III.—EPISTEMOLOGICAL DIFFICULTIES IN PSYCHOLOGY.

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So much has been written during the last few years on the philosophical difficulties inherent in psychology that some apology seems needed, especially to this Society, for again calling attention to so well-worn a subject. Its importance may, however, be pleaded as a sufficient excuse, and in view of the wide-spread tendency among psychologists to minimise or even to deny such difficulties, a brief statement of them from the psychological point of view will not, perhaps, be entirely valueless. Unfortunately, the controversy has been vitiated by exaggerations on both sides, coupled with not a little wilful misunderstanding, and while philosophers are ready, on the strength of epistemological considerations, to deny the possibility of a science of psychology, certain psychologists make the claim that their science is as independent of philosophy as are any of the physical sciences, and this in face of the fact that whereas there is practical unanimity in the definition of the standpoint and method of these latter sciences, psychology shows almost as many definitions as there are psychologists of eminence who make it their special study.

The various difficulties which this paper sets out to consider are closely inter-related, and any separation of them, such as is necessary for the purposes of exposition, is certain to be somewhat artificial; there is, however, an order of treatment sanctioned by convention, which I shall find it well to follow.

I.

The first difficulty, then, is that of marking off the subject matter of psychology from that of the other sciences, physical and mental, and all that I am concerned to show here is that

any definition which limits itself to the data of introspection and, relying on the distinction between the act of experiencing and the object of the experience, between the "process" and the "content," lays the stress for psychology upon the former of the two correlatives, really stultifies its procedure *in limine*.

Introspection may indeed succeed in distinguishing one act of experiencing as different from another act, quite irrespective of difference of content,—may, for example, be able to detect a difference between the process of questioning and the process of desiring, apart from any difference there may be between what is questioned and what is desired. But this is the limit of its powers. It cannot analyse these acts of experiencing in any sense whatever, for they never become its object. They are experienced but not known. As experienced, moreover, they possess worth or value, and from this psychology explicitly abstracts in order to mark itself off from the other mental sciences, such as ethics and history. If, then, introspection is still trusted to give us a positive science, this must be of the contents of consciousness. But physics, chemistry, biology—all the physical sciences—are based on the contents of individual consciousness. How, then, can we mark off psychology from these? Professor Münsterberg* has suggested that whereas the physical sciences are concerned with those portions of the presented object which can be thought of as capable of being experienced in common by several subjects, psychology deals with that in the presented object which can only be experienced by one subject. In further explication of this distinction, however, he writes:† "Unsere Definition, dass das Psychische nur einem vorfindenden Subjekt, das Physische aber mehreren erfahrbar ist, muss somit nochmals korrigiert werden. Wir können jetzt sagen, dass der Begriff des individuellen vorfindenden Subjekts

* *Grundzüge der Psychologie*, p. 72.

† *Op. cit.*, p. 74.

als rein logischen Beziehungszentrums es unmöglich macht, dass irgend ein individuelles Subjekt etwas erfährt, das Objekt des überindividuellen Subjekts ist. Das Physische ist also nicht mehreren vorfindenden individuellen Subjekten gemeinsam, sondern richtiger, es ist das für mehrere aktuelle Subjekte gemeinsam gültige Objekt gedacht als ein Vorfindbares, also losgelöst von der Aktualität; es ist vorfindbar für das Bewusstsein überhaupt und eben deshalb nicht vorfindbar für ein einzelnes Subjekt."

Professor Alexander* has given us weighty reasons for classing all contents of consciousness as physical, and limits the term psychical to conation, something identical throughout individual consciousness except for differences of "direction" corresponding to differences of content. Feeling is also by him provisionally classed with conation as psychical, although Stumpf's theory of "sense-feelings" (Gefühlsempfindungen) would, if proved correct, place these states also among things physical. Professor Alexander's theory, which I myself accept, introduces some difficulty into the current views of psychology, since it seems to limit unduly the scope of the science. It undoubtedly makes a purely introspective science still more demonstrably impossible than before. In return for this loss, however, it indicates the possibility that just as the quantitative science of physics has been evolved, by abstraction, from the physical material or content of sensation and perception, so a quantitative science of psychology may some day be produced, by abstraction and generalisation, from a study of the interrelations of conative tendencies and more or less complicated intellectual abilities in the individual and in the race. It indicates, too, the true position of introspection in psychology. Before the objective science of physics could arise, sensations,

* "Mental Activity in Willing and in Ideas," *Proc. Arist. Soc.*, 1908-1909, pp. 1-40; "On Sensations and Images," *Proc. Arist. Soc.*, present volume, pp. 1-35.

perceptions, etc., had to be distinguished one from another and analysed into their common elements, *to a certain extent*. This process is identical, except as regards degree of difficulty, with the introspection talked about in psychology. Psychology is concerned with conative processes, which can be distinguished from one another by their contents, but of which a science can only be produced by reduction to the common terms of space and time in which physics has found it possible to work, *i.e.* by the measurement of external effects. A special method for investigating thus objectively and quantitatively the processes of consciousness will be briefly described at the end of this paper. Before leaving the present subject, however, it might be well just to remind oneself that the only so-called genuinely psychological measurement, namely, measurement of sensation-intensities, though definitely proved to be possible according to Delbœuf's scheme of "sense-distance," has received no application whatever in later psychology.

II.

It has been hinted just above that explanation can only be achieved in terms of space and time, the reason being that only in terms of these can quantitative relations between antecedent and consequent be expressed. The causal relations in physics, chemistry, and the other physical sciences are all actually or ideally quantified, and the mind can always pass continuously from cause to effect within some identical system of quantified relations. Psychical processes do not fit into any quantitative systems in this way, and hence the modern form of the causal concept does not apply to them. It is *not* because psychical processes are qualitatively distinct from one another that causal explanation in the ordinary sense is impossible,—physical processes present quite as well-marked qualitative differences—but constant quantitative relations, measurable in terms of space and time, are discoverable in physical science, whereas they are difficult to conceive as possible in psycho-

logical science. Time-relations, by themselves, are of course as readily measurable in psychology as in physics. The laws of memory and association, for example, are, so far as they are quantitative, laws of time-relations. The average time taken by one idea to call up another within a given system of ideas, the time saved in re-learning a series of nonsense syllables after a certain expenditure of time in learning them followed by an interval of time of definite length during which the mind is engaged elsewhere—these are instances in point.

This view of the nature of causal explanation is, of course, very far from being held by all or even by the majority of modern psychologists. Thus in December last we find Professor G. M. Stratton,* in his Presidential Address before the American Psychological Association, writing: "Our difficulty in conceiving mental objects to be *efficient* is largely due, I believe, to physics, with its specialised and rigid idea of causation. Rather than break with this authoritative idea, most of us would rather affirm that psychology can never hope to be an explanatory science. Yet we must remember that the exact marks which two events must display before we can regard them as cause and effect are themselves, for the most part, determined empirically. Our tests of the causal relation differ from time to time and from science to science. The idea of causality should normally be in a fluid state: only those of scholastic temper would have it crystallised. Psychology, like any other science, is free to modify the idea of causation to suit its own system of facts. Indeed, we have in something very close to Hume's account a conception to our needs. When we are ready to regard as causal any groups of antecedents that observation invariably discloses, then we are freed from the *a-priori* assumption that causes must always be physical. In our psychology we then become

* G. M. Stratton, "Toward the Correction of Some Rival Methods in Psychology" (President's Address), *The Psychological Review*, Vol. XVI, March, 1909, pp. 73, 74.

empiricists instead of *a-priorists*, and our method of explanation no longer carries an unnecessary load. We are ready to accept as a cause whatever on sufficient observation seems to be a cause."

I have quoted this passage in full because it is typical of much that is said and written by psychologists at the present day. In particular, views of the causal relation of this nature are often put forward in support of the theory of interaction of mind and brain. I prefer to leave the problem of mind and brain untouched (directly, at least) in this paper, although it is a philosophical difficulty arising quite definitely within the domain of psychology itself, and is one on which the theory that contents of consciousness are physical has definite bearing. What I wish to emphasise, however, here is that psychologists withdraw farther than they need from the physical conception of causation when they fall back upon Hume's doctrine of uniform sequence. Physical causation in modern science is uniform sequence *within a quantitatively-determined system*. May not psychical causation, if it really occurs, be regarded as uniform sequence likewise *within some system*? The system in this case, instead of being merely quantitative, would perhaps always be teleological. Such a view is, of course, widely held at the present day. Professor Münsterberg would say that it confused the standpoint of psychology with that of the *Geisteswissenschaften*. However this may be, it is, for scientific purposes, but a poor substitute for a quantitative system. Kant said long ago that a discipline contains so much of science as it does of mathematics, and even if we find, in the course of development of the sciences since his day, reason to doubt the complete accuracy of his statement, we should remember that the most prominent science in this respect, the science of biology, in which Darwin's researches produced a system in most apparent contradiction to Kant's dictum, is now at last beginning to achieve its full destiny in the form of "Biometry,"

or the quantitative study of variation and heredity. There seems to be very little doubt that a similar method, applied to the study of mental variation, will yield equally valuable results. It will be, of necessity, an objective method, using introspection as an "indicator" (*cf.* Karl Lange), but making all its measurements in objective terms.

Such a method would obviously form part of the system which is nowadays known as "functional" psychology, a system contrasted with the older analytic or "structural" psychology in being a psychology of mental operations rather than a psychology of mental elements, and in treating the mind as something "primarily engaged in mediating between the environment and the needs of the organism."* It would bear out Dr. McDougall's definition of psychology as "the positive science of conduct of the living organism."†

The enormous addition made to our knowledge of psychical process by the devotees of this system, comprising among other things the whole domain of animal psychology, indicates to what a great extent psychology as a science may advance independently of the solution it adopts of some of its most important philosophical difficulties. For although functional psychology is as a method quite consistent with the theory of psycho-physical parallelism, most of its adherents are, in fact, interactionists, while theorists who see in the distinction between mind and matter a false abstraction are equally capable of making use of all its results.

III.

The most serious problem of a philosophic nature which psychology has to face is undoubtedly the problem of knowledge. Important articles on this subject have recently been

* J. R. Angell, "The Province of Functional Psychology," *Psychological Review*, Vol. XIV, March, 1907, p. 85.

† Wm. McDougall, *Physiological Psychology*, Dent, 1905.

written by Mr. H. A. Pritchard* and Mr. H. H. Joachim† in *Mind*, and by Professor Dawes Hicks‡ in our own *Proceedings*, and an equally important reply to some of the difficulties thus raised has been made by Mr. T. Loveday.§ While it would be quite superfluous to repeat here, in however abbreviated a form, all the arguments advanced by the two sides in this controversy, perhaps the Society will forgive me for attempting to state once more, as concisely as possible, the central difficulty involved.

Knowledge, it is contended, cannot itself be an object in any sense in which other things are objects. In all cases of knowledge or cognition there are present the two distinguishable but inseparable aspects—process or act of cognising, and content or object cognised. What we know is always the *object* of our knowledge, which, as object, essentially involves the correlative subjective act of knowing. Consequently it is a contradiction in terms to suggest that this subjective act of knowing may itself be treated as an object. The danger inevitably arises that in the search for objects to form the material of its science, psychology may seize on the content in abstraction from the process and, by limiting its attention to the analysis of the former, “deprive it of the very feature which entitles it to be described as mental.”|| The result, for knowledge, is that psychology falls victim to a subjective idealism which makes knowledge, and therefore psychology itself as a science, impossible. The contents of consciousness being regarded not as the actual things known but as a sort of psychical screen or veil between the knower and the things which makes the actual constitution of the things themselves

* *Mind*, N.S., Vol. XVI, January, 1907.

† *Ibid.*, Vol. XVIII, January, 1909.

‡ *Proceedings Aristotelian Society*, 1907–08.

§ *Mind*, N.S., Vol. XVIII, April, 1909.

|| G. Dawes Hicks, “The Relation of Subject and Object,” *Proceedings Aristotelian Society*, 1907–08, p. 162.

something problematical and of no concern to psychology, there arises, on this assumption, the precisely analogous difficulty of justifying the direct knowledge of psychical processes as facts of the real world.

Such, in brief, is the criticism directed by the epistemologists against psychology. The more general form of the difficulty, as it affects the whole of mental process (not cognition only), was considered at the beginning of this paper. The view that contents of consciousness are all physical, if accepted, would make the danger of justly incurring it a less serious one, since there would on this view be less risk of forgetting that the content of consciousness cannot be abstracted from the process and considered by itself, if it is to be used to form part of the subject-matter of psychology. To any purely introspective system of psychology this criticism would be fatal. The process side of the process-content complex, never itself being an object, could only be experienced, never described. All description would have to be in terms of content, but these descriptions of content would not, as in physical science, be a half-way house to explanation. Explanation must be looked for within a wider system, dynamically in the adaptation of the individual to his environment, both mental and physical, statically in the relation of his various mental abilities to one another. These things can be expressed in numerical form and thus can provide us with a quantitative system, which we have seen to be an essential to science. The suggestion, therefore, with which Mr. Pritchard concludes his paper, to the effect that psychology should return to the study of "faculties," seems to me to be highly important. Such a course would correspond very closely, I imagine, with much of the work that is already being done in the study of mental abilities and of their inter-relationships (*Begabungslehre*). Mental activities are functions which may be defined and measured by their effects. For their study, introspection is essential but not sufficient. The most

mysterious of them, perhaps, viz. thought itself, is actualised in the individual under conditions and with results which can always be described and sometimes measured. From this point of view the criticism directed against the psychology of reasoning, to the effect that the latter explains in terms of mental imagery or mental symbolism, becomes irrelevant. "Imageless thought" has been admitted by psychologists for some years past, and recent experiments with well-trained subjects have only served to emphasise a difficulty that had already been realised by many.

An objective method which is quantitative and well suited for such a study of mental capacities or faculties as that just suggested is one referred to towards the beginning of this paper,* which I will now describe. Mental abilities are measurable in terms of their effects. If a single individual be taken, his several distinguishable abilities, sensory discrimination in sight, hearing, etc., memory for different classes of facts, etc., can be measured. If a second individual be similarly measured, he will be found, perhaps, to be superior to the first in some of his abilities, inferior in others. The inter-relations of the several abilities are, perhaps, of more interest than the measures of the abilities themselves, but they are different in the two cases, and would again be different in a third, fourth, etc. Not only, that is, do the abilities vary from individual to individual, but the relation between one ability and another also varies from individual to individual. The question at once suggests itself whether the variation from individual to individual, in the measure of one ability, is connected in any way, directly or inversely, with the variation from individual to individual in the measure of another ability. To put it quite simply: Does good ability in one direction tend, on the average, to be associated with good, moderate, or poor ability in another direction? The relation enquired after is one of concomitant

* P 66.

variation as exhibited in variable material, and a measure of the degree of concomitance is obtainable according to the methods of the mathematical theory of correlation, if a sufficiently large number of subjects are examined. Such a measure would represent the closeness of connection existing in general between one ability and another, and it is plausible to assume that this connection is the essential one, based on the nature of the abilities themselves, but that it is overlaid in the individual case by the other relations, which differ from case to case. The outcome of this line of thought might be that we could regard the mind as a system of inter-related abilities, which would lend itself to quantitative as well as to qualitative description, and ultimately form a basis on which a start might be made to build an all-inclusive explanation of man and his environment.

Whatever the difficulties in the way of such a theory, it is at least certain that the problem of mental variation will have to be faced in psychology, and in doing this, objective measurements will have to be made and the mathematical theory of correlation applied. The method, as we have seen, has the merit of being free from the epistemological difficulties with which purely introspective psychology is beset.

IV.

It may be objected at this stage of the discussion that the accepted definition of psychology as the science of conation stultifies our demand for a quantitative system, and, moreover, that the brilliant work of Professor Stout, Mr. A. F. Shand, Dr. McDougall, and others demonstrates the possibility of a genuinely explanatory though non-quantitative scheme. Instead of the mechanical connection of physical science, we have here the teleological connection of conative processes, which seems to be essentially free from limits of mathematical determination. This is, however, at best only half the truth. The internal energy of conation, if one

may be allowed to use such a phrase, may seem to be a variable and indeterminate quantity, but it is nevertheless a quantity definitely confined within certain limits. Its variations cannot transgress certain fixed bounds. These limits of variation, both in the individual and in the race, can, theoretically at least, be measured with mathematical precision, and the nature of the variability can also be exhaustively determined,—in objective terms, of course.

There seems to be some reason for believing that it was measurement that produced science, and not science that gave rise, in the course of its development, to the method of measurement. At least, I think I see a sign of this in the case of physics, which may explain the general tendency of psychologists to regard sensation as psychical. It is shown, for example, in the line of argument which the late Professor Ebbinghaus adopts in his attempt to distinguish sensation from physical fact.* He argues, in effect, that the two must be distinct because the same physical fact or law can be discovered and verified through the mediation of *different* groups of sensations; for example, the laws of the refraction and dispersion of light by a glass prism might be determined in terms of the colour-sensations aroused in the observer's consciousness, or again, in terms of tactile sensations, if the retina be replaced by a surface sensitive to light, connected with a special form of apparatus. Similarly, the physical law of the velocity of propagation of sound in air might be determined with an arrangement of apparatus in which the ear of the observer is replaced by a manometric flame, which indicates the arrival of the sound-waves in visual terms. While this argument quite fails in its aim of proving that sensations are psychical,—for it only shows that sensations supplement one another in a larger whole—it puts in a clear light the distinction between the physical of direct

* *Grundzüge der Psychologie*, zweite Auflage, Leipzig, 1905, p. 3.

experience and the physical of the science of physics. The latter is essentially a system of quantitative relations, which has resulted from the direction of the attention primarily towards the measurable aspects of objects. In this case, measurement preceded and produced the science. Correspondences and proportions obtained a predominance which soon became transformed for thought into that hypostatized abstraction, the "matter" of the physicist. The distinction between primary and secondary qualities is methodological, not metaphysical. Moreover, it is not limited to the "given" in sensation and perception. The contents of the so-called higher mental processes, imagination, memory, even abstract thought, have also formed part of the material in which the distinction is made. As Professor Alexander has shown us by other arguments, they are equally physical with the last. Physics has already co-ordinated to a certain extent *all* the various forms of experience-content, or, to use a more suitable expression, objective fact. Nerve-physiology supplements the account in many ways. Psychology only remains within its proper sphere so long as it limits its attention to the individual processes of conation (and feeling) which form a system of mental directions corresponding to the various physical objects with which from moment to moment they are compresent. Only so far as the differentiation of the object indicates a correlative differentiation of the conation is the former of strictly psychological interest. Apart from the facts of illusion and error, which are dependent on what Professor Alexander calls the personal (*not* the subjective) factor in experience, the objective universe is simply the sum of its various "appearances" (actual and possible) to different individuals. Thus it is a very real objection to presentationism that it counts the same thing twice. The difficulty stands out most clearly in the discussions generally given in the text-books on the relation of mind and brain. In most of these discussions the subject-object relation is allowed, for the

time being, to fall into the background, and the impossible task is set of bringing into relation two distinct series of entities, viz. psychical contents and physical processes, which have previously been *made* completely disparate from one another by a perfectly gratuitous process of abstraction. As I said before, I do not intend to consider this problem in detail here, and therefore will content myself with this brief indication of the difficulty and of the direction in which its solution may be sought.

Among psychological problems of a more special kind there are two which run some risk of being incorrectly set by a psychologist not fully alive to the pitfalls of epistemology. These are (1) the problem of association of ideas, and (2) the problem of attention. On both points a great deal has been written in recent years, and there seems to be no need here for more than a passing reference to them. In both cases the danger has lain in an inadequate appreciation of the nature and significance of the subject-object relation.