An introduction to psychology / by F. Aveling.

THE OUTLINE SERIES

AN INTRODUCTION TO PSYCHOLOGY

By

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INTRODUCTION

PSYCHOLOGY is still a science in the making rather than a finally established one. This is indicated by the lack of agreement among psychologists upon the exact definition of the subject. There are a number of contemporary schools in existence, each advocating its own particular principles and methods and defining psychology in its own way. It is thus presented as the science of the soul, of mind, of consciousness, of behaviour, and the like. And this is not astonishing when we remember the extraordinarily varied interests of psychologists to-day. They cover so wide a range, and involve so great specialisation, that many points of view are inevitable. There is, however, more real unanimity than might appear on the surface ; since, with negligible exceptions, all would agree that the principal subject-matter of psychology is human conduct ; that it is concerned with conduct in order to discover the principles which account for it, and so be in a position to control and guide it ; and that the

methods to be employed in the study are the observation of behaviour, on the one hand, and introspection, or the inner observation of our own conscious processes, on the other. All the definitions, though apparently exclusive, can be reduced to a single formula. Psychology is the science which investigates behaviour in general from the point of view of its mental implications, whether conscious or unconscious, with a view to control.

To appreciate the present state of scientific psychology it will be useful to review the outstanding points in its historical development. It is the last of the sciences to have broken away from philosophy ; and it still raises acute philosophical problems at every turn. Solutions of these problems have been offered by a succession of great thinkers, in which we find a progressive clarification, each advance marking a higher achievement than the preceding one. But almost from the outset we discover indications of contemporary systems. The central problem, towards which all the others converge, is and always has been that of the nature of man as shown in his various activities, and particularly those of feeling, thinking and willing, so far as they account for human conduct. The history of psychology, accordingly, will be an account of the ways in which

conduct has been interpreted, and of the different conceptions men have framed of themselves as actors in the drama of life. It could have no beginning until the observation that such conduct differs radically from the behaviour of inanimate beings, and in many essentials also from that of animate creatures other than human, had provoked reflection upon the reason why this should be so. From the very origin of the human race man has presumably been a self-conscious animal ; but there could have been no psychology, even the most rudimentary, until he came to reflect upon his own self-consciousness and attempt some explanation of it.

PREHISTORIC THOUGHT

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IT HAS been assumed that psychology originated in the thoughts of primitive men about the phenomena of sleep, dreams, insanity and death. These would lead to belief in the existence of impalpable counterparts of the bodies of the living, which were capable on occasion of severing their connection with the body, and at death finally departed from it to live on as ghosts in an underworld. Proof of this for the primitive mind would lie in the fact that the inert body of the sleeper awoke to report dream adventures in remote places and times, and to recount his meetings and transactions with people already dead. Further proof would be found in the phenomena of mental disease, which would point towards possession of the body of the sufferer by conscious agents other than himself, by demons, ghosts or forces able to control its actions even against his will. The conscious wraith, wandering abroad in sleep and disappearing at death, would be held to inhabit the body during life, and to account for

the latter's vital actions, movements, feelings, thoughts and desires. The assumption presupposes considerable reflection already on the part of primitive man ; and it is probable that it was preceded by a stage of development in which no distinction was made between animate and inanimate beings, but all were thought of as possessing hidden activities similar to those of man himself. In this stage, by an analogical interpretation of Nature in the light of the primitive's own experience, everything would be regarded as endowed with conscious life, and able to play its kindly or malevolent part in human affairs. Until this stage had been outgrown, and distinctions between conscious and unconscious beings recognised, there could be no beginning of science, either physical or psychological. There is evidence of a phase of animism (the endowing of physical objects with consciousness) which precedes the distinction of living from inanimate beings in the developing mind of the very young child which, according to the theory that the development of the individual recapitulates the evolution of its kind, represents the mind of the race in its childhood. We find such evidence also in the early speculations of philosophy. But from the point of transition onwards, psychological history is the history of the problem of the

conscious self. No doubt a gap of centuries lies between the vaguely felt distinction and the earliest records of explicit attempts to explain the nature of the universe and of man as a part of the universe. Such systematic attempts, however, were made by the Greek philosophers. Beginning with them, accordingly, we may divide our summary into four main periods : (1) the epoch of Greek speculation, in which the Mind-Body dualism arises in a general framework of philosophical theory ; (2) the period of mediæval thought, during which great emphasis is laid upon the mental powers as indicating the spiritual nature of man ; (3) the modern era, beginning with the distinction drawn by Descartes between the body and the mind ; (4) contemporary psychology, dating back to the introduction into science of the hypothesis of evolution.

PSYCHOLOGY IN GREEK SPECULATION

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PSYCHOLOGY IN GREEK SPECULATION

THE CENTRAL problem of psychology emerged only gradually in Greek speculative thought, and phases in its development may be distinguished. Greek philosophy arose in an atmosphere of strongly religious and mystical tradition, and at first was mainly concerned with the study of external Nature in a search for principles by which the latter might be explained. The early philosophers were extroverts, *i.e.*, their interests were centred upon cosmic changes rather than upon themselves; and they found the principles required in a physical element, or combination of elements, together with a life-principle not separated from these. All matter is alive, and all living things have souls. An advance was made, however, in the distinction of the forces of love and hatred (attraction and repulsion) from the original, imperishable elements, fire, air, earth and water; an interpretation of physical change, though not clearly recognised, on the

lines of psychical experience. Dualism begins vaguely to assert itself in cosmology, or the philosophical interpretation of physical Nature. It also asserts itself psychologically in a theory of perception. Perceptions are due to emanations from bodies which pass through the pores of sense to the soul, in which like is known by like. Thought is ascribed to all things without distinction, and depends upon the mixture of the elements. A still more interesting advance was made when the formative power of mind or reason was postulated to account for the origin of the world from a primitive agglomeration of infinitely small particles of every sort of substance. A principle which cannot be perceived by the senses is for the first time invoked to explain the evolution of the cosmos ; for mind is distinguished from material things by its characters of simplicity, freedom, omniscience and omnipotence. Just as hylozoism (the conception of the all-pervading life of matter) was a projection of unanalysed personal consciousness upon objects of the external world, so here spirit or reason, experienced in personal thinking, planning and willing, is a projection upon the universe. Thus cosmological dualism (world and soul) is the result of the beginning of reflective analysis of mental process. In psychology this indicates a clearer

distinction between sensory and intellectual knowledge. The former, though not necessarily deceptive, is weak ; the latter acquaints us with the truth, and is due to a spiritual principle or soul. Mind, accordingly, is not only a principle which accounts for the formation of the world, and implies teleology or progress towards a goal ; but also in man it takes the form of an individual soul in a material body. Immanent in the universe, it is also an immanent constitutive principle of the individual person. This doctrine marks a distinct advance in an entirely new direction ; but it was not consistently followed up, and gave place to a theory of atomism in which inherent necessity was substituted for mind or reason in explanation of the way in which cosmic processes came about by the aggregations of physical atoms. Yet psychological problems occupied attention even in this new phase of thought. A theory of knowledge was advanced in conformity with the atomistic postulate. Nothing save material atoms exists. Sense-perception, accordingly, is mechanically determined by images which emanate from objects and come into contact with the soul. But such perception is obscure and deceptive ; for it presents as qualities what is, in fact, quantity. Thought also is a mechanical modification of the soul ; but in thought we grasp the

true natures of things as constituted by the invisible quantified, material atoms. Impulse, conation (striving) and will are explained as the giving out again of the images received in perception. In this theory the distinction between soul and body is not rejected ; but the soul, like all else, consists of atoms of " fire," perfectly smooth and round. It is the noblest part of man, warming his body while alive, and separated from it at death. Atomism reduces psychology to physics, but has significance in psychological history. By stressing the mechanical aspect of Nature, it made way for a vivid contrast between it and the subjective world of Mind ; and by drawing attention to the illusory nature of sensory knowledge it called for a critical examination of all knowledge by a subjective analysis. The antithesis between thought and perception came also to expression in other early schools of Greek thought. It was emphasised by the attempt to explain cosmic change on the basis of mathematical relations. Numerical concepts, unlike the changing objects of sense experience, are eternal, unchangeable, imperishable ; and accordingly they provide a higher kind of reality for thought than that reached in perception. Nature obeys the mathematical laws of abstract number ; and to know Nature is to know the laws its phenomena

express. Applied to psychology, this view makes the soul the numerical harmony of the body, just as the world-soul from which it derives is the harmony of the universe. Its parts, or faculties, are reason, understanding and desire. But this classification of powers is less important than the concept of the principle from which they derive as an abstract mathematical relation. This was a parallel of the still more abstract concept of Being, which was developed in another line of thought, and still further stressed the antithesis between sense and reason. A group of thinkers, beginning with the postulate that Being *is*, and not-Being can neither exist nor be conceived to exist, came to the conclusion that Being is one—unproduced, unchangeable and undivided. This fundamental doctrine of the absolute unity and immutability of Being acutely raised the problem of the distinction between reason and sense, and threw doubt upon the validity of sense-perception of the external world. Whereas intellect grasps reality as in fact the one and changeless, our senses reveal to us nothing but the many and change. The world of movement, becoming, appearance, is an illusion and a paradox. Such a position as this called for a criticism of the worth of knowledge, and again implicitly emphasised the necessity of

undertaking such criticism from the psychological point of view.

The doubts thus cast by all the schools alike upon the validity of sense-perception deepened in the scepticism of the Sophists. All truth, they taught, is relative to the observer ; there is no objective truth. Admittedly our senses deceive us. Why should not reason deceive us also ? Knowledge is only personal belief ; contradictories are equally true if different people hold them to be true ; everything is equally false. But even this movement of scepticism had significance for psychology. It drew attention to the personal element in knowledge. It reduced objective truth to personal opinion. And it immediately provoked an examination of the problem of the value of knowledge which played so great a part in the subsequent shaping of psychological science.

Up to this point Greek philosophy was predominantly objective. It dealt with problems of the physical world to the relative exclusion of man, his mind, its nature and origin. But it led to a view of the relativity of knowledge in the sense that knowledge is relative to the individual possessing it ; and this, at the hands of Socrates, Plato and Aristotle, was met by theories in which psychology definitely found its place and was expanded into coherent systems.

The outstanding contribution of Socrates (b. *circ.* 471 B.C.) to psychology was the substitution of the subjective for the objective method. The Sophists had followed the old method and given up the search for truth. Socrates, looking within consciousness rather than upon the external world, tried to determine the conditions of knowledge by an examination of the mental constitution of man himself. He thus established the validity of our concepts as products of logical induction and definition, and so provided a scientific basis for the principles of knowledge and conduct alike. His method was one of questioning, by which he helped his pupils to form for themselves concepts of the changeless natures of changing things. Starting with commonplace sensory experience, he led them by a process of induction to the admission of stable intellectual definitions. He thus countered the sceptical individualism of the Sophists with a doctrine of rational, universal and socially acceptable knowledge; and he showed that sense-perception and uncritical generalisation can be controlled by critical and logical thought. Logical concepts thus become both the test of truth and the guide of practical aims. Though a moralist and a logician rather than a psychologist, Socrates occupies a high place in psychological history because of his

insistence upon the nature of the process by which true conceptual (abstract and universal) knowledge is reached, or may be reached, by all men.

The Socratic doctrine was developed by Plato (b. 427 B.C.) in a metaphysical direction, which had its bearing upon psychology, in his theory of Ideas. Plato regarded the Socratic concepts as being objectively existent things. Our knowledge of them is occasioned by, but not derived from, sense-perception. Ideas, accordingly, are not merely personal possessions differing from one individual to another, nor even mental contents shared in common by all men. They are realities in themselves, having an existence apart from the sensory world. For Plato, true knowledge is a grasp of changeless reality, not mere opinion born of sense-perception. Socrates had shown that the possession of concepts was the necessary and sufficient condition of stability in knowledge. But to what objects have these concepts reference ? Plato held that knowledge is something received, or given to the mind. Ideas, accordingly, are given ; concepts correspond to the realities from which they proceed. To deny this would be to deny the reality of Being, as well as all possibility of attaining to scientific knowledge. But the Ideas do not exist in the changing world of the senses ; and we are

not in touch with any ideal world. How, then, do we come to know them ? Plato answers with a doctrine of reminiscence, or memory. In a previous existence we actually contemplated the Ideas ; in this life, immersed in a world of flux and change, we recall them to mind. We may thus distinguish the three worlds, *viz.*, of *concrete phenomena*, *concepts* and *Ideas*. Concepts are the mental representations of Ideas beyond the reach of sense ; sensory phenomena are their faint shadows or copies. The importance of this line of thought for psychology is evident. The contrast of sensory phenomena with Ideas, the making of subjective concepts into a real world of objective " universals," emphasising the old distinction of intelligence and sense, sets over against each other two objective worlds, the one the realm of intelligible reality, reason, order and goodness, the other a place of appearance, plurality, disorder and imperfection. But it stresses also subjectivity, and points to a necessary distinction between soul and body. The doctrine of reminiscence necessitates the pre-existence of the soul. This Plato defines as the principle of self-movement, explicitly rejecting the view that it is the harmony of the body. It is the living, moving element in man which perceives, knows and wills. But these processes are on different levels ; and the

soul is accordingly divided into three parts, the rational, the courageous and the appetitive (desire), having their seats in the head, heart and abdomen respectively. The rational soul alone is immortal, possesses free-will, and is created by God. In a series of transmigrations into new bodies it gradually rids itself of its irrational parts through the conquest of desire by reason. Plato's psychology is built around his theory of Ideas, and moves upon the ideal plane. The nature of the soul is deduced from the theory rather than reached by an examination of mental activities. What is now understood as empirical or experimental psychology is, in Plato's view, part of physics, and therefore no true science ; for man, the physical object, belongs to the world of change and becoming and, like all appearance, is not an object of scientific knowledge. Nevertheless, though the rational soul is harboured in the body and thus bound to the world of appearance, by reminiscence it lives also in the ideal world. Plato advanced the two laws of association by similarity and contiguity—that like recalls like, and that, of things experienced together, one tends to recall the other to mind—in support of his theory of reminiscence.

We have seen that the problem of the constitution of the external world led to that of the

validity of knowledge, thereby raising psychological issues. The doctrine of the stability of universal concepts had been opposed by a denial of the existence of anything except individuals ; and Plato's theory was advanced to bridge the gap, and relate the individuals perceived by the senses to the Ideas. He attempted to do this by deriving the former from the latter ; but he failed to show how the derivation comes about either in our knowledge or in the real world.

The problem was taken over by Aristotle (b. 384 B.C.), and its solution by him was made the foundation-stone of his whole philosophy. Like Plato, Aristotle held that there can be no true science of individual objects, for these are continually undergoing change. But he taught that stable intellectual knowledge nevertheless begins in sense-experience, in which only individual existent things are revealed. Instead of regarding experience as a mere occasion for the recall of Ideas, he held it to be the true source of conceptual knowledge. Instead of attempting to deduce individuals from Ideas, he reached abstract concepts by induction from concrete instances. Individuals alone are real, universals are products of the mind discerning identity of nature amidst a plurality of things. Though these may change, the conceptual essences

remain fixed and stable. Thus, although intellectual knowledge is essentially dependent upon sense-perception, it is also essentially superior to it. Aristotle's doctrine of knowledge implies radical differences between his psychology and that of his predecessors. In the first place, since scientific knowledge arises from sense-perception, his method is empirical. Natural events are explained on principles reached by induction. Though all involve change, the phenomena of Nature fall into different classes. Some things move (change) because moved by others ; some change because they move themselves. The latter are alive ; and life is accordingly defined as self-movement, of which the soul is the principle. For Aristotle, soul is not a synonym of mind or consciousness. It is the explanatory principle of every kind of vital process, including nutrition, sensation, movement and thought. Psychology, accordingly, is the empirical study of vital processes as manifested in plants, animals and man. But stress is laid upon sensation and thought ; and, because the more perfect includes the less, and thought is a function of the human soul, the study of the principle of thought in man embraces all psychological problems. In the second place, though his method is that of objective observation, he does not neglect introspection. Indeed, Aristotle's

theory of knowledge is built upon the introspective distinction of percept and concept (object of sense-perception, object of abstract thought) ; and a considerable part of his psychology is devoted to showing how we pass from the sensing of the former to a scientific knowledge of the latter. Nevertheless, his psychology is dominated by a metaphysical theory with regard to the constitution of individual things ; and, indeed, it is on this theory that he accounts for the transition from perceiving to conceiving. Four principles are necessary to explain the constitution of all concrete beings in the physical order, and the changes which they undergo ; matter, form, the efficient (or producing) and the final (or goal) cause. Of these, two are intrinsic principles of the thing in question, the matter and the form. Matter is that out of which the thing is made ; marble, for instance, is the matter of the statue. But matter, before the statue is fashioned, is a definite natural substance ; and it, in turn, is to be conceived as made out of a " first matter," an indeterminate though determinable principle which cannot exist or be known without form. Form, on the other hand, is the determining principle which actuates matter and constitutes it a definite kind of being, marble, oak, horse or man. It is that into which the thing is made. It is also the object

of conceptual knowledge, the changeless essence abiding throughout all the changes the concrete individual undergoes. Applied to psychology, the soul is the form of the body ; the matter of which body is formed is a mere potentiality of life which is actualised by soul. Accordingly soul and body, though distinct, constitute one substance only. Man is a unitary being. Furthermore, there is only one soul in man, accounting for all the processes of nutrition, appetite or desire, locomotion and reason. It is not divided, as Plato taught, into parts, but is distinguished into faculties which are the modes of its activity. The conception is a biological one, in which natural species are regarded as unchanging. Plants have nutritive and reproductive souls ; animals have sentient souls with powers of feeling, imagination and locomotion ; and man's soul adds to these the powers of reason, deliberation and will. In the biological scheme soul may be considered in an ascending scale, the higher developing from and including the lower. In this conception, psychological data in the modern sense are not abruptly separated from physical ones ; but the observation of vital process is observation of behaviour as function of the soul. Aristotle incorporated an astonishing number of empirically established data into the framework of his theory. He

divided mental powers into those of knowing and desire, and connected the power of movement with the latter. He made a study of the special senses, and of the " internal senses " by means of which we perceive, imagine and remember. His explanation of sensory process in general is that the forms of sensed objects are received into knowledge without their matter. Sense is thus regarded on analogy with matter as potential to the reception of forms. To each external sense corresponds a " proper object," as colour to vision ; but besides these there are also " common objects," such as movement and shape, which we apprehend by several senses. The five external senses, however, are insufficient to explain perception, in which different kinds of sensations come together. This function is ascribed to a central sense ; from which also the latent images, without which reasoning is impossible, arise in memory. Aristotle states three laws of associative revival of experience—contiguity, resemblance and contrast (like recalls unlike) ; and he teaches that man alone has the power of active recollection and constructive imagination. To account for conceptual knowledge he advances a theory of abstraction. Like the senses, the intellect stands in relation to its objects as matter to form. It requires " information " in order to

understand. Its proper objects, however, are the universal essences of things ; and these " intelligible forms " are neither discoverable in the world of concrete beings nor exist apart as Ideas. The only things which exist are individuals. The intellect works, accordingly, upon the material supplied by the senses and illuminates the universal essence enshrined in the individual, thus mentally considering it apart from all individualising characters, such, for example, as time and space. Once rendered intelligible in this way, the object impresses itself upon the passive intellect precisely as the sensible object impresses its form upon sense, and the intellect passes over to conceptual knowledge. Intellect is thus distinguished as active and passive, a power of rendering knowable what was only potentially so, and a power of receiving intelligible forms. In this account of the processes of knowledge from the lowest to the highest stage, the same general principles are invoked. All knowledge originates in sensation ; but there is an activity which discovers the universal elements of thought in the concrete beings of sense. Is this activity a faculty of the soul, or is it something transcendental to the individual man ? Aristotle's thought here is obscure and disputed. But in any case, because the intellectual activities transcend the conditions

of matter, he holds that the acting intellect is both immaterial and immortal. On the orectic side (desire, striving, will) Aristotle is no less a pioneer in psychology than on the cognitive (knowing, remembering, etc.). His study of movement led to the view that all perception is accompanied by pleasure or pain. These give rise to impulse and desire. Impulse, appetite and emotion lead to action. But besides these spontaneous motives there is also deliberate will, which may be described as intelligent desire. Corresponding to the division of cognitive states, desire, will and choice are determined by percepts and images, by concepts and rational insight; and in deliberate choice will is free. Aristotle's conception is that of a moderate dualism in which soul and body are not separate entities, but together constitute the individual. On this background he draws the lines of a naturalistic and empirical psychology. The subjective point of view is never lost, although the objective is greatly developed; and psychology takes its place among the biological disciplines as the final chapter of natural science.

There is little of psychological interest in Greek philosophy subsequent to Aristotle. Atomism was reasserted (Epicurus; b. 341 B.C.) with the curious addition of a doctrine of freedom. To this determinism (denial of freedom)

was opposed (Stoics), in an interesting anticipation of a view of consciousness as consisting in passively received sensations, from which all knowledge, feeling and will are derived. These sensations become representations when they rise with increasing clearness in consciousness. These two points mark a phase of development in the concept of the mental as contrasted with the physical, and also foreshadow the modern doctrine of the subjective variation of clearness in ideas.

The last stage of Greek speculation has even less interest for psychology. Attempts were made to unite Jewish religious beliefs with the philosophy of Plato, Aristotle and the Stoics. The number theory and the theory of Ideas were revived ; but philosophy tended to degenerate into mysticism. The chief significance of these movements, so far as psychology is concerned, is that, infiltrating into Christian tradition, they influenced the thought of so great a psychologist as St. Augustine (b. A.D. 354).

PSYCHOLOGY IN EARLY CHRISTIANITY

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With the spread of Christianity, the growing need of expressing its teaching systematically and of providing an apologetic for it resulted in Patristic philosophy (*i.e.*, that of the Church Fathers), which arose in subservience to religious dogma. In this there is little relevant to psychology before St. Augustine except the common distinction of soul and body, the doctrine of immortality, and an increasing precision in the concept of personality. In Augustine, however, we find a psychologist of outstanding eminence, who left the impress of his thought upon all subsequent speculation. Two pivotal ideas stand out in his philosophy : God and the human soul. The great stress laid by Christian teaching upon the value of the individual raised problems concerned with the personality, nature, origin and destiny of man. The theological doctrines of the Trinity and of the dual nature of Christ accentuated those problems ; and in such a setting Augustine's

psychology was developed. Familiar with nearly all the philosophies of antiquity, he is in the main a platonist ; but he incorporated also into his system many results reached by other thinkers. His chief explicit contribution to the science is his vigorous assertion of the value of the introspective method, whereby he defines the subject-matter of psychology as the inner world of consciousness, distinct from that of physical Nature. The soul is known in self-consciousness as a simple, immaterial and spiritual thing. This he proves from the fact of sensation, using a neo-platonist argument : *viz.*, the soul is everywhere in the body, since it receives impressions coming from all parts of the body. It is therefore immaterial ; for it is no one part of the soul which perceives, but the self as a whole. Further, he shows that it is immortal, on the ground that imperishable concepts are discovered within it ; and what contains the imperishable must itself be immortal. The platonic character of these proofs is evident ; but the point made is that they are based upon introspection, which reveals mental life as a continual activity of the soul. This shows itself in three functions—intellect, will and self-conscious memory—which are not distinct from the soul itself. The fundamental principle is will, which moves intellect and

inner sense to action, and is both ethically and psychologically free. Man is therefore by nature a spiritual soul making use of a body. He acts upon the body, but is not acted upon by it. The senses, accordingly, engender neither sensation nor thought ; it is the soul which gives birth to both. Thus all ideas are innate, and are formed in the soul under the influence of divine illumination. Augustine classifies mental powers as faculties of sense and faculties of spirit. The former include appetite and sensory knowledge arising in connection with, but not dependently upon, the external and internal senses. The latter are common sense, imagination and memory. Faculties of spirit embrace will, understanding and intellectual memory. In Augustine's view the source (which is revealed by introspection) of mental activities, though united to the body, has its own substantiality, and can be studied in its own right. In considering its origin, he hesitates between creationism (the creation of the soul from nothing by God) and traducianism (the derivation of the soul of the child from those of the parents) ; but on theological grounds inclines to traducianism. A great gain for psychology is registered by Augustine. In separating the inner from the outer world he justified the study of the former as a distinct branch of knowledge ; and in

insisting upon the immediacy of self-consciousness in reflective thought, he drew a sharp distinction between the self as subject and the objects of its knowledge, thus furthering the dualistic point of view. His influence in psychology is everywhere traceable throughout the Middle Ages, comes to more explicit development at the beginning of the Modern period, and is manifest in many directions of contemporary thought.

PSYCHOLOGY IN THE MIDDLE AGES

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WHILE Platonism colours Patristic speculation, Aristotelianism is the hall-mark of Scholasticism (the philosophy of the mediæval Churchmen), though both streams flow together and intermingle in mediæval thought. The principal representative of Aristotelian tradition is St. Thomas Aquinas (b. 1225, ? 1227), who stands out pre-eminently in the philosophical development of the thirteenth century. More than ever before, psychology becomes in his hands a comprehensive body of unified doctrine, easily separable from the rest of philosophy though intimately connected with it. Aquinas is concerned with the nature of man in order to infer from it his origin and destiny. He accordingly examines all human activities to determine what human nature is and what it implies. He follows closely the main lines of Aristotelian thought, but develops and alters the traditional teaching in several important respects. In his view, all human

activities are functions of faculties proper to man as a composite of matter and form ; but the faculties are due to form, or soul, and not to matter. The existence of the soul is known in any one of its activities ; but its nature as a spiritual actuality is only grasped by diligent reflection upon the characters they display. Aquinas distinguishes the soul from its faculties and these from each other, however, because of irreducible differences in vital operations which cannot be accounted for by any one single principle. Here he parts company with Augustine and clarifies the obscure teaching of Aristotle. The faculties are the proximate grounds of the vegetative, cognitive and appetitive functions. Aquinas, however, was principally interested in knowledge and desire as expressions of the purely mental life. He distinguishes knowledge into two orders, a lower, or sensory, form and a higher, or intellectual, kind. In general, his explanation of the processes of knowing is Aristotelian. The joint activity of the object and the knowing subject engenders a mental image representative of the object. Sensation, perception and sensory appetite are regarded as psycho-physiological processes, stress being laid upon their physical aspect. Here the interdependence of organic function and mental process is in striking

contrast with the Augustinian view. Being organic, the senses are passive powers, reacting to stimuli by the formation of sensations, which are combined into images by an internal sense. Sensory processes, however, acquaint us only with individuals. To the list of internal senses Aquinas adds an estimative sense, the function of which is sensory judgement with respect to the useful or harmful character of concrete objects. Animals possess this sense; but in man it is a kind of reason which deals with particulars. Intellectual processes also are accounted for on Aristotelian principles. Universal concepts are derived from sensory images by the process of abstraction, and are subsequently universalised by a purely mental activity. Passive and acting intellects are distinguished to meet the requirements of the general theory of knowledge; but Aquinas clearly teaches that both "intellects" are intrinsic faculties of the soul itself. Naturalism here replaces the vague mysticism which was taught by the Arab commentators of Aristotle and is traceable perhaps even to Aristotle himself. A notable advance towards a purely scientific psychology is thus made. With regard to orectic processes, Aquinas again divides appetite or desire into the two classes of sensory and rational, which operate on different levels.

Sensory desire inclines us towards objects perceived or imaged ; and its arousal gives rise to passions or emotions. These passions were the object of careful study by the Scholastics in connection with moral philosophy. Rational desire, or will, inclines us towards abstract Good, in respect of which its activity is absolutely determined. The will is free, accordingly, only with regard to contingent, or relative, goods. One general law, however, regulates the life of desire, whether sensory or rational. Some kind of knowledge must call the appetitive powers into action. Knowledge is accordingly superior to will. In contrast with the Augustinians, and particularly with Scotus, Aquinas is thus an intellectualist. The results of his analysis of mental process lead to the Thomistic conception of human nature. Since the soul is only the substantial form, the proper object of study is man himself and not the soul alone ; but man acts as he does in virtue of being " besouled." Further, one soul only constitutes him a spiritual as well as a material being. The doctrine of plurality of forms, held by other Scholastics, was explicitly rejected by Aquinas. Nevertheless, though form of the body, the soul is a spiritual and substantial principle, independent of the organism in its highest activities of conception and

thought. It is accordingly immortal ; not, as Aristotle probably held, in the impersonal form of the acting intellect, but in the personal immortality of its whole being. It is created by God, and was created to enjoy eternal happiness in intellectual union with God. Though presented in a framework of theology, the psychology of Aquinas marks a distinct advance. It unites the biological view of Aristotle with the refined form of animism taught by Plato and Augustine. It thus avoids the dualism which makes two entities of body and soul, which destroys the unity of the individual, and raises insoluble problems with regard to the relation of mind and matter. At the same time, it leaves room among the natural sciences for psychology to deal with mental, as distinct from physical, phenomena, and justifies its existence as a special science with its own subject-matter, point of view, methods and principles.

In contrast with the psychology of Aquinas, several differences in that of Duns Scotus (b. 1274, ? 1266) have a bearing on more recent developments. Adopting Augustinian and Aristotelian doctrines, with personal modifications of great originality, Scotus agrees in the main with Aquinas ; but he teaches that we have an intellectual knowledge of individual things.

Besides abstract and universal knowledge, which is clear and distinct, we also know individuals in a confused manner simultaneously with our sense perception of them. This indicates a growth in clearness of mental contents arising from experience ; and it is a second anticipation of an important current doctrine in psychology. Again, because of its absolute freedom (knowledge of the Good being a condition, but not the cause, of will-acts) will, rather than intellect, is the pre-eminent faculty. This is in line with recent developments of Hormic psychology (impulse, striving), and even with certain postulates of Behaviourism (*see below*). Lastly, though man is the composite resultant of soul and body, Scotus teaches that a "bodily form," as principle of organic structure, also enters into his composition. Though he did not develop the view, this implies a step towards that of Descartes, in which soul and body are conceived as two separate entities.

The general results of Scholastic speculation that are most significant for psychology, are progress in the analysis of cognitive, volitional and emotional processes, as well as the establishing of relations between them ; the making explicit of the essentially unitary nature of consciousness ; and the development of a

theory of personality centred upon the intuitive awareness of the self as a real psychical entity.

The movement reached its zenith in the thirteenth century. After long incubation it rose swiftly to maturity; but hardly less swiftly decay set in. The springs of inspiration dried at their source. Growth and development were arrested; and mere dialectic (argument and hair-splitting) took the place of empirical analysis and the closely reasoned speculation built upon it. So far as psychology is concerned, there is an almost complete blank between the thirteenth and the sixteenth centuries.

THE BEGINNINGS OF MODERN PSYCHOLOGY

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With the rise of the scientific movement, however, it was not long before psychological problems appeared in a fresh setting. At first, as in Greek philosophy, interest was primarily centred upon external Nature ; but even Bacon looked forward to the time when empirical methods should be applied, not only to physical and physiological events, but also to the interplay of ideas and the activities of the will.

The two great forerunners of modern psychology are Descartes (b. 1596) and Locke (b. 1632), from each of whom derive influences which have fundamentally affected psychological thought up to the present day.

Descartes's philosophy began in a universal, methodic doubt which prepared the way for the discovery of incontrovertible truth ; and Descartes found this truth, from which he proposed to deduce all others, in the fact of personal, self-conscious thought :—" I think ; therefore I am." One may doubt all else, even

one's own bodily actions ; one cannot doubt such self-evident intuition. Upon the clearness and distinctness of this truth he based his criterion of valid knowledge. Whatever is as clear and distinct as self-consciousness is true. But for the supposition that some power superior to our own might deceive us in all things, Descartes might at once have applied this criterion to the clear and distinct idea of extension as revealing the nature of matter, and so have raised the antithesis of body and mind. Instead, he turned to the idea of God ; from which he " proved " the existence of a Being whose goodness and wisdom guarantee the veracity of our faculty of knowledge. Clear and distinct ideas (innate in the sense that the mind is predisposed to accept them), and whatever is deduced from these, are accordingly valid. Among such innate ideas is that of the nature of matter as consisting in extension ; and this is sharply distinguished from sensory perceptions, in which bodies *appear* to be coloured, sonorous, odorous, and the like. These qualities are obscure and confused subjective appearances, and not objective properties of things. The essence of body, accordingly, is to be extended ; and the essence of mind is thought. Here is a metaphysical dualism in which the main problem that

exercised subsequent speculation arises. What is the relation between body and mind? The antithesis is further emphasised by Descartes's teaching that animals are automata without feelings or power of self-movement, which obey the physical and mechanical laws that regulate inanimate Nature. Only, in man's case a thinking mind is infused into the automaton by God. Thus essentially opposed to body, the human mind must somewhere come into contact with it to explain the reception of sensations and the production of movements. Descartes locates this contact in the pineal gland at the base of the brain. Here the mind receives feelings from the nerves, and brings about motions in the body by way of the " animal spirits " flowing in the nerve channels. Sensorial life thus has a physiological basis, whereas true thought is wholly mental. The automaton doctrine disposes of the soul as the principle of life in man, and substitutes a thinking mind joined to a mechanically regulated body. The main point brought out in all the detail of Descartes's psychology is the refining of the concept of mind to include conscious events, and the reduction of sensory and motor processes to physical ones. There is interaction between body and mind, but complete disparity of nature. This doctrine bore fruit later,

when interest in the body-mind problem gave place to empirical psychology, in a clearer definition of purely mental phenomena.

The line of thought deriving from Descartes was largely occupied with the psycho-physical problem set by him. The Occasionalists, distinguishing between occasion and cause, held that the body does not cause sensations nor the mind movements, but that physical stimuli and conscious volitions are mere occasions of sensations and movements which, in fact, are caused by God. Leibniz advanced a theory of divinely arranged, or pre-established, harmony. Soul and body do not directly influence one another ; but their actions run in parallel lines. Spinoza, more radical, made of mind and matter two aspects of the one underlying reality, God. Instead of Descartes's interaction, these philosophers asserted psycho-physical parallelism in solution of the difficulty.

While on the Continent rationalism continued its development, in England the foundations of empirical psychology were being laid. Already Hobbes had attacked the concept of a substance-mind, and taught that mental process is a function of the body, and reason the product of sensation. Here lay the germ of modern materialism and associationism (the doctrine that all mental processes are accounted

for as associations of ideas). But we must look to Locke for the full use of the empirical method in psychology. Instead of the deduction of conclusions from the supposed nature of mind, he uses the method of induction to reach a scientific knowledge of the principles of mental life. He thus rejects metaphysical and mystical accounts of the origin of knowledge (innate ideas, pre-established harmony, divine inspiration) for a theory based upon observation. Children, he argues, uneducated people and savages show evidence that knowledge originates in experience. At the outset the mind is a blank tablet. How, then, do ideas become inscribed upon it? Locke teaches that all ideas derive from experience by sensation and reflection. By sensation we perceive the external world as possessing qualities and quantity; but the (secondary) qualities, colour, odour, etc., are subjective only. By reflection we are acquainted with the inner activities of understanding and will. Ideas are simple or complex, the former simply given to the mind, the latter actively formed in it by repetition, comparison and combination of elementary ideas. Mental powers, however (*e.g.*, sensation, memory, imagination, understanding, will), are not separate entities, but only ways in which the mind acts. Locke's distinction between

sensation and reflection shows that mental process is not merely a mechanical interplay of ideas. Mind has the power of reflecting upon the course of its ideas ; and in reflection higher ideas (*e.g.*, of power, cause, unity, relation) are formed. Thus universal ideas are explained on an empirical basis ; a protest against the doctrine of innate ideas. Locke deals more cursorily with the active powers of the mind. Pleasure and pain are kinds of sensation ; will is a mental movement due to " uneasiness " ; and both arise in course of the interplay of ideas. His empirical analysis is clearly a forerunner of later analyses of consciousness into contents and states ; but Locke never disputed the existence of a substantial, active mind. He accepted this as a fundamental datum. It was the existence of the external world that needed explanation ; and our certainty of this, he taught, depends upon the impressiveness, or " liveliness," which characterises certain subjective sensations.

The last statement shows how the next analytic step could be taken by Berkeley (b. 1685). Already secondary qualities had been denied of matter and made subjective. For Berkeley the primary qualities (extension, impenetrability, etc.) also became mental states no less than the secondary. The external

world has thus no reality except in mind: to be is to be perceived. All experience is subjective. This he argued in his *Theory of Vision*, in which he showed how our idea of tridimensional space results from the association of sensations of sight and touch, and in the *Principles*. Ideas, however, presuppose some cause upon which they and their sequences depend; and, having shown that no material reality exists, Berkeley asserts that their cause must be spiritual. Moreover, since the sensory ideas do not depend upon our personal wills, it follows that it is not we, but the eternal, uncreated spirit that produces them. Matter does not exist; spirits alone exist: God and human minds. And the mind is a simple, active being, revealed through experience. Sensory perceptions are ideas in the mind of God, who causes them to appear to us. The perceiving mind is reason, as contrasted with the acting mind, which is will.

Berkeley's idealism forms a stepping-stone between Locke and Hume (b. 1711), whose psychological system had an immense influence upon the development of the science. A radical empiricist, Hume set out to make an exact analysis of mental powers and capacities. He begins by reducing mind to the sum of its contents. He rejects Locke's distinction between sensation and reflection, and substitutes

a law of association for the dynamic activity of the mind. The fundamental mental states are the lively impressions which originate both in outer and inner experience, and their fainter copies, or ideas. We thus have as original elements of mind visual, auditory, tactile, etc., impressions and ideas, as well as pleasures, pains and efforts ; and these are the sole data of knowledge. Connected, compounded and succeeding one another in virtue of association by contiguity, similarity and causal relationship, they constitute consciousness ; which is accordingly conceived as an agglomeration of sensations regulated by the principles of association. Where Hartley (b. 1705) used associated nervous processes to explain the occurrence and order of mental events, Hume postulates only mental elements and mental laws, thus avoiding any appeal either to body or to mind in explanation of consciousness. Impressions, ideas and laws of association take the place of brain processes, as well as of any really active principle of thought. Even the self is reduced to a mere bundle of associated ideas. While Locke reasoned away secondary physical qualities and their unknown substratum, while Berkeley extended the reasoning to primary qualities and physical substance, Hume used the same line of attack upon the mind itself,

and nothing substantial remained. Hume's empirical analysis of causality, which reduces even will to sensations, is equally radical. The causal relation is one in which two ideas are constantly experienced in a sequence ; and repetition of such experience in the past sets up the habit of expecting a similar relation in the future. But there is no real efficiency in the " cause." For, if we analyse the notion of power it contains, we find no more than the sensations of effort we ourselves experience when we move external bodies, or those of the impact of bodies upon us. Here there are only several sensations in constant sequence (feeling of effort and movement of limb ; sensations of moving body and impact). No real power is involved in either case. We read our sensation of effort into sequences of external events, and come to an illusory belief in real power, or energy, resident in the " cause." We experience effort, and believe in our own causality in willing. But this is illusory also ; for, though perceived movements follow upon will-acts, this is in fact apprehended only as a sequence of strongest motive as inner event and change of place as outer event. Feelings of pleasure and pain, corresponding to impressions, give rise to emotions, which are thus also reduced to sensations and become associated with ideas.

The system is one of radical sensationalism, in which all mental events are hypostatised ; and psychology is presented as a naturalistic and positive science, the task of which is to investigate the structure of consciousness. It is no longer the science of soul or of mind, but of mental phenomena. Hume's influence in psychology can hardly be over-stated. He was the founder, with Hartley, of the Associationist and Structuralist schools which have lasted almost to the present day. Transferred to France, his doctrines were modified into a still more complete sensationalism by Condillac (b. 1715), who omitted the principle of habit as accounting for mental synthesis. In Britain and abroad, these movements provoked reactions in the Scotch "Common Sense" philosophy and French Eclecticism. Hume's psychological doctrines were developed in the two contrary directions of spiritualism and materialism. Everything being reduced to sensation, it was easy to construct the world out of ideas, as Berkeley had done ; and scarcely less easy to identify sensations with states of the brain, as did Hartley, Priestley and the French Encyclopædists. Finally, it was Hume's phenomenalism and "scepticism" which awoke Kant from his dogmatic slumber to labour at his Critical Philosophy.

Three further influences have contributed to the shaping of contemporary psychology. Already in the movements of Cartesian rationalism and Locke's empiricism, we find many of its elements ; but the speculations of Leibniz (b. 1646), the philosophy of Kant (b. 1724) and the formulation of the theory of evolution by Darwin (b. 1809) supplied other exceedingly important ones.

Leibniz's conception of the world is wholly psychological. Unlike Descartes, who set himself to doubt all previous principles and conclusions of philosophy, Leibniz wished to establish a system in which Greek, Mediæval and Contemporary thought would be reconciled. To this end he advanced a theory of reality, of which his doctrine of monads, principle of pre-established harmony, and law of continuity, are the cardinal points. Mind and matter, divorced by Descartes, were to be reconciled in a pan-psychism (universe in which all that exists is held to be spiritual). Leibniz begins with the concept of mental substances as independent activities, essentially individual, yet together constituting a world. These active forces he calls " monads." He conceives them, on analogy with material atoms, as simple, indivisible and indestructible ; but he also endows them all, in varying degree, with the power of mental

representation. The human soul is such a monad, conscious of what it represents. Others represent the universe confusedly or even unconsciously, and so reflect every other monad in existence. The world consists of these immaterial monads in an ascending scale of perfection, their place being determined by the degree of clearness with which each actively represents the rest. Thus the lowest (inorganic) monads manifest unconscious representation in attraction and repulsion only. Plants are "sleeping monads" with unconscious ideas, or formative vital forces. Animal soul-monads represent obscurely in sensation and memory; while the human soul is capable of forming clear and distinct, as well as adequate, concepts. There is thus an absolute psychical continuity between the lowest monad and the human soul. Though the conception is vitalistic, it is not that of Aristotle; for, instead of interpreting mind in terms of life, Leibniz interprets life in mental terms. Bodies are aggregates of simple monads apprehended in obscure sensory perception as spatially and temporally ordered, but in clear analytic thought as aggregates of active spiritual entities. No monad, however, can act upon another, or receive influence from it. Their activity is wholly immanent, or within themselves. A problem

accordingly arises with regard to the correspondence of the succession of ideas in the mind with the movements of the monads of the body. Leibniz solves this problem by postulating a pre-established harmony between them. Soul and body agree like two clocks, originally set going by God and absolutely synchronised. Remote as his doctrine may appear from contemporary psychology, it nevertheless has had considerable influence upon it. The assertion of unconscious mental activity is accepted to-day. The concept of growth in clearness of ideas from unconsciousness to full apperception, or clearness (as in Scotus and the Stoics), has born fruit in many directions. And the doctrine of the essential activity of self-consciousness as dynamic will (Augustine), which determines the course and clarification of representations in consciousness, has left its impress upon the science.

The philosophy of Leibniz was a consistent and closely reasoned system. At the hands of his follower Wolff (b. 1679) it became little more than a series of dogmatic assertions. The meeting point of Dogmatism and the scepticism of Hume in the mind of Kant gave rise to the Critical Philosophy. Kant opposed all speculation which goes beyond empirical experience without first having justified its procedure by a preliminary critical examination of the extent

and limitations of knowledge. Impressed by Hume's analysis of causality, which regarded belief in the causal relation as being due to a subjective element of habit or custom, and concerned to distinguish the universal element in knowledge from the particular elements of experience, he was led to the hypothesis that, instead of the mind conforming to objects in knowing them, objects conform to the mind. The manifold items of experience become unified and stamped with the impress or form of mentality. Since nothing necessary and universal can come from experience, space and time (the universality and necessity of which are shown in mathematics) must be subjective forms, prior to all experience, which are impressed upon sensations. They are the prerequisite conditions of external and internal sensation. Things-in-themselves are neither spatial nor temporal ; co-existence and succession are phenomenal—appearances only—and accordingly are only subjective. Analysis of judgement shows further that there are subjective categories, forms of thought not derived from experience, under which phenomenal knowledge becomes organised. Since these, like the sensory forms, are logical and subjective conditions of knowledge, reality as it is in itself remains unknown. By speculative knowledge

we can reach neither to the real self, the world nor God. Nevertheless, Kant's doctrine of the unity of apperception and of the categories has profound significance for psychology. The organisation of disparate items of experience into mental objects with spatial and temporal characters, their interpretation by inclusion in a category, points to more than was admitted in Hume's sensationalism. Though we cannot know its nature, the doctrine reintroduces the notion of a self which actively organises experience. Moreover, even if we cannot grasp things-in-themselves, we do know our own organised experiences ; and it is thus possible to formulate psychological laws on the basis of experience, even in the absence of knowledge of the soul. Kant's treatment of willing and feeling allows him to bring back into philosophy what his analysis of pure reason had made him reject. Passing from consideration of thought to that of action, he finds a " categorical imperative " in the consideration of duty. This presupposes the freedom of the will, the existence of God and the immortality of the soul. The ultimate value does not lie in the region of knowledge, but in that of will and feeling, where teleology, or the seeking of ends and goals, and æsthetic appreciation are experienced. Feeling, willing and knowing are three separable faculties. Though

Kant declared that an exact science of psychology was impossible, his general position indicates how such a science might be built up. It must no longer be concerned with souls, but must study experience ; and, to be successful, must employ mathematical method. In rejecting metaphysics and " subjectifying " physical science by introducing mental elements into its construction, he revealed a point of view for the study of mental phenomena which greatly influenced subsequent speculative thought. His place in psychological history is indicated by his comparison of himself with Copernicus as a revolutionary in science, making objects conform to mind rather than making the mind merely reflect objects. The implications of this reversal of theory have remained a permanent gain.

While in Britain and France empiricism developed, in Germany psychology never wholly lost its metaphysical background. Herbart (b. 1776) combined elements of the philosophies of Kant and Leibniz, but laid greater stress upon introspection. He rejected the doctrine of unitary faculties ; and postulated a simple, active soul as the subject of mental life, teaching that ideas are due to its reactions upon other beings (" Reals ") with which it co-exists. He attempted to express all psychical activities in

mathematical formulæ and to reduce mind to a kind of mental mechanics. Conscious states are thus regarded as an equilibrium of opposing forces. Ideas are conceived as complexes of sensations; but instead of passive links between them, as in associationism, he postulated active mental forces which are conceived as summating algebraically. Ideas struggle together or ally themselves in consciousness. The conception suggested an unconscious region of mind into which ideas, that are too feeble for successful competition, sink, to rise again when their opposing ideas weaken, or when their own force increases by alliance with others. The dynamic alliance of ideas, to which fresh material is assimilated in learning, is called by Herbart an "apperceptive mass." It is conceived as an aggregate of active past experience to which new ideas ally themselves. Apperception is thus the active combination of ideas into a growing unity; the dynamic background of experience makes the assimilation of fresh material possible. This conception was, and still is, of great fruitfulness in educational theory and practice. Herbart's aim was to make psychology an exact empirical science, with practical applications. Though his dynamic of ideas did not prove successful, he certainly advanced the study in both these respects.

EVOLUTION AND PSYCHOLOGY

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THE POSITIVISTIC trend in England was given fresh impetus by the re-statement of the hypothesis of evolution and the vast amount of evidence collected in its favour. Though formulated in several quarters before his time, it was the influence of Darwin in its support, more than any other, that went to shape contemporary psychology. Both Lamarck and Darwin held that acquired characteristics (or at least some) are cumulative, and inherited from previous generations, and that these characteristics are acquired not only by the action of the environment upon the organism, but also, in part, by the efforts of the creature to adapt itself to its environment. This implies a psychological factor in evolution; and, though the inheritance of acquired characteristics is not now generally accepted, the view proved to be an incentive to research and a workable principle of interpretation. Darwin's psychological interests were extraordinarily broad and profound. He applied the principle of natural selection to problems of

instinctive behaviour, emotional expression in man and animals, protecting and attracting traits, and the like; and in the *Descent of Man* he extended the same principle to higher mental processes also, and showed the similarity between human reasoning and processes of the animal mind. The influence of the evolutionary hypothesis upon psychology was enormous. Like the saturated solution of a salt into which a crystal is dropped, current psychologies began to crystallise round it. The mental gulf between man and the rest of the animal kingdom was bridged. Genetic views of the mind came speedily to replace static ones; and many acute psychological observations, from Aristotle onwards, were found to fit readily into the new naturalistic scheme. The stage was fully set for the development of contemporary psychology. The first thoroughgoing application of the new principle was made by Spencer (b. 1820) within the framework of associationism. On analogy with the derivation of complex organic structures from simpler forms he derived all more complex mental states from primitive sensation, or feeling, elements which accompany elementary nervous process. Intelligence was similarly derived, through instinct, from primitive reflex action. Mental products are, accordingly, capable of analysis into simple elementary

forms ; and by association these are bound into wholes, not merely in the developing mental life of the individual, but racially also. Associations formed in early social experience, animal or human, are stamped in and transmitted by heredity. There is thus a reconciliation of innate ideas and experience ; the universal and necessary elements of thought coming, not from individual experience, but from that of the race. They are the result of past history recorded in hereditary neural arrangements of the brain. Feelings, emotions and will are reduced to aspects of complex sensory processes, the complexity of which is conceived on analogy with chemical compounds, rather than as the result of summation or mere addition. Here is no hint of any synthetic or creative activity of a conscious self in respect of its own mental contents ; the psychology is a wholly structural one. Indeed self, as mind-substance, is for Spencer only an unknowable something postulated to explain persistence and unity, in spite of all changes, in the aggregate of states of consciousness. Like all associationisms and structuralisms, Spencer's psychology is now outgrown. It was none the less a contribution of worth, focussing attention upon the naturalistic evolution of mind as a subject of special study. It indicated the place of psychology among the other biological

How far is mind's structure due to environment? Not only since man shares this with other kinds of life

sciences ; and, by insistence upon the racial derivation of individual mental characteristics, related the science closely to sociology.

A second consequence of the acceptance of the Darwinian hypothesis was the application of the concepts of variation, selection and adaptation to the study of individual differences. Though experimental work had shown that people differ in respect of sensory acuity, quickness of reaction-time, and the like, it was Galton (b. 1822) who first investigated the problem of individual differences on a large scale in his studies of hereditary genius, mental images, mental number-forms and similar matters. Even more important was his contribution of a statistical method, which was to prove of enormous service in psychological investigation. In order to find the relation between mental qualities, which cannot directly be measured, we require some device by which we can ascertain how far they tend to go together. Such a device Galton provided in the " coefficient of correlation," which has since so been developed and perfected as to be of inestimable value in psychological research. The raising of the problem of individual differences, and the creation of this instrument of research, entitle him to a foremost place as a pioneer of contemporary psychology.

A third consequence of the introduction of the hypothesis of evolution was the extension of psychology to the comparative study of animals, primitive peoples, children and abnormal persons, with a view to discovering genetic relations between them and normal adults in respect of mental process. Whereas previous interests had chiefly been directed upon the normal adult mind, either deducing its characters from the nature of the soul, or inducing its principles from empirical observation, interest now was largely centred upon evolutionary connections. Behaviour in all its forms, interpreted on analogy with the personal conscious behaviour of the student, was closely observed by naturalists ; and observation in experimental conditions later on took the place of uncontrolled field work. A vast and growing literature upon animal, child, primitive and pathological psychology began to accumulate. Experiments upon creatures, ranging from unicellular organisms to anthropoids and young children, were multiplied ; and the original impetus, far from spending itself, has steadily increased up to the present, every school of psychology drawing inspiration from the comparative observation of behaviour. The chief dangers of this line of attack have been an undue tendency to interpret the behaviour of animals

and children as if they were human adults, and the "behaviouristic" tendency to dispense with consciousness altogether in interpreting the actions not only of lowly organisms but even of man himself.

EXPERIMENTAL PSYCHOLOGY

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EXPERIMENTAL PSYCHOLOGY

ALREADY experimental psychology had begun, in a small way, in the attacks made in physical and physiological laboratories upon problems connected with sensation. Both psycho-physics (the correlation of mental with physical changes, when physiological conditions are kept constant) and psycho-physiology (the correlation of mental events with physiological changes) had made headway. The growth of the experimental spirit in psychology is indicated, as we have seen, as far back as Herbart. It is illustrated by such work as that of the physiologists Weber and Fechner, who established the psycho-physical law of sensation (*viz.*, sensory intensity increases in arithmetical progression while the stimulus is increased geometrically). It was advanced by physicists like Helmholtz, who investigated vision and hearing as well as the temporal differences of reaction-times. It came at length to a head in the establishment by Wundt of the first exclusively psychological laboratory

at Leipzig. Here not only sensory processes, but higher mental processes also—memory, imagination, attention, association, feeling, emotion, thought and will—were proposed for investigation. Within a comparatively short time psychological laboratories multiplied throughout Europe and America : and at the present day there is hardly a centre of psychological teaching where experimental work, forming the nucleus of training and theoretical teaching, is not carried out. Besides observation and introspection, the ordinary methods of physical science are employed ; and within the past few decades statistical treatment of the data of research has increasingly been followed up. These methods, becoming progressively more refined and adapted to the subject-matter, have proved not only fruitful in their application to special problems, but illuminating in general psychological theory also.

The multiplication of centres of research, and the continual splitting up of larger problems into their parts for detailed solution, have led to increasing specialisation in psychology and a shift of interest even greater than that caused by the introduction of the empirical standpoint. The old problems concerned with soul, mind or consciousness, its relation to body, its origin and destiny, have largely been thrust out of view by

preoccupation with more immediate issues. They have been left to the philosophers, while experimental psychologists have busied themselves more and more with the investigation of mental processes as such in all their detail. This does not mean that the more fundamental problems are no longer urgent. It means a distribution of labour, in which the experimentalists are content with the spadework that yields immediate practical returns. For psychology to-day is in the position of physical science when this made its greatest advances and applied its discoveries in every direction to social and material well-being. There also more fundamental problems lay in the background, which to-day the mathematical physicists are attempting to solve. It is not unduly optimistic to hope that the immense amount of material being gathered together in experimental psychology will lead to an empirically established and acceptable view of the nature of the conscious principle.

SOCIAL AND COMPARATIVE PSYCHOLOGY

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ANOTHER line along which psychologists have been working, is the investigation of man in his social aspects. This also may be traced to the influence of evolutionism upon the science. It has led to the formulation of doctrines of social and dynamic psychology which supplement the data derived from the experimental investigation of mental process, and link up comparative with normal, abnormal and pathological psychology. No longer considered as isolated individuals in a merely physical environment, the reactions of organisms, and particularly of man, to social stimuli were investigated. What are the springs of action which instigate behaviour in response to such stimuli? The hormic psychologies provide an answer. The original drives to action are the inborn psycho-physical, or body-mind, dispositions, differing in different organisms, to behave in typical ways upon external stimulation whether physical or social. Profusely illustrated in the behaviour of lower animals, and especially of

insects, they are the primary motives of all behaviour, in the service of which all the cognitive powers have their existence and meaning. It has been said that intelligence is a tool at the service of instinct. How far down in the biological scale animals are to be credited with consciousness analogous to ours may be disputable ; but there is evidence of adaptation by insight, or by trial and error, which makes learning possible at a very low stage indeed. Such cognitive powers as animals may possess are accordingly regarded as serving the original hormic forces. The action of these forces, however, may become modified by consciousness in various ways. Fresh kinds of stimuli may become substituted for those originally adapted to release them. They may become specialised to a single individual belonging to the class of stimuli apt to activate them, and so be more readily called into exercise by that individual than by others. In creatures capable of mental abstraction and conception, moreover, the hormic drives may come into play in response to stimulation by abstract and conceptual ideals. On the other hand, modifications of original forms of behaviour, or behaviour-patterns, also come about dependently upon processes of trial and error and of insight. This is especially noticeable in human social conduct, in which the goals of

instinct are not as a rule directly attained, but are secured through means that are often of an exceedingly circuitous kind. Thus all the social machinery of law, industry, commerce, and the like are human inventions used to secure the instinctive ends prescribed by Nature. Hormic psychology presents a very complete dynamic view of human behaviour, into which the details of comparative and experimental psychology naturally fit. It thus reflects the best features of pre-scientific psychology, and provides a broad foundation for the investigation of the nature of the principle of conscious life. In its recognition of dispositions, drives or tendencies, it emphasises the part played by the unconscious in the determination of consciousness ; and, by extending mentality beyond the region of awareness, it points to a mental vitalism comparable with that of Aristotle.

Having indicated the main directions in which the currents of contemporary psychology are flowing, it will be convenient to summarise the present position of the science under several heads, roughly corresponding to the division of mental process into cognitive, conative and affective. Though there may be some unavoidable overlap, this will enable us briefly to review and contrast the chief schools of psychological thought in existence at the present day.

From what has been said with regard to hormic psychology, it will be clear that the investigation of cognitive processes has its bearing upon the explanation of behaviour ; for modification of connate, or inborn, behaviour-patterns depends upon forms of cognition. From the lowly organism which slightly alters its native reaction to a stimulus when confronted with difficulty in attaining its end or maintaining its " psychic equilibrium," to the human being who plans a long and complicated series of actions leading to some remotely conceived goal and strives to attain it, the strivings are determined by cognition, but at very different levels. No one of us, however, has direct insight into the mind of any creature other than himself ; and we must accordingly interpret behaviour at all levels, on analogy with our own, and refer it to mental processes which we immediately apprehend in introspection. Analysis of human consciousness must yield all our principles of explanation. Such analysis has led to the formulation of four principal theories of cognitive process which are advanced today. All except one are protests against the associationisms and structuralisms in which mind was reduced to the sum total of its phenomenal elements or states. The remaining one is an extension of associationism to physiology ;

and it contrives to do away with consciousness altogether. Since we have already considered associationism in dealing with Hume and Spencer, no recapitulation is necessary here. We need only recall the main point of the theory ; *viz.*, that all processes of consciousness whatsoever are reducible to sensations regulated by associative laws. Apart from the distortion of many mental phenomena by forcing them into the too rigid framework of the theory, the omission of the functional and dynamic aspect of mind was fatal, as is shown by all contemporary presentations of psychology, including Behaviourism. Dynamic activity is smuggled in by way of neural process, even if it is not admitted right of hospitality in consciousness. Associationism has been ousted by contemporary systems, because it was inadequate to explain vital factors of personal experience. It had no place for emotional activity, purposive striving, or creative thinking.

BEHAVIOURISM

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In a sense, however, associationism has taken on a new lease of life in the more extreme form of Behaviourism; but at the price of sacrificing consciousness altogether. Behaviourism is not only a psychology without a soul; it is psychology without either mind or consciousness. It proposes that the consideration of psychologists should be limited to external and observable behaviour; and then proceeds to explain behaviour, in a strictly deterministic manner, in the light of the principle of contiguous association. In this theory, all forms of behaviour in animals, all kinds of human conduct, no matter how socially desirable or morally elevated, are conceived as built upon the foundation of a few native reflexes inherited by all the members of the species. Like any other animal, man starts life with a limited equipment of unlearned reaction-patterns to external stimuli; and upon these are grafted an immense number of other behaviour-patterns, which make up his learned equipment.

To explain the activation of reaction-patterns by stimuli other than those which originally alone called them into activity, the behaviourist uses the principle of the conditioned reflex. Experiments have shown that a stimulus that is incapable of provoking a given reaction will, after presentation together with a connate stimulus to that reaction, evoke it. Thus Pavlov induced salivation in dogs as a reaction to the ringing of a bell, after the bell had been rung a number of times in connection with the presentation of food. Watson, again, showed that fear-reactions, originally provoked in very young children only by startling stimuli, such as loud noise or loss of support, could be associated with the sight of objects with regard to which the child had previously exhibited no signs of fear. A dog, in which the infant had before only shown interest, afterwards provoked fear-behaviour if it had been seen at the same time that the child had been frightened by a violent noise. Similarly, rage and love reactions, naturally provoked by a limited range of definite stimuli, could be " conditioned " to others. Moreover, just as the connate connections admitted of a fairly wide range of stimulus (*e.g.*, *any* loud noise) in provoking appropriate responses, so the conditioned reactions, it was found, spread also to stimuli that only

resembled the one to which they had actually been conditioned (*e.g.*, the child would not only fear a dog, but anything *like* a dog, as, for instance, a teddy bear, or even a bit of fur or cloth). This looks like association by similarity, but in fact it can be reduced to contiguous association. On the basis of associative attachment, or "conditioning," and substitution of stimuli, together with alteration in the character of the response, behaviouristic psychology was erected, but on a physiological rather than a psychological foundation. It is a system strongly reminiscent of that of Hartley. The original endowment of man is a group of physiological reaction-mechanisms of a relatively simple kind. All complex behaviour is explained by environmental conditioning, which results in the formation (and re-formation) of habits as physiological as the inherited mechanisms themselves. The concept of instinct, accordingly, is not needed to explain behaviour; neither is the concept of consciousness nor thought. For thought also is only a conditioned reaction to external stimuli on a par with any other. It consists in feeble movements of the organs of articulation (inner or sub-vocal speech) which have become substituted for the gross movements of limbs and body that were originally evoked by the same stimuli. The

evidence upon which behaviourism is based is of a conative, or emotional, order rather than cognitive ; and the theory ends in excluding thought as an interesting or useful topic for psychological investigation, and denying to consciousness any effective part in the determination of behaviour. It may therefore seem out of place to consider behaviourism in this volume, except as an instance of refusing to allow mental processes any right of citizenship in psychology. Behaviourism is not at present maintained however, in its exclusive and rigid form, as outlined above. Though a considerable group of psychologists would still call themselves behaviourists, and make use of the conditioned reflex as the chief explanatory principle in psychology, there are few who altogether dispense with consciousness, or employ the principle of stimulus and physiological response alone to explain behaviour. Both consciousness and thought have been reintroduced into more moderate Behaviourism. Though genetic and even dynamic as a theory, its single principle was not enough to embrace all the facts. It could not explain how new ideas, or new types of behaviour, could arise, except as mere rearrangements of old ones. Yet thought, in some of its operations, is creative ; and some behaviour gives evidence of true originality.

Behaviourism could not continue to maintain that thought is sub-vocal speech, for definite experimental evidence disproves the statement. While the general bias of Behaviourism, accordingly, is towards a physiological explanation of mental events, its original formulation has been greatly modified. There were, however, aspects of permanent value even in the original statement of the doctrine. It was a protest against the merely structural view of consciousness to which pure introspection had led. It emphasised the importance of an objective examination of behaviour as functional. It introduced the principle of conditioning and transfer into general psychology in connection with behaviour, and not merely as a mode of association of inert ideas ; and thus indirectly paved the way for a return to the dynamic conception of consciousness. Finally, though failing to account for purpose and volition as human experiences, its aim of determining behaviour on morally and socially desirable lines by the practical use of conditioned reflexes—its very name *Behaviourism*—suggested the lines upon which all along psychology had been developing ; *i.e.*, as the science of the principles of behaviour, by the application of which conduct might be directed and guided.

FORMALISM OR "GESTALT"

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A SECOND type of contemporary psychology, definitely in revolt against the atomistic and structuralistic conception of consciousness, has developed from the fundamental postulate that there is more in any psychological whole than the mere sum of its parts. In germ this system, commonly known as *Gestaltpsychologie*, or Formalism, may be traced back to Wundt's (b. 1832) doctrine of mental creative synthesis ; which is illustrated, among others, by the fact that though one can analyse a tonal clang into a fundamental tone with its overtones, the mere putting of these together again does not result in the clang. There is more in the latter than the sum of the tonal components. This view was developed by the Austrian psychologists, particularly Ehrenfels, who noted that a large number of sensory qualities belong to perceived wholes as such, and cannot be derived from the isolated sensations which enter into them. Thus " triangular," " round," " square," are properties of triangles, circles, squares, as

mentally apprehended wholes, and add something to the elementary sensations supposed to constitute them. This " something " is evidently relational in character, as appears even more evidently if we consider a melody, which is not a mere collection of notes, but of notes related in a definite manner. Thus, though every single note is altered when the melody is transposed, the tune itself remains unchanged because of the " form quality " constituting it. This fruitful conception, originally worked out with regard to shapes (hence *Gestalt*=German for *shape*, or *form*), was extended to wholes of other kinds ; and attention was focussed upon the dynamic mental process by which wholes come to be formed and isolated. The most recent, and perhaps best-known, developments of Formalism, however, are due to the work of a group of German psychologists (Wertheimer, Köhler and Koffka) who have extended the theory to cover conscious processes other than perception. They have brought forward experimental evidence in its support, and have applied it in the interpretation of animal and child psychology with very considerable success. Meanwhile, the Austrian school has not been idle either in experiment or development of theory ; and, though there are divergences of opinion between the two schools with regard to

the nature of the mental processes involved in the creation of form, both are in general fundamental agreement. Though the Austrian school antedates that of Berlin, the latter considers that the principles of Formalism were first stated by Wertheimer as the result of his research into the problem of movement apparently perceived when the stimuli presented are not themselves moving. The problem is that of the zoetrope or kinematograph, in which the eye is stimulated by successive pictures representing stationary, but different, phases of moving objects, and combines these pictures into the representation of apparently continuous movement. Wertheimer rightly explained the apparent movement as something over and above the impressions actually made by the isolated stimuli, and attributed it to a configurational or formalising process as immediate as the sensing of the elements which are perceived as already in relation. There are not two processes, first sensing and then shaping, as the Austrians hold, in the perception of wholes, but only one. With this modification, the conception of form or shape was at once extended to cover all the operations of sensory perception, as well as of thought. Connected with the psychological doctrine of mentally configured wholes, which has met with wide acceptance,

is a physiological one : namely, that there exist connate configurational patterns in the nervous system, which are correlated with the mental wholes, and correspond to objectively configured wholes in the environment. These physiological patterns are held to function as response mechanisms. Though based on speculation rather than physiological evidence, this is a far-reaching extension of psychological theory to physiology, and even to physics. Other than psychological aspects of Formalism, however, need not detain us here. Having shown that wholes are, in fact, more than the sum of their parts, it was necessary to complete the doctrine by showing that they are original, in the sense that no other mental items than structured wholes are directly known, and that it is to these we react. Instead of elementary sensations, or the " buzzing, booming confusion " of sensations held by James to be the ground from which consciousness develops, Formalists teach that mental development starts with structures or wholes, however primitive their character may be. To substantiate this genetically, they point to observations and experiments made upon child and animal behaviour. Primitive and incomplex wholes become more complex and fully structurated in virtue of the *Principle of Precision*, whereby

they " tend to become as perfect as prevailing conditions permit." This not only accounts for our tendency to perceive, say, an incompletely drawn triangle as a complete triangle, but also shows how learning takes place in the animal, child and adult by increasing structuration of wholes and the inclusion of new elements within them. The old view that learning comes about by slow associative processes of trial and error, during which pleasurable or successful reactions are stamped in so as to become habits, while unsuccessful or painful ones become eliminated, is supplanted in Formalism by a doctrine of insightful learning. New wholes are suddenly apprehended ; a new structuration occurs, or a new element is incorporated into the situation, with consequent changes in reaction. Many examples of the working of the Principle of Precision are given in Formalist literature. Köhler's observation of the behaviour of his chimpanzees is classic. Faced with problem-situations in the attainment of goals (*e.g.*, food), they overcame the difficulties by behaviour which displayed insight. To cite examples, one gifted ape, whose fruit was too far from the bars of his cage to draw in with a short bamboo pole, happened by chance to fix two bamboos together, and used the artificially made " tool " to fish the food into the cage. Once he had thus

chanced upon the solution, he perceived the means towards the goal insightfully, and thereafter was able to fit bamboo poles together to gain his ends. His reaction to the situation had altered. In the Formalist explanation this means that the whole situation (cage, food, sticks, etc.) had become enriched by the integration of the two-poles-joined-together with the rest. Indeed, he had already perceived this enriched whole when he unsuccessfully tried to push one stick in line with the other towards the fruit. The sticks were not joined together, but the solution was indicated. Though the ape stumbled on his solution by chance, he at once perceived the tool appropriate to the situation. Learning in this respect was complete. Other instances are given to show that insightful solution does not always arise by chance, but by scrutiny of relations. And several examples are advanced, in which the difficulty of breaking up one whole, and perceiving its parts as integrated in another whole, is brought out. Thus one ape, able to use a box to reach fruit hanging high up in the cage, did not make use of it when another ape was lying upon it. It was then a "resting place," not a "means for reaching fruit." When her companion had fallen off the box, however, she at once grasped it, carried it under the goal, mounted, and seized the fruit.

Köhler notes also, in illustration of the same point, that the following situation proved very difficult. The fruit lay outside the cage ; there was no stick in sight ; but a dried tree with branches stood at the back of the cage. The difficulty lay in " releasing " a part (branch) from one whole (tree), and transferring it into another configuration. While it was in the configuration " tree," it could not be apprehended as a tool. A similar account is given of learning in human beings. A child comes to dread the fire, not by association of painful experience with the visual appearance of fire, but because the relatively simple fire-whole suddenly becomes more completely structured and meaningful, calling for a new reaction. Meaning thus grows in more primitive, but already meaningful, wholes by further structuration. It is not created by experience, but merely transformed by it. Rignano has pointed out that serious difficulties beset this account of meaning and its growth. He stresses the part played by our emotional attitudes in the determination of what shall be object-wholes for us, and of our conative dispositions in the fixing of their meaning. A chair is a unitary whole to sit on, a part of a drawing-room set, or the like. And he insists upon the share that experience has in contributing both to wholes and their

meanings by way of association. It seems to be clear that the concept of association cannot yet be dispensed with in psychology, however much Formalism has contributed to the advance of the science. The greatest contribution of *Gestalt* to contemporary psychology, however, is undoubtedly its vigorous protest, supported by a wealth of comparative and experimental evidence, against the insufficiency of associationism. Not only are mental objects originally perceived as meaningful wholes which grow by structuration, but they are wholes perceived in relation to goals to be attained, and so explain behaviour. Thus purpose is implied from the outset of mental life. Although Formalists have almost entirely neglected detailed study of feelings, emotions and will-acts, in this respect their theory will fit in with hormic psychology, to which it makes serious contributions on the cognitive side. Nevertheless, though implying conative activity throughout, and emphasising cognitive activity in the tendency to perfect configurational wholes and to enrich them with meaning, it stops short of any real mental creativity, either in thought or behaviour, which might take us beyond the sphere of sensory experience. Unlike the behaviourist principle, that of Formalism would seem to have little practical application to the development of

character and the guidance of conduct. Though it is no doubt true that " the larger the wholes and the greater their unity, articulation, and meaning . . . the more personality will they express," the claim that an explanation of personal development is ultimately given by means of the universal law of *Gestalt* alone needs further substantiation ; for it would appear that subsidiary principles also are required to construct a complete psychology of personality.

PSYCHO-ANALYSIS

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SINCE the third type of contemporary psychology has a volume to itself in this series, it will only be necessary to refer to it very briefly. Psycho-analysis, popularly perhaps the best known of current psychological systems, embraces a number of theories which have grown up around a method of investigating and treating mental disorder. It originated in the practice of hypnosis, during which it was found possible to bring to light the original occasions of certain pathological derangements in neurotic patients, and so to cure them. It was subsequently discovered that the hypnotic state was not necessary in order to secure curative results. Emotionally charged memories, though normally forgotten, could be recovered by appropriate treatment during a state of ordinary relaxation ; and discharge, or working off, of the emotion then effected a cure. The point of departure for the analysis was found in the dreams of the patients. An elaborate theory grew up around these observations ; and it has

been extended from pathology to cover the psychology of everyday life. In the first place, the release of emotional tension of which the patient was wholly unconscious pointed to an unconscious, yet active, region of mind which influenced both consciousness and behaviour. This point became of capital importance in the theory. In the second place, great resistance was frequently encountered in carrying out the analytical technique ; a fact which led to the formulation of the theory of " censorship." The conception is that of an active, repressive factor tending to secure the maintenance of the unconscious in its unconscious state. An indication of the functioning of the same mechanism was also found in the distorted forms of dreams ; which were interpreted on good evidence as disguised manifestations of unconscious wishes. According to the view taken with respect to the inheritance of acquired characteristics, the unconscious is regarded as entirely individual or partly racial in origin ; and the censorship, once conceived as the result of conscious social and moral repression, is now, at least in part, held to be an integral force of the unconscious mind itself. Theoretically systematised by Freud, psycho-analytic doctrine is presented as a mechanistic determinism on purely naturalistic lines. Conscious

events are determined by unconscious ones which never may, or never can, come to awareness, and yet are psychical activities. Personality is rooted in the unconscious rather than in the conscious mind. And, though full use is made of the principle of association to explain the derivation and transference of forms of behaviour and thought from their unconscious motives, the fundamental explanatory principle of the system is that of the dynamic nature of the unconscious. Whether this is the drive of sex or the will to power, whether it is unique or manifold, differs according to the interpretation of different authors. But all alike definitely infer from the empirical evidence the two capital points of mental activity and the extension of this beyond the sphere of awareness. While Formalism, dispensing with association, provides the mental wholes grasped by the mind, Psycho-analysis, in common with Hormic psychology, indicates the activities making use of them.

The three contemporary psychological systems just considered are not, in fact, exclusive, but are mutually supplementary. All are based upon empirical observations, and are typically dynamic. All are concerned with the explanation of behaviour. But whereas one finds this in organic mechanisms and their conditioning

without recourse to mind, another discovers it in the integration of conscious " configurations " and growth of meaning, and the third in the profound depths of the unconscious. Each view has contributed to the development of current psychology. Native reaction-patterns together with the alterations wrought in them by conditioning ; the conception of active configuration in percept and memory, as well as in the behaviour to which these give rise ; the extension of the essential character of consciousness to the unconscious—all these have been incorporated into psychological theory, or at least have profoundly modified the outlook of the present day.

THE "TWO FACTOR" THEORY

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A FOURTH system, incorporating the vital parts of the foregoing, has recently been developed within the field of experimental psychology. During the past twenty-five years, psychologists the world over have been investigating so-called " intelligence " and devising means for its measurement. Obviously, there can be no direct measure of such a mental function ; but the accuracy and speed with which a person's mind works in performing intellectual tasks can be estimated from his output. Even then there is no natural unit of measurement ; it is possible only to calculate norms, with their probable errors, from samples of the population, and to compare the performances of individuals with the norm. In this way a " mental age " can be assigned to them, which may or may not correspond with their real age. Original work in this field was done by Binet, who constructed " intelligence " tests to be administered to individuals (children) singly. Later, group tests were devised, by

which large numbers might be tested at the same time. There was, and still is, much controversy in regard to the nature of "intelligence"; but statistical considerations have led to almost unanimous acceptance of the view advanced by Spearman, that whatever shows itself in intelligent behaviour, and is measured by the tests, consists of two factors, the one ("g") a general mental ability involved in all the tests, and the other a specific ability which differs according to the character of the particular test employed. To illustrate by a rough example, we might say that there is a common general factor of consciousness both in seeing and hearing, but a specific factor (eye or ear) involved in each performance. Using a large battery of varied tests, the specific factors tend to cancel one another, and a relatively pure measure of "g" may be obtained. Experimental and analytic work has shown that some tests are more "saturated" with "g" than others; and that it is best conceived as pure mental energy working through different engines. What is it that characterises individuals who are gifted with general mental ability? The results of an immense amount of mental testing, running into millions of cases, show that they score highly in tests which chiefly involve three

mental processes, deriving from three basic laws or principles of original cognition. They score in the tests (1) when the mental items involved come quickly and clearly to awareness, (2) when relations of various kinds between the items are quickly and clearly noticed, and (3) when, such relations being applied to such items, correlated items rise quickly, clearly and accurately before the mind. All these processes are characterised by insight ; and they are exclusively the ways in which new knowledge, as distinct from remembered or recalled knowledge, arises.[1] The principles accounting for these processes have been termed by Spearman, who formulated them as providing a complete account of the genesis of knowledge, *Principles of Noegenesis*. They are expressed as follows. (1) "Any lived experience tends to evoke immediately a knowing of its characters and experiencer." (2) "The mentally presenting of any two or more characters tends to evoke immediately a knowing of relation between them." (3) "The presenting of any character together with any relation

[1]The following test illustrates all three processes: "Complete the sentence 'Smoke is to fire as finger-print is to . . .'" No answer can be given unless the meanings of "smoke," and "fire" and "finger-print" are grasped, the relation of "sign" obtaining between "smoke" and "fire" perceived, and that relation applied to "finger-print" to generate the item required.

tends to evoke immediately a knowing of the correlative character." Briefly, knowledge arises from experience ; relations are grasped within knowledge ; the application of relations to items of knowledge generates new items. Of these principles the last is astonishingly fruitful. It can take us in thought beyond any previous experience, even beyond all possible experience. To it are due scientific hypothesis and invention, as for instance the transfer of the perceived relation of steam and kettle-lid to the conceived situation of steam in a boiler in order to work an engine. It accounts for artistic creation in every sphere of art, and even for concepts which have never entered into experience in any way, such as those of infinity, eternity or God. While all the noegenetic processes are expressions of mental activity and even creativity, the third thus expresses creativity in an especial manner. But the noegenetic principles, though accounting for the origin of knowledge, do not cover the entire cognitive field. And it is the claim of the system we are examining that it is explanatory of all cognitive process. The noegenetic principles do not explain remembering or forgetting, variations in clearness of mental items, differences in original mental endowment, or power of controlling thought. Five further principles of a quantitative

kind are accordingly necessary to complete the account of cognition. The first is one of constancy ; every mind maintains a total simultaneous output, which may vary in quality but tends to be constant in quantity. This principle, illustrated by the limitation of mental span, restates the two-factor doctrine. An individual's general mental energy tends to be constant, but is available for different operations. Next comes the principle of retentivity, manifested both in inertia and facilitation of mental processes, under which head the old law of association is included. Mental items experienced together tend to be retained and experienced together again. The reverse of this is the principle of fatigue, which summarises the tendency of a mentally experienced event not to occur again. These two principles together express the summated effect of earlier upon later experience. The fourth principle is that of conative control. By willing and striving we can alter the direction and intensity of our knowing. Lastly, there is the principle of primordial potencies, indicating those original individual differences which are the ultimate personal conditions of the functioning of the others. These five quantitative principles, together with the noegenetic laws, form a framework of explanation into which it

has been found possible to fit every variety of cognitive process hitherto examined. It must be noted that the noegenetic, or qualitative, principles are stated in a purely psychological way without reference to physiology, whereas the quantitative principles, while capable of similar statement, are given physiological consideration as well. In respect of the three processes in which experience, relations and correlates become known, the psycho-physical connection is utterly obscure, and no help is afforded by physiology in their explanation. This is not so with regard to the quantitative principles, except in one case. Though they express psychological tendencies, physiology is able to throw some light upon them. The two aspects should, no doubt, be kept separate; but neither science can here afford to ignore the other. Most interesting in this connection is the recent work of Lashley, which indicates a general energy resident in the nervous system and available for use in various directions. This is an exact physiological parallel of the psychological doctrine of the two factors. The one exception, emphasised by Spearman, is the principle of conative control. Recent experimental investigation of will-acts (*see below*) supports his view. It points to a distinction between conation and volition. Now, the

dependence of a conation (say, to move a limb) upon a will-act to do so is as utterly obscure as the passage of experience into knowledge ; and physiology has no useful explanatory suggestion to offer the psychologist in the matter. The problem, like that of the origin of knowledge, remains a purely psychological one. Indeed, this was already indicated in the statement of the first noegenetic principle, where the experiencing subject is asserted to be one of the objects of which we tend to become aware. This subject is very intimately connected with his will-acts which according to the evidence appear to be absolutely effortless precursors of conations of a physiological as well as a psychological character. We have, then, in this system a general mental energy presented which, at least to some extent, can be directed at will from one kind of operation to another. The well-investigated phenomena of inertia, mental lag or perseveration, and of oscillation (or "fluctuation of attention"), are aspects of this same energy. It works in various engines to produce different cognitive results. The engines, in Spearman's view, are provided by the nervous system, so far as its function is localised ; and this, coupled with his doctrine of the nature of noegenetic process, leads him to suggest that the chief purposes

subserved by cerebral localisation are sensation, movement and retention. The roots of the mind ramify in physiology ; its branches, flowers and fruits, so far as we at present know, have no physiological implications. There remains one point to complete the picture. In this presentation of psychology we have energy and engines ; but there is also an engineer. The investigation of the former will indicate the conception we are to form of the latter ; which, in the writer's judgement, is the keystone of a personalistic psychology.

THE DEVELOPMENT OF CONTEMPORARY PSYCHOLOGY

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THE CONTEMPORARY systems of psychology, which have so far been considered, are scientific in the strict sense of the word. They do not attempt ultimate, but only proximate explanations of phenomena ; they simply investigate behaviour, or the mental processes underlying behaviour. Even on the cognitive side, however, many experimental data have been gleaned for deeper philosophical consideration. The essentially dynamic character of mental process, activity in the formation and completion of configurated wholes, activity in the region of the unconscious, creativeness in the operation of noegenetic laws, the central position of the self in the psychological synthesis : all these positions, already gained in science, point to the lines upon which a philosophy of human personality must proceed. In this we shall be reminded of much ancient speculation. For the pendulum, heavily weighted now with empirical and experimental data, is swinging

backward again in contemporary thought from materialistic and physiological explanations of mental phenomena to spiritualistic and purely psychological ones. We can trace an ascending spiral on the record of psychological history ; and at each higher point in the curve the restatement of the old animistic doctrine takes on a more refined and substantiated form. To-day epiphenomenalism (the view that mind is a by-product of matter) need hardly be taken seriously. The issue is between parallelism or an interaction between mind and body ; and contemporary psychologists appear to be about equally divided upon that issue.

THE WILL

THE WILL

THIS CONSIDERATION leads us directly to the topic of conation, or mind in its aspect of active willing and striving. Here again contemporary schools have arisen as protests against associationism, structuralism and phenomenalism. Already, as far back as Maine de Biran, a theoretical doctrine was advanced to account for the origin of habit, will and consciousness of self in a genetic manner. It was an attempt to explain volitional consciousness as consciousness of self upon empirical lines, which would cut across the mechanistic conception of the followers of Hume. Biran held that the self was essentially an experiencing activity of a spiritual kind ; and he explained how it becomes aware of itself as such. In the first instance, certain reflex activities are mechanically determined by external stimuli. But, on repetition of stimulation, experience divides into two orders, that of active self and that of object to which the self reacts. It is self as will, especially when effort is experienced in the exercise of its activity upon

objects, which is revealed to us. William James also stresses the feeling of effort in " the slow dead heave of the will," as well as the *fiat* (" let it be so ") which distinguishes the highest form of will-acts from all other processes of consciousness. Of recent years, however, a great deal of experimental work has been carried out upon problems connected with willing and striving, the results of which fit in well with the findings of Hormic psychology and psychoanalytic theory. This work has mainly followed the two methods of controlled introspection and of estimates. Beginning with researches upon choice carried out in the laboratory of Wundt, the first method was perfected, both with regard to choice of problems for attack and in technique, by a group of workers largely influenced by Külpe. Notable among these are Ach and Michotte. The first named, investigating the resolutions taken by his subjects to carry out prescribed mental tasks, found that the true will-act occurs at the moment of resolution, and not in the subsequent performance. The latter, he found, was conditioned by the previous volition, and took place in virtue of what he called a " determining tendency " brought about by it. These volitional determining tendencies are assimilable to native, or instinctive, dispositions in that they may operate

without further conscious guidance or control. Ach was able to induce very strong resolutions in the course of his experiments, which aimed at measuring the strength of the will when pitted against strong associative tendencies. His subjects were required, say, to find rhymes to syllables which had so been learned over and over again with others that, when re-presented, there was an almost irresistible tendency to react with the associated syllables. What he really measured, if anything, was not the strength of will-acts, but that of the associative against the determining tendency. Nevertheless, his work shows that conative activities are called into being by the will. Further experimental investigation has emphasised the distinction between conation and volition, and shown that, while great effort may be involved and experienced in striving, acts of will may be entirely effortless and yet effective. Ach's fine introspective analyses further prove that the experience of resolution is in an intimate way bound up with the lived experience of the self; which can be characterised only by the description "*I* truly will." Thus volition, in its form of resolution, is a peculiarly impressive manifestation of self-activity. Here are gains for psychology of the greatest importance; the introspective isolation of will-acts, their clear

distinction from feelings of effort, and the definite relating of volitional process to the active self.

Similar results were obtained by Michotte, who investigated the process of voluntary choice. In his experiments the subjects were required to choose, for good reasons, between alternative arithmetical operations to be carried out, between different combinations in pairs of pleasant and unpleasant liquids, one of which had to be tasted, and the like. As in Ach's experiments, it was found that the choice-process developed under the influence of volitional determining tendencies set up by the previous acceptance of the instruction (resolution to choose). The choices themselves were capable of analysis on broad lines. Though exceedingly complicated processes, fairly definite phases were distinguishable in them, such as the perception of the alternatives, evolution and deliberation of motives, development of feelings, and finally consent to, or designation of, the alternative chosen. The subjects distinguished two typical kinds of choice, cold and lively, and it was found that the " cold choices " were the more voluntary of the two. But these were precisely those choices in which the feeling of effort was least apparent ; and the introspections to this effect were borne out by the

objective controls (breathing records, etc.), which showed "lively choices" to be accompanied by considerable physiological disturbance. This observation further emphasises the distinction between volition and conation, to which reference has been made. As has already been stated, the whole process of choice may take place automatically in virtue of the previous resolution to choose; but there occurred many cases in which will intervened during the choice itself. When this happened, the experience of self-activity, as in the case of Ach's resolutions, was reduplicated in what Michotte terms "consciousness of action." This is an important result of Michotte's investigation; for it points again to the phenomenal appearance of self in consciousness, an experience sharply differentiated from the consciousness of effort which may accompany it. Once more self, as will, is indicated as an experience entirely distinct from feelings of physiological origin. Experiments similar to those of Ach and Michotte have been carried out in the laboratory of the present writer, with results which confirm their conclusions; and correlation of the introspective reports with psycho-galvanometric records taken during the researches corroborates the distinction, exceedingly important for theory, between volition and conation. Where effort is

reported, the galvanometer indicates bodily change.

Research of another kind was carried out by Webb, who used the method of estimates. His problem was to discover what character-qualities tend to be found together in individuals ; and to this end he had a large number of persons ranked in order, by competent judges, in respect of different character-qualities which they displayed. Only those rankings were used in his conclusions when several independent judges agreed in their estimates closely enough to obtain a good "reliability co-efficient" (*i.e.*, when high agreement obtained between the rankings). Having obtained his data in this way, Webb calculated statistically the tendency of certain traits of character and intelligence to be shown in the same individuals. He found that the moral and social qualities of perseverance in face of obstacles, kindness on principle, trustworthiness, and conscientiousness are qualities of persons whose intelligence is profound rather than quick ; whereas readiness to become angry, eagerness for admiration, and bodily activity in pursuit of pleasure, characterise those persons whose intelligence is quick but not profound. He thus showed that a general will-factor exists which reveals itself in character ; and he concludes that consistency

in conduct results from deliberate willing. Webb's data might have been interpreted in another way, as pointing to the general factor of perseveration already established by previous work. Stability in character might not be due to will, but to mental inertia. His conclusion, however, is supported by further investigations made by Lankes, who used the methods both of experiment and estimates. Having obtained rankings for character-qualities similar to Webb's, he also tested for perseveration, and correlated his results. The event proved that consistency of conduct, or perseverance, is not perseveration. The latter is a native character of the nervous system ; the former the result of a person's own effort and will. Lankes sums up by saying " the self, with persons used to act . . . from higher motives of reason and principle, not according to merely natural bent and inclination . . . can modify, and directly counteract, its own nervous system and its innate tendency towards perseveration or the opposite."

It will readily be seen how the two lines of attack upon the problem of will lead to similar and mutually supplementary results. A large field is opened for further exploration ; but already the gain is recorded of an aspect of self which is fundamental. It is a self which enters

experience as an essentially active and controlling reality, largely directing its own behaviour, and irreducible to a mechanical system of sensations or neural processes.

FEELING AND EMOTION

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FEELING AND EMOTION

If the field for work upon the will is large, that for the investigation of feeling and emotion is still larger. The psychology of emotion is in a far less advanced state than that either of cognition or conation. To begin with, there is a difficulty with regard to the meaning of the term emotion itself. Sometimes it signifies conation, sometimes feeling, sometimes a blend of both. Until more exact analysis is forthcoming, there is bound to be confusion. From very early times two chief views have claimed adherents ; one, that emotion is a mental state which leads to conation, the other that bodily conation is experienced as emotion. The two views are contrasted by James, who advanced the latter, in a well-known passage : —" Common sense says, we lose out fortune, are sorry and weep ; we meet a bear, are frightened and run . . . the more rational statement is that we feel sorry because we cry . . . afraid because we tremble." James picturesquely over-emphasises the rôle of the

skeletal muscles in emotion ; but visceral and glandular changes must principally be taken into account. The elements of both views are implicit already in Descartes's doctrine of the passions of the soul. Like all conscious processes, emotions are thoughts, not bodily states. None the less, they are perceptions of changes occurring in the body. Physical impressions conveyed to the brain bring about bodily changes which result in seeking, avoiding or defence reactions. In the lower animals this is all that happens. But in man the mind perceives the bodily " commotion," and so experiences " passion." Emotion is thus a conative adjustment of the body perceived by the mind. But it is more than this. It is also an incentive to acts of will, which in turn influence movements of the body. It is accordingly not merely, as for James, a mass of bodily sensation, but a dynamic mental state lying midway between knowing and doing. Interesting in this connection is Wundt's emotional theory of will. Elementary feeling-qualities carried by sensations become fused in higher and higher " emotions " which develop in regular sequences, and usually lead to acts of will. These latter consist in those emotional sequences which end in a feeling of resolution and lead to overt action. Since consciously willed

acts tend to become mechanised and unconscious in us, Wundt extends the concept of will to cover all purposeful action whatever which satisfies biological needs. Thus his emotional theory of volition includes both impulsive and reflex acts, which genetically once expressed conscious wants of the organism, but now simply connote a typically emotional sequence in which the feeling of resolution is absent. Will as emotion is thus an entirely general and fundamental character of mind. A similar rôle assigned to emotion will be recalled from what has been said of Behaviourism, in which theory both natural and acquired reaction-patterns are regarded as activated by external stimuli. Here the conative aspect of emotion is stressed to the exclusion of the feeling aspect; and will is reduced to mere physiological striving. In sharp contrast with this last view is that of the Hormic psychology developed by McDougall. Here emotion is made the central part of the instinctive process, which is initiated by perception of connately adapted stimuli and issues in definite conative activities leading to observable behaviour. Both on the perceptual and the conative side, modifications may occur which explain the complexities of acquired forms of behaviour; but the emotional core of instinctive and

acquired behaviour is fundamental in the theory. This view leads to the exceedingly important conclusion that emotion is the clue to behaviour, as it indicates the natural springs of action. By the play of cognitive process upon these through the emotions, character may be built up and conduct may to a large extent be guided ; and it is by stimulating the natural needs and wants of human beings in this way that the success of applied psychology in all its branches depends. The investigation of the physiological changes connected with emotion, though of less psychological interest, has proceeded apace. Since the time of Lotze, who was one of the first to examine changes in facial expression, bodily posture, alterations in breathing and pulse, under emotional stress, many investigations of this problem have been undertaken. In general it may be said that these point to the autonomic nervous system, the lower centres (thalamus and basal ganglia) of the brain, and the endocrine, or ductless, glands, as more particularly concerned in emotional reactions. The work of Langley, Head and Sherrington on neural processes, and that of Brown-Séquard, Cannon and Crile on the secretions of the ductless glands, may be cited in support. Especially interesting is Cannon's investigation of the function of the

adrenal glands. He showed that fear and rage excited in animals provoked the secretion of adrenin, with consequent increase in blood pressure, liberation of glycogen from the liver, and heightened stimulation of striped, or so-called "voluntary," muscles. This indicates a conative set in the animal, fitting it to react with greater vigour to the object which provokes fear or rage. But the question still remains open whether these changes are the cause or the effect of the mental state. One indication of a possible answer lies in the temporal sequence of events. Some of the physiological changes are very slow, and all require time. In experiments upon will-acts, using the psychogalvanometer as control, the mental attitude seems certainly to precede the physiological one as indicated by the deflections of the needle. This would appear to show that the conative part of the response takes place definitely before the experience of the "emotion." Here, again, there appears to be evidence of the essential activity of mind, as already instanced in the creative activities of thought and the controlling aspects of conation.

PERSONALISM

PERSONALISM

BEFORE passing on to consider the applications of psychology to practical life, it will be in place here to suggest, in the light of the foregoing analyses, a view which has been shaping itself in contemporary thought with regard to the nature of the feeling, thinking and willing subject. Those psychologists who are not so "departmentalised" as to exclude consideration of the deeper problems of their science, are coming to realise that analysis, though a useful and even necessary method, breaks up in thought what is in fact indivisible. The conception of consciousness as a mosaic of sensations, or products of mental chemistry, has been abandoned. Functional psychology has been substituted for structuralism. Since Herbart, polemic has waged fiercely against the theory of faculties (intellect, memory, imagination, etc.) as unitary functions, until definite experimental evidence has been adduced that no such functions exist. The notion of man as a collection of separable instincts,

of personality as the integration of native and acquired reaction-patterns, or modes of behaviour, is beginning to lose favour. In place of these abstract products of analysis, stress is laid upon the undivided totality of the person as an organic whole, all of whose reactions are purposive. This is personalistic psychology ; and it has taken several forms. Most interesting is Stern's view that scientific psychology and personalism go together. For Stern, a " person " is a being which, in spite of the multiplicity of its parts, presents a real unity, having a character and value of its own. Thus, notwithstanding its many subordinate functions, a person is in fact a unitary and purposive self-activity. It is, however, psycho-physically neutral, lying beyond its physical and mental manifestations, either of which may be interpreted mechanistically or teleologically. For, in Stern's view, the antagonism between mechanism and teleology is reconciled in a teleo-mechanical parallelism. Moreover, a person's " disposition " is a single inner factor which co-operates with external factors, and thus manifests itself in a series of single tendencies and characteristics. This doctrine is the philosophical basis of Stern's scientific treatment of individual differences ; to which subject he has contributed experimental results of a very high order. While

Stern's purposive self-activity is beyond its manifestation, other personalists maintain that it is actually lived and apprehended in self-experience. This is the conclusion of much experimental work by such investigators as Dürr, Katzaroff, Michotte and Ach, to some of which reference has been made above. As actually experienced, the self, according to Calkins, exhibits four principal characters. It is consciously self-identical ; it is consciously unique, consciously related as ground to its own experience and also in many ways to its environment. These characters, together with that of its activity, provide a clue to the conception we should frame of it. Is it matter ? Is it spirit ? Is it a compound of both ? Clearly it is not matter in the old sense in which matter was conceived as an inert substratum for quantities and qualities. Modern physics itself is abandoning that concept for one of energy, which it has borrowed from psychology. Clearly it is not matter in the sense of mere potency ; for that is a contradiction of all experience. As clearly, it is not spirit in the sense that it exhibits no physical phenomena ; otherwise there could be no communication between selves, nor interaction between a self and its environment. We are driven back upon psycho-physical interaction or parallelism,

with an altered value put upon both the terms psychical and physical ; for the reality lying behind physical phenomena, and the psychical as given in experience, appear to be assimilable in the form of energy directed towards ends, aimed at goals, one kind of which at least is evidently self-conscious. Whether this personalistic view be acceptable, or, as in other philosophical interpretations of the facts advanced by different schools of psychologists, pure spiritualism or pure materialism is to be preferred, one thing is pragmatically certain, since, in fact, it *works*. This is, that the discoveries of contemporary psychology are applicable with advantage to the practical affairs of everyday life. The science is not only a theoretical, but also an applied one.

The principal directions in which psychology has already proved of value in application to practical problems are those of education, medicine and industry ; though its applicability has proved to be possible in other spheres also, such as those of law, commerce and social organisation.

APPLIED PSYCHOLOGY: EDUCATION

APPLIED PSYCHOLOGY: EDUCATION

DURING the modern period, at least as far back as Herbart, psychological knowledge has been employed in the service of education. The doctrine of apperceptive masses indicated lines upon which educational practice should proceed. The child should gradually and progressively be supplied with information which is easily assimilable to the background of knowledge already possessed. Moreover, in this process his own powers of observation should be trained; for information is not simply poured into his mind by the teacher, he must acquire it for himself. Pestalozzi and Fröbel insisted on this aspect of training, not neglecting character-formation, the latter especially emphasising the value of vivid stimuli (colours, playthings, etc.) in attracting and securing attention. His theory of education by the play-method led to the institution of the kindergarten, and has further been developed in the Montessori system. But other problems

demanded attention also. The discarding of the doctrine of faculties raised the question of the possibility of "transfer of training." Does training in one subject, or skill, facilitate the learning of another? Does learning Latin, say, make learning Greek easier? Or does practice in manipulation with one hand help in the acquisition of skill with the other? It was found that such facilitation only occurs when the several subjects or skills concerned are very similar in character; a fact which has largely influenced educational curricula. A like problem arose in respect of memory. Is this a unitary power, good or bad all round; or do people have good memories for some things and bad for others? Again, research has shown that "memory" consists in a number of memory-functions, and that the degree of functional unity is connected with the degree of likeness of the material remembered. Thus, though retentiveness varies from one individual to another, it is incapable of general training. On the other hand, work initiated by Ebbinghaus and prosecuted by a large number of investigators shows that there are advantageous methods of memorising and acquiring skills. In general, for example, learning by wholes is more economical than learning by parts; spaced-out learning is better than learning all

at once. These conclusions also have been fruitful for educational practice. Even more important, however, has been the discovery of the possibility of measuring general mental ability, as well as certain special aptitudes, by the use of intelligence and other tests. This not only permits of children being graded for teaching appropriate to their mental age, but also gives indications of special abilities which would benefit by intensive training, or the lack of such abilities in children upon whom training would be wasted. On the character side, as contrasted with intelligence, much headway has also been made in applying psychological knowledge to problems of maladjusted, naughty or troublesome children. Emotional and conative defects, lack of control, and wrongly formed habits are, to a large extent, amenable to treatment ; and the multiplication of highly successful child-guidance clinics for this purpose is evidence of the educational and re-educational value of applied psychology.

APPLIED PSYCHOLOGY: PSYCHOTHERAPY

APPLIED PSYCHOLOGY: PSYCHOTHERAPY

THIS LAST consideration indicates a connection between educational psychology and psychotherapy. Just as maladjusted children can be successfully readjusted by psychological means, so many forms of neurosis yield to psychological treatment. From time immemorial psychology has in one way or other played its part in the practice of general medicine. Plato relates how Socrates described the cure of headache by suggestion, and the earliest records of Egyptian medicine show how psychological principles were used in effecting cures. Psychotherapy is to-day a recognised branch of the medical profession, specialising along definite lines in the treatment of functional, and sometimes organic, disease of mental origin. The chief methods in use are those of suggestion during hypnosis or in the hypnoidal state, psycho-analysis and re-education. By such means not only phobias (fears), compulsions (irresistible impulses), tremors, tics and morbid

habits, such as alcoholism or drug-addiction, may be cured, but even serious physical conditions may be ameliorated. Apart from definite curative suggestions and catharsis, or mental purging, however, the influence of emotional states and conative attitudes upon physiological processes is well known ; and the skilled practitioner draws upon general, as well as special, knowledge and technique in his therapeutic procedure.

APPLIED PSYCHOLOGY: INDUSTRY

APPLIED PSYCHOLOGY: INDUSTRY

AMONG the latest developments of applied psychology is that connected with industry. It has at length come to be realised that human beings, as well as machines and materials, are involved in production ; and that individual differences are of the greatest importance in adapting people to the various avocations of industrial life. Some employments require much intelligence, others less. As we have seen, individuals may be tested for general mental ability and advised in respect of, or selected for, tasks which are suited to their capacity. Again, perseverative tendencies, which make for slowness in adaptability, would be a great handicap in some tasks, whereas a strong perseverator would perform others with ease and success. This general factor can also be tested, and advice given or selection made accordingly. Similarly, many special aptitudes which fit or disqualify people for particular forms of work can be investigated by testing. In this

way, a fairly complete picture of the individual is reached, so far as possibilities of performance are concerned. There are some jobs in which he can never make good ; in others he may prove a success. That he will not certainly be successful in these depends on other factors than general and special abilities of a cognitive or executive kind. Human beings are not machines, nor even intelligent machines. Their emotional and conative make-up must also be reckoned with. Their needs, desires and feelings constitute a no less important consideration than their abilities in fitting them for different employments ; and individual differences in these respects also must be taken into account, not only in vocational guidance and selection, but in their subsequent occupational career as well. Here, again, psychology has much to offer to worker, employer, distributor, salesman and even consumer. Investigations have been carried out upon the best ways of performing different tasks, the introduction of rest-periods between spells of work, the lessening of the hours of the working day, the avoidance of fatigue and boredom, the provision of adequate incentives to arouse ambition, and the like ; and the results, when applied, have proved to be advantageous to all concerned. Greater production has been secured with less effort,

fatigue and emotional disturbance. Though here, as elsewhere, psychological research and application have begun with problems of the head and hands rather than of the heart, an immense field is opened up for further work. Our increasing knowledge of will and character-qualities will be found as applicable to industrial conditions as our knowledge of intelligence and special aptitudes has already been ; and the legitimate needs and desires of human nature, even when they differ, will be taken into account in industrial organisation. An illustration may already be found in the psychology of advertising and salesmanship. Clearly these can be practically successful only so far as they are based upon knowledge of the desires and motives which lead people to purchase goods. It is not enough to catch attention by a striking poster or paragraph, and to hold it by repetition. A mere description of an article by a salesman will not sell it. The prospective purchaser must want to buy, or be made to want to buy, by an appeal to need or desire. He must be given a motive to purchase which will be sufficiently strong to sway him. The appeal through the eye or the ear is not so much to his judgement as to his feelings. By further extension of this principle, applied psychology can go far both in industry and commerce. It

can reach to professions or callings of every kind. Indeed, there is no sphere of life that it cannot touch. For to control our own thoughts, feelings and actions, and to adapt ourselves to our place in the social organism, some understanding of human nature, as manifested in ourselves and in others, is required. We must know those points in which we are alike and those in which we differ. Most of us learn a little of that knowledge in a rough and ready way through experience of ourselves and others in our various social contacts. But a detailed and exact knowledge is only possible through scientific observation of the facts and their experimental investigation. We end with the definition with which we began. Psychology is the science which investigates behaviour in general, from the point of view of its mental implications, and with a view to its guidance and control.

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