normal sleep; and, if left to himself, he may lie for some little time and then rouse up in a way which seems, both to himself and to onlookers, quite indistinguishable from the process of waking from natural sleep.

But the condition into which S has passed differs greatly from ordinary sleep in one respect; namely, S remains more or less responsive to H; in fact, although he may at first respond only sluggishly, S is utterly obedient to H; he makes every movement suggested to him; his limbs are completely plastic to the touch of H and retain any position given them without sign of inclination to move. Further, S, while in this condition, accepts all statements made to him by H, even absurd or wildly improbable propositions, with child-like uncritical credulity and docility; and acts as though he believed them.

The state into which S has passed is called *hypnosis*, and H is said to have *hypnotized* him. The question before us is: What exactly has happened to S? It is clear that S, while in hypnosis, shows increased suggestibility towards H, whose every word or slightest indication is now law for him. Yet the condition is not one of increased general suggestibility:

for towards other persons he remains indifferent, shows no suggestibility; a roomful of people may shout at him, and, even though they all keep repeating the same assertion or instruction, they seem to have no slightest influence upon him.[1] This peculiar relation of extreme and exclusive docility to H is called *hypnotic rapport*. It is of the essence of the state of hypnosis; therefore the secret of hypnosis lies in

[1] This fact illustrates the falsity of the old-fashioned intellectualist theory of suggestion which asserted that the process consists merely in implanting 'an idea' very 'forcibly' in the mind of the subject, as by shouting it very loudly or repeating it many times, and then leaving 'the idea' thus implanted to work out its natural effects. This theory of suggestion was founded in the old false theory (most explicitly taught by Herbart and later by the French philosopher, A. Fouilleé) that ideas are forces, or exert forces. Such simple hypnotic experimentation as that cited above is very convincing in this respect. For example, suppose I tell my hypnotic subject to clench his fists and to revolve his fists about one another. You, a bystander, then say to him: 'Why do you keep on revolving your fists?' And he replies: 'Because the professor told me to do so.' You say, 'Well! stop them', and forthwith his fists come to rest. Now we repeat the experiment with a slight modification. I set S to revolving his fists again; and I say: 'You cannot stop the motion of your fists; they will keep on revolving until I give the word for them to stop.' Again you intervene as before and say, 'Now, stop them.' The fists continue to revolve. You say: 'You would like to stop that silly movement, wouldn't you?' S replies 'Yes!' You say: 'Well, you can stop them now, try.' On this the movement of the fists becomes slower and jerky for a few seconds, and then continues as before. You say: 'Did you try to stop them?' 'Yes, I tried', says S, 'but I couldn't.' 'Why couldn't you?' 'I don't know, they seem to go on of themselves.' Thus you may implant 'the idea' that the movement is about to cease or that S is able to control the movement, and S understands your words, entertains 'the idea' you implant; but 'the idea' so implanted remains ineffective to control the movement. Now I intervene and say, 'Now stop them,' and immediately the movement ceases. I implant the same 'idea'; and this 'idea' which, when implanted by you is perfectly ineffective, when implanted by me seems all-powerful. Why this difference in the two cases? The answer is that the controlling factor or force is not 'the idea' but the active tendency which is evoked by my words but not by yours, because S is in *rapport* with me but not with you. Further, by a few words to S, I can put him in *rapport* with you; and your words will then convey effective suggestions.

the answer to the question—Why is S so suggestible to H, while so indifferent to others? The true answer is indicated by reflection on the process of induction of hypnosis as described above.

S begins by concentrating his attention on H as a natural compliance with H's request. If his natural docility towards H is sufficient to secure the success of the first suggestion and S finds that he cannot unclasp his hands, his attention is further concentrated on H and his docility towards him is increased. This attitude may be described by the words—Whatever is he going to do to me next? With the success of each further suggestion, this attitude towards H is deepened and confirmed. Now an attitude of this sort is conative; it implies the direction or fixation of some tendency or tendencies. In this case the predominant tendency at work is the submissive tendency, complicated perhaps with a faint stirring of curiosity or of fear, or of both. But why is S indifferent to others, though so extravagantly docile to H? The answer is threefold: first, in proportion as our attention is concentrated on one thing or one person it is withdrawn from other things and persons. Secondly, H has suggested to S general relaxation, drowsiness and sleep; and, in proportion as this suggestion is realized, the mind and brain of S become relatively quiescent, as in normal sleep. Hence, S is asleep, or nearly so, so far as all other things and persons are concerned; while he remains alert towards H, interested in him, concentrated upon him; and, just because all functions of his mind other than those concerned with H are sluggish or quiescent, the suggestions that come from H evoke no critical response; they have the field to themselves and exert undisputed sway. Thirdly, and most importantly, by means of his successful initial suggestions, H has evoked strongly in S the propensity to submit, defer, obey; and this tendency, continuing to operate, keeps S attentive to H, makes effective every instruction or hint coming from H to S.

Normal life presents familiar instances of persistence, even during sleep, of such attitudes of subconscious interest and

attention. The mother who falls asleep beside her ailing child may remain undisturbed by a thunderstorm, but wakes at the slightest sound from the child. The ship's engineer wakens if the sound of the engines becomes in any way unusual. In hypnosis, then, we have one part of the personality active, while all the rest slumbers; and the active part is the submissive tendency concentrated upon the operator, together with whatever abilities may become activated by this tendency under guidance of the operator. In the deeper stages of hypnosis this one system dominates completely. In less deep stages the rest of the personality may manifest some activity. S may even walk about and talk with others, almost as though in a normal condition; but a word from H controls him, arrests or impels any particular movements, or throws him back into deep sleep.

Mental Conflict Experimentally Induced

The lighter stages of hypnosis afford us the opportunity to study experimentally the phenomena of mental conflict, the understanding of which is so important for mental hygiene and therapy. In all conflict the personality is divided against itself; some one tendency or system of tendencies is working against another (as when fear conflicts with curiosity or the protective impulse) or against the whole of the rest of the organized personality (as when a crude impulse of anger, of cupidity, or of sex, is controlled by voluntary effort). In hypnosis such division of the personality into two conflicting parts may readily be induced.

If S is sufficiently responsive to a third person, he may be stirred by him to make an effort to disobey or defy H. Suppose H has told S that his extended right arm is rigid and cannot be bent, and S is stirred by another person to an effort to bend it. We see the flexor muscles of the arm come into strong action; this is the effect of the voluntary effort. But the arm does not bend, because, at the very moment the flexors come into play, the extensor muscles of the arm become more strongly contracted; this is the work of the conflicting part of the personality obedient to H. If S then

be encouraged by the third person to make a greater voluntary effort, we may see a greater effort manifested in greater tension of the flexors and in the spread of strong contractions to the muscles of the shoulder and chest ; but the extensors also contract more strongly and prevent bending of the arm. That is the simplest possible outward manifestation of an internal conflict : the personality is divided against itself ; one conative system, which innervates the flexors, works against another which innervates the extensors. Under the conditions described, the suggestion given by H calls into activity a system which predominates over the rest of the personality.

But the power of H over S is limited ; it is not a magical and absolute power. H can merely evoke in S a certain striving or tendency ; and this tendency is not all-powerful. If circumstances are such as to provoke a stronger tendency, a more powerful motive, than that evoked by H, the latter is overcome. For example, if H tells S that he cannot rise from his chair, S may struggle in vain to do so, all his voluntary muscular efforts being counteracted by the contraction of antagonistic muscles innervated by the opposed tendency. But if, then, the room were set on fire, would S remain sitting to be burnt alive ? Not at all. The fire would provoke in him intense fear with such strong effort to escape as would easily overcome the antagonistic tendency ; and S would run from the room. Or again, if H suggests to S the performance of any simple action, S will perform it with a sort of fanatical insistence, even though it be something utterly ridiculous. But let H suggest some action that is repugnant to the moral sentiments of S ; then S, with some evidence of internal conflict, succeeds in controlling the impulsion towards the act ; and (as I have often witnessed) his revolt against the control of H may go so far that he ' throws off the spell ', ceases to be suggestible to H and comes suddenly out of hypnosis to a normal waking state. Here we have artificially created, on a petty scale, the drama that has been the main theme of poets and dramatists all down the ages, conflict in the soul of man.

Post-Hypnotic Conflict

We have noted a law of striving to the effect that a tendency, once excited, persists until it has reached its end, attained its goal. Hypnotic suggestion enables us to illustrate this law experimentally and, at the same time, to study the subconscious working of tendencies. First, let us notice that a tendency evoked during hypnosis is relatively independent of the sleep-like state; once evoked and set towards a goal, the tendency works towards that goal, equally in the sleeplike and in the waking state. If, for example, H tells S in hypnosis that his hands are inseparably locked together and will relax and separate only when S rises from the chair, and if H then wakens S, avoiding any suggestion to terminate the tendency evoked by this suggestion, S, on waking from the hypnotic sleep, is still unable to relax and release his hands. If, as is commonly the case after deep hypnosis, S cannot recall to consciousness the events of the hypnotic period (including the suggestions made to him), he is surprised and puzzled by his inability to separate his hands. He may make strenuous efforts to separate them; but, at each such effort, the muscles antagonistic to those which his effort innervates come into stronger action and prevent success. (In these circumstances a resolute self-assertive man may persist in his efforts and gradually work his hands apart, in spite of the conflicting tendency that innervates the flexor muscles of his hands.) Then S rises from his chair, and, again to his surprise, his hands, which had seemed immovably locked together, relax and no effort is required to separate them.

The striving evoked by the suggestion is not a merely mechanical after-effect. It is a mental activity guided, like all striving, by more or less intelligent appreciation of the circumstances. Let us illustrate this fact by modifying the experiment. H tells S in hypnosis that his hands are locked and will continue locked until he, H, shall touch his own face for the fifth time; and that, on the fifth touch, S will rise from his chair, take out the handkerchief of a bystander, B, and tie a knot in it. S is then wakened from hypnosis;

he seems perfectly wide awake, except that his hands are locked. S denies all memory of the events of hypnosis; asked if he knows what signal will release his hands and whether any suggestion of further action has been given him, he professes complete ignorance; and the study of many such cases justifies the acceptance of this denial as truthful.[1] H in the course of conversation brings his hand to his face in a natural manner at irregular intervals. S seems to take no notice; but close observation of him will reveal a furtive watching of H by S. On the fifth touch, S separates his hands, rises, approaches the bystander, B, and reaches for his handkerchief. If B makes some protest or resistance, S persists, with a sort of fanatical insistence, until he has seized the handkerchief and tied a knot in it.

If S is then asked why he has done this unusual and rather absurd thing, he will invent a plausible reason or motive; he may say, for example, that he knows B has an engagement for the evening and he has tied the knot in order that B may be reminded of it. This is a typical instance of a process of common occurrence in daily life known technically as *rationalization*: S, not knowing the motive of his action and called upon to explain it, invents a motive or alleges a reason, one which seems to him a satisfactory explanation of his action but which in reality is utterly fictitious.

To *rationalize* is to make a false statement of motive, but it is not to tell a lie; for the statement is made in good faith with no intention to deceive. Only the most honest and self-critical person, well accustomed to ruthless self-examination, can hope to avoid frequent rationalization. It may be added that, in rationalizing, inventing explanations of our actions, most of us are naturally biased in favour of motives that are highly respectable or meritorious; just as, in imputing motives to those we dislike, we incline to imagine disreputable motives.

[1] This incapacity to remember is called *post-hypnotic amnesia*. In many subjects it seems to follow the hypnotic state spontaneously; and in many it may be induced or prevented by suggestion during hypnosis.

This insight into rationalization, this illustration of the obscurity of the motives of many of our actions, is only one of the several lessons we may learn from the simple typical post-hypnotic action described above. We learn also that the tendency evoked by suggestion in hypnosis is not merely an impulse to perform some exactly prescribed action in a mechanical fashion, but is rather a system of mental activity capable of guiding action by the aid of sense-impressions subconsciously appreciated; for the subject S has *subconsciously noted and counted the signals.*

There is abundant evidence that this conclusion is true not only of the post-hypnotic working of suggestion, but also of many other, perhaps all, instances of subconscious impulson; each such impulsion is one aspect of a system of mental activity that expresses itself very partially only in consciousness and, for the most part, only indirectly.

The topic of mental conflict is very important: let us, then, consider another experimental instance. In this case we have a subject, S, who does not exhibit post-hypnotic amnesia; i.e., either by aid of suggestion or spontaneously, he can remember on waking all that has occurred during hypnosis; and S is a philosopher (I am describing one of many such experiments actually made) interested in hypnotism and sceptical of the post-hypnotic power of suggestion. It is agreed that he shall make test of this power. S is then hypnotized and is told that, before he leaves the room, he will go over to a chair in the far corner and sit down upon it. When hypnosis is terminated, S volunteers that he remembers he has been told he will go and sit on that chair, but he is not going to do it. He is told that is for him to decide. It is time for him to go; but he hovers: evidently a conflict is going on in him. He confesses that he feels a strong inclination to sit down in that chair; but, he says, he believes in free will and he does not mean to yield to this absurd impulse. He hovers yet a while, making conversation; and at last he says, 'Do you know, I think perhaps I had better sit on that chair, I shall not feel comfortable till I have done so,' and, suiting his action

to his words, he goes away puzzled but relieved of his conflict.[1]

Consider a similar but slightly different instance. S, knowing what has been suggested in hypnosis, makes a great effort and succeeds in going away without having carried out the suggestion given. Later in the day he returns and says: 'That suggestion of yours keeps worrying me; it seems I can't feel right until I have done it.'

These two instances illustrate a fundamental law of inner conflict, namely, that conflict is distressing; and this is true whether the conflict takes place in fully conscious fashion or is largely subconscious. The distress that accompanies many forms of neurotic disorder, especially those of the type known as neurasthenia, seems to be mainly of this nature.

Consider a still simpler instance. During hypnosis I give to S the suggestion that at noon on the following day he will come into my office. S does not remember the events of the hypnotic period (i.e. he is subject to post-hypnotic amnesia) and he is a shy, diffident person. At noon on the following day I see him through the ground-glass of my office-door hesitating outside it; he goes away, walks to and fro, comes back, enters in an embarrassed manner and says apologetically: 'I thought perhaps you wanted to see me.' He knows nothing (consciously) of the suggestion; but the tendency evoked by it has brought him to the door; there it has entered into conflict with a natural impulse to retreat. It has proved stronger than its opponent and has impelled S to enter; whereupon he rationalizes, invents a plausible excuse for his intrusion.

It may be asked—What would be the consequence if a man should succeed in continuing to resist a post-hypnotic suggestion in spite of its strong impulsion? I cannot answer the question positively: for it is not fair to the subject to leave him in such a state, and in making such experiments I have made it a rule to remove by suggestion the effect of any successfully resisted suggestion. For to leave any such

[1] I ask the reader to note that I do not absurdly regard this or any similar experiment as a refutation of 'free will'.

suggestion working in the subject would be to leave him in a morbid condition, however mild. It seems to me probable that the tendency induced would, in the course of time, become feebler to the point of extinction. But many experiments have shown that a suggestion given during hypnosis may work strongly to determine action after so long an interval as two weeks.

CHAPTER XVII

DISORDER OF MENTAL FUNCTION

MANY disorders of mental life are due to injury or disease of the brain. Others arise through the incapacity of the personality to cope with the problems and difficulties he encounters, his inability to adjust himself to his environment. In disorders of the latter kind the tissues of the body, including the brain and all the nervous system, may be healthy ; but there is some lack of balance, of harmony and co-operation between the parts. The perfectly healthy organism is a functional unity, a system of many functions harmoniously integrated, each in due subordination to the whole system. In the disorders of this second class, commonly called *functional disorders,* there is some excess of one function, or some failure of integration, some falling away of one or more functions out of the control of the whole system, or some conflict of one part against the rest of the system.

Functional disorders are peculiarly instructive ; for, in a sense, they analyse for us the vastly complex whole of personality, revealing in relative isolation and purity various functions which, in the healthy person, remain obscure because controlled and modified by, and intimately synthesized with, the whole system of functions.

Separation of part from the whole may be complete ; as in the common case of a limb that exhibits complete functional anaesthesia and paralysis. If you prick or pinch or burn the skin of that limb, the patient truthfully asserts he feels nothing ; if his eyes are closed and you move that limb, he cannot tell what its position is and does not know that it has been moved ; and he is unable to move it voluntarily,

to innervate any of its muscles, or to prevent their contraction. Yet in such a case all the muscles and all the nerves and nerve-centres immediately concerned in movements of the limb are intact. In some such cases the limb will at times move spontaneously; and sometimes these *automatic movements* take the form of a gesture which seems to express some emotion or some intention of some detached fragment of the personality.

In other cases the separation is less complete. A limb, for example, without being paralysed or anaesthetic, may make sudden movements which the patient, by making a strong effort, can partially control, but which occur without his volition and *in spite of* his intention to remain still. Such are the tics and stereotyped movements which may occur as the sole obvious symptoms, or as events incidental to some more complex disorder. In either case the movements seem to express some fragment of the personality. In cases of both types, those of completely detached and those of only partially detached functions, recovery may be sudden and complete; and such recovery is the most conclusive evidence of the functional nature of the trouble.

Cases of functional disorder furnish the great majority of those sudden cures which catch the popular imagination; they seem miraculous, especially if religious emotion and belief play a leading part in effecting the cure.

A useful and valid analogy helps us to understand these disorders. We may liken the whole person to an army on the march. Normally all parts, all units of various functions, are in touch with one another, and the functions of all parts are so controlled as to contribute to the efficiency of the whole army.

The destruction or utter disorganization of one or of several units of the army would correspond to an organic disability of the personality. But if some unit (or group of units) of the army should lose touch with the main body, while remaining itself intact, that would correspond to one form of functional disorder, the type of disorder called *dissociation* and illustrated by the completely paralysed and anaesthetic

limb. The detached unit is in itself healthy and competent ; but it no longer co-operates with the whole, no longer is subordinated to it, and contributes nothing to its life and efficiency ; yet it is capable of manœuvring intelligently and of looking after itself.[1] If, on the other hand, some unit or group of units of the army, without losing touch with the main body, becomes insubordinate, if it no longer co-operates wholeheartedly, if it acts ' on its own ', if it adopts its own objective and its own method of achieving it, regardless of the strategy of the whole ; or if it merely opposes the plans of the whole, and keeps urging upon the whole its own plan conceived from its own point of view, then we have an illustration of functional disorder of a second great type, the type characterized by continuing conflict within the system of the personality.

The grand word *integrity* most adequately describes the perfectly healthy personality, the man who is adequately poised, balanced, integrated, the man in whom discipline and self-discipline have built up, from a native basis of disposition, temperament and temper, a harmoniously and strongly organized character. All functional disorders, whether of the dissociative or the repressive type, imply failure to maintain integrity.

The attainment of *integrity* or complete integration is a gradual process extending through all the years of childhood and youth ; to promote this process and to guide it along favourable channels is the chief function of all educational agencies. Men make very different degrees of progress along this path towards complete integrity. Some, achieving it in high degree, become resistant to all the stresses of a stormy life ; beneath all the bludgeonings of fate their heads are ' bloody but unbowed ', they remain ' masters of their fate ', ' captains of their souls '. Others progress but a little way along this path towards complete integration ; such men may, under fortunate circumstances, live happily and usefully ; but they have little power of resistance and, when difficulties

[1] The functionally anaesthetic arm avoids the bruises, burns and scratches which an organically anaesthetic arm almost inevitably suffers.

arise, they manifest their lack of integrity and become disintegrated in various ways and degrees.

The Two great Types of Functional Disorders

The great majority of symptoms of functional disorder fall into the two classes illustrated by our analogy: on the one hand, the class in which some part of the system has 'lost touch' with the rest; on the other hand, the class in which some part, without having 'lost touch', works against the rest of the system rather than in harmony with, and due subordination to, the whole. The former class we call symptoms of *dissociation*. For those of the second class we have no equally good name; they may be called broadly *conflict symptoms*; or, because the activities of the rebellious part are generally held in check or repressed by the rest of the personality, they may also be called *repression symptoms*.

Some cases of disorder exhibit only dissociative symptoms, or perhaps a single such symptom (as, for example, the completely paralysed limb of a patient who seems in all other respects healthy or normal). Other cases are characterized by repression symptoms (or a single such symptom) such as a tic or other involuntary recurrent movement or abnormality of movement, or a recurrent bad dream, without dissociative symptoms. But we cannot divide all cases into two corresponding clearly defined classes; for very many victims of functional disorder exhibit symptoms of both kinds. Nevertheless, among the types of disorder generally recognized and distinguished by special names, some are characterized by predominance of dissociative symptoms; and in others symptoms of continuing conflict and repression are the essential features, while dissociation plays a minor role, if any.

Among names used to distinguish the predominantly dissociative disorders the more important are *hysteria*, *exaltation* or *mania*, *depression* or *melancholia*, and *manic-depressive insanity* (the disorder characterized by alternation of exaltation and depression); and chief among the disorders in which conflict and repression predominate are *neurasthenia*,

psychasthenia, obsessions and *compulsions, paranoia* or *delusional insanity,* and *dementia praecox* or *schizophrenia.*

Of less importance are certain forms of functional disorder of which the essence is simple excess or defect of some function ; and some others of which the essence is the direction of the energy of some propensity into unusual or abnormal channels of expression—cases which may be loosely classed together as *perversions.*

Some authorities deprecate the use of all such names, on the ground that they are apt to mislead us into assuming that there corresponds to each such name a disease-entity (comparable to diseases due to infection by some pathogenic organism or microbe) which has its specific symptoms, causes, and inevitable course, and which is entirely distinct and clearly distinguishable from every other named disorder ; whereas in reality there are no such entities, but rather an infinite variety of combinations of symptoms due to conflict, repression, dissociation, or excess or defect or perversion of particular functions. And there is much force in this objection : yet the names are so well established in medical usage that it is necessary to be acquainted with them ; and they are very useful for the purpose of indicating roughly and briefly the general type to which many a case conforms.

Mental Conflict

In very many cases it is possible to find evidence that the onset of definite symptoms of disorder was preceded by a period of conflict, a period during which the personality has confronted some difficulty, some problem, some situation calling for a decisive resolution, without finding himself able to effect the required resolution : unable to take action or to make a decision, he has continued to be impelled towards incompatible goals, has continued, however obscurely, to feel the attraction of possibilities that are mutually exclusive. Love or honour, ambition or duty, God or Mammon, success or self-respect, family or country ; such pairs of terms suggest some of the great legitimate *interests* which, in many instances, owing to an unfortunate conjunction of circumstances, can

be harmonized only with difficulty, if at all. And, on a lower plane, lust, fear, cupidity, greed, malice, vengeance, and vanity imply crude impulses that may maintain a not unequal conflict with a man's higher tendencies.

A period of such conflict, preparatory to the onset of more definite symptoms of disorder, is, perhaps, the invariable rule. In some cases dissociative symptoms appear suddenly, out of a clear sky as it were, on the occasion of some emotional shock ; but it is not improbable that, even in these cases, the critical moment was preceded by a period of obscure conflict that has set up a state of strain, and that, in the absence of such preceding strain, no disorder would have persisted after the brief immediate effects of the shock had passed away ; that is to say, in the absence of such predisposing strain, the personality would have known how to readjust itself, to regain its balance, to re-establish its integrity and equilibrium.

The work of conflict in preparing the way for the onset of more definite symptoms is most clearly illustrated by the process of *incubation* (instances of which were very frequent among soldiers during the Great War). The patient has suffered some severe shock which undoubtedly has played a major role in bringing about his neurotic trouble (e.g. he has been buried by shell-explosion on the field of battle). But no definite mental symptoms have followed immediately on the shock. In order that he may recover from physical injury, such as wounds, bruises, or broken bones, he has been taken to hospital and there confined to bed. After a few weeks, when his physical injuries are wholly healed, it is found that he has developed functional symptoms ; perhaps he has lost all power to move his injured limb (now physically restored) or complains of some strange defect of vision, or of some persistent pain, or of some form of involuntary movement, or of uncontrollable impulse to absurd or reprehensible action. There is good reason to believe that, if we could observe all the mental workings of the patient during the period of incubation, both the clearly conscious and the more obscure and hidden workings, we should find among them

some conflict of tendencies, some question barely formulated, some problem not honestly faced and, therefore, not solved by a resolute decision, by a voluntary conscious choice between the possibilities obscurely envisaged.

A stage of preparatory conflict may be suspected in all cases of neurotic disorder ; yet symptoms of the dissociative type are apt to appear suddenly on the occasion of some emotional shock ; while repressive symptoms take form gradually, perhaps becoming more marked and more complex throughout a period of weeks, months, or years.

CHAPTER XVIII

AMNESIA AND OTHER DISSOCIATIVE SYMPTOMS

ONE of the commonest forms of dissociative symptom is simple functional *amnesia*. The patient, after some shock, slight or severe, finds himself unable to recall some tract of his past life; so far as voluntary recall is concerned a section of his past is blotted out, a section which may have been of a few seconds' duration only or may extend through many years. Most commonly such a forgotten section is one immediately preceding the moment of shock; a case of this kind is called one of retro-active amnesia. In the more extreme of such cases, the forgotten section includes the whole of the patient's life preceding the moment of dissociating shock. He may retain all his general comprehension of things and his powers of adjustment; his speech and understanding of spoken and written language are not impaired; his character remains substantially unchanged: but he is unable to recollect any particular fact or circumstance of his past life; his name, his occupation, his home, his wife and children are all forgotten.

In rarer and more obscure cases the loss is more extreme; the patient forgets not only all particular facts and experiences, but seems to have lost also all general knowledge and all acquired powers of adjustment, all acquired abilities; he seems like an infant opening its eyes for the first time on the world, but an infant with an adult body.[1]

In such cases the organized structure that underlies and is implied by all recollection is not destroyed or even impaired; it is merely rendered inaccessible to the conscious personality;

[1] Detailed accounts of cases illustrating all the types of disorder here discussed may be found in my *Abnormal Psychology*.

in terms of our analogy, it is somehow thrown out of touch with the main body of the organization. This fact is revealed most clearly when, as often happens, spontaneously or upon the evocation of some strong motive for recollection, the disability passes away as suddenly as it came, and the patient finds himself once more 'in possession of' all his store of memories.

Other evidence that the lost memories are intact and merely 'out of touch' is afforded by many cases in which they find independent or detached expression. Such expression is most apt to occur in those cases in which memory is lost for some connected train of incidents in which the patient's emotional life is deeply implicated: for example, a young girl nurses her mother through a painful sickness until death occurs under very distressing circumstances. The girl swoons and on coming to herself has lost all recollection of the sickness and death of her mother; she is cheerful and unconcerned. After a time she undergoes a sudden change; with expressions of intense distress and grief, she seems to live again, to re-enact, the scene of her mother's final hour and, absorbed in her dream, is indifferent to all about her. The lost memories, with all their appropriate emotions, are dominating the scene; they fill the patient's consciousness to the virtual exclusion of all irrelevant thoughts and impressions. After a short time this phase passes, giving place once more to the phase of personality that is normal but for the amnesia for the distressing incidents. These two phases then alternate indefinitely.[1]

Such a case stands midway in a scale of cases of such dissociative phenomena, a scale which ranges from the very simple to the most profound and the most complex divisions of personality. At the one end of the scale are cases in which some one function, or relatively simple system of functions, is 'out of touch' with, or dissociated from, the main system. At the other end are cases in which the total personality seems to be split into two systems (or even more) nearly

[1] This case of Irene is one of the many classical cases described by Professor Pierre Janet.

equal in extent of abilities and tendencies, but dissimilar in respect of the abilities and tendencies displayed by them.

In the cases of the simpler type the prominent feature or symptom is the loss of some special ability or group of abilities, the ability to remember some incident or some tract of experience (as in the simple amnesia cases); the ability to command, control, or make use of, some function or system of functions, such as the motor or perceptive function of a limb, or the motor speech-functions, or the perceptive functions of the eye or ear.[1] In such cases it may be difficult to point to any affective root of the trouble; yet we are justified in suspecting such a root in every case: for, in the cases of deeper division or disintegration of personality, an affective basis seems to be clearly indicated; that is to say, the division is the consequence of an opposition and conflict of tendencies.

In the profoundest cases of dissociation the primary tendencies themselves seem to be sorted out into two groups, each the affective basis of one of the two systems formed by division of the whole personality. In less extreme cases it is the acquired or secondary tendencies (the sentiments) that have become grouped in two or more separate systems. The case of the young girl (Irene), briefly described above, affords an excellent illustration. She was affectionately devoted to her mother; this strong sentiment sustained her activities throughout the long and arduous task of nursing, enabling her to overcome her natural repugnance to some of its features and to keep in check her longing for a life of social activity natural to a young girl. But, during the period of nursing, there must have been continual conflict and stress between these two sides of Irene's personality. Though permitted little or no expression, her natural impulses to social activity and self-expression must have worked within her, however obscurely; perhaps at times taking the form of conscious desires for companionship, for adventure,

[1] E.g. in one such patient, who in her normal condition was familiar with a foreign language, the whole system of abilities which constitutes such familiarity remained at the command of one of the two personalities and was inaccessible to the other.

for knowledge, for self-development. But the needs of her sick mother were so insistent that the activities sustained by her sentiment of filial love were constantly evoked; the tendencies of this sentiment dominated all her life during this period of stress; with consequently increasing strain and opposition between the two systems. Then came the moment of emotional shock, sufficiently severe to produce a swoon. During this brief period of loss of self-control, dissociation takes place; a cleavage occurs along the plane of stress; the two sides of the personality, long in conflict and seldom in co-operation, part company, and thereafter function independently, each dominating the organism in turn to the exclusion of the other. The complex sentiment of filial devotion carries with it all the abilities developed in its service, especially all abilities concerned in recollection of the mother and in all activities connected with her. When this part of the personality is in abeyance, Irene is as though she had never known her mother. When this same part is active and dominant, she is as though this one interest (this one sentiment and all the knowledge and skill developed in its service) alone existed in her; thinking, feeling and acting are wholly concerned with this one theme, and she lives again in a waking dream the incidents of her too exclusive task.

After the onset of dissociation, Irene lives for the most part tranquilly, untroubled by the painful memories of her mother, unmoved by sorrow and regret. Merciful Nature seems to have found a way to end or, at least, to alleviate her suffering; her sorrow (a function of her filial sentiment) with all its painful memories, is detached from her, save in the brief periods when it wells up, dominates her and expresses itself without restraint. She has found a relief from conflict and all its distresses; but at the cost of a loss of the integrity of her personality.

Dissociation as an Escape from Conflict

Such relief from the distress of conflict is a common result of dissociation. The indifference of the patient to some

severe disability astonishes the observer. In some cases the patient gives the impression that she hugs her symptoms to her bosom as valued possessions; she seems to resist and resent all efforts to deprive her of them. Can we assume that in some sense such relief is actually sought? Some authorities say: Yes, the relief is a gain brought by the neurosis and the patient has desired such relief; and, when it has come, she treasures it and is reluctant to regain her integrity. So experienced and wise a psychiatrist as Professor Eugene Bleuler writes: 'In the ordinary neuroses one always finds on close inspection an advantage from the disease.' And many others speak of 'the flight into neurosis', regarding the neurotic trouble as a refuge from responsibility, a form of self-indulgence, a haven positively sought by the personality for whom life's problems have proved too difficult. Is this literally true of any, of most, or of all cases? A very difficult and subtle question.

Before attempting to answer this question let us look at other cases of dissociation, cases in which a positive answer would seem more plausible than in the case of Irene. There is a class of cases known as *fugues* or *flights*. The patient is found at a distance from his home engaged in some mode of life very different from his usual routine; he may be engaged in some regular occupation or he may seem to be aimlessly wandering. In either case he cannot give any intelligible account of himself and his present doings; and he remembers nothing of his former life, though he seems to remember in normal fashion the events of his new life. Such a case commonly comes into the care of the police; but, if left to himself, sooner or later he may 'come to himself', perhaps on occasion of hearing the name of his native place, on meeting an old friend, or on hearing news of his home: suddenly he remembers his former life, while the memory of his period of *fugue* drops away and cannot be recalled. He may then return to his home and duties; and perhaps, after a long or short interval, the *fugue* is repeated along similar lines.

In many such cases it is possible to discover the *motive* of the fugue, its affective basis. Perhaps it is a boy who, con-

fined by circumstance and parental supervision to some dull round of duties, has long indulged in day-dreams of exciting adventures on *the road*, or on the high seas, or as a member of some pirate gang. Or it is a soldier, who, during long months, has manfully ' carried on ' in spite of the perpetual danger and horrors and discomforts of the battle-front, obsessed at moments of leisure by desireful thoughts of the safety and comfort of civil life, secret thoughts and desires which he feels to be in some sense shameful and inadmissible.[1]

In such cases the secret desires, together with the fantasies generated by them, have formed a system having but little relation to the rest of the personality; there comes some moment of confusion, a dream, an emotional shock or excitement that throws the normal personality off its balance; at that moment dissociation suddenly takes place, the two systems of tendencies lose touch with one another, and the repressed system dominates and expresses itself in the *fugue*.[2]

In such cases the disorder is produced by the desires incompatible with the normal course of life. But we cannot properly say that the patient desired or sought the neurosis as an escape from his regular mode of life.

However, another feature of many such cases gives more countenance to the view implied in the phrase ' flight into neurosis '. Consider the soldier whose *fugue* has led him far from the battle-field and who finds himself in the comfort and safety of a hospital. The patient has two good grounds for desiring to retain his symptoms, for reluctance to part with them. First, the battle-field memories which he has lost are in themselves painful, distressing, horrible; secondly, so long as his amnesia continues he is an invalid, unfit for duty, excused from all obligation to return to the field of duty; and he is excused also in his own eyes and in those

[1] The Great War produced a multitude of such cases among the soldiers, many of whom were, it is only too probable, shot as deserters. Scores of them came under my care.

[2] It is significant that in many cases the change from one phase of personality to the other occurs during sleep; the patient falls asleep in one phase, and wakens in the other; significant because sleep is a state of general relative dissociation of the brain.

of his comrades, relatives, and friends. No wonder, then, that many such a patient manifests, not only aversion, but a positive repugnance or active resistance to all efforts to restore his lost memories!

Such resistance is sometimes very clearly shown when attempts are made to recover the lost memories by the aid of hypnotic suggestion. As we have seen, the conative force evocable by suggestion in hypnosis is capable of greatly reinforcing voluntary efforts to remember; it can be used with great effect as a help to exploration of the patient's past, and will often serve to restore dissociated functions in mild and simple cases. But where there is strong resistance to recollecting some past incident (by reason of its repugnant nature or in the form of a desire to retain the symptoms as a protective screen) hypnotic suggestion may wholly fail of effect, even though (as is usual in the dissociative cases) the patient passes readily into deep hypnosis. The resistance may be manifested, not only as an absolute block in the memory-train, but also in more positive ways, as by tears and groans, or by a sudden throwing off of the spell of the hypnotist if he persists in urging the recovery of the lost functions.

Even in such cases, though desire to retain the symptoms is clearly manifested, it is not clear that we can fairly assert that the symptoms were in any sense desired before they appeared. For in many cases of the type we have been discussing, the disability appears suddenly as a completed symptom, one which the patient can hardly have foreseen and, therefore, can hardly have desired.

But there is another class of cases, common in civil life, in which the symptoms appear gradually and as prolongations or modifications of symptoms of organic origin. The clearest instances are those in which some disability caused by an accident becomes complicated by some functional disability in a patient who expects and demands legal compensation from his employers or from a railway or street-car company. In such cases, especially if the functional disability is a mere persistence or modification of some disability that was caused

by organic injury in the accident, we may reasonably suspect that a positive desire for the continuance of the disability is an important factor in generating and maintaining the functional symptom. The man whose arm has been injured finds himself unable to move it when the splints are removed and no organic defect remains; perhaps it is in rigid contracture. In such a case we may suppose that the patient, in brooding on his future prospects, pictures his arm as rigid and useless with a certain complacency, or anticipates such a state with an obscure and vague desire that it may be realized. In such a case the symptom may fairly be said to be brought about and maintained by the desire of the patient, even though he may also consciously and genuinely desire to recover complete health. The desire that produces and manifests the disability is likely to be unacknowledged, more or less disguised and hidden from the patient's own introspection, in other words, *repressed*; for it is incompatible with what he expects of himself, with his self-respect. And, just by reason of this repression, the symptom is the more resistant to every therapeutic procedure. In order to control it, to get the better of its disordering affect, it is necessary that the patient shall clearly recognize this obscure desire, admit it to himself, face it frankly in clear consciousness, and, in the light of this understanding, effect a new and better adjustment to his problem.

Such desire for compensation for injury is the simplest and commonest type of disability-producing desire. But other less transparent types are not uncommon. Suppose a young woman finds that she does not receive all the consideration and sympathetic attention she craves, either from her husband, her parents, her family or her circle of friends. She can hardly have failed to observe that sickness commonly elicits an access of such attention and consideration, that relatives hasten to satisfy the invalid's wishes, that, in fact, an invalid becomes the centre of attention of a subservient circle. Here, then, is a motive for 'flight into sickness'; and many hysterical symptoms are thus motivated.

The motives that may work in such obscure fashion to

bring on, or maintain, disabilities are many and various; but we may class most of them under four heads: (1) the desire of attention, of sympathy, the desire to compel subservience; (2) the desire for compensation, monetary or other; (3) the desire for protection, for defence and excuse against censure, blame, against hard judgements and hard demands; (4) the desire for revenge, for getting even with others who, we feel, 'have not treated us right', have hurt our self-esteem, have judged us harshly. This last is, I think, very common and may be expressed in the formula 'There! You see how unjust you were; now you have made me sick, and you will have to take the consequences'.

The motives that produce neurotic symptoms are not, for the most part, desires in the full sense of the word; their goals are not as a rule explicitly formulated in words; the prospective patient does not say to himself: 'Now I will have a paralysed limb, or an obstinate vomiting, and compel them to be kind and attentive to my every whim.' He does not even say to himself: 'If only I were sick they would have to pay me more attention!' But probably he does indulge fleeting fantasies of himself as a sick man, a centre of kindly concern; and, in accordance with his observation of various forms of sickness and the suggestions afforded by pains and disabilities incidental to passing organic disturbances of health, his fantasy depicts this or that form of disability; his attention (determined by motives of which he is not clearly aware) seizes upon them and accentuates them, until he believes himself a sick man, and thus becomes one in reality.

CHAPTER XIX

FUNCTIONAL DISORDER OF THE REPRESSIVE TYPE

IN the foregoing chapter we have briefly considered the nature and genesis of dissociative symptoms. We have seen that internal conflict commonly, perhaps in every case, prepares the way for the onset of such symptoms. We have seen that the appearance of the disability brings, in some sense, a termination of the conflict, solves in some degree, however unsatisfactorily, the problem that has engendered the conflict. Such termination of conflict by dissociation is apt to occur in persons of markedly extrovert temperament. In others, especially in well-marked introverts, dissociation does not readily take place; in these persons conflict, once engendered, continues either until the circumstances that gave rise to it are favourably altered, or until the patient learns to adapt himself to them by some resolute action or decision, achieved by means of some new and wiser evaluation of the factors involved.

Internal conflict is always exhausting; for it involves a wasteful consumption of the vital energies of the organism. All decision in favour of one goal as against some attractive but incompatible goal involves something of the nature of conflict and is fatiguing. When we are definitely set towards some goal, we have only to choose between various possible routes, between alternative means to be adopted for the attainment of the goal. Such choice is almost purely an intellectual operation; and, though it may be a long and difficult process, it is much less fatiguing than the process of choosing between alternative and incompatible goals both of which appeal to us strongly. In the latter case both

goals attract us; that is to say, the contemplation of each one stirs in us an impulse towards its attainment, an impulse which, as we continue to contemplate the possible goal, becomes an explicit desire. The two impulses, the two desires, are then in conflict; when either is stirred to incipient action, the other is apt to come into play and to check action. Before effective action can be taken a definite decision must be made, involving the repudiation of one of the two alternative goals.

Consider first a trivial case: a poor girl's only coin will buy a ticket for a 'movie' which she strongly desires to see; but, if she buys the ticket, she will have to go without supper, and she is already hungry. She stands irresolute between the adjoining doors of the theatre and the café, impelled towards the one by her desire to see the picture-story, towards the other by her hunger, her desire for a meal. That is a brute conflict of impulses. It may be resolved by the toss of a coin, following a decision to abide by the result of the toss. Or it may be resolved by some reflection that brings into play an additional motive on one side or the other; e.g. she may reflect that, if she goes without supper, she will not be fit for the morrow's work by means of which she supports her sick mother. Even so trivial a conflict is disagreeable or distressing; for both impulses are checked and thwarted so long as the conflict endures; and all thwarting of impulse or desire is distressing.

Such a situation as this is necessarily of brief duration; the mere passage of time removes both alternatives. But in many cases the desired alternatives remain open indefinitely or are repeatedly presented; and, even though decision be made on successive recurrences of the situation, the conflict is renewed on each occasion.

More serious, more conductive to disorder, is the situation of him who, confronting two strongly desired and incompatible alternatives, allows himself to be led by circumstances into following one line without having thought out the problem and without having made a well-considered decision. For example, a youth, conscious of good abilities, strongly desires to go into business and acquire wealth. At the same

time he has intellectual ambition, desires to distinguish himself in science and to enter college with that goal in view. He is a little ashamed of his strong desire for wealth and luxury; he does not like to admit its strength even to himself; the shame is the mark in consciousness of a third impulse which, working obscurely, *represses* the desire for wealth. He enters college. But now, instead of working happily towards the goal of his intellectual ambition, he finds himself unable to concentrate on his studies; he suffers from headache and insomnia. He seeks advice; and questioning reveals that he has many dreams, some of which, on analysis, clearly show the obscure working of the repressed desire for the alternative goal and line of effort.[1] Such is a mild case of neurasthenia. Its essence seems to be a lack of disposable energy, or an inability effectively to concentrate energy on the daily task, together with general symptoms of fatigue or undue liability to fatigue. The repressed tendency continues to work within the patient; and the repression is maintained at the cost of a certain amount of energy that should go into his work. The condition is distressing, not only because of the checking of the repressed tendency, but also because the patient finds himself inefficient, cannot make satisfying progress along the line which he has chosen.

The desire for wealth has generated in our patient's mind various schemes by which it may be attained; the memory of these is repressed together with the desire; and these, together with their affective basis, constitute a *complex*. The complex, working obscurely, may engender not only dreams, but also waking fantasies that may run through his mind, or occupy the background of consciousness, while he sits attempting to concentrate on a book or a lecture, fantasies of successful commercial operations or fantasies of wealth and luxury.

Further, the complex is apt to distort his judgement. He may express unduly harsh judgements or otherwise display an excessive animosity against a friend who has taken the line now closed to him, or against successful business-men in

[1] Cf. a case of this type in my *Outline of Abnormal Psychology*, p. 153.

general ; he is then in danger of becoming a rabid socialist or communist. When he is challenged to justify the violence of his scorn or hatred for such persons, he seeks to do so by calling them cruel oppressors of the poor, robbers or sharks, and argues with much show of reason that capitalism is the root of all the evils of our civilization. This is the process known as *rationalization*, the alleging of reasons for a conclusion or a line of conduct the motives for which, being unacknowledged, unacceptable and perhaps disreputable, are repressed and, therefore, obscure to the subject.

Thus the repressed impulses of a complex may produce, not only general inefficiency, but also actual disorder of mental process and of conduct. Let us briefly consider some of the graver types of disorder thus engendered.

Graver Results of Repression

Suppose a man who has committed some grave offence, say incest or forgery (or perhaps has merely indulged in fantasies of such actions). He is ashamed of his actions and fears the consequences of discovery of them by others. He feels guilty, and, without frankly acknowledging his guilt, resolves to avoid such action in the future. But he continues to harbour guilty desires of the same nature, repressing them together with his memories of the guilty actions. His obscure feeling of unworthiness, of guilt, leads him to feel that the police have an eye on him, and that his friends are spying on him or working against him. He is unduly sensitive, and misinterprets all their actions in terms of his dread and suspicion. He sees in most harmless actions evidence of conspiracies against him. He ' rationalizes ', interpreting many harmless incidents so as to bring them into line with his system of explanation in terms of suspicion. Thus he develops a *delusion of persecution*, a form of the very intractable disorder known as *paranoia*.

In many such cases, rationalization goes farther. If a man is the victim of a widespread conspiracy of persecution, he must be a very remarkable person : some explanation is required by any rational mind ; and the paranoiac is rational.

As with most other reasoners who reach false conclusions, including the greatest philosophers, it is not his reasoning processes, but rather his premises, that are at fault; and his minor premise is his error. Syllogistically formulated his implicit argument would run: All good men who are widely persecuted are great men; I am a good man widely persecuted; therefore I am a great man. And this conclusion satisfies in some degree his obscure impulse to compensate in some manner for his repressed guilty memory of wrong-doing. Thus he develops a *delusion of grandeur*, and perhaps comes to believe that he is a divinely appointed saviour of mankind.[1]

Another form of disorder due to continuing conflict and repression involves even graver and more general departure from normal mental functioning. An introverted youth of weak character (i.e. only partially integrated) fails to meet his difficulties by resolute action. Instead of making decisions and acting upon them, he broods upon his difficulties, his failures and his weaknesses.

Instead of confessing his faults and his defects and frankly examining them with a view to improvement, he represses his knowledge of them and seeks compensation in fantasies of distinguished achievement. Then arises some major difficulty, due perhaps to his own foolish or wrong doing. He shrinks back entirely into his life of fantasies, losing all sympathetic contact with his fellow-men. His fantasies are now more real to him than his contact with the outside world; he is utterly incapable of decision or of resolute action; his inner stirrings no longer find any adequate expression; he is wholly dominated by his inner conflict. In this condition no activity is carried through to its proper goal; every mental movement is checked, harassed, incomplete; and, just as bodily organs atrophy when not used, all his mental functions undergo progressive deterioration.

[1] Cf. my *Outline of Abnormal Psychology*, case 40, p. 339. In this case a delusion of this kind led the patient to kill the members of his family and several other persons.

This is the disorder known (by reason of its frequency in young people) as *dementia praecox* or by the more modern name *schizophrenia*.

Several varieties of this disorder are generally recognized by psychiatrists. When fully established it is very intractable and commonly results in complete *dementia* or mental decay. This intractability and the fact that, when the disorder has obtained in an advanced form for a long period, the brain and other tissues show degenerative changes, these facts have led many psychiatrists to regard schizophrenia as an organic disease that arises mainly from some constitutional defect. Yet, in very many cases, difficulties and social problems too great for the patient's unaided powers of adjustment seem to precipitate the attacks; and there is good ground for the view that timely and wise assistance in the early stages of the disorder may bring the patient back to health, by leading him to overcome his difficulties, to effect a better social adjustment, and, especially, to restore and maintain more sympathetic contacts with his fellow-men.

It would seem likely that we may properly recognize as mild cases of this disorder a large number of persons who never are regarded as victims of mental disease and who never come under the care of the psychiatrist; who are regarded rather as cranky, peculiar, eccentric; people who take up weird cults, practise strange rites, devote themselves to hopeless causes of no great merit, preach strange faiths and promulgate useless panaceas. All such persons have, in common with the victims of schizophrenia, a certain detachment from their social world; they lack sympathetic *rapport* with their fellow-men; they have little effective contact with others. It is true that some of them are would-be leaders of forlorn hopes; but they remain without followers, prophets without disciples, misunderstood and absurd figures; not so much because their beliefs are false or their intellectual processes deranged, as because they lack the power to persuade. If a man is 'sound at heart', if he is in good emotional rapport with his fellows, he may play the mad prophet and lead enthusiastic thousands in pursuit of the most elusive and

absurd ideals. But persons of the class we have in view cannot persuade, because they are twisted at the core, warped in their affective life; motivated by impulses that awaken no sympathetic response, their words and actions leave their fellows cold and critical. However actively they may move about, they remain shut-in personalities, living in a world which they do not share with their fellows; for it is a world coloured and distorted by the medium of their twisted affective life, an unreal world in which realities are inextricably entangled with their fantasies.

The Inferiority Complex

The mildest degree of distortion of this kind is the possession of the so famous *inferiority complex.* This term has been given a wide vogue by the teachings of Dr. Alfred Adler and his many disciples. Both in their writings and in popular parlance the meaning of it remains very vague.

Adler, at one time a disciple of Freud, has revolted against the *pan-sexualism* of Freud's psychology, the dogmatic derivation of all functional disorder and of almost all normal activity from the sex propensity. Looking round for a substitute for the energy of the sex-impulse, the *libido* of Freud, he claims to have found it in the *will-to-power*, the desire to dominate, to be praised, to be admired, to be looked up to, to attain distinction or social eminence. And he regards most functional disorders as results of abortive misdirected efforts inspired by this desire.

I also have taught in my earlier books, as in this one, that the desires of this kind, desires springing from the propensity to self-assertion, play a leading role in human life. The peculiarity of Adler's doctrine is that, in his view, desires and efforts of this sort are evoked only by way of some consciously realized defect or inferiority, whether bodily or mental, and take always the form of striving to compensate for such defects: in so far, we are told, as the compensatory effort is successful, we have the man of achievement, the man of genius, of talent, the leader or discoverer; in so far as the effort is abortive, we have the neurotic, the crank,

the dervish, the mad visionary, or the schizophrenic patient. Thus the *inferiority complex* is made to appear as the root of all good and of all evil in human life, of all success and of all failure.

This doctrine seems to me as one-sided as the pan-sexual doctrine of Freud ; it seems grossly to overemphasize the role of one fundamental propensity, one great spring of energy, one source of successful effort, one factor in some functional disorders. The inferiority complex is, I believe, of frequent occurrence and is, in those personalities in which it takes shape, a powerful disturbing factor : but, I submit, we must define it more exactly and narrowly, and must restrict the role assigned to it. Dr. Beran Wolfe, a foremost disciple of Adler, writes of ' that exaggerated sense of helplessness which we call an inferiority complex ' ; and he tells us that this is engendered when a child ' begins life with a severe handicap ', which ' added to his natural sense of inadequacy ' produces an inferiority complex.

The doctrine needs to be pruned and made more precise. First, it is not true that all desire for distinction, all effort of self-assertion, can be evoked only by way of consciousness of some defect. Some of the most masterful self-assertive and ambitious men develop this type of personality simply by reason of the strength of their self-assertive propensity, combined with general vigour and efficiency of their natural endowment or with some special talent. If the story of Demosthenes be true (that he developed his powers of oratory in an effort to overcome a defect, a stutter) he represents one road to excellence and distinction, but one road only and that a somewhat unusual one. Many men have made immense efforts to overcome a speech defect without becoming great orators. Demosthenes must have possessed a constitution of potential excellence in various respects, or his efforts would have carried him but a little way towards the goal of distinguished achievement. Further, a ' sense of helplessness ', however acute, does not constitute and is not to be identified with an inferiority complex ; for this is a peculiar and distorted form of the sentiment of self-regard.[1] It is

[1] Cf. Chapter XIV, p. 232.

the kind of self-sentiment that develops in a child whose efforts at self-assertion, repeatedly failing to attain success, bring repeated rebuffs and mortifications; which failures and mortifications are not frankly recognized and acknowledged as such, but rather are disguised and repressed. The fox without a tail, refusing to admit the drawbacks of the tailless state and making believe that he is proud of it, or boasting of other peculiarities—that is the type of the creature with an inferiority complex. A person who takes his failures and rebuffs in that way becomes morbidly sensitive in all social relations. Just because he does not frankly recognize his desire for success and distinction and the failures of his efforts prompted by that desire, the desire works within him subconsciously and outside his rational control; and, working without the moderating influence of the organized personality, it works with crude urgency, disturbing and distorting all his social relations. Owing to the uncontrolled working of the desire, such a man becomes morbidly sensitive to the regards of his fellows; the whole system of the perverted self-sentiment, working in this relatively detached fashion, engenders vague suspicions, irritations and resentments, and corresponding fantasies concerned with the self. He becomes unduly self-centred or egotistical; but not with the healthy egotism of the frankly aggressive self-seeker; rather with a morbid, because disguised and repressed, egotism.

We may, perhaps, see, in the facts we are discussing, a very partial justification of Lombroso's famous thesis that genius is closely allied to insanity. For the morbid egotism of the introverted personality which, in a man of ordinary endowments, engenders merely bizarre fantasies and absurd or perhaps violent efforts of uncontrolled self-assertion, may, in another of greater natural gifts, prompt flights of imagination which, however bizarre and remote from reality, nevertheless issue in interesting and beautiful creations, poems, pictures, stories, such as those of William Blake or Edgar Allan Poe.

In disorders of the kind discussed in this chapter (as also in the manic-depressive and other kinds) there is no sharp

line to be drawn between the normal and the abnormal, between health and disease. For legal and medical purposes a line is drawn with a view to the practical handling of cases; the accepted boundary is that degree of departure from the normal which justifies and requires the treatment of the patient as for the time being irresponsible, or no longer capable of directing his conduct and affairs without serious risk of injury to himself or to others. The popular mind misinterprets this practical distinction as meaning that a man is definitely either sane or insane. But just as there are all gradations between the normal state and alcoholic intoxication, so it is with the various forms of mental disorder.

The same practical considerations have led the medical world to divide the mental disorders into two great classes called respectively the psychoses and the neuroses or psychoneuroses, or the mental diseases and the nervous diseases. But this distinction is one of degree rather than of kind. Thus hysteria and neurasthenia are commonly regarded as nervous rather than as mental disorders; but, when the symptoms are so severe as to involve serious risk to the patient or his circle, these disorders are recognized as mental and the patient may require to be treated as irresponsible and placed under control.

CHAPTER XX

COMPULSIONS AND OBSESSIONS

FUNCTIONAL disorders of a third great class are due mainly to repression, but may also involve some dissociation. These are the cases of *compulsive actions, obsessive ideas,* and *perversions*; they figure in the law courts as cases of uncontrollable impulse. The propensity of fear or that of sex plays the chief role in most of these cases.

A simple *phobia* is perhaps the commonest and most transparent of such cases. A child, while committing some forbidden action, is severely frightened; perhaps, while he is stealing fruit in some confined space such as a closet storeroom, he is frightened by a savage dog or an irate elder. He feels guilty and ashamed of the whole incident. The memory of it is repressed and becomes dissociated, so that he cannot recall it; but the affect of the memory, the emotional impulse of fear, is apt to be evoked by any incident or situation which normally would revive the memory. Therefore the patient,whenever he has occasion to enter, or to remain within, a small enclosed place, finds himself liable to a quite irrational or seemingly groundless fear; he strives to escape, and is miserable until he can do so; he has acquired a *claustrophobia.*

It would seem that fear alone will not produce a phobia. If a child is severely frightened on a single occasion by a dog, he may afterwards show undue timidity in the presence of that particular dog and, perhaps, in the presence of any dog. And, of course, if similar incidents recur, his liability to the fear-reaction in presence of dogs is likely to be confirmed. His condition may be described by saying that, through the

incident or the series of similar incidents, his fear propensity has become 'conditioned' to the particular dog, or to all dogs. But it is better described by saying that through the incident (or incidents) there has been formed in the child a rudimentary sentiment of fear for that dog (or for dogs in general). Such a condition differs from a phobia in that the memory of the inducing incident is not repressed and the fear-impulse does not work in the violent and uncontrollable fashion characteristic of the phobia. Some impulse of shame or guilt evoked by the exciting incident seems to be the repressing factor which, by shutting out from consciousness the memory of the incident, may make of such a rudimentary sentiment a *complex*.[1]

Sex Perversion

An innocent child falls into bad company; his elder companion excites his budding sex-nature by bawdy talk and, while the child is in this condition, induces him to steal some small object. The sex-energy is thus led to find an abnormal channel of expression; the child feels that the whole incident (the talk and his consequent excitement) was something to be ashamed of. The memory of the incident is repressed by his shame; and the diversion of the sex-excitement to the abnormal channel is confirmed by continuing repression of all more natural expression. Thereafter, when an opportunity for petty thieving presents itself, he experiences an 'uncontrollable impulse' to steal. That is to say, the occasion excites again his sex-nature, and the energy of the impulse vents itself as before in the abnormal channel, in the act of stealing. The motive of the stealing is not any desire to possess the object, but rather is the perverted sex-impulse. The perverted tendency works in relative detachment from

[1] The word 'complex' is used by some authors to cover, not only repressed and therefore morbid sentiments (as it is here used), but also sentiments of every kind, all instances of units of organization formed by the habitual direction of some propensity upon some object and the consequent 'gearing' of the propensity to the corresponding ability or system of abilities. It seems better to differentiate the two words and thus enrich our terminology.

the rest of the personality and therefore in uncontrollable fashion; for the child utterly fails to understand what is going on within him. He has become a victim of *kleptomania.*

By reason of its great strength and of its very gradual and insidious maturation, and also by reason of the many social inhibitions laid upon its expressions, the sex propensity is peculiarly liable to perversions. The kleptomania described above is but one of many forms of such perversions. Very common are cases of the kind classed together as forms of *fetishism.* In a case of this type the patient is liable to sexual excitement on perception of, or on mere imagination of, some object to which the normal man remains indifferent. Common fetish-objects are articles of clothing of the opposite sex; and it is easy to see why this should be so. The principle of the genesis of such perversions is simple and obvious in the light of what we have learnt of the propensity as a source of energy, energy which is directed to a goal but is liable to re-direction. The patient, generally a young person who has little or no understanding of his sex-nature, is so unfortunate as to have his attention specially drawn to some particular object (e.g. the shoe of the sexually attractive person) during a state of obscure and more or less repressed excitement of his sex propensity. The tendency becomes 'conditioned' to that object; that is to say, the patient has become sexually interested in the object; the perception of the object (or of any similar object) suffices to excite the propensity and direct its energy towards itself. In other words, there is formed a rudimentary and abnormal sentiment of sexual attraction to the object.[1]

[1] In a pronounced case of this sort, say of shoe-fetishism, the patient is likely to make a secret collection of women's shoes. Such a case may afford a striking illustration of the principle of diversion of the energy of a propensity from other objects in consequence of its specialized direction upon some one object (a principle we formulated in discussing the formation of sentiments in Chapter XIII); for the patient whose sex-energy is concentrated upon some fetish-object may have become incapable of being sexually attracted or excited through the more normal channels.

Sex Inversion

More important, because more distressing and disastrous, but very similar in principle is *sexual inversion*, the liability to sex-excitement directed towards persons of the same sex. It is still a disputed question whether some such cases are innate or constitutional inverts ; but it is certain that many young persons suffer *inversion* in very various degrees owing to unfortunate circumstances. Wherever young people are deprived unduly of the society of the opposite sex and are herded with others of their own sex, there is risk of such inversion. For the sex propensity is liable to engender, under the influence of chemical factors (the hormones of the sex glands), a strong appetite, a spontaneous excitement, an outburst of energy that seeks an object and readily attaches itself, in the absence of persons of the opposite sex, to some person of the same sex. In the milder instances of inversion the sex-tendency expresses itself only indirectly and in partially inhibited fashion ; and such cases are likely to be cured by a mere change to a more natural social environment. Other cases are more obstinate ; it is probable that the earlier in life the trouble has begun, the longer it has endured, and the more complete the habitual expression of the inverted tendency, the more difficult will be the cure. It is widely asserted that cases of constitutional inversion are incurable.

Compulsions or Uncontrollable Impulses

The so-called *uncontrollable impulses* are closely allied with the disorders discussed in the foregoing paragraphs. The difference, the greater impulsive power, the greater degree of ' uncontrollability ', seems to be due to the larger share of repression, and perhaps also of dissociation, in their genesis. In many of these cases the energy of the ' uncontrollable impulse ' seems to derive from the sex propensity. But other propensities, especially those of anger and of fear, are liable to engender such impulses. For example, under some particular circumstance, a momentary impulse to violent aggression may be repressed and the memory of the incident

dissociated. Then, when a similar situation recurs, the subject may be liable to a homicidal impulse which is quite irrational: if a murderous act is committed, it may seem to be without adequate motive, may seem utterly groundless.

In one such case, a soldier had been attacked in a lonely place by a prisoner whom he was conducting to the rear. In an outburst of fury he had slain the prisoner; then horror and remorse had repressed the memory of the incident. And, though in this way he was relieved of conscious horror and remorse, he remained liable to a similar outburst of homicidal fury whenever he happened to walk with another man in a lonely place. He was cured of this trouble only when (by the aid of suggestion in hypnosis) he was enabled to overcome the repression and bring back the memory in fully conscious recollection.

Tics and other Involuntary Movements

A *tic* is an involuntary movement which is repeated again and again, perhaps at brief intervals, and which the patient can suppress only with difficulty and by special effort. Twitches of muscles of the face are perhaps the commonest forms of tic movement. Another common form is a twitch of the neck-muscles which causes a lateral jerking of the head.

Closely allied with tics are various forms of involuntary distortions or complications of routine movements. Stammering and stuttering are disorders of this class. Writer's cramp is another. Apart from these affections of speech and writing, such complications most frequently perhaps affect the gait. Very many of the 'shell-shocked' soldiers of the Great War presented such distortions of the movements of walking in a variety of bizarre forms. Some could walk only on their toes; some jumped along as though on springs; some could walk only straddling with their legs widely apart, etc., etc. Such a man, so long as he sat or lay on his back, might seem to have complete normal control of his muscles; but, as soon as he attempted to walk, the bizarre contortions

appeared, and no amount of voluntary effort sufficed to control them.[1]

Such forced movements are of great theoretical interest, because they illustrate so clearly and vividly the truth of the hormic principle and the falsity of the principles of habit and association as commonly laid down in the older books on psychology.[2] According to the old doctrine of habit (still widely accepted) the repetition of any movement inevitably generates a habit ; and a habit once formed is, according to this false doctrine, not merely an open efferent channel of co-ordinated innervation, but also a dynamic factor in behaviour, a spring of energy, an acquired propensity, a governing tendency which determines, not only just how we

[1] In a similar way a stammerer may be able to sing or intone verse smoothly, stammering only in conversation.

[2] My affection for the late William James and my admiration for his great *Principles of Psychology* make me reluctant to criticize his work. Yet it is no disparagement of that great man to recognize that he had not attained to final truth in the infinitely difficult fields in which he laboured so productively. His essay on ' Habit ' remains one of his most admired and influential productions. Yet it was just in his treatment of habit that his own work illustrated most clearly the limited insight and positive error of the psychology of his time. According to the time-honoured doctrine which he so forcibly expounded, habit is all-powerful and habit-formation is purely a matter of repetition, the repeated flow of nervous energy through some one system of channels in the brain. Other great writers on human nature, notably the late Josiah Royce and Professor John Dewey, have carried to an even greater excess the same error of overestimating the role of habit in human life, making the human adult appear to be little more than a bundle of habits. This unfortunate agreement in error of the three most influential American philosophers of their time (together with the plausibility of the commonly accepted physiological interpretation of habit as a matter of channels worn by use in the brain) has fixed the error on the necks of a whole generation of students. It has been one of the great advantages accruing to Professor Freud from his complete detachment from the academic psychology that he has not had to struggle in the toils of this tough network of error. This question of the role of habit is of the first importance: for the acceptance of the traditional doctrine inevitably makes for a mechanistic view of human nature and all the far-reaching implications of that view.

shall make our voluntary movements, but also to what ends they shall be directed. Further, the traditional doctrine asserts that the more frequently the habitual movement is repeated the more set becomes the habit and the greater, the more irresistible, its power to govern our behaviour and determine our desires and our goals.

Now a tic movement conforms to the common type of a habit. And it is a movement which (in many cases) is repeated very often ; it may be repeated every few seconds of waking life during many years. The traditional doctrine of habit would lead us to believe that the frequent repetition of the movement must produce a habit so fixed and so dynamically powerful as to be quite irresistible and curable, if at all, only by some prolonged course of sustained practice which shall induce an equally strong habit of a more acceptable kind. Yet what do we find ?

We find that in many cases (and the implication is that the same is probably true of all such cases) the involuntary movement may be suddenly and completely cured as though by a magic formula. The patient who has stammered or grimaced or limped or repeated some other antic a hundred thousand times (perhaps to his own intense annoyance and in spite of his most resolute efforts and resort to ' cures ' of all sorts) is suddenly freed of his disability, and makes his movements in normal fashion without effort. If the traditional doctrine of habit were true, such a cure would be a miracle, something utterly unintelligible. Yet medical treatment, by physicians who had some little psychological understanding of such cases, produced during the Great War a multitude of such ' miracles '.

Consider a single typical instance.[1] A soldier, a highly intelligent man, presents the curious symptom that he can walk only straddling widely, as though his two feet were on opposite sides of a deep ditch. The symptom has persisted for some months, although the patient is painfully conscious that he presents a ridiculous spectacle. He has no understanding of his condition and of its origin. The

[1] Case 29, p. 301, in my *Abnormal Psychology*.

symptom had first manifested itself when he got up from his hospital bed after being buried and rendered unconscious by shell-explosion.

How attack the problem ? How set about to remove this absurd crippling ' habit ' ? If we are guided by the traditional doctrine of habit, we shall try to break the habit and build up a better habit in its place. And we shall have no success. If we accept the hormic principles, we shall look upon the distortion of gait as due to some hidden repressed tendency interfering with the normal outflow of voluntary innervation. And, thus regarding it, we shall try to discover the nature of that repressed factor, to bring it back to full consciousness, and to place it under the control of the integrated personality, so that it shall no longer work as a detached, independent and, therefore, uncontrollable fragment of the whole organization.

The first step, then, is to inquire after incidents of the past that may be significantly related to the symptom. But, as in so many cases, simple inquiry reveals nothing, just because the relevant incidents are repressed and cannot easily be recollected.

The next step is to look for other symptoms. In this particular case our patient reveals on inquiry two other symptoms not obvious on mere inspection. He complains that he cannot shave himself as he used to do. And he complains of a recurrent dream of a disagreeable kind ; he dreams repeatedly that he runs frantically and, as he runs, a shell glides behind him almost touching him, but never exploding. So far as he can recollect, these two symptoms began to trouble him at about the time he discovered his inability to walk in normal fashion. The presumption is that all three symptoms have a common origin and root. The dream points the way to a repressed memory. He can recollect no incident that seems to be significantly related to his symptoms. But steady probing and encouragement at last bring to consciousness an incident which during all the months of his stay in hospital has never recurred to mind—clearly a repressed memory. He relates how, one day while standing in the doorway of his dug-out, shaving himself,

with his legs wide apart and his back to the open, a shell fell and buried itself between his feet. He had fled frantically from the spot. Clearly the fall of the shell had evoked his fear tendency in full strength. After running at top speed for a mile or more, he had returned to his post of duty and carried on. Here, then, was a repressed emotional memory adequate to the production of the symptoms, a memory repressed by his shame or guilt at having behaved like a fool or a coward and having deserted his post. And that the complex was the ground of the symptoms was made clear by the fact that, after he had fully recollected and related the incident, all three symptoms abruptly ceased to trouble him.

The slight wound that had sent him to hospital was inflicted some weeks after the incident of the shell, during which weeks he had carried on actively. The stay in hospital had given opportunity for the incubation process resulting in repression and the consequent development of the symptoms. In this last respect the case was a little unusual. More commonly symptoms of this sort were manifested by soldiers very soon after being buried alive by shell explosions or some other such terrifying incident. Of course, the whole psychological background was favourable to the development of the complex. And there is no room for doubt about the main points—that the incident determined the form of the symptoms ; that the maintenance of them was the work of the active but repressed emotional memory or fear complex ; and that the peculiar forced movements, the innervations that kept his feet wide apart and inhibited his attempts to shave himself, were not a mere habit of any sort but the work of the fear propensity. Many similar and more dramatic instances of sudden disappearance of such long-continued forced movements on the dragging to light of some repressed memory might be cited in support of this interpretation.

The interpretation is supported also by the fact of the sudden onset of such movement disorders in many cases. A fixed habit is not suddenly acquired ; it is by its very nature and definition the product of many repetitions of the movement.

A third striking feature of some such cases pointing in the same direction is the intermittence of the forced movement. The movement ceases and all seems well. Then occurs some emotional upset or some impairment of the patient's condition, perhaps by physical causes; and the symptom breaks out afresh. In such cases we may suppose that the patient's improved condition enables him to exert a more effective general control of his movements, including those of the parts specially affected; and that the new disturbance brings back in some degree the disintegration of which the forced movements are one symptom.

A fourth evidence is the following. In some obstinate cases of tic movements of a distressing kind, e.g. a violent jerk of the head, the surgeon, ignoring the mental aspect of the case, has divided the offending muscle in order to give the patient relief from the symptom; and forthwith the symptom breaks out in some other part, some other muscle begins to twitch.

Fifthly, the forced movement is in some of these cases clearly symbolic; that is to say, it expresses symbolically the emotional tendency that is repressed and is finding an indirect expression in the symbolic movement.

A sixth piece of evidence may be said to clinch the case. This is the success of a new method of treatment of such movements, a method due chiefly to Professor Knight Dunlap. The method reverses the old-fashioned method of urging the patient to restrain the movement and cultivate assiduously 'a better habit'. It encourages him to practise the forced movement, the stutter, or the limp or what not, to perform and practise it volitionally with full conscious intention. If the forced movement were merely a habit, it would only be further confirmed by voluntary repetition. But if it is due to the energy of some propensity working in some complex, the volitional practice of the movement may well bring that energy under voluntary direction.

I have said above that there is no essential difference of principle and no sharp line to be drawn between *impulsions*

and *obsessions*, between ' uncontrollable impulses ' and what used to be called ' fixed ideas '. In cases of both kinds we have to do with the energy of some propensity expressing itself in some repressed system, some complex. The difference is that in some such complexes the abilities involved are predominantly of the motor or executive type, while in others they are of the more purely cognitive type.

The older psychology, with its intellectualistic bias and its neglect of the conative aspect and factors of all mental life, postulated ' fixed ideas ' ; but why and how ' the idea ' was ' fixed ' it could never explain. It was a notable case of using a name as a cloak for ignorance.

CHAPTER XXI

MENTAL HYGIENE AND TREATMENT

THE fields of mental hygiene and psycho-therapeutics are beyond the scope of this book. But a few words may be said on these topics ; not only because some understanding of them is one of the proper rewards of the study of psychology and of great value both for the conduct of one's life and for the help and guidance of others, but also because the principles involved further illustrate and enforce the teachings of hormic psychology.

The modern man is more beset by the dangers of mental conflict and hence of functional disorder than his forefathers. The present age is the age of liberty ; liberty such as no other age or civilization has known ; liberty for every man to choose his course of life, his calling, his education, his mate, his daily regimen, his religion, his moral code. In former ages a man did not have to ask—Shall I be a vegetarian or an eater of flesh ; an engineer or an artist ; a Methodist, a Catholic, or a free thinker ; a monogamist or a free liver ; a puritan or a libertine ; a Stoic or an Epicurean ; a democrat or an aristocrat ; a socialist or an individualist ; a 'wet' or a 'dry'. In early ages, though laws were fewer and institutions for their enforcement rudimentary, custom was all-pervasive and all-powerful ; and men conformed without question to the traditional code of their society. If, in some moment of passion, a man transgressed that code, he looked upon himself as a sinner and accepted without resentment or complaint the traditional penalties.

In these respects the change from primitive times is immense ; and the change that has taken place in the last fifty years has made a greater difference than all the preceding centuries since man first began to clothe himself.

Whether this immense access of liberty is good or bad; whether it marks a great step of human progress or the beginning of the dissolution of our Western civilization, these are problems not for psychology but for philosophy, a philosophy that takes full account of all that psychology can learn of human nature.

But the psychologist notes that such liberty imposes also the necessity and the responsibility of choosing and that this responsibility is too great for most of us. Modern man, for the most part, seeks some herd in which he may sink his individuality; for, by conformity with the social code, he may avoid the hard tasks of choosing the better and rejecting the worse, may obviate the necessity of forming for himself a scale of values, a philosophy of life. For the most part he succeeds in conforming in all those superficial matters in which conformity is the obvious path of least resistance, made easy by the arts of advertisement and mass-production. But in the deeper things of life he never makes the necessary decisions, never even clearly formulates his problems or becomes aware of the need for a rational choice between alternatives. Rather, he drifts, trusting vaguely to the social currents to carry him through life without grave disaster.

Such superficial conformity, combined with neglect to face all the more serious of the problems thrust upon each one of us by modern liberty, is the essence of Babbittry. Babbitt is not a good man, nor a bad man; he is merely the average sensual man drifting and stumbling among the difficulties of modern life, without authoritative guidance and without such discipline as might enable him to become a mature person, a personality securely integrated, capable of rational decision in life's crises.

Babbitt is essentially naïve; that is to say, he knows little or nothing of the motivation of his actions and judgements. If he is a pious man, he easily persuades himself that all his actions express conventionally approved motives and that the Lord is always on his side: hence his excesses of righteous indignation and his reputation for hypocrisy; hence he is

an easy target for the cynical criticisms of the highbrow and of the amateur psycho-analyst. Hence also his liability to neurotic disorders, the product of obscure conflicts of which he has no understanding and from which, therefore, he is unable to extricate himself.

Self-knowledge, to be achieved only by frank self-examination, is the prime safeguard against neurotic disorder. *Know thyself* is the first maxim of mental hygiene. Self-examination involves introspection. Introspection has a bad name. But there are two kinds of introspection. There is a morbid brooding upon one's inner life, generally accompanied by compensatory fantasies, a futile thrashing over of the past and future without definite aim. And there is intelligently directed examination of the motives of one's actions. It is well to be frank and honest towards all other persons; but that is possible only on condition that one is frank with oneself and honest in one's private self-communings, a fact not sufficiently recognized. Many a man who prides himself on his frankness and honesty constantly deceives himself even more than he deceives others as to the nature of his motives. Not every harsh judgement and action is due to *sadism* (a perverted seeking of sexual satisfaction from infliction of pain) as it is now the fashion to allege; nor is every severe self-criticism and every act of penance or contrition an instance of *masochism* (a perverted seeking of sexual satisfaction in the suffering of pain). But the naïve person, in explaining his motives, is very apt to *rationalize* and to represent them as more praiseworthy than they actually are. While others fall into the opposite error of taking a cynical view of the motives both of themselves and of their fellows, finding perhaps a perverse pleasure in applying the doctrine of psychological hedonism, the now-exploded, though formerly widely accepted, theory that all actions are motivated by the desire of pleasure or the aversion from pain. We need to avoid both hypocrisy and cynicism.

Frank and honest self-criticism is the prime condition of self-knowledge; but self-knowledge is not a sufficient safe-

guard against disorder. As William James has said, many a rotter knows himself, his weaknesses, his liabilities, his vices and his virtues, far better than does the average man. All intellectual development and refinement is unavailing unless accompanied by the growth of well-knit or highly integrated character. Such integration is most readily achieved through the adoption of some aim or goal in life that seems supremely worth while, through the influence of a master-purpose that can subordinate all minor purposes and enlist in its service all the energies of the personality. Such a master-purpose results from the development of a master-sentiment (or system of sentiments). The master-sentiment may be a love (or a hatred) of any object, concrete or abstract; of God (of the good) or of the devil (of evil); of mankind in general, or of some individual; it may be a devotion to family or church or country; or it may be a personal ambition, low or high. Whatever its nature, so long as it is so strong as to supply overmastering motives for all situations, it will serve to form strong character and integrate the personality.

The third need is for a rational scale of values, what is commonly called a philosophy of life. Though such a scale of values can be achieved only by aid of much critical reflection, it is not the product of rational reflection alone, does not consist merely in a system of beliefs as to relative values. A man may assent to the proposition that intellectual effort is of more value than watching football games, yet may habitually postpone the former to the latter; he may agree that great music is of more value than musical comedy, yet, in practice, prefer the latter. The nature of values is a subtle and much-disputed problem. But broadly we may say that any object or form of activity has value for a man (positive or negative) in proportion to the strength of his impulses towards or away from it, his desire or aversion; and broadly we may distinguish four levels of valuation.

At the lowest level, a man's behaviour is the expression of

his untamed native tendencies: if his nature is such that he spontaneously, without reflection, gives himself up to gluttony, or to lustful indulgence, or to works of charity, his values are determined by his native disposition. This is the level of valuation natural to childhood.

At the second level, a man's behaviour is determined mainly by his sentiments for concrete objects, by his love for his family, his church or his country, by his hatred for war, or for the police, or for organized religion.

At the third level, the working of the concrete sentiments is in some degree modified and controlled by sentiments for abstract objects. If he has learnt to love justice or fair play, the impulses of this sentiment will modify the behaviour prompted by his loves, or his hatreds, for concrete things and persons.

At the fourth level, reflection has led him to something like a stable scale of values: he not only has a sentiment for fair play, but he has decided that it is of more value than the satisfaction of his crude impulses, and more to be desired than the gratification of his concrete sentiments of love and hate; that his desire for fair play must not merely check and modify his more spontaneous inclinations, but must rule over them absolutely. Fair play thus becomes an ideal value. His impulse to fair play springs from the abstract sentiment, but owes its dominance in his feeling and conduct to the rational reflection that has given it a first place in his scale of values; has made it a value which he desires to see realized in general, but especially in his own conduct. He has decided, after reflection and, perhaps, after much bitter experience, that health is better than gluttony, that loyalty must take precedence of lust, that 'kind hearts are more than coronets', that justice is more than charity, that if he should gain the whole world but lose his soul (i.e. realize his ambition but in the process lose his self-respect) he will have made a fatal mistake. Such a scale of values can give him guidance in a multitude of problems and can resolve for him many a conflict that might trouble him indefinitely.

Sublimation of Impulses

Sublimation is a process of high importance both for prevention and cure of functional disorders. Its essence is the raising of the plane (intellectual, moral, or aesthetic) upon which our tendencies operate. The psycho-analysts have rightly insisted upon its importance, but have not succeeded in throwing light upon the nature of the process or in prescribing the means by which it may be furthered.

The first condition of sublimation is some degree of restraint of the native impulses: for, in the absence of all restraint, they will inevitably give rise to forms of impulsive behaviour hardly superior to that of animals. Such restraint is not to be confused with repression, which is restraint plus disguise and is the main ground of continued subconscious conflict. Repression involves, not only the waste of the energy of the repressed impulse, but also waste of the energy required for the continued restraint of that impulse. It involves in some degree division of the personality. When, on the other hand, restraint leads to sublimation, the energy of the restrained impulse is guided into useful channels where it co-operates in sustaining activity directed to goals consciously approved by the whole personality. Sublimation is thus a synthetic process, without which integration of the personality can hardly be achieved.

Consider the behaviour of four soldiers, A, B, C, and D, going up to the front for the first time during the late war. All are equally exposed to the threat of bursting shells. A, perhaps owing to a peculiarity of native disposition, experiences no fear and remains utterly reckless. B, whenever a shell falls near him, yields, without restraint, to the impulse of fear and flees and cowers without shame. C represses his fear, endeavours to suppress every expression of fear, maintains that he is unafraid, perhaps boasts of his fearlessness, refusing to acknowledge his fear even to himself. In D the fear-impulse is excited as strongly as in B and C; but he neither yields himself up to it nor represses it; he acknowledges his fear, but realizes that it is the inevitable

reaction of the normal man and that his duty is to carry on and accomplish his task *in spite of his fear*. C becomes the seat of a most wearing conflict between fear and shame. D, on the other hand, becomes expert in taking cover, in judging when and where shells are likely to fall; his fear-impulse prompts him to adopt every reasonable precaution and sustains the intellectual operations that lead to the behaviour best adapted to each situation; and, in the moment of 'going over the top', the same energy adds to his general tension and to the vigour of all his actions and gives a zest and exhilaration to the whole experience. His fear has become sublimated into caution and into increased vigour and efficiency of action directed towards his goal.

In all dangerous sports, the danger evokes some degree of fear; and the energy of this tendency, being sublimated, adds to the zest of striving and to the satisfaction of success; that is the normal course for all who are capable of such sublimation and therefore capable of enjoying such sport. Big-game shooting and mountain climbing are the outstanding instances.[1]

Consider sublimation of the sex-energy. A youth finds himself irresistibly attracted by a girl whom he sees on the stage. At first his state is perhaps hardly more than lustful desire, the crude working of the sex-impulse. On nearer acquaintance, he finds she has virtues that evoke his respect, capacities that provoke his admiration, troubles that elicit his sympathy and his desire to shield and help her, perhaps also ideals that are worthy of reverence. Even her physical beauty now appeals to him as something too delicate and precious to be the mere toy and food of his sex appetite; and, if she gives him her company in public, he is proud and grateful to appear as her devoted attendant and protector. All these impulses blend in a highly complex con-

[1] Just after writing these lines I read in a novel—'There was nothing like imminent danger to add zest to living.' This is said of a gangster; and it is probably true of a large proportion of such persons; that is to say, for them, danger becomes, through sublimated fear, a principal source of the fascination of their mode of life. But it is true also of many others.

figuration (or *Gestalt*) in which each tendency, while contributing its share of energy to the whole system of activity and playing some part in determining all feeling and action in relation to the object, is profoundly modified in its working by the whole system of which it is a part. The youth now is not merely sexually excited in the presence of the girl; he is in love with her: that is to say, there has become organized in him the highly complex sentiment of sex love. From such a sentiment spring, according to the circumstances, a large range of affects (blends of emotion, feeling, and desire); each is like a chord of music; in each chord the ground-tone or fundamental is the sex-impulse; but, though the fundamental gives depth and strength to each chord, contributing now more and now less, it never appears in its primitive crudity.

Consider the further course of this process, if the courtship results in a happy marriage. The children and the home become the main interest of the woman, their welfare a prime condition of her happiness. The man's love for his wife now prompts him to efforts, not only for her personal welfare, but also for the securing of this larger goal; and to all these sustained efforts, guided by a long-range foresight of future possibilities, the sex tendency contributes something of its energy, which is thus sublimated in altruistic activities, perhaps activities on behalf of children and of generations not yet born.

These two examples illustrate the two principal modes of sublimation. The former (that of the man acting under danger) involves only the configurational blending of affects directly evoked by the situation, and is an affair of the moment only; though it is probable that each repetition of such momentary sublimation facilitates similar sublimation on later occasions; as we see in the man inured to dangers of many kinds.[1] The second mode of sublimation is of

[1] Here we have the justification of games that excite fear in children. It might seem that, since the fear propensity is unduly strong in most civilized human beings (as strong as was, perhaps, needful and serviceable in primitive man), it is wise policy to protect the child from all

more value; for such sublimation through the growth of sentiments is of lasting effect.

Not only does the sentiment for the particular object endure so long as the object endures (unless gradually destroyed by many unfortunate shocks and blows); but also the sentiment, if its object be lost, still endures and tends to find a new object. The man who has once been in love falls in love again more readily; and in him the sex-impulse will not easily operate again in the crude isolated fashion in which it may first have come into play. Hence the importance of favourable social contacts between young people of both sexes; and hence the role of 'calf-love' in the development of the adolescent.

The importance of sublimation is well illustrated by men in whom in boyhood and early manhood the sex-impulse has worked in isolation and, therefore, without sublimation, impelling to crude interest in sex and to consorting with loose

fear, aiming at allowing the tendency to atrophy through disuse. But, even if this policy could be entirely successful (which is not possible), it would deprive the child of one great spring of energy. Further, since it cannot hope to be successful to the point of avoiding all fear and producing atrophy of the fear tendency, it is of great importance that the child shall learn to sublimate the energy of the fear-impulse; and this he does in games in which he learns to carry on in spite of fear. The children best known to me (one of whom has become a crack stunt-performer of a great air-force delighting in his work) played many games in which fear was unmistakably excited in them, and they have developed in consequence a remarkable combination of caution and boldness.

On the other hand, if a child shrinks from and avoids all dangers, allowing the fear impulse to operate unchecked and solo, he will be incapable of sublimating it and will remain a timid creature all his life.

Again, if he represses his fears, he will be liable to acquire phobias and other forms of neurotic trouble.

Watch children entering the sea for the first time when breakers are rolling on the beach. With very few exceptions, all display fear; but, while some refuse to face the ordeal, others, with or without encouragement, sublimate their fear and find delight in the exciting experience. To this day the sight of great breakers dashing on the beach evokes fear in me; but the fear does not prevent me from hurling myself into them; rather it lends vigour to my movements and zest to the enjoyment.

women. It happens in some such cases that at a mature age the man, wishing to ' settle down ' to the enjoyment of family-life, marries a girl whom he admires on account of her innocence and purity ; and then, to his dismay, finds that in her company he is sexually impotent : the sex tendency, having long worked in isolation, cannot enter into the configuration of his sentiment of affection.

The growth of sentiments or complex secondary tendencies is the chief mode of sublimation ; but it would seem that all impulses may be sublimated in the more direct fashion which we have discussed in the case of fear. The romantic and idealistic longings which the adolescent so often experiences and which, in many cases, are expressed in verse or song or other art form, or at least find a partial satisfaction in art and the contemplation of beauty, these longings are so closely associated with the maturing of the sex tendency that we can hardly fail to recognize in them the sublimated working of the sex-energy.

The same principles of sublimation hold good of all the primary tendencies. Where development is normal and favourable, fear is sublimated in caution, prudence, awe, reverence and a ' sense of the sublime ' ; lust is sublimated in love and art ; self-assertion in self-respect, ambition and efforts at self-development and self-discipline ; the submissive impulse is sublimated in respect and admiration ; curiosity in wonder, awe and scientific endeavour ; disgust in scrupulosity and in dislike of all that is dirty or squalid or mean ; the crude herd-tendency in friendship and sociability ; anger in all controlled efforts that encounter opposition. Even hunger, of all the primary tendencies the least susceptible to sublimation, is to some extent sublimated when our meals become decorous social festivities.

In all these processes of sublimation there commonly is, no doubt, an intellectual factor consisting in the better evaluation of desired goals ; as when the youth arrives, in one way or another, at the judgement that good health is of more value than big muscles, or that intellectual power is preferable to athletic skill.

Psycho-therapeutics

The treatment by mental influences of functional disorders is now recognized to be a very large and important branch of medicine, about which an extensive literature has rapidly developed in recent years.[1] Here we can only note very briefly its most general principles.

Since the functional disorder is commonly due to the inability of the patient to cope with the tasks of life, the patient may in some cases be relieved, or even cured, by a change of circumstances which lighten those tasks. But in most cases the change must be an inner one. In very simple cases the trouble may be merely a symptom that persists after the conditions which gave rise to it have passed away. Here suggestion in the waking state, direct or indirect, such as every intelligent medical man frequently uses, may suffice. Or suggestion may be subtly combined with reasoning, in the blend that we call *persuasion* and commonly use when we seek to persuade a friend that the world is not so dark as it seems to him, his difficulties not so insuperable as he feels them to be.

Direct suggestion of the disappearance of symptoms may often succeed in the hypnotic state where waking suggestion fails; and hypnotic suggestion may be used to induce sleep and a more cheerful and restful state of mind. In many cases pains, even pains that have some organic basis such as neuralgic and rheumatic pains, may be suddenly and completely removed; and sometimes a few repetitions of such suggestion seem to effect enduring relief.[2] Some simple cases of disorder of movement, including some cases of enuresis, yield to the same simple treatment. In all such cases the disorder would seem to be of the nature of a self-perpetuating faulty habit which only needs to be broken off.

[1] A development greatly stimulated by the occurrence of a multitude of functional disorders among the victims of the Great War.

[2] In one case of neuralgic pain, so severe and persistent that the surgeons had decided to excise the Gasserian ganglion (a very serious operation), I was able to bring immediate relief; and a few repetitions seemed to make the relief complete and enduring.

In some cases the patient's conviction that he cannot be cured is a main factor in maintaining the symptoms. Then any procedure that will break down the symptom, even momentarily, may be of great assistance. For example, a man suffers functional paralysis of a limb or of his vocal cords, the consequence of some strain or shock, and has come to believe that his disability is incurable. Then suggestion, waking or hypnotic, a sudden emotional shock, the application of a strong electric current, or any other influence that will induce movement of the paralysed part, may break the vicious circle and effect a cure.

In all more serious cases the symptoms persist because the mental grounds of them continue; and it is necessary to change, in some way, the patient's attitude or outlook.

Where there is some obscure reluctance to be cured, perhaps because of the advantages brought by the symptoms in the form of attention and consideration, a whole-hearted desire to be well must somehow be evoked in the patient. This is the type of case in which the old-fashioned methods of severity had a certain justification and success. They served to make the patient realize that it was not worth while to be sick. Thus a bucket of cold water thrown upon the patient during an outbreak of ' hysterical ' emotion would sometimes terminate the display and discourage recurrence. And any severe deprivation of privileges might have similar effects, encouraging positive efforts at recovery. But where the mental grounds of the symptoms persist, relief of symptoms by suggestion, or by any other summary method, is apt to be followed by recurrence of the symptoms or by the appearance of new symptoms no less troublesome. Hence, the only scientific and radical treatment is to discover those mental grounds of the symptoms and, in the light of better understanding resulting from the mental exploration, to lead the patient to achieve some readjustment of himself. There are, therefore, two stages or steps in all radical cure of severe functional disorder, *mental exploration* and *mental readjustment*.

Mental Exploration

There are four chief methods of exploration, which, however, may be and commonly are combined in various degrees. First, exploration by sympathetic and tactful conversation which leads the patient to discover and acknowledge the hidden sources of his trouble, his secret and unacknowledged desires and grudges and resentments, his conflicts and complexes.

Secondly (and this is especially useful where there is dissociative amnesia) exploration may be assisted by hypnotic suggestion. In the hypnotic state, long-forgotten incidents may be brought to mind more readily than in the waking state.

Thirdly, dream-analysis may be of much assistance in exploration. We have seen that dreams are apt to give distorted expression, often symbolical and allegorical, to obscure repressed tendencies. The recounting of a single dream will sometimes suffice to put the physician on the right track, to give him the clue to the root of the trouble. But in more complicated cases the analysis of many dreams may be needed in order to obtain insight into the condition. The analysis is effected by getting the patient to recite or write down his dream in detail; and then requiring him to dwell upon each detail in turn, revealing whatever thoughts then come to mind. Sometimes, in the course of this process, the patient will spontaneously discern the significance of the dream. Or a process of tentative triangulation, in which patient and physician co-operate, may bring out a probable significance, which may or may not be confirmed by comparison with other dreams similarly analysed. And, in general, the physician's large experience in such work enables him to make good guesses at the significance of various details.

The fourth method is Freud's psycho-analytic procedure. In this, which often is combined with dream-analysis, the patient is led to adopt an attitude of impartial introspection. He lies quietly ruminating, describing to the physician whatever passes through his mind; while the latter, keeping

himself as much as possible in the background, unobtrusively steers the course of the patient's rumination to relevant topics and memories, always alert to note whatever may be of significance as revealing repressed desires, conflicts, blockings or inhibitions. In this process various images or incidents of dreams may with advantage be taken as the starting-point of rumination.

Mental Readjustment

When exploration has indicated, clearly or obscurely and tentatively, the nature of the trouble, the patient may be able to readjust himself without further help.[1] In other cases the process of readjustment may be difficult and of long duration; and then the powers of the physician are taxed to the utmost. A long process of re-education may be necessary; involving, perhaps, much in the way of re-evaluation. Throughout the process it is the inevitable duty of the physician to gain and to hold in the fullest degree the confidence of the patient; to make him feel that he is in contact with a wise, sympathetic and deeply understanding friend whose sole aim is to help him to understand himself and, through understanding, to regain complete self-control, wise self-direction, inner harmony and satisfactory adjustment to the difficulties of life. In all this process it is inevitable that the personal influence of the physician upon his patient shall be very great. The more his own personality is harmonious, strong, well-poised, wise, tolerant, sympathetic, earnest and of high ideals, the more surely will he help his patient to develop his own personality along similar lines.

I say nothing here of the difficult and highly controversial topic of 'transference' as an aid to readjustment, beyond remarking that, in such intimate and prolonged personal contact as that between the patient and the analyst, suggestion inevitably plays a considerable role, whether the physician consciously makes use of it or, according to the

[1] As in the simple case mentioned on p. 247, that of the dream of the tea-party at Buckingham Palace.

orthodox psycho-analytic maxim, deliberately aims to reduce it to a minimum.

In view of the great strength of the sex tendency, of its gradual maturation during childhood and youth, of its immense social importance, of the many restrictions imposed upon its expressions by convention and morality, it is inevitable that it should be one of the main factors in the genesis of many functional disorders. But there is no good ground for the extravagant claim that it is in every case the main factor. Those who confront every case with this ill-founded conviction are apt to be misled into overlooking various other factors that may be of the essence of the trouble.

Compensation

In the peculiar system of Dr. Alfred Adler (which has recently attained a wide popularity and claims the peculiar title, ' individual psychology ') the principle of compensatory effort occupies a place of central importance. According to this system, all functional disorders arise in the course of efforts to achieve some kind of compensation for some inadequacy or deficiency, bodily or mental ; the disorder is the consequence of the failure or misdirection of such efforts ; and treatment must consist in guiding the patient to better-directed and more successful compensatory effort. There is, no doubt, a modicum of truth in this doctrine ; but to me it seems as one-sided and distorted as the pan-sexual doctrine of Sigmund Freud. Perhaps its chief value is as a counter-weight which makes against the uncritical acceptance of the far-reaching claims of the Freudians, to whose strongly suggestive influence, backed as it is by the prestige and literary skill of their great leader, too many physicians surrender completely their independence and critical judgement.

The Principles of Dr. C. G. Jung

Dr. C. G. Jung has separated himself from the Freudian school of psycho-analysts, and has developed a very speculative doctrine which, by unadventurous minds, is regarded even less favourably than the Freudian teachings. In my

opinion it contains less of fundamental error and, perhaps, more indications of the lines of progress of psychology in the future. As regards the causation of disorder, Jung's doctrine differs from Freud's in assigning a subordinate role to the sex propensity; also in laying less stress upon the influence of incidents in the early history of the patient, and more upon the difficulties that lie before him. And in his therapeutic procedure Jung assigns to the physician a more active role, a role in which he must assume the function of spiritual adviser and guide, as well as that of leading the patient to a fuller self-knowledge. It may be added that Jung adopts towards all use of suggestion an attitude of virtuous repudiation, a repudiation no less complete and no better grounded and no less amusing than that of the Freudians.

CHAPTER XXII

SOME FUNDAMENTALS OF THE PHYSIOLOGY OF THE BRAIN

IN discussing mental structure and functions, we have likened the mind to a factory full of delicate machines, recognizing that the analogy is very imperfect. We said that just as the factory contains many machines, each a unit capable of performing some special operation, so the mind contains many functional units each of which we call a disposition. We distinguished dispositions of two principal classes ; on the one hand, the various abilities, each of which is so constituted as to perform, when set in action, some special function ; on the other hand, the propensities, which we likened to so many dynamos, each of which can generate energy and supply it to various abilities, thus activating them or bringing them into play.

We said also that the many abilities may be broadly regarded as of two main classes, the perceptive or cognitive on the one hand, the executive on the other ; although no sharp distinction can be drawn. The connexions between the abilities and the propensities (which we likened to the gearing or belting through which the dynamo drives the machines) are two-way connexions ; so that there is reciprocal action between them, maintaining a circular activity. An activity initiated at any point in the whole system is apt to maintain itself by playing to and fro in this reciprocating fashion, until the natural goal of the propensity concerned is attained.

In the traditional psychology the functional units that are here called ' dispositions ' were called ' ideas ' : the mind was said to consist of a mass of ideas linked together with

various degrees of intimacy, so that activity or excitement spreads from one to another. The scheme of the mind's structure here presented is superior to that older scheme in recognizing the broad distinction between the two great classes of disposition, namely the abilities and the propensities. The older scheme made no such distinction; its 'ideas' corresponded to our abilities only.

With the great increase of knowledge of the structure of the brain brought by the clinical and experimental studies of the last hundred years, sustained efforts have been made to translate the scheme of mental structure and functions, inferred from introspective observation of the course of mental life and from the objective study of behaviour, into terms of brain-structure and brain-function.

Stratification and Localization of Brain-Functions

In the latter part of the nineteenth century the doctrine of the strict localization in the brain of the distinguishable functions seemed to be in a fair way to be established; although there were difficulties which led some authorities to maintain the view that the great brain operates in some sense as an undifferentiated whole. Recent years have brought support for the latter view; and the whole problem remains in the greatest obscurity.[1]

Out of all the immense amount of observation, experiment and discussion, directed to this problem of the correlation of psychological fact and theory with the anatomy and physiology of the brain, the following are the principal conclusions that have emerged and may be regarded as well founded.

The nervous system is built up in layers of which the oldest are the lowest and are of relatively simple functions; the spinal cord (and its upper end which forms part of the brain) is the first or lowest layer, comprising the oldest and simplest structures and functions. The second layer is the

[1] Cf. especially Dr. K. S. Lashley's article, 'Nervous Mechanisms in Learning', in the volume *Foundations of Experimental Psychology*, Clark University Press, 1929.

mid-brain, comprising the cerebellum and the masses of tissue loosely designated as the basal ganglia, and making up all of the brain between the cerebral hemispheres and the spinal layer.[1] The cerebral hemispheres, which in the human brain greatly preponderate in size over all the rest of the nervous system, comprise two principal layers; the third layer which is directly connected with the first and second layers, and a fourth which is connected with the two lower layers only indirectly, namely, through the medium of the third or sensori-motor layer.

In the lowest and oldest vertebrate animals the nervous system consists of the first or lowest layer, with only slight rudiments of the higher layers. In those rather higher in the scale, such as the higher fishes and the amphibians, the mid-brain is of considerable bulk, but the cerebral hemispheres are very small. In the lower mammals the cerebral hemispheres are present and seem to correspond in function to the third layer of the human brain. In the higher mammals, and especially in the apes, the fourth layer is distinguishable in the large hemispheres. And in man this fourth layer constitutes the greater part of the brain. Thus, in the course of evolution the successive layers have been super-imposed, each higher layer growing up from the next lower.

All the evidence regarding the functions of these anatomical layers converges to show that each higher layer modifies and controls the functioning of the lower layers, without superseding those functions. By the administration of narcotic or anaesthetic drugs, such as chloroform and ether and alcohol, the functions of these layers seem to be abolished in the order from above downwards. Under increasing dosage of such drugs, a man shows first some impairment of the highest functions of mind and brain, loss of critical self-consciousness and impairment of judgement and reasoning; the fourth layer is progressively put out of action, until he lives at the level of one of the higher animals—utilizing only the three

[1] The term mid-brain is applied in technical usage to a restricted part of this layer, but the broader meaning here given is, I think, well justified.

lower levels; he lives, for the time, a life of sense-perception and uncontrolled affective responses. At a further stage, his sensori-motor functions are impaired; though he can still be stirred to outbursts of crude and violent affective response, during which he must be admitted to be conscious in a low indiscriminating fashion (comparable to the responses of a lower vertebrate animal to sense-impressions). And, at a third stage, he lies unconscious, his life-processes sustained and regulated by only the first or lowest layer of the nervous system. If the dose of the drug is pushed beyond this point, the functions of the first layer are gravely impaired, and the man dies, generally from arrest of the rhythmic working of heart or lungs.

Observation of the effects of brain injuries, both accidental and surgically induced, bear out these indications of the hierarchical relations of the four brain-layers.

The Seat of the Propensities in the Brain

A conclusion of the highest interest is indicated by observations of the kinds just mentioned and has been confirmed by special experiments of several kinds; namely, the second brain-layer, and more especially that part of it known as the *thalamus*, contains 'centres', or groups of neurones, which are essential for the manifestation of the fundamental propensities. And this conclusion is in accordance with expectation founded on comparative psychology. For it is obvious that very similar fundamental propensities are manifested by most of the vertebrates; propensities of sex, of food-seeking, of fear and anger and disgust and curiosity;[1] and the vertebrates of the lower types, whose brains have only the second layer (or in which the third layer is still only rudimentary) nevertheless manifest these fundamental propensities. These sub-cortical 'centres' of the second layer are, then, the great energizers of the whole system.

Cerebral Plasticity

A third great well-established fact is that the functions of

[1] Cf. Appendix to this chapter.

the first and second layers are relatively fixed or stereotyped, while those of the third and, still more, those of the fourth, are eminently plastic and adaptable. The functions and structures of the first and second layers are determined in the main by heredity and the maturation processes of foetal life, infancy, and youth ; those of the third layer are determined in part in the same fashion, but also in large degree by the forms of activity induced by the influences of the environment acting upon the innately given organization. While, in the development of the fourth layer, heredity, it would seem, does little beyond providing the great mass of nerve cells (amounting to some billions) which await the moulding touch of experience and activity.

We cannot positively assert that the two lower layers are wholly lacking in plasticity, that their development and adult organization owe nothing to the shaping influence of environment ; but it is certain that such influences play in them but a minor role, and that all we call learning or development through experience chiefly involves and depends upon the plasticity of the third and fourth layers. Even the simplest quasi-mechanical modes of learning (such as the simplest instances of acquirement of ' conditioned responses ' in the laboratory) are a matter of the plasticity of the third and fourth layers, the cortex of the great brain.[1]

The Reflex Theory and its Difficulties

A fourth conclusion is in the main of a negative character. The reflexes of the lowest or spinal level, although varying according to the state of rest or activity of other parts of the nervous system, are comparatively fixed, stereotyped and alike in all members of a species ; and, since the nervous tissue consists everywhere of a multitude of protoplasmic filaments forming a tangled network, it has seemed safe to

[1] The workers of Pavlov's school insist very explicitly on this conclusion : thus Dr. J. S. Rosenthal : ' Since, from the experiments on dogs it appears clearly that the building of conditioned reflexes is possible only when the cerebral cortex is intact, we are justified in concluding that the conditioned reflexes are built up in that cortex.'

conclude that the structure underlying a reflex movement is a path of low resistance through this tangle ; a path formed of filaments or neurones intimately joined together to form a conducting system leading from some sensory point to some muscle group ; a system such that, when its sensory extremity is excited, the excitation-process spreads through the system until it reaches the muscle-group and brings it into action.

This conception of the reflex arc of the spinal layer seems to be well founded ; and, on this as a basis, a vast amount of ingenious speculation has attempted to exhibit the whole nervous system as consisting of a vast multitude of such reflex arcs ; those of the lower levels being conceived as, in the main, shaped by heredity ; those of the higher levels as taking form, and becoming linked together in highly complex systems, under the touch of environmental influences.

According to the scheme thus reached by a bold and speculative use of the imagination, all mental growth, all learning, is to be regarded as essentially a linking together of reflex arcs, or a complication of existing reflex arcs and systems of such arcs by the incorporation of previously separate neurones ; all of which growth-processes result in the modification of the course taken by the nervous excitation initiated in any such arc or system.

This scheme of interpretation of all nervous structure as consisting of reflex arcs ; of all nervous activity as the simple conduction of excitation from sensory point to muscle (or other executive organs, such as glands) ; and of all mental growth as essentially a complication of pre-existing reflex arcs and systems and of the connexions between them ; this scheme owes its attractiveness very largely to the fact that it fits very well with the traditional psychology of association. For that psychology described all mental life as the successive appearance in consciousness of ' ideas ' ; and it regarded the order of appearance of ideas as determined wholly by links of association between them, links formed in the main according to the principle of contiguity or immediate succession in

time. And it seemed plausible to assume that each 'idea' was in some sense a function of a group of neurones, or of the excitation of such a group. In this way 'ideas' (including under that most comprehensive, elusive and misleading of all words all forms of experience and of mental activity) were made to appear as irrelevant by-products of the play of excitation in neurone-groups, the excitation shifting from group to group according to the incidence of stimuli upon the sensory terminals of the groups and according to the more or less fixed connexions between the groups; but always in the form of an onward flow of excitation along reflex arcs towards the executive organs.[1]

The more judicious exponents of this seductive scheme have always been aware of certain difficulties, difficulties which, as many of them assumed, might perhaps be overcome with the progress of knowledge.

In the first place, those who were not obstinately blinded by their enthusiasm for this reduction of the mysteries of mind to problems of brain-mechanics, did not entirely ignore a wealth of facts, facts of selection, of striving, of concentration, of effort, which in this book are discussed under the general head of striving, of conation, of volition. It was usual to lump all such facts under the head of *attention*. For some 'attention' remained the last of the faculties, an active agent. For others 'attention' was merely a matter of intensity or clearness of 'ideas' (though it was difficult to find any clear meaning in such phrases). Others

[1] Behaviourism, which has been until recently so widely taught in America as a substitute for psychology, consisted in the acceptance of this scheme as literally true and adequate in principle to the explanation of every form and detail of animal and human behaviour. The most thoroughgoing exposition of the scheme (made as recently as the year 1931) is that of Dr. E. B. Holt.

Dr. Holt develops the scheme with an admirable ingenuity and a magnificent contempt for a multitude of facts (including all the facts of heredity) and for the opinions of 99 per cent. of his scientific colleagues. Professor Thorndike's earlier works conformed pretty closely to this scheme, but his latest book (*Human Learning*, N.Y., 1931) displays a great weakening of his dogmatic assumptions, a weakening which adds greatly to the strength of his position.

again marred the limpid simplicity of the mechanistic reflexology by complicating the simple virtue of *pure associationism* with the hedonistic assumption, ascribing to those eminently immaterial facts, pleasure and pain, a strange power to modify the play of mechanical forces, a power to determine 'attention' to this or that object, with preference for one kind of action or aversion from another.[1]

We had, then, the position that the prevailing psychology, together with its translation into terms of the mechanics of reflexes, found itself utterly unable to include in its scheme the facts of feeling and striving (say, at a rough estimate, one-half of the facts that the science seeks to reduce to intelligible order) and contented itself with the pious hope that some day things would be better; while, of the facts of which it did profess to take account, it took account only after mutilating them out of all recognition.

But in the last few years cruel blows have come to the enthusiasts of reflexology; and they have come from the side of physiology itself.

There has been an accumulation of evidence which seems to show that the essential activity of the nervous tissues consists wholly and solely in the transmission from part to part of an 'impulse', a tiny electrical change of condition lasting only a minute fraction of a second, always and everywhere the same, except that, according to the condition of the nerve thread at the moment, the extent of the change may be more or less. And this evidence also points to the view that apart from such variations in the extent or degree of such momentary electrical changes, the only other way in which the essential nerve-process varies, or can vary, from one nerve-filament to another, or from time to time in any one filament, is in respect of the rate of succession of such 'impulses'.

Now it is certain that, if this is the last word of physiology on the nature of the nervous processes, if the conclusion just

[1] Dr. L. T. Troland has made in a series of large volumes heroic efforts to reconcile hedonism with mechanism.

now indicated is true, we can never hope to explain behaviour (and still less experience) in terms of the play of nerve-processes. If the nerve-process is this and nothing more, we shall have to remain content with explanations that are in the main psychological; and we shall have to assume that psychical activities somehow influence the play of the nerve-processes (modifying the extent or the rate of succession of the nerve-impulses) in ways which guide them through the jungle of the brain to issue in this or that form of action. Recent advances of physiology along this line thus play into the hands of psychology. But it remains probable that there is some grave defect in this extremely simplified view of the nerve-processes.

A more serious, a more irremediable, blow to the all-sufficiency of the mechanistic reflex scheme is that kind of increase of knowledge of the brain functions summarized by Dr. K. S. Lashley in the article referred to above (p. 319) and in his recent book.[1] This evidence (not entirely new but greatly strengthened of late years, especially by Lashley's work on the brains of rats) seems to prove that the performance of any action acquired or learnt under training does not depend upon any particular part of the brain cortex. For it is shown that, if a number of animals be trained to perform the same action under particular circumstances, various parts of the cortex of the brain may be destroyed in the several animals (these parts together making up or corresponding to the whole of the cortex) without destroying the acquired capacity of any one of the animals to perform the particular task. Yet, if the whole cortex be destroyed, the acquired capacity is lost. The acquired capacity therefore depends (it would seem) upon the functioning of *some* part of the cortex, but not upon that of any one part; any part, if not too small, will serve, will render possible the display of the acquired capacity.

To this it must be added that essentially the same task (the attainment of a particular goal), such as following a

[1] *Brain Mechanisms and Intelligence*, Chicago, 1929.

route through a maze, or the opening of a latched food-box, may be and often is achieved by the same animal on different occasions by means of very different movements, by very different combinations of innervations of various muscles. And this is true not only of intact animals, but also of animals suffering from serious mutilations of the brain.[1]

Now, this conclusion, which seems to be abundantly established as one with which all future theories of cerebral physiology must reckon, is utterly incompatible with the scheme of the reflexologists, the assumption that all *learning* consists in setting up new fixed paths of low resistance through the cortex of the brain. It compels us to seek for explanation of some quite different type. In some way that at present we do not in the least understand, the excitation-process, entering the cortex of the brain from below, is *steered* to its appropriate exit, namely, the efferent or motor channels leading to the muscles by whose orderly contractions the particular task is executed : and this is true whether the brain is intact or grossly mutilated.

One moral we may safely draw from this impasse, this breakdown of the reflexologist's scheme of interpretation of behaviour and of the learning process ; namely, we cannot afford to despise and neglect and ignore the psychological approach to the problems of behaviour.[2] We shall find that the closer attack on the problem of learning in the following chapter equally enforces this lesson. We must rather continue to attack the problems of mental life from both sides,

[1] ' For the maze-habit . . . there is no evidence for localization. It is weakened after any injury to the hemispheres but survives any small injury and is abolished by any large one, irrespective of location.' And : ' The cerebral hemispheres are somehow concerned in the formation of the more complex associations, but the nature of their contribution to learning is still a complete mystery.' And : ' The evidence from many lines of investigation opposes interpretation of learning as the formation of definite " conditioned-reflex arcs " through the cerebral hemispheres or through any other part of the central nervous system.' These citations are from Lashley's article in *Foundations of Experimental Psychology*, Worcester, 1929.

[2] As the reflexologists have commonly done.

that of physiology and that of psychology, aiming at a continual approximation and harmonization of the findings of these two still separate sciences.

APPENDIX TO CHAPTER XXII

The Evidences Pointing to Subcortical Centres as the Neural Bases of the Innate Propensities

Dr. P. Bard [1] reports experiments of his own which lead to the conclusion ' that the nervous organization for the display of rage, both in its somatic and its visceral aspects, is located in the base of the diencephalon, a phylogenetically ancient part of the brain, common to all members of the vertebrate series. So much is true of rage '. He goes on to ask: ' What of other primitive emotions ? Have they, too, a neural basis in the older parts of the nervous system ? ' And he replies: ' We should expect to find that the essential neural basis for these reactions, like that of rage, lies in the brain-stem . . . to conclude that they are not subcortical reactions would be premature and out of harmony with the evidence about to be presented.' He then summarizes various clinical evidences, of which the following case, described by Dr. Kinnier Wilson, may serve as a sample. A patient had suffered a ' stroke ' which had destroyed the connexion between the thalamus and the cerebral cortex. ' The least emotional stimulus threw her into a fit of crying with copious tears. . . . In such cases as these the over-reaction may be confined to either laughing or crying, or both modes of expression may occur at different times in the same individual.' Uncontrollable pathological laughter and crying are typical consequences of lesions of the voluntary paths from the cortex to the medulla and the spinal cord ; and Wilson states that ' the more severe the volitional facio-respiratory paralysis, the more exaggerated is involuntary innervation of the same mechanism '. This fact suggests that interruption of the path of voluntary cortical control of the subcortical or thalamic centres leads to unbalanced and excessive activity of those centres, an activity which expresses itself in the unduly emotional

[1] In his article in *Foundations of Experimental Psychology*, Worcester, Mass., 1929.

behaviour and which under normal conditions is held in check by cortical activity. 'Further, there is evidence to show that when the base of the thalamic region, the part essential for the rage-reaction, is the site of a morbid condition, there is typically a loss of emotional expression.' Bard sums up as follows: 'The foregoing observations, physiological, clinical and pathological, point to the diencephalon [a part of the *thalamus*] as the region in which resides the neural organization for the expression of various emotional states. It also follows from the same evidence that inhibitory cortical influences normally prevent the primitive activities from dominating behaviour. The subcortical processes are at all times ready to seize control of the motor reactions and, when the cortical check is released, they do so promptly and with elemental vigour. . . . As the neural basis for the conditioned responses of the higher mammals, the cortex greatly increases the number of circumstances which are capable of acting as emotional stimuli. By means of the cortex the inborn, stereotyped, emotional reactions . . . become, as the result of experience, conditioned responses.' In this connexion the reader should refer to the discussion (Chapter XIII) of the organization of the affective life and its appendix on 'conditioned responses'.

Experimental work on animals by Dr. W. B. Cannon and clinical studies by Sir Henry Head strongly support this view as to the seat of the neural bases of the propensities, which indeed is now pretty generally accepted.

When in 1907 I wrote my *Social Psychology* and claimed this subcortical seat for the nervous basis of the emotional impulses, the general argument was clear; but I could appeal only to one piece of experimental evidence, that of Pagano, who had evoked emotional reactions by direct stimulation of this part of the brain. The evidence now available not only suffices to establish the view, but it also confirms the view (put forward in my *Social Psychology* and rejected by very many critics) that the primary emotions are but an aspect of the instinctive responses. In this connexion the following passages from Bard's article are significant: 'The discharge of nervous impulses which evokes the extraordinary emotional display of the decorticate animal is conditioned by central mechanisms which are situated in the more ventral part of the caudal half of the diencephalon, probably in the hypothalamus. A part of the central arrangements for the expression of rage are, of course, located below

this level. Certain individual elements of the entire reaction may be induced in the spinal animal, and still more in the bulbo-spinal or mid-brain preparations, but the results of this investigation indicate that it is only when the diencephalic mechanism is present that these elements can readily be welded together to form the rage-reaction. This same investigation shows that at the level of the diencephalon the visceral activities of rage are linked and co-ordinated with the somatic. *The two were found to be inseparable.*' [1]

Psychologists have been very slow to accept the conclusion here clearly indicated. It seems, therefore, worth while to cite other high authorities. Dr. W. B. Cannon [2] describes the violent display of the emotional symptoms and bodily movements characteristic of anger observed in cats and dogs when the cerebral cortex (third and fourth layers of the nervous system) has been put out of action by surgical operation, leaving the first and second layers intact. 'As soon as recovery from anaesthesia was complete, a remarkable group of activities appeared, such as are usually seen in an infuriated animal—a sort of sham rage. A complete list of these quasi-emotional phenomena which we observed (in the cat) is as follows : vigorous lashing of the tail ; arching of the trunk, and thrusting and jerking of the limbs in the thongs which fasten them to the animal board, combined with a display of claws in the forefeet and clawing motions, often persistent ; snarling ; rapid head movements from side to side with attempts to bite ; and extremely rapid panting respiration. These activities occur, without special stimulation (apart from the operative procedure and confinement to the board), in " fits " or periods, lasting from a few seconds to several minutes. During the intermediate quiet stages a " fit " could be evoked by slight handling of the animal, touching the paws or jarring the table. Besides these changes which involved skeletal muscle there were typical and more permanent effects produced by sympathetic impulses : erection of the tail hair, which recurred again and again after they were smoothed down ; elevation of the vibrissae ; sweating of the toe-pads ; dilatation of the pupil to a size during activity that

[1] I have italicized the sentence which is particularly significant as evidence of the inseparability, in instinctive responses, of the emotional symptoms from the outward behaviour.

[2] In his article, 'Neural Organization for Emotional Expression', in the volume on *Feelings and Emotions*, Worcester, Mass., 1928.

was threefold the size during a preceding quiet period; micturition; a high blood-pressure; an abundant outpouring of adrenalin; and, as Bulato and I found, an increase of blood sugar up to five times the normal concentration. . . . The animals may manifest this pseudo-affective state, or sham rage, at short intervals for two or three hours before the arterial blood-pressure falls too low for continuance of activity.' In short, under these conditions the animal manifests, as completely as its mutilated and hampered condition permits, *both the characteristic outward behaviour of anger and the complex of visceral and other symptoms characteristic of that affective excitement.* Cannon writes further: 'Thus in the diencephalon, in a part of the old brain, which is common to all members of the vertebrate series from the fishes to the mammals, is localized the neural apparatus for integrating the complex reaction system of rage, not only the external expression, but also the internal mobilization of the bodily forces for the violent physical efforts in which rage typically culminates. . . . All the known changes may be readily and reasonably interpreted as rendering the organism especially capable of enduring prolonged and extreme physical effort.'

The evidence of a thalamic centre for one propensity, the affective or emotional-conative reaction which we call anger, is complete. What, then, of the other propensities? The evidence is less direct and complete, but points strongly in the same direction. Cannon writes:[1] 'The physiological organization which establishes the reflex figure of rage I have detailed because it may serve as a prototype for other primitive emotional responses. The expressions of fear, joy, and grief are similar in character: in their essential features they are not learned and they are exhibited so early in the human infant that they may properly be classed with rage as being natively inherent in the brain. There is good evidence that central control for the expression of these emotions, like that for rage, lies subcortically and, specifically, in the thalamic region.'

In a recent article[2] Dr. J. S. Rosenthal, one of the collaborators of Professor Pavlov, recognizes the instinctive 'centres' of the thalamus, and, in relation to the 'centre' of the food-seeking

[1] Ibid.

[2] 'Typologie nach der Lebre von den bedingten Reflexen', *Charakter*, Bd. I, Berlin, 1932.

propensity, writes: 'A further very important condition for the building of a conditioned reflex is the degree of excitability of the cerebral cortex at the moment, which degree of excitability depends in turn upon the degree of excitation of the relevant subcortical centres. As we have assumed, there is in the subcortical parts of the great brain a food-centre, which is also represented in the cortex; if the animal is not hungry, then the excitability of the food-centre both in the subcortical region as also in the cortex is greatly diminished and the formation of conditioned reflexes is impossible.'

I wish to emphasize especially the recent evidence of the very special energetic functions of these thalamic 'centres'. Cannon writes: [1] 'When the cortical government is set aside, the subordinate activities, released from inhibition, become prominent. Then only slight stimulation is required to produce extreme effects. Thus may be explained the violent and persistent display of sham rage by our decorticate cats . . . the vigorous snapping, snarling and resistance of the hemisphereless dogs when taken from their cages, and the excessive responses to mildly affective stimuli by human beings with thalamus freed from the cortex. The *extraordinary intensity* of these exhibitions seems to indicate that the neural apparatus for emotional expression is set and ready for energetic discharge, and that if only the superior control is weakened or inhibited, appropriate stimuli evoke an *intense and powerful response*. . . . The cortical neurones, however, can check only some of the bodily activities, those which are normally under voluntary control. It cannot check the stormy processes of the thalamus which cause shivering and forcible emptying of the bladder and rectum.' Again: 'Thus as an accompaniment of each emotional expression *there could surge up from the old brain* to the cerebral cortex impulses characteristic of the neurone pattern then prevailing. . . . Emotional experiences . . . are produced by *unusual and powerful influences* emerging from the region of the thalamus and affecting various systems of cortical neurones.' Again: 'The readiness of these mechanisms, when released from inhibition, to exhibit a major response to a minor stimulus, explains, I think, some of the most characteristic features of emotional experience. We have emotional "seizures"; we laugh, weep, or rage, "uncontrollably"; we feel as if "possessed"; what

[1] op. cit.

we do in the stress of excitement is " surprising ", " shocking ", —something " surges up within us " and our actions seem no longer our own. These common by-words are explicable in terms of a *sudden and powerful domination* of the bodily forces by subcortical neurones. Under favouring circumstances, with only a momentary lifting of the normal inhibitory check, these neurones *capture the effector machinery and drive it violently* into one or another of its variegated attitudes.'

In citing the foregoing passages I have italicized the phrases which recognize and insist upon the great intensity and volume of the general excitements which result when any one of the affective ' centres ' of the basal ganglia of the brain is roused to action. The facts are difficult to reconcile with the now widely-accepted all-or-none principle of nervous excitation, though perhaps this is not impossible. But, in any case, they do seem to imply that the excitation of these centres does somehow result in very intense outflow of excitation along visceral and somatic efferent nerves as well as to the brain cortex. *This is the important truth on which I have long insisted.*

It is difficult, if not impossible, to make the facts intelligible without the assumption that nervous energy is transmitted in greater or lesser quantities (according to the intensity of the transmitted excitations) from part to part of the nervous system, from one neurone group to others. Although this principle, first clearly formulated by myself in my various early writings on physiological psychology, as the principle of the vicarious usage of nervous energy, has never been explicitly accepted by the physiologists of the laboratory, it has been assumed and used by almost every one who has attempted to understand the activities of the organism as a whole, including all the writers of the psycho-analytic schools. Without it, such conceptions as the *libido*, repression, the complex, sublimation, transference, displacement of affect, conflict, in short all the best-justified working concepts of the psycho-analysts, are meaningless. Are we, then, to observe the taboo placed upon this principle by the physiologists of the laboratory as a deduction from the *all-or-none* principle ? To do so means the arrest of all endeavour to harmonize psychological fact with physiological theory until such time as the physiologists may discover their error and raise the taboo.

If we accept the principle that nervous energy is liberated within neurones upon their excitation and, when thus liberated,

flows from one neurone group to another in the process of transmission of excitation, two possibilities of explaining the intensity of general excitement resulting from excitation of the affective 'centres' of the thalamus present themselves.

The one possibility is that these centres achieve these effects by collecting and concentrating streams of afferent energy. This possibility was suggested and exploited for all it was worth in a paper read by me at the opening of the Phipps Psychiatric Institute.[1] I did not then and I do not now believe that this principle is adequate to the facts. I hold it to be more probable that the neurone groups constituting the affective centres of the thalamus are endowed in a much higher degree than other neurones with the potentiality of liberating and transmitting to other neurones quantities of nervous energy. This seems to be implied in much of Professor Cannon's discussion. How else can we interpret such expressions as the following? 'The stormy processes of the thalamus'; 'the neural apparatus for emotional expression is set and ready for energetic *discharge*'; 'appropriate stimuli evoke an intense and powerful response'; 'sudden and powerful domination of the bodily forces by subcortical neurones'; 'these neurones capture the effector machinery and drive it violently'; 'these neurones . . . do not require detailed innervation from above in order to be driven into action . . . being *released* for action . . . they discharge precipitately and intensely. We know that intense activity in one part of the nervous system extends to other parts by "irradiation"'; these neurones effect 'the internal mobilization of the bodily forces for violent physical efforts'.

[1] Published in the *American Journal of Psychiatry* (1913) under the title, 'The Sources and Direction of Psycho-physical Energy'.

CHAPTER XXIII

LEARNING AND THE STEERING PROCESSES

WHERE an animal, under particular circumstances encountered by it for the first time in its life, proceeds smoothly and without hesitation to some natural goal, we speak of purely instinctive action. Such actions are not displayed by human beings in unmistakable fashion ; hence all the fuss and difficulty about the question of instincts in the human species. We have seen that such purely instinctive action implies a native propensity to such action linked with appropriate native abilities, perceptive and executive ; and we saw that such a system of linked dispositions, provided by heredity and reaching a state of readiness for action by spontaneous maturation, constitutes, in the strictest sense of the word, an instinct.

We have seen also that in the higher mammalian species (including the human) the young creature is born at a stage of its development at which few, if any, such complex systems or units of organization, are mature : hence its early activities take, for the most part, the form of vague somewhat ineffective movements accompanied by more or less vague signs of emotional excitement. So indefinite are these movements and expressions that it is not possible to assert of them positively that they are directed to any goal. Yet indications of their truly conative or goal-seeking nature are not wholly lacking. The human mother, observing such vague movements, rightly interprets them as expressing a want, a need, as vague strivings towards the satisfaction of some need ; they at once raise in her mind the question—What is it he wants ? She seeks to interpret these signs of a need in order to satisfy it. Is it that he is hungry ? Is there a pin sticking

into him? Are his clothes too tight at some point? Is his position uncomfortable? Is it merely that he needs the comforting contact of warm arms, the sound of a soothing voice or the sight of a smiling face? The average mother is, in these matters, infinitely wiser than the foolish scientist who interprets all these signs as merely mechanical reflexes. She busies herself in providing the satisfactions demanded; in so far as she is successful, the unrest of the infant is stilled, giving place to blissful content. Some scientists would say that she has merely removed certain exciting stimuli; but she knows better. She is laying the foundations of that most intimate relation which, in many thousands of instances during the Great War, revealed its enduring deep-seated nature in the last murmurs of dying lips.

The infant's development is a long process of spontaneous maturation, modified by a multitude of *adaptive acts*. In a multitude of instances we observe that an adaptive action is first achieved slowly, with much or little fumbling or stumbling, with ineffective or ill-directed movements, some of which lead away from, rather than towards, the natural goal; and, on recurrence of similar circumstances, the train of action which leads to the goal is shorter and more effective, the movements are more precise, more economical, more effectively directed and combined. Such improvement, such increase of efficiency of action following upon successful action, is the outward mark of *learning*; and learning is, by common consent, one mark or evidence of 'intelligence'.

To achieve the best possible understanding of the learning-process is one of the principal tasks of psychology. Such understanding must be the foundation of all educational practice. No wonder, then, that a vast literature has grown up about this problem, and that a multitude of laborious experiments have been made for the purpose of throwing light upon it. Yet, in spite of all this labour, a leading authority can still truly say of the learning-process that it is 'something which we scarcely understand at all at present';[1]

[1] Dr. Gardner Murphy in his *Experimental Social Psychology*, N.Y., 1931.

and another high authority asserts: 'It is doubtful that we know anything more about the mechanism of learning than did Descartes.' [1]

In face of this obscurity of the problem, many diverse doctrines are propounded; broadly speaking, they may all be grouped in two large classes. In order to grasp clearly this broad distinction, we must first have clearly in mind the distinction between *adaptive achievement* and *learning*. Adaptive achievement (or, for short, 'achievement' simply) is the process of attaining to a goal by means of action not provided for, not precisely prescribed by, pre-existing organization.

If an animal, confronted for the first time by a certain situation, such as a maze or a problem box, were to display some urge towards the goal (food or what not) in ineffective movements followed by effective movements leading him to the goal, we should properly speak of his *achievement*, or of the process of achievement. A multitude of observations (both casual and experimental) lead us to expect that the same animal, if and when he confronts the same or a closely similar situation a second time, will achieve his goal more effectively (with less fumbling, fewer ill-directed and ineffective movements, with greater economy of effort). For such improvement is very commonly displayed; and, if no marked improvement of procedure is discernible on the second occasion, we confidently expect it on later recurrences of the situation. Such expectation is founded upon, and has been verified by, many observations on animals of all levels of the evolutionary scale. Even in the unicellular animalcules some slight, though perhaps disputable, indications of such improvement with practice have been observed by patient students.

When we observe such improvement, we say that the animal has *learnt*, or that learning has taken place. But until we have observed such improvement, we cannot properly assert that learning has taken place. If the animal were to display

[1] Dr. K. S. Lashley in *Foundations of Experimental Psychology*, Worcester, 1929.

on successive occasions as much fumbling, as much of ill-directed effort as upon the first occasion, we should have to conclude that he had achieved without learning. The improvement we commonly observe on a second, or third, or later occasion is evidence of two things, justifies two inferences: first, that, in the process of achieving, some change has been made in the animal's organization; secondly, that this change, this new feature of his total organization (produced in the process of achieving) has endured, has been retained, and plays its part in facilitating achievement on later occasions. In the animals, then, learning takes place during achievement, but is evidenced only in so far as *retention* is manifested by reproduction of the achieving behaviour on some later occasion. Such evidence of retention of changed organization underlying improved capacity is the objective evidence of what, in the broadest sense of the word, we call *memory*.

Thus the word 'learning' covers facts of two distinct orders, first, facts of adaptive achievement; secondly, facts of memory. Every instance of learning presents these two phases; the phase of achieving and the stage of retention. And the stage of achieving has two aspects, may be looked at and described from two points of view; first, it may be regarded as the process of attaining to the goal; secondly, it is the achieving of some inner adjustment, of some new step of organization, some growth or differentiation, or a synthesis of some part or parts of the total mental structure, namely, the part concerned in the activity of achieving. And such organization, newly acquired in the course of achieving, is what is retained and may later be manifested in improved or increased facility.

Though the learning takes place during the process of achieving, we could not properly speak of learning if there were no retention.[1]

[1] We can imagine a very intelligent creature lacking all memory or retentiveness. Such a creature would readily solve many problems, would readily achieve its goals in many diverse situations; but it would not improve its powers; it would show no increase of facility

In ourselves the case is not quite the same. Suppose that, after some little effort you solve a simple puzzle. If, on the following day, you are presented with the same puzzle, you may confidently say : ' I know how to solve that puzzle.' And you may at once demonstrate the fact that you have learnt how to solve it, by doing so in the most economical or effective manner. You *remember* how to repeat your achievement. This is, then, introspective confirmation of the inference we made from the observation of animal learning, namely, that *learning takes place during the process of achievement.*

These considerations are so simple and obvious that it may seem absurd to set them forth solemnly in black and white and to print in italics this simple and obvious conclusion. Yet the truth of this conclusion is one that has very commonly been overlooked ; and muddled thinking over the fundamentals of the problem of learning has been the rule rather than the exception. Therefore we cannot be too careful in making our first steps.

We are now prepared to understand the difference between the two schools or great classes of interpretations of the learning-process. The one school may be called broadly the mechanistic school ; it includes all the exponents of reflex ology, and also some [1] who do not accept the reflex and

in face of any particular problem, no matter how often it might solve it. It would learn nothing, would manifest no mental growth except such as might be due to maturation. No such creature is known to us : some retentive capacity, some retentivity however slight, some trace of ' memory ' seems to be common to all animals and perhaps to all living things. On the other hand, we can imagine a creature in which the power of adaptation, of achievement, was very slight, while retentiveness was very great. This condition we see approximately realized in some feeble-minded persons who have remarkably retentive memories. In general the distinction between achieving and retaining, as two indispensable phases of all learning, is emphasized by investigations by the method of *correlation* ; for such investigations have clearly shown that degrees of capacity for achievement and degrees of retentivity are not closely correlated ; they do not ' go together ' in the make-up of personality.

[1] e.g. this is true, I think, of Professor K. S. Lashley, though I speak subject to correction.

the ' conditioned reflex ' as the only conceptions required for the explanation of behaviour. The members of this school assume that achievement is always and only a happy accident ; that the animal (or man), confronted with a problem, achieves its solution only by making strictly random movements (reflexes evoked by the various sense-impressions or stimuli that fall upon the sense-organs) until some happy conjunction of such movements results in the solution of the problem ; or, as they, in consistency, must rather say, removes the stimuli which evoke the movements. For, in their view, such terms as ' problem ' and ' solution of problem ', as ' goal ' and ' effort ', are out of place, inadmissible and, strictly speaking, meaningless or, at least, misleading because involving false assumptions, such as the attribution to the creature of a purposive or teleological mode of action, in short, of a capacity to seek goals, to strive towards them. They deny that any animal has any such capacity, and they assert or imply that, when we seem to discover such a capacity in ourselves and our fellows, we are subject to an illusion and are in error if we believe that we really have any such goal-seeking capacity.

The exponents of this way of thinking assert, then, that achievement is always a happy accident, the consequence of a fortuitous conjunction of stimuli and nerve-processes. But they admit that this conjunction is apt to be repeated more readily than other conjunctions, than all those that do not result in achievement. And this fact they accept as evidence of some persisting or retained change in the animal's organization (a change mainly in the brain in the case of all higher animals).

Having made these initial assumptions, this school finds itself up against the problem—Why does improvement result from achievement ? Why does the animal not only achieve but also learn ? On the first occasion of achievement, the animal has made a number of strictly random movements evoked by various stimuli ; eventually some happy combination or train of such movements has led to achievement. On later occasions this particular combination or train of

movement is reproduced more readily than other movements. Why is this? Why does this particular combination of movements occupy a preferred position among all the random movements made? Why does it leave, in a higher degree than all other movements, a trace which facilitates its reproduction?

With this problem this school has been much concerned. They have expended upon it a vast amount of ingenuity. And, in the opinion of all competent judges, these efforts, so purposefully directed to the goal of showing that 'purpose' and 'goal' are meaningless misleading terms, have proved entirely unsuccessful.

The principle which they have most relied upon is the principle of frequency of repetition; the 'successful'[1] movements, they say, are necessarily repeated on every occasion of achievement, whereas all other movements may occur only once. But, unfortunately for the argument, the facts are against it. An animal may repeat many times the same false or unsuccessful movements before achieving; and yet, on a subsequent occasion, the successful movements (made only once) are reproduced, and the many-times-repeated unsuccessful movements are not repeated. Nor is it true that the successful movements of the first occasion are always and necessarily reproduced in repetitions of the achievement. It frequently happens that an animal, having achieved its goal by one series of movements on one, or on several, occasions, suddenly, on a later occasion, achieves the same goal by aid of some entirely different series of movements;[2] and then, perhaps, alternates freely between these two modes of successful action on subsequent occasions.

This is only one, though the most striking, perhaps, of the failures of the attempts of this school. It reproduces in

[1] It is impossible to discuss the problem without most tedious circumlocution if we strictly avoid the use of such terms as 'successful' which strictly are inadmissible under the assumptions of this school.

[2] e.g. a rat that has learnt to open a latch by pulling it with its paw, and has perhaps done this several times, achieves its goal by pushing the latch aside with its snout.

modern guise the tragedy of the failure of the pure association-psychology, so confidently taught a century ago by James Mill and his followers. It is not worth while to exhibit the inadequacy of the various other explanations attempted by this school. Their failure is generally recognized.

Before turning to the other school, let us notice that for this mechanistic school 'intelligence' is a word of little meaning; it can mean only the capacity of exhibiting retentiveness, and more especially the retentiveness manifested in the mysterious unexplained preferential reproduction of 'successful' modes of action.

The rival school is less dogmatic, more various, more tentative, more conscious of the difficulties of the problem. Its members are united by their recognition of the fact that 'intelligence' is displayed in the act of achievement; that achievement is not normally or usually a merely random series of movements, successful through pure accident.[1]

Secondly, they (or most of them) seek light upon the process of learning by observation of, and reflection upon, their own experiences during learning and also by reflection upon the reports of such experiences given by other persons; that is to say, they make use of the evidence afforded by introspection.[2] Now such evidence shows that, when we are con-

[1] I believe that Professor G. F. Stout has the distinction of having first clearly insisted upon this truth. But it is only since the recent rise of the Gestalt school that the fact has been widely recognized by American psychologists.

[2] We have here the best illustration of the two opposed procedures that may be applied to many problems. On the one hand, is the procedure of seeking to explain from below upwards: those who follow this procedure busy themselves chiefly with the simplest manifestations of processes of a particular type; and these they seek in the behaviour of the lower animals or of young infants; believing that, if they can find valid explanations in these simplest instances, the same principles of explanation will be found to apply in the higher and more complex instances. Now this procedure is sound enough; there is no logical objection to it, if only it will work. It naturally leads to the mechanistic hypotheses and, as we see, in the case of the problem of learning, these fail to explain. The other procedure is to study the more-developed forms of the type of process in question,

fronted with a problem which at first sight we cannot solve, we not infrequently achieve a sudden *insight*, an insight which forthwith guides our movements in appropriate fashion to the goal.

The Solving of a Simple Maze-Problem

Suppose the problem to be that of getting out of a simple maze (drawn on paper).[1] At first sight you perceive a number of channels bounded by straight lines; but you cannot perceive a continuous open channel leading from the centre to the exit. Surveying the maze, you suddenly perceive that a conjunction of three passages forms such a channel. Your problem is solved by this 'insight'. The execution of the required movements of your hand presents no difficulty—you have all the necessary organization. Whether or no you execute those movements, you have *learned* how to solve the problem. The execution of the task by your hand may be postponed an hour, or a day, or a year. If the interval between insight and execution is long, you may well find that you cannot immediately see the solution on returning to the maze. (And the longer the interval, the less sure is the immediate recurrence of the insight.) Yet there is good evidence that, even in that case, the achievement of insight on the second occasion is easier than on the first. We may, then, confidently infer that in the moment of achievement of insight there is effected a change, a development, an

and especially to study such processes in oneself and in other human adults under such conditions that our objective observations of behaviour are supplemented by introspective observation and reports. For this procedure we claim two important advantages: first, the aid of introspection; secondly, that the well-developed activity of the man may be analysed more successfully than the similar but simpler activities of animals and young children; because features and aspects which remain implicit and involved in the latter have become, through the course of evolution, explicit and readily recognizable in the former. If we can analyse and explain the process in its developed form, we may fairly hope to extend the same principles to its simpler but obscurer forms.

[1] Cp. Fig. 3, p. 357.

improvement of organization; and that this new feature endures, yet endures not absolutely but somewhat uncertainly, endures yet is liable to fade gradually or to be wiped out or worn away in the course of time. Such an enduring novel element of organization is what is most commonly called a *memory-trace*. Those who prefer a very technical terminology call it an *engram*.

What, then, is this 'insight'? Or better—What is the process of attaining insight? This is a question of the deepest interest; for it seems clear that in many, if not all cases, of adaptive behaviour, of achievement, of intelligent learning, the achievement of insight is an essential part or step.

Insight and the Perception of Relations

If we return to our instance of finding the way out of a maze, it is clear that the insight that leads us to the goal is perception of certain spatial relations. At the moment of achieving the necessary insight, we become aware of the three open channels, not merely as such, but as opening into one another and as forming a continuous open route to the goal.

Suppose that the maze, in which you trace your path with the point of a pencil, is not merely drawn on paper but is made of metal walls, so that your pencil-point runs in sunken channels. Under such conditions, if you merely keep moving your pencil to and fro in the most random irregular manner without taking its point from the surface, you may reach the goal. If you were blindfolded, you might well solve your problem in that *relatively* blind fashion. I say 'relatively blind', because, even if blindfolded, you would still be seeking the goal, the exit, as you made your movements; and one outward manifestation of such seeking would be the fact that your hand would not merely keep moving hither and thither, perhaps simply to and fro in one channel from end to end, but rather would vary the direction of its movements and would repeatedly enter such side-openings as were encountered by the pencil-point. Just such behaviour

is what we commonly observe if we put an animal (say, a rat) into a maze whose parts it cannot survey ; it runs hither and thither, but keeps varying its direction and entering all possible channels in a way that justifies us in saying *that it is seeking the goal*, that its movements are *relatively* random and *relatively* blind, *but not completely and utterly random or blind*.[1]

Achievement of insight is, then, the perceiving of relations of one sort or another. Now notice that all perception involves such perceiving of relations. Of all relations those of space are of the most importance for the guidance of our movements and we may confine our attention to them, merely noting that many forms of perception involve other relations, such as those of order in time, of magnitude or intensity, of cause and effect, etc. In the simplest visual perception, as of a single spot of light, we become aware not merely of the light but also of its direction or location in the visual field ; and whenever we recognize an object by its shape, we do so through perceiving a complex of spatial relations.

In an earlier chapter we saw reason to believe that the grasping of relations is a fundamental mental function characteristic of mind at every stage and level. If we do not take it fully into account, we cannot hope to understand the learning-process. This function has been grossly neglected and is ignored by many psychologists. Especially, many psychologists have been slow to admit that animals perceive relations. Yet the fact has been experimentally demonstrated in the most direct fashion ; and indeed, in all the many

[1] An interesting confirmation is afforded by the following observation which I have made in many instances while working with rats in a water-maze. If, during a series of such experiments, the rat becomes fatigued, and especially if it becomes also chilled, its movements cease to display these marks of seeking a goal ; rather, the rat continues to swim, but it now swims to and fro from end to end of one channel, simply reversing its direction each time it comes up against an end wall of the channel ; that is to say, in this condition of diminished vitality, the rat's behaviour approximates closely to that of a reflex machine, ceasing to be purposive and intelligent.

instances in which animals learn to distinguish one shape from another and to react discriminatingly to two or more simple visual shapes, we have clear evidence of such perception.[1]

Simple Insight is Not Enough. Insight Must be Relevant, and Relevance Implies Foresight

Let us return again to our maze-problem. We have seen that insight, the grasping of spatial relations, is a necessary condition of success, of intelligent achievement. But what relations? Suppose that you are confronted with the maze and asked simply to look at it with a view to recognizing it at some later time, distinguishing it from other somewhat similar mazes. In perceiving it you notice many of its multitude of spatial relations. Perhaps you notice that some of its channels form the letter E, and you note that as a recognition mark. Suppose, further, that when you have done this, you are challenged to take a pencil and try to escape from the maze. Your insight, your grasping of those particular spatial relations, is now of little or no assistance. The problem still lies before you unsolved. Now notice that, in order to solve it, you do not need to notice all the spatial relations presented by the maze with its many parts. What you need is to grasp certain only of these, namely, the *relevant* relations. If you can select those, can single them out among all the multitude of spatial relations presented by the maze, you may ignore all the others. The relatively stupid man may look over all the relations in turn, without solving the problem. The highly intelligent man quickly seizes upon, selects, the relevant relations; and the problem is solved.

It is clear, then, that the insight that solves the problem, that leads to the goal, is not a mere grasping of relations, it is also *a selection of the relevant relations.* But relevant to what? Clearly, success (achievement) depends upon selective

[1] Professor Pavlov has shown, by aid of his 'conditioned reflex' methods, that dogs may learn to discriminate shapes with considerable nicety; and Professor Lashley has demonstrated a similar capacity in rats.

grasping of those relations that are *relevant to the attaining of the goal.*[1]

Go back once more to our maze, and the principle just stated is a truism, an obvious and indisputable truth. Why, then, should this truth be generally ignored? Because in many other instances of achievement it is not so obviously true. Yet the principle is, I think, true of every instance of achievement that can properly be called intelligent.

Foresight is Necessary as well as Insight

How is the selection of relevant relations effected? Since these relations are relevant to the attainment of the goal, it would seem that the goal is somehow, in some sense, operative in the process. And this may be inferred from the general truth that insightful achievement occurs typically and, probably, only as an incident in some goal-seeking process. We ourselves commonly achieve insight and solve a problem only when we are trying to solve it; when we have set the solution of the problem as our goal; in other words, when we have the goal in view, or have *foresight of the goal.*[2]

[1] Here again what is indisputably true of man may be asserted also of the animal. Yet the confidence with which we make such an assertion of an animal is inevitably less complete. It may be that animal-behaviour obeys some laws utterly different from those our own obeys; but, in view of a wealth of contrary evidence, that is wildly improbable. When a rat or a racoon opens deftly and quickly a series of interlocking latches which lock the lid of his food-box, he gives us good evidence not only that he perceives the latches in their spatial relations, but also that among all the multitude of relations, many of which have little relevance to his task, he selectively grasps those that are relevant. And when, after experience in opening some half-dozen latches, he shows greatly increased facility in opening later latches of the series, this general improvement seems to be in the main due to more effective selection of the relevant parts and relations of the total field.

Facts of this order are described in the two articles by my son and myself previously mentioned, *J. Comparative Psychology*, vols. vii and xi.

[2] It is a complication that not infrequently in ourselves, when we have struggled vainly with some problem, the solution comes suddenly to mind at some moment when we are not consciously occupied with

Our maze-problem again illustrates clearly the principle. Looking at the maze, you see the exit as your goal (as the opening through which your pencil must pass out). You selectively perceive it, and then you selectively perceive the channels which lead to it in their spatial relations to it. Now this selective foresight depends upon, is a function of, your desire to solve the problem, to attain the goal. If you have not accepted the challenge to solve the problem, you may look at the maze without even noticing that it has an exit; or, if you notice the exit, it is not a goal for you. You may merely remark—What a pretty pattern! Or—Yes, it is a nice game, but I'm not playing it to-day. But if you 'for any reason' accept the challenge, if from any motive you set yourself to attain the goal (it may be the desire to win a prize, or a desire to show how clever you are, or the desire to co-operate with another person in an experiment interesting to him), from that moment the exit becomes your goal, you foresee and desire the passing out through the exit; and the selective activity, governed by this foresight, sets in.

It is the same whenever we solve a problem; and all intelligent activity is the solving of a problem. The solution is the goal towards which we look forward; and such looking forward, such desireful foresight of the goal and of the attainment of it, governs or guides or steers the selective activity which picks out the relevant relations.

All this sounds very complicated. Can it be true that animals also sometimes achieve their goals, intelligently solve their problems, in so complicated a fashion? The answer must be distinctly—Yes. In many instances of problem-solving by animals, it is very clear that their achievement implies foresight as well as relevant insight. When, for example, a rat (one that has many times found his food in a certain box by raising its lid) struggles long and vigorously to open the lid; and when we find that he will thus strive

the problem, sometimes in sleep or at the moment of waking from sleep. This is no exception to the rule, but rather one more evidence of effective subconscious activity and the subconscious persistence of such activity.

whenever he is hungry, remaining indifferent to the box when he is not hungry, it would be pedantic to doubt that he in some sense expects to find food in the box and is striving towards the realization of that expectation.[1]

But Why the Learning ?

We have seen that learning is commonly manifested when adaptive achievement is repeated ; in other words, if the first achievement involves any irrelevant or ineffective movements, these become fewer and less on repetition of the achievement. Cases of two types may be broadly distinguished ; first, those in which on the second occasion achievement is practically perfect and immediate, the goal being reached by a series of movements that leave little or no room for further improvement ; secondly, those cases in which there is manifested gradual improvement in a series of successive achievements. Learning of the former type is frequently manifested by men ; and the second type is very commonly manifested by animals, especially under the conditions of laboratory experiment. Are these two types of learning fundamentally distinct ? We will postpone the consideration of this question. Here we notice merely the important fact that there seems to be no sharp line to be drawn between them. All degrees of gradualness of learning on repetition are manifested by both men and animals ;

[1] For many other instances of behaviour implying foresight cf. *Insight and Foresight in Various Animals*, by K. D. and W. McDougall. We are not quite alone in insisting upon the reality and functional efficiency of foresight of the goal among animals. Dr. E. C. Tolman's recent book, *Purposive Behaviour* (N.Y., 1932), expounds the necessity of attributing to animals ' cognitive expectation '. That Tolman should have reached this conclusion should carry the more weight, since he claims to be a behaviourist in the sense that he professes to owe nothing to introspective observation ; and also because he has devoted himself for many years to experimental study of animal behaviour with an acknowledged mechanistic bias. Tolman very rightly insists that, in attributing to an animal ' cognitive expectation ', we do not necessarily assume that the animal can represent, think of, or form an ' idea ' of an absent or remote object. Expectation or foresight may occur, as he insists, on the purely perceptual plane.

sometimes the man perfects his achievement process only through many repetitions; sometimes the animal achieves suddenly and perfectly, i.e. in a manner that leaves no room for further improvement.

Sudden and perfect achievement in face of a problem that at first baffles has been generally accepted as the objective mark of insight. Of course, the suddenness in itself does not suffice; it is when sudden achievement is repeated on later occasions that we have the sure mark of insight.

Keeping in view cases of this sort of learning, we ask—Why on later occasions are the successful movements repeated, while the unsuccessful movements are not repeated? This is the problem that has been the Waterloo of the triumphant mechanists. With it they have struggled in vain and have retired defeated. Can we do any better by taking account of the psychical factors?

In the case of the man solving and repeating the maze-puzzle, we say that he follows the right route the second time because he remembers it to be the right route, the route which he has successfully followed the first time. Here we must distinguish two cases. In one case the conditions are such that the man can survey the whole maze and see at a glance the 'right route'. If he cannot see all parts of the maze together, the case is a little different. Suppose the man to be in a maze formed of high hedges, like that at Hampton Court. He is then in a situation closely comparable to that of a rat in the ordinary alley-maze so much used in laboratories. At each parting of the ways he has to select the right one and neglect the wrong one. Shall we say that the man takes the right turning because he judges it to be right and the alternative to be wrong? If so, the further question arises—How is this judgement of rightness founded? Founded on memory, you may say. But on what sort of memory? Is it not true that you choose the right route because you *feel* it to be right, and *feel* the alternative to be *wrong*? Is it not true that you judge the one route to be right because you *feel inclined* to follow that route and to avoid the alternative? In other words, you know or judge

this route to be 'right' because you feel it to be right; and you judge that one to be wrong because, if you enter it, you *feel* it to be wrong. And if you enter a path and don't get either the feeling of rightness or of wrongness, then you are in doubt; you simply don't know, you cannot form a judgement.

What more can be said of this 'feeling' which determines our judgement and our action? Just now I described the experience on entering a right channel of the maze as *feeling inclined to go forward*; and the experience on entering a wrong channel may be similarly described as *feeling disinclined to go forward.* In the former case our forward striving towards the goal is re-inforced, intensified, encouraged; in the latter case it is checked, weakened, discouraged. The phrase 'feeling inclined to go forward' is popular language; but it may well embody the truth. And I suggest that this natural and popular description of such an experience does contain the long-sought key to this fundamental problem.

The Essential Role of Pleasure and Pain in the Learning-Process

It has long been suspected that pleasure and pain have some role to play in the learning-process. Professor Thorndike, in interpreting his classical experiments on cats escaping from cages by opening latched doors,[1] took up a curiously mixed position. He interpreted the first achievement of the cat (the first opening of a latched door) mechanically, that is, as due to a happy accident in the course of *purely random* scratchings and clawings, these movements being regarded, not as incidents in the course of striving for the food or striving to escape from the box, but as so many mechanical reflex movements. But when he came to the second part of this particular problem of learning, the problem—Why are the successful movements sooner or later (after one, a few, or many repetitions) alone repeated in preference to all others?—in face of this problem he invoked the psychical factors, pleasure and pain. The pleasure resulting from the

[1] *Animal Intelligence*, N.Y., 1898.

attainment of the food somehow 'stamps in', accentuates or confirms, the traces left by the success-bringing movements. The generalized statement of this interpretation has commonly been called the *law of effect.*

The Law of Effect

Two difficulties have prevented the general acceptance of this interpretation and this law. First, it has seemed to all the mechanistically inclined (including all the behaviourists and also many psychologists who do not repudiate the attribution of psychical life to the animals) illegitimate to invoke psychical factors for the explanation of behaviour, whether in animals or men.[1] This difficulty no longer looms so large; for the doctrine of *emergent evolution* has come into fashion and has been accepted by many authorities who formerly held it illegitimate to invoke psychic factors as playing a role in behaviour; and the doctrine of *emergence* teaches that the psychic factors have emerged from and are generated by the highly complex brain-processes and that they, in turn, play back upon and modify the course of the brain-processes from which they emerge. Further, even if we still refuse to admit the legitimacy of regarding psychic factors (such as pleasure and pain) as causally efficacious, it remains possible that these may eventually be translated into physical terms; that is to say, we may regard the causal efficacy in behaviour that seems to belong to the psychic factors of pleasure and pain as really belonging to the physical brain events of which they are the psychic parallels or epiphenomena. And on this view, therefore, so long as we have not the vaguest notion as to what may be these postu-

[1] This is a logical necessity for all those psychologists (and twenty years ago they were a majority) who on various grounds accepted the principle of *psycho-physical parallelism* or the nearly allied doctrine of consciousness or psychic events as *epiphenomena.* But curiously enough, the same reluctance to interpret in terms of psychic factors was shown by most of those who solved the problem of the relations of mind to matter by accepting *psychic monism,* the doctrine that all events are psychic, physical events being merely the appearance to us of such psychic happenings.

lated physical parallels of pleasure and pain, it is the part of wisdom to follow Thorndike in accepting the plain indications that pleasure and pain do play an important role, under the reservation that this role may really be played by their physical accompaniments in the brain.

The second difficulty in the way of the law of effect is more serious. It arises not merely, as does the former, from some metaphysical prejudice or some questionable assumption about the relations between mind and matter, between the psychical and the physical, but is rather a serious logical difficulty. Thorndike's cat, having by chance made a movement which releases the latch, walks out of the cage, and, guided by sense-impressions from the food, walks to the food and eats it ; and, as it eats the food, certain pleasant sensations are excited by the food acting on the sense-organs of taste and smell. The pleasantness of the experience of eating is the pleasure assumed by Thorndike to do the essential work of ' stamping in ' the association between the accidental movement which released the latch and the particular conjunction of sense-impressions which evoked that movement. The postulated pleasure, then, follows after the essential, the crucial movement ; a distinct interval of time separates the supervening pleasure from the preceding crucial movement, an interval (that may be of few or many seconds) occupied with quite other movements. And, when the pleasure sets in, the crucial movement is already in the past and the pleasure accompanies the movements of eating. How, then, can the pleasure, which does not arise until the crucial movement has ceased and been followed by many other movements, how can it ' stamp in ' the association between that movement and the sense-impressions that evoked it ? Causes must precede their effects. This seems to be an inescapable law, whether we are dealing with physical or with psychic events.

This, I think, is the main ground of the general reluctance to accept Thorndike's law of effect. And neither Thorndike nor any other psychologist has offered a solution of the difficulty. Yet Thorndike, in his latest publication, holds fast

to his law of effect, supporting it with ingenious new experiments on human subjects which, he holds (rightly, I think), strongly confirm it.

Foresight the Key to the Riddle

The key to this riddle is, I submit, the foresight or expectation which, as we have seen, is clearly implied in the behaviour of animals of many kinds when they achieve the solution of problems, and of which we are distinctly conscious in ourselves as we tackle similar problems.

Let us go back once more to our own experience in solving a maze-problem. The case is essentially the same whether you are walking in a Hampton Court maze or following with a pencil the channels of a maze drawn on paper. Suppose that you are strongly desirous of achieving a solution rapidly because you are competing for a rich prize, money or glory or superiority or what not. Suppose, further, that, after much fruitless wandering to and fro, you are following with your pencil the channels of a maze without having 'seen' the solution. Suddenly you see that you are in a channel that leads without obstruction to the exit. Your psychic state is suddenly changed. Your state of discouragement, of anxiety or despondency (you may have been on the point of giving up in despair), suddenly gives place to one of confidence or confident hope; seeing clearly that your goal and your prize are within reach, and will be attained by a few movements that you can easily make, you make those movements with vigour and attain your goal.

Now the essential point here is that, *as you foresee the attainment of the goal and the steps necessary to the attainment of it, you experience something of the pleasure of success*; the pleasure of success *accompanies* the making of those movements: and, according to the fundamental law of feeling,[1] it reinforces, sustains, invigorates, those movements. You may or may not formulate in words the judgement—This is the right road. But, if you do so, the formulation of the explicit judgement follows upon your confident foresight, or expecta-

[1] Cf. pp. 122 and 138.

tion, or anticipation, of success; and the judgement is grounded in that feeling of pleasurable re-inforcement of your striving activity.

We may feel sure that the animal, under similar circumstances, does not make or formulate in words an explicit judgement. He merely sees his goal straight before him and presses on to it, his whole activity suffused with pleasant feeling and his movements re-inforced or invigorated. The essential fact seems to be (in man or animal) that, as the goal and the route leading to it are perceived, the striving process, the whole activity, becomes suffused with pleasant feeling and is re-inforced, raised to a higher degree of intensity. Is not this undeniably true of every form of sustained striving towards a distant goal? Are we not encouraged, re-invigorated, as soon as we come within sight of our goal, as soon as it is clearly within our reach? It is the same whether we are merely playing a trivial game, or striving to reach the North Pole or the summit of Mount Everest, or struggling with a problem in chess or mathematics. And the pleasure is great in proportion to the intensity of our desire to attain.

On the other hand, as you wander in the maze and try a new route, at first you follow it hopefully; presently you discover that it is a blind alley. Or, in climbing a difficult mountain, you hopefully follow some ridge, until you come upon some impassable barrier. At the moment of discovering the route to be impossible, the feeling-tone of your activity is reversed; you are discouraged, the energy of your striving is checked: you may give up in despair; or you may rest awhile despondent, and then summon up enough energy to make another effort along some other line of attack. In an exactly comparable manner, the animal, struggling with a problem, a maze or a latched cage or food-box, desists from his efforts along a particular line when those efforts prove unavailing. Like the man, he may give up and run off on some other quest; or he may sit down and scratch his head or his flank, and presently try a new line of attack.

Now we come to the most crucial point of the problem

of learning. Achievement, the solving of the problem on the first attempt, depends, we have seen, upon four distinguishable factors: (1) the impulse towards, the desire for, the goal; (2) insight into the situation, i.e. selectively perceiving such features of the situation and such of their relations as are relevant to the attainment of the goal; (3) foresight of the goal; (4) feeling; unpleasant feeling which, when we are baffled along any line of effort, discourages us and turns us aside, and pleasant feeling which re-inforces our striving along any line that brings us perceptibly nearer to our goal. What is the difference between the total activity on this first occasion of success and the total activity on the next and subsequent occasions?

Take the case of solving a maze of the Hampton Court type (see Fig. 3). On the second occasion, although you cannot see the way to the goal and perhaps cannot see the goal, you know the goal is there, and you know there is a way to it. Therefore, after your first success, you start out more hopefully or more confidently on the second attempt. You now *feel* sure you can do it; you are less easily discouraged; you are in little danger of giving up in despair. But you do not clearly remember the route by which you have achieved on the first occasion. You wander to and fro as before, uncertain of your route; each time you enter a passage, you pursue it hopefully until you get the feeling of discouragement, of disappointment, when (with or without the formulated judgement—This is wrong) you turn back, and try another route. Suddenly, at the spot B, you come in sight of the spot A at which, on the first occasion, you first saw your goal and the route to it clear and open before you. You hasten on to A, encouraged, pleasantly anticipating success, and so on to your goal. The point A has become a subsidiary goal, a step, a landmark on your route; the sight of A is almost as good as the sight of the goal itself clear before you; it brings the same pleasant encouragement, confirms your effort in that direction.

Now consider your third attempt. You still cannot remember all the complex route. You set out as before and

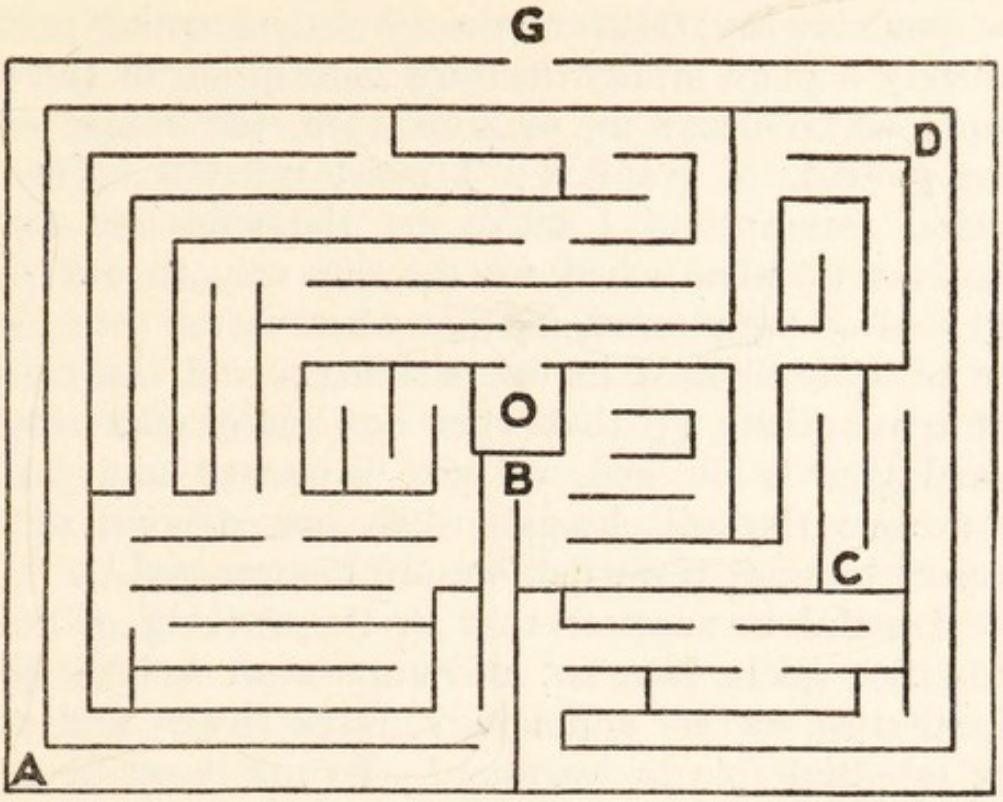


FIG. 3.—Simple maze in which O is the starting-point, and G the exit or goal.

wander, until you come, at the spot C, in sight of B, the spot at which on the second occasion you sighted A and experienced the pleasant encouraging anticipation of success. B now plays the same role as A on the second occasion ; it is a subsidiary goal ; the sight of it brings you the pleasant anticipation of success, and again you press on to B, to A and to the goal. The complete learning may require further repetitions of this process. But eventually you pass from one landmark to another confidently, without making any wrong turnings ; and you have then learnt or mastered your maze. And all through the process of learning, at every crucial point, pleasant or unpleasant feeling plays an essential role ; feeling which accompanies and qualifies the activity ; not feeling which comes (as in Thorndike's interpretation) only on completion of the task ; but pleasant feeling which comes before attainment, evoked by anticipation of success ; and unpleasant feeling which also comes before effort is completely blocked, comes with the anticipation of such blocking.

Now, you may say, this is no theory of the learning-process; it is merely a plain straightforward description of the series of events which occur in, or constitute, the course of the learning-process. I grant it; I insist upon it. The only theoretical assumptions I make are the wild and fanciful assumptions (1) that when we see our way to our much-desired goal we are pleased, (2) that when we are thus pleased we are also encouraged in our striving; and the converse pair of assumptions, (3) that when our line of effort towards a desired goal is blocked, we are displeased and (4) that when we are thus displeased, when our striving becomes unpleasant because thwarted, we are discouraged.[1]

Is it fanciful to suppose that in the striving of animals towards their goals, pleasant and unpleasant feelings qualify anticipation of success and failure, respectively, and play a similar essential role in learning? To me it seems a very natural and legitimate assumption. Fortunately we have experimental evidence which directly and strongly supports this interpretation of the learning process in animals. Professor Washburn was, I believe, the first to report the facts; her observations have been confirmed by other workers.

The significant facts are as follows. In learning a complicated maze, animals (rats have commonly been used) learn the last part first, and the first part last; and the intermediate parts in the same order. That is to say—in a long maze of many turnings, which the rat learns to master in the course of many successive trials, the first evidence of learning is the elimination of errors (of false turnings and hesitations) in the part of the maze which leads directly to the exit and the food-box; next a similar improvement is shown in the section preceding this in the order of advance

[1] This truth, the much-sought key to the problem of all intelligent learning, is one of the truths revealed to babes and sucklings, but hidden from the men of science. I cannot forbear to cite the following paragraph from to-day's newspaper: 'Thus the Ottawa Conference opens in that atmosphere of confidence which is engendered by an initial victory. The delegates will go about their work with the energy of a cricket team in the field which has got a couple of important wickets in the first few overs.'

towards the goal; and so on, until the whole course is run smoothly without error.

I do not see how we can hope for a more complete confirmation of the interpretation of the learning process in animals offered above.

The learning of other tasks than the solving of a maze, whether by man or animal, can be interpreted in essentially similar fashion. Where the rat or the racoon learns to open a series of latches, the application of the principle is not quite so obvious. The case is comparable to our learning a difficult manipulation by repeated trials; we acquire the knack, as we say; and we may do this with more or less of analytic discernment of the relations of the things we handle and of the steps of our progress; but always we are guided by the feelings of rightness and wrongness; as we repeat the successful series, we have the pleasant feeling that our movements are right and we press through to the goal, encouraged; and if we make other movements, we have the unpleasant feeling that they are wrong; and we desist, or modify them.

I suggest, then, that learning by the rat is a process essentially similar to learning by a man faced with a similar problem. In the man, the processes take place on a higher level of differentiation and explicitness. We might make an ascending scale of instances of such learning, ranging from the rat learning to find the exit from the maze to the climber aspiring to the summit of Mount Everest. Midway would stand such instances as the man learning his way out of the Hampton Court maze. As the latter's learning-process is to that of the climber on the mountain, so is the rat's learning to that of the man in the maze. But the same essential factors are present in all three cases: (1) desire or impulse towards the goal; (2) relevantly selective insight; (3) foresight; (4) pleasant or unpleasant feeling, qualifying the foresight and re-inforcing or checking the impulse according to the quality of the feeling; and finally, (5) retentiveness, which brings back the appropriate feeling upon reperception of the situation which has previously evoked it.

The higher the level in the scale of mind, the more is the process of trial and error conducted on the plane of imagination rather than of sense-perception.

All instances of truly intelligent learning seem to be but varieties of this same process. We might perhaps claim that, where explicit reasoning occurs as a step in the course of achieving, the process must be regarded as different in kind. Yet the reasoning process is but a complication of the same fundamental process. In any case the selectivity of the act of relevant insight remains the core or essence of the process that marks it as intelligent. And such relevant selectivity is the essence of all productive reasoning.

Is all Learning of one Type?

We have seen that the attempt to find a mechanistic interpretation of intelligent learning has failed, in spite of much ingenuity devoted to it. But the question remains—Is there a kind of learning which is not intelligent? Is there a learning which, perhaps, results from mere repetition of a particular form of activity?

I incline to think that we must recognize as distinct these two forms: on the one hand, intelligent learning involving achievement through insight and foresight; on the other hand, a quasi-mechanical learning, which involves mere repetition with some increase of facility, some fixation of the particular sequence of activity such that it repeats itself more readily after each repetition.

The process of becoming automatic through repetition seems to be of this latter type. Undoubtedly we can and do form habits, which, when formed, have a certain fixity as preferred modes of action towards particular goals. If I have always begun to shave myself on the right cheek, I continue to do so; commonly I do not think about the matter, but proceed, quasi-mechanically or automatically, to shave in the usual manner, while thinking about other things. Some men, if they have to walk frequently from one point in a city to another, will always follow the same route,

although there may be other routes equally good. In these and a multitude of such instances, the exercise of the habit cannot be called an intelligent activity. The actual route or sequence of action may be less effective, less economical than some alternative ; and persistence in it is then a mark of lack of intelligence rather than of intelligence. There is, then, a kind of learning which consists merely in the fixation or facilitation of a series of activities through repetition. Notice, I do not say that the learning of this type may properly be described as a mechanical process. The activity which results, on repetition, in the formation of the habit is a conative activity, a striving towards a goal ; there is some element of striving, and some satisfaction results from reaching the goal ; and there is no good reason to suppose that, if these elements were lacking, mere repetition of a movement sequence would result in facilitation. What evidence we have points to the probability that, if the process were reduced to the mechanical level, if it were deprived completely of the striving nature, no formation of the habit would take place.

The much-studied process of committing to memory long rows of non-sense syllables approximates to unintelligent learning through sheer repetition. You may set about the task more or less intelligently. If you set about it intelligently, you seek to grasp the series as a whole made up of parts in relations to one another and to the whole, relations which you selectively perceive. And this greatly facilitates the learning. It introduces the factor of insight and achievement. But if you set about it unintelligently and keep repeating the series in as mechanical a fashion as you can, you still acquire (though only after very many repetitions) the power to repeat the series by heart.[1] And if, when you have learnt a series, you repeat it again and again, it can be shown that these repetitions are not without effect ; they

[1] This result was found by my colleague, Miss May Smith, and myself in a prolonged experiment of the kind suggested. Cf. ' Some Experiments in Learning and Retention ', *Brit. Journ. of Psychology*, vol. x.

result in what is called *overlearning*, which manifests itself in a more enduring retention.

Such overlearning affords, perhaps, the clearest evidence of the effect of sheer repetition apart from all insight and achievement. But animal experiment affords evidence of the same kind. If you put a rat into a maze of many turnings and practise him in it until he runs it smoothly, and if you then open a shorter route to the exit, what will happen? If the new and shorter route is a very simple and obvious one, some rats will at once follow it and continue to do so. They are sufficiently intelligent and, perhaps, lucky to break the habit. But others continue to follow the old longer and habitual route indefinitely. And even if, by introducing a block on the old route, you induce them to follow the new short route two or three times, they may revert to the old route as soon as the block is removed. One more example of the much-celebrated 'awful power' of habit.

Habit, though one must not overrate its role and its power, is a real factor in the lives of men and animals; and habit is formed and accentuated by repetition, by repeating the process in a way that involves no *achievement*, no new adaptation, no economy, no increase of efficiency.

I conclude, then, that there are two distinct types of learning-process: intelligent learning involving achievement through relevant insight, foresight and feeling; and unintelligent learning through mere repetition. And it would seem that very many actual instances of learning are of mixed type, the two processes being intimately blended in various proportions.

APPENDIX TO CHAPTER XXIII

Other Instances of Animal Learning

The topic is so important that it seems worth while to cite other evidences of the role of pleasant and unpleasant anticipation in the learning-process in animals. In the course of a prolonged experiment,[1] I have had occasion to observe the

[1] Designed to test the question of Lamarckian transmission of acquired facility. Cf. two papers in *Brit. Journ. of Psychology*, 1927 and 1930.

behaviour of some hundreds of rats while learning to master the following problem.

The rat is placed in a tank half-full of water at O. He is urgent to escape from the water, and can do so only by swimming to and running up one or other of the two gangways, B and D. Of these two routes of escape one, B, is brightly lit and also is so wired that, as the rat touches it and climbs upon it out of the water, he receives through his feet a strong galvanic current. This shock, it seems safe to assume, is unpleasant,

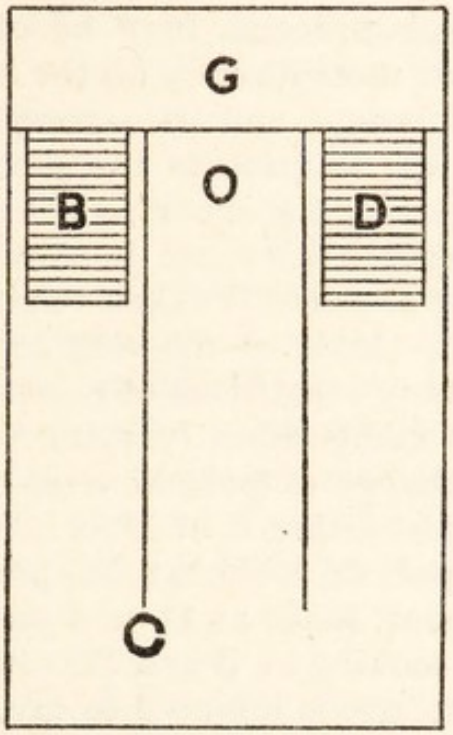


FIG. 4.—Plan of tank from which rats learn to escape avoiding electric shock. The tank is half-full of water. The rat is placed in the water at O. He can escape from the water only by running up one or other of the two gangways B and D. B is brightly lit and carries the shocking current. B and D exchange positions at each immersion of the rat.

and in all probability it evokes in some degree the fear-impulse. At any rate, the rat commonly makes some violent movement and very often squeaks as he receives the shock; and the shock is something that he learns to avoid. If the bright shock-giving gangway is always in the one position, all rats quickly learn to avoid it by taking, on every occasion of immersion, the other route, D.

For the purpose of my experiment, it was desirable to make the task more difficult. Therefore I adopted the procedure of switching both the illumination and the shock from one gangway

to the other after each immersion of each rat; that is to say, B and D were made to exchange positions regularly at each trial. This makes the task of the rat very much more difficult, in fact, brings it near the limit of the capacity of some of the duller rats. Nevertheless every one out of the hundreds of rats subjected to the process has learnt, sooner or later, to avoid always B and to escape always by way of D. Some have required some 600 immersions and have received the shock more than 300 times before they have succeeded in surely effecting the discrimination between B and D. Many interesting features of the learning-process may be observed. I describe only those which bear most directly on the interpretation offered above in terms of foresight and its accompanying feeling.

(1) The learning, the solution of the problem of escape from the water without getting the shock, is not achieved as a gradually increasing preference for route D shown by an increase in the number of times D route is taken relatively to the number of times B is taken. Most of the rats continue to take B as often as D during many repetitions of escape. And after receiving the shock on B many times (varying with the rat from 30 to 300) a marked change of behaviour is manifested. Instead of rushing recklessly at either B or D as hitherto, the rat pauses at or about the spot C, looks at B, perhaps approaches B cautiously, turns about, looks at D, and perhaps repeats several times this alternate looking at B and D. It is a phase of hesitation, of uncertainty; one is tempted to say, a phase of deliberation before action. Such suspension of action, such hesitation, such deliberation, is the beginning of wisdom. It seems to imply a conflict of two impulses, the impulse to escape from the water by any route perceived and the impulse to avoid and retreat from the shock-giving gangway. But the rat, with his poor little dose of 'intelligence', his rudimentary capacity for memory and discrimination, cannot at once decide which is the dangerous route, which the safe one. He takes B once again, or perhaps twice or thrice; and then he discriminates. If we were dealing with a man or child, we should say that he achieves a judgement of discrimination; judges B to be the wrong and D to be the right route. Thereafter he makes no more errors, but takes every time the route D. And, when this stage has been reached, it becomes very difficult to trap him into making an error. For example, if at the very moment he is approaching D, the current is switched over, so that D becomes B (that is, becomes

brightly lit), the rat will promptly turn about and swim round to the other gangway, now D; and he will do this again and again.

(2) In the period that precedes the effective discrimination between B and D, the rat commonly manifests clearly his anticipation of the shock. When he has received the shock on B a number of times, he will, as he approaches B, put on speed and rush at and up the gangway in a way which reduces to a minimum the duration of the shock. And also, generally at a later stage, he will pause as he comes in sight of B, instead of swimming to it without delay; and then, after pausing, gathers himself together like a sprinter starting in a race, and makes his rush at the gangway.

(3) A rat which learns to rush at B, will also rush at D, so long as he has not achieved the discrimination, and, after he has learnt to take route D, he will commonly continue to rush at D in the old agitated way on several occasions; until, having taken D several times, he ceases to expect the shock and escapes by route D calmly and confidently every time.

(4) A rat which commonly squeaks as he receives the shock on B will also squeak as he leaps on B, even if the shocking current is cut off. He cries out *before* he is hurt; just as does a child accustomed to blows at the threat of a blow, on anticipation of the blow.

(5) A considerable proportion of all the rats acquire the habit of turning always to the same side, escaping by the gangway of that side, both when it is B and when it is D. This is a clear instance of unintelligent habit formation. He goes that way, not because that is the better way, but merely because he has gone that way before. And when a rat has repeated this habitual unintelligent behaviour many times, it seems to be very difficult for him to break the habit and effect the discrimination which alone will enable him to achieve avoidance of the shock. He becomes the seat of a conflict between ' habit ' and ' intelligence '; and eventually, in spite of the ' awful power of habit ', intelligence wins the day.

(6) More interesting is the behaviour of a smaller proportion of all the rats which form the habit (a habit of a rather different kind) of escaping always by B. Having begun by escaping by B, the bright light is accepted as the mark of the route of escape, and the rat guides himself to B by aid of this mark, never attempting the alternative route to D which is equally accessible

to him. Yet such a rat also learns eventually to avoid B and to take D every time in preference. This, I say, is a very interesting sequence of events, one of crucial significance. If all learning were, as is so commonly assumed, the mere unintelligent formation of a habit, how could the rat learn to break this habit? The external conditions remain constant; but some change takes place *in the rat*, a change which leads to the discriminative behaviour, the abandonment of the habit of going to B, and the substitution of the better habit of going to D.

It might be suggested that, on the first occasion of escape by D, the change is due to some fortunate conjunction of sense-stimuli newly arisen. That seems to be the only possible suggestion open to those who seek a mechanistic interpretation. But several considerations conspire to rule it out. First, there is no assignable change in the circumstances; secondly, the rat has been repeating the habitual behaviour many times and thus confirming the habit; and it is very improbable that the very slight environmental changes, which inevitably occur from one occasion to another, should break the old confirmed habit if they failed to break it in the early stages of its formation. Thirdly and most conclusively, the occasion of discrimination is preceded by occasions on which the rat, although he continues to take B, hesitates before doing so, and manifests increasingly prolonged hesitation on successive occasions. This seems to be clear evidence of a gradually accumulating change in the rat, a change accentuated by each new reception of the shock.

We can interpret the facts only by assuming that the successive shocks induce in the rat an anticipation or expectation of the shock on B, an anticipation which becomes more and more definite and explicit, manifesting its increasing power to evoke an antagonistic impulse of retreat from B; which antagonistic impulse of retreat from B holds in check the impulse to rush out by B until at last it sends the rat to D. On the next occasion, when he turns towards B, he gets the unpleasant feeling of wrongness; and when he turns towards D, he gets the pleasant feeling of rightness and continues to advance to D; in other words, he makes the very simple implicit judgements—that is wrong and this is right, rudimentary judgements of denial and affirmation, or a bipolar judgement of discrimination. In this connexion I insist on the fact that at the critical stage of this process (that immediately preceding the first taking of the route D) the rat, in almost all cases, hovering near the spot

C, turns repeatedly and looks first at B, then at D, again at B and so on, before he finally takes D. The procedure is remarkably 'human'; and when the rat, in some cases, after looking several times at D, eventually takes B once again, one inclines to interpret his behaviour as expressing, at the lowest level, that kind of decision which in ourselves we generalize in the words: ''Tis better to endure the ills we have than fly to others that we know not of.' Like that sentence, the rat's behaviour expresses an excess of caution.

CHAPTER XXIV

PERSONALITY

THE word *personality* is derived from the Latin word *persona* ; it was used of the mask worn by a Roman actor to render easier the impersonation of the ' character ' he desired to play. In accordance with this origin some modern writers would use the word to imply whatever is peculiar to, or distinctive of, a man, to the exclusion of all that he has in common with other men. On the physical plane, according to this usage, a squint or a difference of colour between a man's two eyes would be a feature of his personality, while his possession of two eyes would not.

It seems to me that this usage ignores the fundamental truth that all parts, all features and functions of the developed personality play their part in that integrated unity which is the person, make some contribution, however slight, towards determining the unique quality and flavour of that complex totality. Even a slight squint or ' cast ' of one eye is not an isolated feature that could be changed, leaving the rest of the personality unaltered. We know how Lord Byron's club foot made a vast difference to the course of his life and the development of his personality ; and so inert a feature as a mole on the face may play a similar role. Still more decidedly must any detail of the mental constitution play a role in determining the unique quality of the total man.

Personality should, then, be used to imply that totality ; not the sum of the distinguishable features and functions which by analysis we discover in it, but rather the synthetic unity of all features and functions in their intimate interplay. The parts distinguishable by analysis may properly be called

factors of personality. The totality is not the mere sum of the distinguishable parts; it is the organic whole of which they are parts. This perhaps is true in some degree of every organism, but true in a fuller sense of men than of animals, and in the highest degree of the most highly integrated personality.

But, though we may not regard a personality as the sum of its distinguishable parts, we may enrich our understanding of any personality by analysis of it, by dissecting out, as it were, its various distinguishable features and functions, and studying each of these as an instance of its class, a class of which we already have some generalized knowledge gained from the study of other instances. Throughout the chapters of this book we have been following this procedure. In this final chapter we are concerned to survey the personality as a whole, to see how the parts we have discovered by analysis fit together and how the elementary functions we have defined and studied play their parts in the synthetic unity of the whole personality.

A portrait painted by a great artist gives us a vivid impression of a personality as seen by the artist. If we are acquainted with the man depicted, we may be surprised to find revealed in the portrait traits (or resemblances perhaps to relatives known to us) which had escaped our discernment in all our intercourse with the man. In such a case we have brought home to us in some degree the richness and complexity of personality. At the best the painted portrait can give us only one aspect of the personality; and commonly one aspect is deliberately chosen and accentuated. The artist commonly depicts his sitter as a representative of some type, as the man of action, or as the student, or as the poet, or the visionary, or the schemer.

The biographer and the novelist may follow a similar plan with good effect. And of recent years many psychologists have proposed to set up certain types of personality to one or other of which every individual must (as they seem to suggest) conform more or less closely. Now, it is possible, even probable, that there are certain types of human

constitution ; that just as the various breeds of a domesticated animal-species have different constitutions, revealed in bodily form and proportions, in their behaviour, in their curve of growth and in their liability to various disorders and diseases, so also there are races of men, each conforming to a distinctive constitutional type. We know something about such constitutional peculiarities so far as they are manifested in bodily form, in colour and hair and skin texture, in blood composition, and in liabilities to disease. But we have no established knowledge of corresponding mental peculiarities of these racial types. And, even if we had sure knowledge of well-marked racial types of mental constitution, such knowledge could help us but little in understanding the personalities of men of our contemporary civilizations, and would not justify the attempt to classify them according to a limited number of types : this for two good reasons.

First, the populations of our modern civilized nations are of such mixed origins that almost every member must have ancestors of many different racial strains. Take at random a child from any common school in America and, if you can get the evidence, it will appear in very many cases that some of his ancestors come of the much-mixed population of Great Britain, others from various parts of Europe and Asia, and, in addition, there may be a streak of the Red Indian and even possibly of the Negro. It is true that occasionally some of the striking traits of some one ancestor seem to be manifested, seem to be reassembled, to a degree that marks the man as of the same physical type as his ancestor. But this is the exception rather than the rule. In the crossing of unlike stocks, the groups of traits characteristic of either stock tend to be broken up and the traits transmitted and redistributed in other combinations.

Secondly, the mental factors of a man's constitution are more liable than the bodily factors to be profoundly modified in the course of his life, especially during the years of infancy and childhood. Such acquired modifications may amount to transformation of inborn peculiarities. Even two 'identical twins', whose innate constitutions may be almost identical,

diverge from one another in the course of growing up, and diverge the more widely the more diverse their environments and occupations.

For these reasons, and also because the innate constitution comprises a great multitude of factors derived in a somewhat haphazard fashion (by mere chance sorting as it were) from the two parents, and because every such factor undergoes modification through its interplay with many other factors and with the whole organism, the attempt to set up valid or useful types of personality seems mistaken and doomed to failure.

What we may legitimately attempt is to classify the factors of personality in certain large groups, and to ascertain the general laws of the operation of factors of each such group within the complex whole and the varieties and range of variation of such factors. And, in the light of such general knowledge of the factors of personality, we may then approach the study of any one personality with better hope of penetrating its secrets, of describing it in analytic fashion and of tracing its traits back to constitutional factors and to the modifying influences of the environment.

Factors of Personality—The Five Great Classes

In earlier chapters we have distinguished five main classes of such factors of developed personality under the heads of *disposition, temperament, temper, character,* and *intellect.* It would be premature to assert that these constitute an exhaustive classification. Certainly we must recognize the indirect influences of peculiarities that are primarily and strictly of the body. A man with very short legs is not likely to seek or attain distinction as a sprint racer; and the man with inadequate digestive organs will always be at a disadvantage in any line of sustained effort. But the mental aspect of personality vastly predominates in importance and general interest over the bodily. And our five classes of factors seem to comprehend all that are of direct influence in the mental life; not that we may assume that we have already defined or recognized all distinguishable factors of importance,

but rather there would seem to be a place under one of these five heads for any factor we are likely to discover. Yet in making this broad assumption, we must remain open-minded; it may be, for example, that some human beings have telepathic or clairvoyant capacities that are of a different order from any hitherto generally recognized. It may be that some works of genius are products of a mode of activity radically distinct, some power to resume and express experience wider, more comprehensive, than that of the individual through whose hand or tongue the work takes shape.

Putting aside such possibilities to await further investigation, let us dwell a little on the ways in which our five classes of factors play their roles in developed personality, and more especially the two great groups of factors that we call 'intellect' and 'character'.

The Integration of Intellect

The very fact that common speech has evolved these two words and uses them effectively in discussing personalities is strong evidence that each of these two great groups of factors is more than a group, is in some sense and degree a functioning unit. We have seen that the units of intellect, the raw material of which its structure is composed, are the cognitive abilities, a multitude of which are developed during the early years of life by growth and differentiation of native abilities, which in turn are given 'by heredity' in groups of units of allied function, such as the topographical and the linguistic and the athletic abilities.

There are two different ways in which such a process of growth and differentiation might take place. First, it might be that the natively given unit grows and then throws off a bud, some smaller or larger part of itself, which, having been separated from the parent, lives, grows and functions independently of the parent and of other similar buds. Secondly, it might be that, as in growth and differentiation of the parts of one of the common flowering plants, the buds remain in vital connexion with the parent, so that growth

with differentiation results in a complex structure having a parent stem with branches and twigs and leaves and flowers. If the development of the mental structure followed the former pattern, the process would result in a multitude of detached units functioning independently, a mere crowd of 'ideas'.

The older psychology postulated such a crowd of ideas, each functioning as an independent unit, and merely connected with others by links of association formed according to the law of habit. And, having postulated such 'ideas', each a sort of copy or mould, or die, or an impression stamped upon the mind by some object, it confronted the problem—How are general and abstract 'ideas' formed? And the only answer suggested was that different individual specimens of the one kind of object successively stamp their impressions upon the same mould, until it becomes blurred in all its details; and the blurred mould is the 'general idea' of the class of objects.

Now, up to a very limited point, this account seems plausible. Take the case of a city-bred child which sees sparrows, but no other birds. The first sparrow seen stamps on the child's mind 'the idea', the image, of that particular bird; the visual impressions of other slightly different sparrows are received in the same mould and blur that mould until it becomes 'the idea' of bird-in-general. But now the child goes out from the city and wanders widely; he sees cocks and hens, pigeons and hawks, humming-birds and ostriches. Though so widely different they still are all birds to him; and yet each kind is for him distinct from the rest, and even some individual birds stand out for him as such. Any theory of 'ideas' as copies of objects stamped upon the mind by way of sense-impressions breaks down in face of these simple facts, before this first degree of complication of the problem.

If we conceive the growth of the intellect after the second pattern, we get a scheme less hopelessly inadequate. The child becomes familiar with sparrows; and all sparrows are alike to him; each is merely a bird, a fluttering creature with feathery body, two wings and two legs. When later

he encounters birds of other kinds, they have the same essential distinguishing features. Suppose his first other birds are a cageful of doves. They have the same essential marks as the sparrow and evoke in the child similar responses; yet they are unmistakably different. The ability concerned in the perception and recognition of birds becomes differentiated into two abilities, that which recognizes sparrows and that which recognizes doves. Yet they remain branches of the common stem, the ability to recognize birds-in-general. If we are to talk in terms of 'ideas', we must say that the 'idea' of bird is general from its first formation, and that the 'ideas' of kinds of birds and of particular individual birds become differentiated from this 'general idea' in successive acts of perception.

The complexity of the mental structure of the human being is so vast that we can hope to achieve some understanding of it only through first considering the simpler problem of the animal mind. Consider the case of the kitten becoming acquainted with birds. It is interested in birds only as objects that evoke its hunting propensity; and the condition of its being interested is its possession of a bird-hunting instinct, a propensity to hunt geared to an ability which enables it to single out birds among all objects that affect its sense organs. Like the child, it begins life in the city and knows only sparrows. Then it runs wild in the country, earning its living by preying upon birds. It encounters birds of two kinds, those that run on the ground and birds of flight. They are alike in so far as both evoke the hunting propensity; they are different in so far as one kind requires to be stalked upon the ground, the other kind to be pursued in the trees by climbing. In differentiating two abilities of pursuit, the kitten would learn to distinguish birds of the two kinds; and, if he had a rudimentary language, he would call them by different names, perhaps 'runners' and 'fliers'. The kitten might go on to differentiate within each of these classes, two or more kinds according to the kinds of behaviour on his part required for successful hunting of them. In this way the kitten would build up a system

of knowledge about birds; and the system would consist of a number of abilities (each such as to enable him to recognize and practically deal with birds of one kind) all differentiated from one native ability and all still rooted in and activated by the one propensity, the hunting propensity.

The mental structure of such an animal as the cat consists of a relatively small number of such systems of abilities, each rooted in some one propensity, each differentiated from some native ability. We cannot properly ascribe intellect to such an animal: for the several systems remain separate and distinct; they are not integrated into one system; or, if some degree of integration is achieved, it is but an incipient degree.

Consider one step towards integration which the cat may achieve. The cat becomes the mother of a litter of kittens. As the kittens become active, the mother brings them birds to eat and to play with. The system of abilities she has acquired as servants of her hunting propensity now are also activated by her maternal propensity; she no longer hunts only in order to satisfy her own hunger, but also to satisfy the needs of her kittens.

That is the type of one process that makes for integration and in man goes very much further than in animals, goes so far in a well-organized mind that in it any ability or system of abilities may be brought into play in the service of any propensity. Yet in very many men integration never advances beyond a point at which it is far from complete. Such men continue, like the cat, to have departmental minds; the knowledge of such a man consists of a number of systems of abilities each developed (by differentiation largely) in the service of some one interest; and each system functions only in that service.

One great difference between the mind of such a man and that of the animal is that, whereas the animal develops each system of abilities out of one instinct in the service of one propensity, the man's systems of abilities are developed as complex sentiments, each one rooted, not in one propensity, but in a number of propensities that are combined in the

one system. Thus a man may acquire a religious sentiment, a family sentiment, and a sentiment and a taste for some branch of science, say entomology. Each of these develops a complex system of abilities; and each remains distinct from the other two systems, functioning only in the service of the complex tendencies of its own system. In all the conduct of his family life, the man is activated only by the tendencies of his family sentiment (or group of closely allied sentiments) and is guided only by customary rules and experience gained (i.e. abilities differentiated) in the course of such activities. He never brings his scientific system or his religious system to bear upon this department of his life.

In a similar fashion his religious life remains apart, a cult sustained by the tendencies of a distinct sentiment and guided by a system of abilities that serve only these tendencies. He never brings his scientific knowledge into relations with this cult. And his scientific activities remain equally separate and apart. On Sunday he believes in brotherly love for all living creatures and in the special creation of each species. From Monday to Friday he is busy earning support for his family and ruling its affairs; and he acts according to the principle 'each man for his own and the devil take the hindmost'. On Saturday he gives himself up to his scientific hobby, neglects his family, ruthlessly sticks pins through his beetles (being a mechanist in science who has no room for nonsense about the feelings of a beetle) and arranges them in the order determined by the theory of organic evolution. He is in turn three different persons, one might almost say.

Such a departmental mind has not developed intellect in the full sense; he has acquired rather three small distinct primitive intellects, each in the service of one interest, one sentiment.

Consider a little further how each such department of such a mind is organized. It has a unity of interest, it is concerned (in modern parlance) with one system of values, because it is rooted in one organized system of propensities, those incorporated in the sentiment; but its integration is furthered by a multitude of links of association formed, in

the course of its activities, between its various abilities; associations formed largely according to the accidents of time and place. The various more interesting incidents experienced in the practice of the religious cult are apt to be associated together. The same is true of the incidents of his family life, and again of those of his scientific pursuits.[1] But between the man's memories of the three kinds, between the three systems, links of association are few and feeble. When he is hearing a sermon or attending a church festival, he is not likely to be reminded of his family responsibilities or his scientific pursuits; and when he is absorbed in his beetle-hunting, nothing reminds him of his family or his church activities; and in each case for two good reasons: first, the dominance of one interest, of one system of tendencies; secondly, the paucity of links of association between the several systems, and the abundance of such links within each system.

Such departmental development is natural. How is it that some men escape it, or pass beyond this stage to develop intellect in the full sense of the word, while all normal men develop intellect in some degree?

The man of 'no education' acquires intellect in a modest degree in so far as certain of his abilities are necessarily brought into the service of all his interests. For example, our man of three great interests, even if he were quite 'uneducated', an untutored savage, would inevitably bring his topographical abilities into the service of all three interests; in all three forms of activity he must find his way about from place to place.

But it is the cultivation of intellect in the process we most commonly call 'education' that, in civilized communities, most effectively promotes its development, forestalls the departmental specialization of any one system of abilities,

[1] Here the reader must bear in mind our discussion of the two kinds of learning, the intelligent learning which involves discrimination and results in differentiation of abilities, and the habit learning which is a mere linking together in virtue of the conjunction of elements or abilities in one train of activity.

and produces a single more or less integrated system, one which comprises all the abilities and is at the service of all tendencies and interests.

Language is studied for its own sake, as we say ; in reality, various incentives are artfully provided to evoke in the child efforts to understand words and their relations and to become skilled in the use of them ; language abilities are thus developed into a highly complex system that is at the service of all interests. The acquisition of reading and writing is merely accessory ; it involves subsidiary systems of abilities, chiefly executive. The study of geometry ' for its own sake ' develops the topographical abilities, and puts them also at the service of all interests. The study of arithmetic and algebra differentiates the system of abilities concerned with numbers and their relations. Each of these studies is a course of ' disinterested ' activity, i.e. an activity prompted and sustained by many tendencies, of which the best, the most conducive to the development of universally serviceable abilities, is the tendency of curiosity.

Of course, the student of any one such branch of knowledge may specialize too early and too much. He may then become an expert in, a master of, say geometry, while remaining a simple-minded creature in all other spheres. Extreme instances of this sort of thing are the calculating prodigies who, at an early age, develop astonishing arithmetical powers, while, in some cases, remaining otherwise dull-witted and incompetent.

But all-round education involves the cultivation of abilities of many kinds, resulting in a balanced system of systems, all parts of which can be brought to the service of any interest or tendency ; and between all parts of which many links of association are formed. A higher integration is achieved by some study of the principles of thinking, of methodology or logic ; and the most complete integration by philosophical study rightly conducted, a study which will not only integrate the special systems of scientific knowledge, but also bring them into the service of the higher sentiments in which our higher values are founded.

Intellect, thus cultivated and integrated, becomes a universal instrument which can be used by every tendency and every system of tendencies, by every sentiment, to promote the attainment of its ends or goals. Yet it is still but a means, a servant of the tendencies, an infinitely flexible and very powerful instrument: it does not, and by its very nature cannot, determine our goals; though it has its part to play, as reconciler and adjuster, whenever tendencies and interests come into rivalry or conflict—a power that 'shapes our ends rough-hew them how we may'.

The Integration of Character

We have seen how intellect is integrated and how at the same time its systems of abilities become relatively independent of particular tendencies and sentiments, because rendered capable of functioning in the service of all of them. It remains to consider how character becomes an integrated system relatively independent of intellect.

We have seen that sentiments and tastes are the units of organization of the affective side of personality; sentiments of love and hate, of respect and contempt, of admiration, of reverence, of pride, of ambition, centred upon objects of many kinds, persons, things, groups, institutions, and abstract qualities; tastes for activities of various kinds, all those activities in which repeated successes have confirmed and strengthened the particular modes of activity in which some tendency or sentiment has expressed itself.

We said that the mere possession of an array of sentiments and tastes, though it gives a certain consistency to conduct, does not constitute character. Character is achieved by a further step of organization, organization of a higher level which integrates the sentiments and tastes into one system. So long as this higher level of organization is not achieved, the various sentiments may enter into brute conflict with one another, with resulting inefficiency of action, waste of energy, confusion of methods and wavering of purposes. It is only the attainment of such higher level of organization

that renders a man capable of volition or exercise of will-power in the full sense of the words.[1]

Such higher organization may take many forms and approach towards completeness or perfection of integration in various degrees. We can consider only a few of such forms. The simplest form of integration, the one most easily understood, is attained by the development of some one sentiment to such strength and range of influence that it easily overrules the promptings of all other sentiments and all sporadic impulses. Such an overruling or dominant sentiment we may call a master-sentiment. It may be a sentiment of love or of hate for some person or other concrete object. In an earlier chapter we have seen how a mother's single-hearted devotion to an only child may dominate the whole course of her life, furnishing a determining motive for every situation, postponing every other tendency and desire to the desires of her maternal sentiment. In such a case the course of life thus determined may be thoroughly consistent and effective and wholly admirable ; yet circumstances may arise in which the master-sentiment will override all scruples and all restraints, all considerations of justice and even of common decency, and impel to acts of injustice, deceit, cruelty or crime.

In a simple case of this sort we can hardly speak of a master-purpose. For, as was said on an earlier page, purpose implies a deliberate self-conscious acceptance of some goal as one to be attained.

A higher level of integration is exemplified by the man who develops a strong ambition. If his ambition is not directed to any clearly envisaged goal, it may be described as a fixed desire for distinction or fame, or as a love of glory. Such desire differs from such simple desires as the desire for food when hungry, the desire for a safe retreat when in danger, the desire for company when lonely ; these are desires

[1] There are two usages of the word 'will'; a looser wide usage that makes the exercise of 'will' equivalent to 'conation' in general; and a stricter usage which confines it to the highest forms of conation properly called 'volition', the expression in action of character.

that sporadically spring from the propensities, according to the situation of the moment. The desire for fame is a fixed desire, because it springs from the sentiment of self-regard, and is centred upon the self, an object perpetually present, one from which it is impossible to be separated, one which is inevitably brought to mind in all situations, especially all situations that call for choice of goals and decision as regards means to the chosen goal. This peculiarly and inevitably intimate relation of the self-as-object to the thinking organism gives to this sentiment a preferred position of peculiar power, makes its desires a co-operating factor in the motivation of all more serious activities. It is the co-operation of this factor which, in self-conscious choice and decision, raises other desires to the plane of purpose in the full sense, raises behaviour to the plane of conduct, extends the range of foresight until it reaches beyond the limit of the individual's lifetime, and gives to conduct a consistency which no other sentiment can ensure.

The dominant role of the self-sentiment is least difficult to understand where it takes the form of ambition directed upon a clearly defined goal. Imagine a boy, conscious of great capacities, who resolves that he will become Prime Minister, or Lord Chancellor, or President of the United States, or head of some vast corporation. He lays his plans; cultivates the knowledge and the skill and the acquaintances that seem to him most serviceable as means to that goal; and values all things, positively or negatively, in proportion as they seem to make for or against the realization of his ambition, scorning delights and living laborious days. Thus he becomes a highly integrated personality of strong character.

But, if this is all, our hero remains a crude personality; he will, except in so far as restrained by a kindly disposition or considerations of policy, act in ruthless, cruel or unscrupulous fashion when such action seems to forward his ambition. And, since such persons have commonly but little understanding of their own motives, that is to say, are essentially naïve, he may easily become something of a hypocrite.[1]

[1] Hence 'the last infirmity of noble mind'. Illustrations of the truth of this characterization of ambition abound in the political

Character in the full sense is of more complex organization than that of the crudely ambitious man ; it is achieved only by a more reflective working of the sentiment of self-regard, a greater degree of co-operation of the intellect. First, it implies the formation of moral sentiments, sentiments of admiration for certain qualities of personality and of dislike, hatred or contempt for other qualities, sentiments which will of themselves supply motives for actions expressive of the admired qualities and for the avoidance of actions expressive of the qualities disliked. It requires also that, by reflective judgement, such qualities (which, in virtue of the sentiments of liking and disliking for them, become, in the convenient jargon of contemporary philosophy, ' values ') shall have been ranged, however roughly, in a scale of comparative values.

But more still is required if the moral sentiments are to govern a man's conduct in all relations. Consider a single such sentiment, the love of justice or fair play, which is claimed in peculiar degree for Englishmen. The man who has acquired this sentiment will approve acts of justice and deplore acts

sphere. The naïve egotism of so many successful statesmen is the great bane of political life. It may be said, without exaggeration, that the great problem of democracy is to bring into positions of dominant influence men of great capacities who are not naïvely ambitious, men who will sustain the labours and bear the buffets inevitable in the strife of parties from other motives than unadulterated ambition. The late Lord Curzon provides a striking example of an ambitious man. He achieved a highly honourable and useful career, enjoying great honour, distinction, power and wealth, attaining everything except the goal of his ambition, the premiership. And, because he failed to attain this, we are invited by his biographers and the reviewers of his biography to regard his life as a solemn tragedy and the Earl himself as suffering pangs and tortures that deserve our deepest sympathy. More instructive, as illustrating the disastrous effects that may be wrought by naïve egotism of this sort, is the career of Woodrow Wilson. Is it too much to say that in this case the ambition attained its goal, yet in the very moment of attainment brought disaster to itself and to the world, through his unwillingness to dim the glory of his achievement by sharing it with others who should have been his colleagues ? I can conceive of no remedy for this outstanding difficulty of modern civilization short of the drastic one of inducing all our young people to make some study of psychology.

of injustice. But, if the sentiment is to ensure that his own conduct shall be just on all occasions, even when his ambition prompts him to injustice, a man must have learnt to desire that he himself shall be a just man; justice must be for him a quality of the ideal he strives to realize in his own person. This means that the sentiment of love of justice must be incorporated in, organized within, his sentiment of self-regard. When this is the case, all the great energy of the self-regarding motives operates on the side of justice in his own conduct. Of such a man one may truly say: 'Thrice is he armed that hath his quarrel just'; and one may feel sure that he will enter into no quarrel where he is not convinced of the justice of his cause.

When such a man confronts the problem of his own conduct in a particular case, he will contemplate the possibility of unjust action not merely with the mild disapproval that such action by another man would evoke, but rather with abhorrence: and if he is betrayed into unjust action, he will not merely disapprove or regret the action; he will suffer the pangs of remorse, the most painful of all emotions. When, on the other hand, perhaps after a hard struggle, he has acted justly, he will enjoy a peculiarly deep satisfaction.

The same is true of sentiments for other great moral qualities, honesty and generosity and charity. When such sentiments are organized within the sentiment of self-regard, it becomes a great and complex system, all parts of which contribute to the energy of self-conscious effort and play their role in self-conscious deliberation, and in the choice of both goals and means.

The system of the sentiments thus becomes a hierarchy dominated by the self-sentiment which has assimilated to itself the abstract sentiments, ideals of conduct and character which the man has made his own in a peculiarly intimate sense, in the sense that they have become a part of the very core of his personality.

It is commonly asserted that habit is of the essence of character; and in two ways this is true, if we use the word

'habit' in the widest possible sense: for sentiments are, in that sense, themselves habits; and the law of increased strength through use (which we have recognized in Chapter XXIII) holds true of the tendencies of character. But more important, in confirming and strengthening the tendencies of character, is the law of taste-formation (Chapter XV). Consider again the sentiment for justice or fair play; and take the case of a man whose business it is to administer justice, the magistrate or judge. On each occasion on which he attains a just decision, he experiences the satisfaction of successful action. Such activity becomes not merely a habit, but a taste; he loves his professional work, we say, just as, on a lower plane, the successful golfer acquires a taste for the game. Thus, through exercise, the sentiment engenders a taste and is re-enforced by it; while all action of the opposite kind becomes distasteful.

Here we see a little deeper into the generally recognized truth that the playing of games in the right spirit greatly promotes the formation of character. Contact with admired personalities in real life and in literature may do much to form the abstract sentiments and to organize them within the self-sentiment; but only the exercise of them in conduct can confirm them and give them effective power to rule absolutely; and for such exercise games afford abundant opportunities. Team games are esteemed highly in this respect, and rightly; for they can exercise the virtue of loyalty and develop the group-spirit. But the single-handed game is not without its advantages, especially when played without an umpire. How small a difference it may seem between the man who, in the tennis singles, gives himself the benefit of the doubt about 'in' and 'out', and the man who gives it always to his opponent—yet how great in reality! The one you cannot feel sure of when out of sight; to the other you may confidently entrust your fortune and your honour. He who is faithful in small things is likely to be faithful also in greater matters: for he has confirmed by successful exercise, on a multitude of small occasions, the tendencies which alone can keep him on the

straight path on the rare occasions of major temptation to diverge.

Ask any normally honest man why he did not win that hotly contested game by giving a verdict in his own favour at the crucial moment when only he could say whether the ball fell inside or outside the court ; or why, though he is hard up, he gave back to a clerk whom he will never see again the excess of change given him in error. He will not prate of his sentiment for justice or honour ; but he may well say, and truly, that it was because common self-respect required it.

A few words on a delicate question may conclude this brief discussion of a very large, very difficult and supremely important topic. Many good people have been taught to believe that the one sure way, if not the only way, to develop character in the young is to give them ' religious instruction '.[1] Now, it is certain that you cannot teach character as you may teach algebra or Latin grammar. Properly speaking, you cannot teach it at all. Even exhortational sermons and inspirational addresses are of uncertain effect ; too often they work adversely upon some considerable proportion of the hearers. If you preach, it is essential that you shall practise what you preach ; but it is better and safer, on the whole, to practise without preaching. It is in commenting upon the characters of men, especially those of history and of literature in general, that any teacher may find the best opportunity of guiding the formation of character ; for, if his own personality commands in some degree the admiration of his pupils, he will hardly fail to evoke in them, by the subtle working of emotional contagion and persuasion, something of his own reactions to the personalities discussed.[2]

[1] It is true, I believe, of American colleges in general, that if character and its development are touched on at all, it is in the department of religion ; and if there are in the library any books on the topic, they will be found on the shelves assigned to that department. In comment on which state of affairs I add that some of the most entirely honest and trustworthy persons known to me owe nothing *directly* to any religious instruction.

[2] Bible personalities are peculiarly unsuited for discussion with this end in view. For the religious instructor will, almost inevitably,

The Traits or Qualities of Personality

There is a multitude of adjectives and of corresponding abstract nouns which are used in describing persons; and these are commonly used, even by psychologists, in very indiscriminating fashion. We have analysed Personality into factors of five large classes, namely, factors of disposition, of temperament, of temper, of intellect, and of character. And we have seen that certain of these many adjectives are most properly used of one only of these five aspects of personality. For example, a man may properly be said to be of timid, or pugnacious, or self-assertive, or gluttonous, or inquisitive, or thrifty disposition, if the corresponding propensity of his constitution is disproportionately strong. Similarly, he may be said to be of excitable, or sluggish, or extroverted, or apathetic temperament. Of his temper we may say that it is energetic and fiery, fickle or steadfast, hopeful or despondent, highly affectable or equable. These three great factors, being in the main determined by heredity, that is to say, not commonly much modified by the course of life, by experience, education and training, serve as a background upon which the other two great factors, intellect and character, develop and operate; not an inert background, but one which constantly exerts its influences, modifying both the course of development and the operations of intellect and of character.

Certain other adjectives are properly applicable to intellect alone; such terms as acute, penetrating, comprehensive, encyclopaedic, witty, analytic, synoptic, well-ordered, original, cultivated or neglected, specialized or evenly developed, many-sided, poorly or richly furnished, resourceful, inclined to the abstract or to the concrete, logical, inductive, deductive, discursive, inconsequent.

separate the sheep from the goats, placing a vast and unbridgeable gulf between, and will 'whitewash' the sheep at the expense of the unfortunate goats. It is impossible to discuss in a churchly atmosphere the personality of the son of Jesse with the critical detachment essential to a just evaluation of his acts and character.

Character we properly describe by aid of such adjectives as strong, stable and well-knit, trustworthy, resolute, moral, refined, disciplined ; and their opposites, weak, unstable, etc. Or we may indicate some one sentiment which, in virtue of its great strength and extensive organization, exerts a special influence ; as when we say of a man that he is ambitious or truth-loving, is of patriotic or highly religious character.

Are there, then, any adjectives which are properly reserved for the description of personality as a whole ? Yes, undoubtedly, there are adjectives which cannot properly be applied to any one of the five great constituents of personality, but which should be reserved for personality as such, for the qualities which imply the intimate synthetic cooperation of intellect and character modified by the background of disposition, temperament and temper. Such are the words of the following list : versatile, many-sided, massive, commanding, powerful, forceful, enterprising, adventurous, simple, transparent, ingenuous, frank, crafty, baffling, theatrical, sentimental, artistic, poetic, matter-of-fact, deep, shallow, sardonic, humorous, considerate, charming, tactful, of sound judgement, just, prudent, heroic, courageous.

It is true that some of these adjectives might be applied, without serious impropriety, to either character or intellect, such, for example, as simple, shallow, massive. And there are others the proper application of which presents very subtle and difficult psychological problems ; for example, the term ' intuitive '. Is it more properly applied to intellect or to personality as a whole ? Does it imply some special ' moral ' quality as well as a mode of intellectual operation ?

A whole volume might be devoted to the discussion of such problems. But that some of the adjectives listed as applicable to personality as a whole are not applicable to any one partial aspect of personality may be illustrated in a single instance.

Tact or tactfulness is, perhaps, the quality which most obviously requires the combination of affective and intellectual qualities, is of both the head and the heart. A man of slow or obtuse intellectual quality can hardly be tactful ; quickness of perception and of understanding, and resource-

fulness that comes only with much social experience, are necessary; but also a sympathetic and kindly disposition is implied: and a high degree of tact will be shown only by a person of disciplined character, one who has learnt to control his impulses and modulate his expressions.

Consider finally the adjective 'courageous'. Clearly it implies a moral quality. But may we not apply it to disposition, to temper, and to character, or is courage rather a quality of the whole personality? We must distinguish; for the word is commonly used in several senses. A man may be said to have courage, if he is merely immune to fear in situations that provoke fear in most men. But this may well be due to a peculiarity of disposition, an unusual weakness of the fear propensity. In such a case, we might say that he has a courageous disposition; but the adjective is not 'happy', is not entirely fitting; 'fearless' or 'reckless' would be more suitable. Again, we may speak of the courage of a horse, meaning that he continues to work vigorously under difficult circumstances or in spite of fatigue. We might on similar grounds describe a man as courageous. In both cases we should be using the word of a complex quality of temper, a temper that is fiery and persistent and not easily discouraged. And, again, we should feel that the word 'courage' is used in a sense not wholly fitting; a sense that derogates something from its full value. Thirdly, a naturally timid man may have acquired by self-discipline so resolute a character that, in spite of fear and discouragement, he persists in his efforts—a form of courage abundantly illustrated during the Great War. He also might be called courageous; though 'resolute' is the more fitting word. But courage in the fullest sense implies also an intellectual factor. Suppose a man who by native disposition is but little liable to fear; whose temper is energetic, persistent and not easily discouraged; who has a strong admiration for courage and contempt for cowardice; who has acquired, in an adventurous course of life, a taste for dangerous activities and who is of resolute, firmly knit character. Suppose, further, that he is resourceful of intellect, that he has learnt

in a thousand adventures how to deal with wild men and wild beasts, with storm and fire and flood, has learnt when to take a swift aggressive initiative, when to bend without breaking, and when to watch and wait, has learnt also to estimate justly his own powers; then you have a man who is courageous in a very full sense. If anything could add to his courage it would be a firm and reasonably grounded religious belief, a belief that, so long as he acts according to his best light, he has, in an ultimate sense, nothing to fear. Such is courage in the fullest sense, a quality of the whole personality, courage such as is best illustrated by some of the great explorers.

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