

Lecture I

THE GENERAL NATURE OF THE HUMAN INTELLECT

A general account of the workings of the human intellect must necessarily deal in part with matters comparatively familiar to students of mental science and at first sight comparatively forbidding to those who are not already psychologists, but the justification of the present undertaking lies in the fact that I shall attempt to deal with some of the more neglected facts of the science of the intellect; while on the other hand these neglected facts are such as promise to possess a comparatively general interest. As indicated in the general title to these lectures, I propose to ask you to study the intellectual life of man especially in so far as it is a product of social conditions. Now if the mind of man is notoriously something very mysterious the life of human society is now-a-days a favorite topic for inquiry. And if it is customary to say that elementary mental science is obliged to deal with very hackneyed problems, it is obvious that so soon as we deal with the relations between the individual mind and society we concern ourselves with matters that must possess an inexhaustible novelty. Now everybody knows that the mind of an individual man is formed under social conditions. It is a commonplace that we ordinarily carry on our thinking more or less expressly in language, spoken or written, or inwardly repeated. And language is an explicitly social process at least as to its origin, and more or less as to its intention when used by an individual, even in soliloquy. Thus the social relationships of intellectual processes are [Ia] in a measure universally recognized, but I shall show you in the later lectures of this course, I do not think that even recent psychology has yet sufficiently drawn the lesson of the social aspects of the intellectual life of man. Some of the most important and mysterious problems as to the nature of fundamental truth stand in an entirely new light if only we take due account of the social origin of intellectual processes. On the other hand some of the most constant practical problems as to the guidance of the intellect, and as to the business of the teacher of minds seem to me to appear in new and significant light when we view our intellect as an essentially social product. I propose then in following lectures a series of studies of the social relations of the human mind, which, as I hope, may interest those who love human nature and may help those who have to teach, or otherwise to guide minds.

But this first lecture must be devoted almost altogether to purely introductory matter. Our proper business can be reached only in the latter lectures. For the first, to-day, since my lectures will all belong by virtue of their topic and method to the scope of the science called Psychology, I must say by way of general introduction of that science. Thereafter I shall devote myself upon this occasion to a general preliminary account of the nature of intelligence, both animal and human.

First, then for a brief discussion of the definitions [typescript cut-off: illegible] the [typescript pages omitted by Royce] scope and the methods of what is called mental science, or psychology.

All men are in some sense psychologists. All are interested in their fellow men, and above all in the minds of their fellow men. But the methods of psychological study which are employed in the interests of science differ from the popular methods, first of all by trying to make a clear difference between the study of minds when made with the purpose of understanding them, and the estimate of minds which we daily make for the purpose of expressing our likes and dislikes, and of guiding our practical relations with the persons in whose minds we take interest. For ordinary life minds are either interesting or uninteresting in proportion as they are the minds of people for whom we feel personal concern or with whom we have few or no dealings. For the psychologist, all minds are interesting, merely because processes go on in them which he is concerned to understand. The psychologist is as [2] interested in the minds of disagreeable, of defective, of untrained, or even of insane people as he is in the minds of his friends or of his family. In fact, since he can often better understand the mental processes of certain kinds of defective people than he can understand the processes going on in those more complex minds in which he takes private and personal interest, he often finds that the scientific interest of a mental process may tend in particular cases to stand in inverse ratio to the moral or personal value which this process otherwise possesses. Yet of course such a divorce between the scientific and the practical interests in mental life is only an accident of our imperfect knowledge. The psychologist tends, in proportion as he understands mental life, to regard minds and mental processes with an interest which differs from the popular in two ways, (1) In so far as the psychologists interests are broader and more impersonal than the popular and natural interest in minds, and (2) In so far as the psychologist as such wants to comprehend the nature and the law of the mental life which he is studying, rather than directly to estimate the value of what goes on in this mental life. Thus it is with the psychologist as it is with the botanist who does not found his science upon any distinction

between edible and useless or poisonous plants, but who studies the nature and law of plant life. But precisely as the botanist gets information which, when once obtained, may be practically useful to the farmer or to the gardener, so the psychologist tries to acquire information concerning minds which may ultimately be useful in the practical life in which we are concerned to estimate, and required to guide, to mold, or any way to influence them. And thus, in the end, the two sorts of interest in minds, the practical and the scientific interest tend to reunite.

I have already assumed in what I have thus said a definition of psychology which I may as well formally state at the outset of these lectures. Psychology is the doctrine or science which undertakes to study the nature, the processes [3] and the laws of mental life in men and animals. Thus the psychologist is, as I have said, interested in minds precisely as the botanist is interested in plants. He examines minds, he analyzes their processes, he asks what are the conditions under which these processes occur, and how the processes vary with the conditions. If he discovers any uniformities sufficiently exact to be capable of expression as laws of mental life, he is interested to state such laws. Meanwhile, it is as well to say at once that it would be a mistake to suppose, as some have done, that the psychologist is primarily or principally concerned with the study of his own mind. Some people have indeed imagined that psychology differs especially from more or less scientific undertakings in that, while other sciences study the world which lies about us, psychology, which studies the mind, is primarily confined to what has been called the inner world, the world which every man knows, or is supposed to know in his own personal experience alone. But this is a mistake. Of his own mind the psychologist tries to discover what he can, very much as a botanist who owns a private garden, very rightly studies the problem of plant life to a garden that he himself cultivated would make a very imperfect acquaintance with the phenomena of plant life, so a psychologist who studied his own mind would go but a very little way in his science. The comparison, in fact, is imperfectly fitted to indicate the narrowness of the psychologist's field in case he should confine himself to his own mind; for the botanist might make his private garden a very rich field for observation and experiment, while for reasons upon which I need not enter here our own minds, unless we study them through a constant comparison with the minds of others, yield a comparatively poor field for scientific scrutiny of a psychological sort. The direct study of our own mental processes is technically [4] called Introspection; and I may as well say at once that introspection is only one of the psychologist's methods of work, the method exclusively or even principally pursued in the study of mental laws and processes.

The principal instrument of psychological investigation, whatever one's special method, in a particular case, may become, is an instrument which everybody is familiar, namely, the social comparison of what goes on in various minds by means of the study of the various ways in which minds express themselves. To this principal instrument of psychological study all the special methods of the science are subordinated. The following lectures will try to illustrate this assertion [illegible]; but let me at once explain [illegible] fundamental truth by a particular instance. We are all acquainted with certain mental phenomena called emotions, such as, love, fear, grief and the like. Now what do we know of the nature and the laws of such processes? I answer first, that by bare introspection, by an immediate study of our own emotional states as they occur in ourselves, we can come to know very little of scientific importance concerning the condition under which these emotions occur, or the true nature of such emotions. And there is a very good reason why this should be the case. When we are under the influence of such emotions in any very violent way, we are often too excited to observe them, still less to understand their conditions, unless we are already well instructed in psychology, or at least in the practical knowledge of human nature. When we get to the point where we are able to observe the emotion with care, it may be already less vehement. Or, if our power to observe the emotion is present, as in a way it sometimes is, along with a pretty vehement state of the emotion itself, our inner observation is rendered deceitful or even worthless by various personal prejudices which make us blind to what is going on even when we pretend to comprehend it best. Thus an introspective study of current emotional states is likely to be to any extent misleading because of what one may call, in Ruskin's phrase, the pathetic fallacies of our emotional conditions themselves. Some very emotional people observe themselves a great deal, but without ever coming, on that account, to any fair comprehension of themselves. Hysterical, and other nervously burdened emotional patients, sometimes pride themselves upon a consciousness of their extremely clear and skillful introspective comprehension of their inner conditions. But this consciousness is usually in such people very misleading. Some of them write long letters or diaries in which they love to record what they take to be the precise nature and meaning of their emotional states. Such documents are very useful to the psychologist, but, in such cases, are very seldom at all enlightening to the patient himself. His introspection comes to mean an elaborate posing, an often surprisingly ingenious and systematic fooling of himself by himself. It becomes easy to see, when you know him, that in whatever inner state he pretends to be, or takes himself to be, in precisely that inner state he is not, but in some more or

less characteristically different mental condition. He records very sentimentally his noble emotions of self-sacrifice at just the time when he is obviously brutally selfish. He complains of utter melancholy and despair in moods which he obviously more or less delights in keeping up an even reinforcing. He assures you of his strength of purpose at moments when he is obviously vacillating, professes the absolute sincerity of his motives at the very moment when he is plainly lying to himself and to everybody else, and so on indefinitely. More normal people know, without writing such elaborate confessions that they understand their own emotional life comparatively ill; and popular wisdom has recorded numerous familiar sayings its sense of mystery of fear, of grief, of love, and of other passions. What, then repeat is the instrument that can guide us towards a better comprehension of such passions? I reply a comparison of phenomena of emotion as exhibited by various people, under various [6] circumstances, and a study of the conditions, social and physical, under which these expressions take place. We thus learn concerning the emotions a great deal that is of scientific interest. A comparison of the emotional phenomena in men and in animals, - a comparison such as Darwin undertook in his famous book on "The Expression of Emotion in Man and in the Animals", instructs us that the emotional life is an incident in the vast process of the accommodation of organizations to their environment which has been going on throughout the whole course of evolution; and shows us that there is no human emotion which is not prefigured in some way in the animal world. The light that we thus get as to the biological meaning of the emotions supplemented by the vast collection of facts which can be made on the human level, when we consider the social conditions of our emotional life. For instance, the emotions in general are subject to the principle of social contagion. The expression of emotion in our fellows may lead to the arousing of similar expressions, and consequently of similar emotions in ourselves, so that emotion is by no means an individual, but is very largely a social affair, in part in its very origin, and still more in its growth as we mature. A comparative study carried on in another direction shows us that in proportion as men possess and express definite ideas or definite and consciously skillful plans and purposes, the emotional expressions are less violent, so that we observe emotions to be incidents of an imperfect, confused, or interrupted adjustment of our organisms to the world in which we are living, or as they say to our environment. Finally a study of the emotional excitability of nervously diseased or degenerate persons, indicates to us the intimate connection between emotional states and functional derangements of our physical condition, so that we have learned that most emotions, in violent cases are due [typescript cut-off: illegible] internal mental

causes to [7] which we consciously attribute them, as to the current alterations of our physiological condition. These are examples of the way in which a comparative study of the expressions of mental life in many people guide us to a knowledge of the laws and conditions of mental life which no introspection could possibly reach. And thus, by the case of the study of emotions I have already illustrated the fundamental instrument of all psychology.

The particular methods of which psychology makes use in applying the instrument whose nature has thus been indicated are numerous; but they all depend upon some special sort of comparison of the contents of various minds by means of a study of the ways in which minds express themselves. These more special methods may be roughly classified as follows; first there are what one may call in general the more strictly and explicitly social methods of psychological study. Of these the first and in its beginnings one of the oldest is a method dependent upon an analysis of human language and literature, viewed as a record of the working of the general mind. Human language, indeed, is very largely a psychological record; and is an inexhaustible source of information concerning the processes of men's minds. Thus the terms which are used by popular language, in referring to mental processes record a certain rough but valuable classification of the facts of mind-classification which, as a record of many men's inner experience, is not without its scientific interest. The wisdom which has taken shape in popular proverbs is again largely of a psychological nature. Literature and especially poetry is still another collection of documents and confessions relating to the most significant of mental processes. The value of these documents, as expressing, not alone the peculiarity of individual minds, but also what is common to many minds, is indicated by the very fact that literature gets its permanent reputation by virtue of the fact that a great many different people find in it the mirror of their own inner life. In yet another way is language a treasure of facts of psychological significance, namely in so far as both grammatical and rhetorical forms are due to psychological motives, so that the laws of syntax, and the figures of speech, are, as it were, crystallized expressions of characteristic mental processes. But the study of the more strictly social embodiments of the laws of mental life is not confined to such a consideration of language and of literature. Turning in another direction we find that the institutions of society are due to very significant mental functions, whose nature we can to some extent be read by a study of the forms which these institutions have assumed. And not only institutions, - social processes also have their psychological significance. The phenomena of the great social movements, - religious crises, political outbreaks, commercial panics, mobs,

revolutions, - all these are distinctly facts for the psychologist. To sum up then, the methods of social psychology may be applied whenever we seek to understand the laws of mind through a study of language, of literature, of institutions, and of social movements.

But our science uses its universal instrument in yet other ways. A second and highly significant group of psychological methods, the comparing of minds, is characteristic of what is nowadays called Experimental Psychology. Here the plan of work still depends upon the contents of various minds; but the methods pursued are those which can best be carried on in laboratories, and with the aid of trained observers. Experimental Psychology means the study of such mental processes as take place under determinate artificial conditions. And how it is possible to study such mental processes we can easily indicate by familiar examples. When you look into a stereoscope, you see, instead of the flat pictures which are really present, what appears to be a single, solid object. The mental process here in question, is the process which takes place in all persons of normal vision; it is the process of seeing objects in a space of three dimensions. But ordinarily many of the conditions of this familiar process escape us. We can easily discover for ourselves that the co-operation of our two eyes has something to do with the matter; but the precise way in which our two eyes co-operate to make us perceive objects as solid, no direct introspection, apart from experiment and comparison of various experiences, in different people, can tell us. The stereoscope however furnishes us with the means of making experimentally evident some of the conditions of vision in three dimensions. We can determine what relation between the two flat pictures assures the effect of relief and solidity so characteristic of stereoscopic views; we interfere with this relation in various ways, can produce so-called conflicts of the retinal fields, by presenting one picture to one eye and another to the other at the same time; in brief we can produce, can vary and can destroy the normal effects of our two-eyed vision by artificial means. The use of the stereoscope thus offers a familiar example of a type of psychological experiments. Now in modern psychological laboratories there are a great number of means employed for producing mental processes under such artificial means. From the nature of the case the experimental study of mind succeeds most readily in case of simple mental processes, as for instance the processes of sense perception, of comparatively simple activities of memory, of attention &c. Moreover the comparative study of minds under such artificial conditions can best be carried on when the minds concerned are those of trained observers, accustomed to analyze and report what takes place under the conditions of the laboratory. Nevertheless, the use of experimental psychology is a constantly

extending application; and there already many cases where a statistical record of the mental processes are large numbers of inexpert persons, whose minds are working under artificial conditions, becomes important for the purposes of the experimental psychologists.

Still a third group of psychological methods consists of those which have come into use in connection with the work of medical men, especially of alienates and neurologists. These are the methods of medical or of physiological psychology proper. They are allied very closely to the [10] methods of the experimental psychologist but differ from the fact that while the experimental psychologist is studying minds under the artificial conditions of the laboratory, the medical psychologist is considering minds under the extraordinary conditions due to nervous disease. It is in this connection that psychology gets the intimate relation to nervous physiology which is so characteristic of the modern point of view. Yet it must be remembered that even the physiological psychologist is concerned with minds, and not primarily with brains, or with nervous mechanisms as such. The physiological psychologist is directly interested in the comparative study of mind with reference to the way in which their processes are altered when the nervous mechanism is altered in certain more or less determinate fashions by disease. He is therefore led to lay great stress upon the connections between mental functions and brain functions. Yet it must be remembered that every psychologist has to study mind mainly in connection with its physical expressions. Some people imagine that medical, or physiological psychologists, are somehow more materialistic in their methods, and in their presuppositions, than are other students of psychology. This need not be in any sense the case. Every expression of the mind which is capable of being observed or interpreted from without is a physical expression. Everybody who interprets the laughter or the weeping, the words or the gestures of his fellows is studying material expressions of mind, physical organs and functions which record mental processes, outward appearances of the otherwise invisible inner life. Now a physiologist who traces such physical functions as laughter, weeping, speech or gesture to the nervous centres in which they are initiated, and who then notes how these expressions, and the mental life which they express get altered when the nervous system varies in health or in disease, is just as much a materialist, and just as little as the [11] ordinary man of common sense, who well knows that, as a matter of fact, our mental states vary along with their physical expression, so that certain mental states cannot in us exist without appropriate expression in our words or our demeanor, while on the other hand, certain expressions cannot exist without the appropriate mental states. We hear much of the mystery of the connection

between mind and brain. Physiologists are often called materialistic for insisting to much upon it; and there are people who feel insulted when they hear that our most exalted mental processes do no occur except in definite relation to the states of nervous tissue. Yet people are not surprised when their attention is called to the fact that sorrow and joy have definite relations to the physical processes called weeping and laughter. They do not think it materialistic to say that the highest thought is in us intimately bound up with the physical processes called speech. Nor are they insulted by the reflection that a man's character is expressed in his deeds. Yet one's deeds are physical processes. The relation between mind and brain is no more materialistic in character or in significance than are these familiar relations between mind and its expressions in demeanor, in speech and in conduct.

II.

So much then for a general introductory statement of the nature, the scope and the methods of psychology. I am now free to pass to the special topic of these lectures. We are to apply the foregoing methods to the study of the human Intellect. And we may as well begin by a brief account of what we mean by the Intellect, i.e. by the intellectual facts and processes of the mind. And here, at once, I shall try to apply the general principles just laid down by asking you to consider as we endeavor to define the intellect, not merely or chiefly those states of your own mind which you call intellectual states, but rather the expressions, the deeds, the conduct which a comparative study of the beings who have minds will at once lead you to regard as the characteristic expressions of intelligence. For, as I insist, the best way to find our what we mean by the intellect is to consider what is the characteristic behavior of any intelligent creature in so far as he shows signs of intelligence. The general answer to this question which a comparative study of very various grades of intelligence shown in the conduct of animals and men will readily suggest, is that an intelligent animal is one whose doings are constantly moulded by what happens to him; in other words an intelligent animal is one that shows in his conduct the results of his experience.

Let us consider a little more closely what this means. To this end let us observe at once that all animals from the lowest to the highest are engaged in processes of what is called adjustment to their environment. That is, what they do, on the whole, is to act in response to whatever stimulates their senses, as light stimulates the organs of vision, or sound the organs of hearing. And the responses made to such stimulation are on the whole such as tend to enable the animal concerned

to survive and to fit himself to those physical conditions which are indicated to him by the disturbances of his organs of sense. When a dog picks up his ears, his movements constitutes what we call an adjustment to his environment. He hears a sound. He moves his head and his ears so as to listen better. And listening better is advantageous to him. That is the sort of movement that, in the long run, helps to keep him alive, by enabling him to detect danger, to mind his master, etc. Well, all the movements whereby animals flee from enemies, pursue prey, hunt mates etc., are called adjustments to their environment. Such movements are in general initiated by physical causes which disturb sense organs. The animal's nervous system is so constituted or so trained that when its senses are aroused by outer disturbances, it reacts with a series of out going nervous currents that in their turn arouse, or as we say innervate series of muscles; and this innervation of muscles terminates in conduct that on the whole tends to be suitable to the [13] animal according to its nature and situation.

Now when we survey in a comparative way the doings of animals we observe that while all these doings normally tend to constitute useful adjustments to the environment, the individual animal avoiding dangers and seeking food according to its needs, these doings nevertheless present on very noteworthy contrast as we pass from lower to higher levels. All of the activities of many lower forms of life, and some of the activities of even the highest animals, are subject to the rule that under given conditions they are repeated over and over, often to the point where weariness begins, and sometimes even the limit of exhaustion, without any noteworthy alteration, and that whatever the results of previous activities of the same sort may have been. Seldom, I suppose is an activity thus endlessly repeated without some more or less insignificant alteration in consequence of experience. Doubtless if we examined closely enough we should find everywhere at least minute variations of activity due to experience. But in a large number of cases these variations are for our present purposes insignificant; and the rule of a repetition of a single act over and over up to the point of weariness or exhaustion is almost the only one observable. So, in our selves, breathing has indeed its alterations in sleep and in waking, in rest and in exercise, and is subject to more or less voluntary modifications. But on the whole the breathing of a given person, under given conditions, occurs in a fairly regular fashion, and tends little to be altered by the normal results of previous experience. In the same way, there are numerous reflexes, or involuntary reactions to stimuli, such as coughing, sneezing, the knee-jerk, and other such processes; and these are such that, under given conditions, they may occur over and over in ways which, however

variable with our current nervous condition, are not subject to what we should call a tendency to learn by experience.

[14] But in very strong contrast to such activities are those numerous and higher sorts of conduct which are subject to the law that what we have done in the past, as well as what has happened in the past to our organisms, is constantly represented in the form which our present acts assume. These higher activities appear in very numerous grades. Many activities which are closely allied in their nature to the reflexes of which I just spoke are still subject in the other direction to a constant, if not very intelligent modification by experience. Thus walking is a comparatively involuntary process when once we have set about it. Our will gives the signal for the start; and henceforth we keep walking with little interference from the will until we reach some point where we have to stop or to turn. Thus walking is now, in its details, a quasi-reflex action with most of us; and our steps are repeated over and over again in a fashion due to sense stimulations. But walking also is subject to alterations by virtue of experience. If we have been for some time at sea we acquire a new gait which we may have difficulty in abandoning after we reach land. To take another case there is a half mechanical tendency of the eyes, when unoccupied, to turn towards any bright object that chances to enter the field of vision. This tendency becomes very manifest early in infancy; yet it is subject to modification by experience. We have now no tendency to try to look at the sun, for we have learned that the act is too painful. When the electric lights were first introduced into city streets, I found my own eyes often and involuntarily tending to stare at them. The result was uncomfortable, and my eyes have now no involuntary curiosity about electric lights. In countless such ways the original tendencies of our nervous system get modified through experience, even where these tendencies are themselves decidedly below the intelligent level, and are more or less reflex in their character. But as one passes from lower to higher levels amongst our function, one finds that more and more what [end of typescript]