Structural and Functional Psychology

By E. B. TITCHENER (1899)

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Professor Caldwell has recently devoted several pages of Discussion[1] to a consideration of my article *The Postulates of a Structural Psychology*.[2] For this I am grateful. I should be more grateful, however, if Professor Caldwell had rendered my meaning a little more accurately. After writing that "it would be unwise to make any attempt" to exclude epistemology and psychogenesis entirely from "a work meant to serve the purpose of instruction," since "the attempt would involve a total disregard of historical conditions," I am surprised to learn that I would have my readers infer that my "own *Outline* deals exclusively with the first of the six brands of psychology." I am still more surprised, remembering the existence of works like Stumpf's *Tonpsychologie,* to learn that I have somewhere dubbed the structural study of the higher processes a "mere plan of arrangement" : I cannot discover the passage. Nevertheless, I am glad to take advantage of Professor Caldwell's criticisms to work out certain phases of my argument that could not well be embodied in my former article.

1. Professor Caldwell complains that it is: "difficult for the reader" of my previous paper "to keep the 'structural' view persistently in sight." This is no doubt true. It is difficult, even when dealing experimentally with a special structural problem, to hold oneself rigidly to the anatomical standpoint. But it is not, I believe, an epistemological law that truth of thinking and ease of thinking are strictly proportional; and it would, therefore, appear more profitable to cast round for the reason of this difficulty, and thus to overcome it, than to urge difficulty as an argument against the general position, and decline further effort. If a question is worth discussion at all, it is worth discussion as well after its difficulty has been determined as before.

The reasons for difficulty in the present case are, as a matter of fact, peculiarly obvious. The whole trend of our thought-habits, and the whole of linguistic tradition, favor a functional, and make against a structural consideration of mind. In our daily life and conversation, we have no temptation to think or speak of our mental states and processes in any other than a functional way. If Professor Caldwell [p. 291] will jot down the phrases containing the word 'mind,' or referring to any mental complex, that are employed by himself or by those about him in the course of a day's non-professional talk, he can easily assure himself that the fact is as

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here stated. It is true that certain of them, formulated (as they will probably be) in terms of an associationism such as is represented in the history of psychology by James Mill, may seem, at first sight, to present a structural appearance. But a very little scrutiny will show that these 'bits' of mind are really mintages, tokens with a meaning-value, and not parts of a structure, removed from any kind of' functional relation.

Introspection, from the structural standpoint, is observation of an Is; introspection, from the functional standpoint, is observation of an Is-for. Unschooled introspection tends almost irresistibly, then, to the introspection of an Is-for. But there are two extra-psychological functions that we are very apt to appeal to, in mental reference: the Is-for-thought and the Is-for-conduct. In other words, unschooled introspection is apt to be an introspection, not of psychological material at all, but of meanings (logical function) or of values (ethical function). It is the latter that crops up as 'morbid introspection' in fiction and in homiletic literature. The heroine who "is clever at introspection and analysis," who "studies her own sensations and dissects her moods," who is "mentally cross-eyed from turning her eyes inward so constantly," -- such an one is not introspecting psychologically, not observing mental facts; she is viewing her mind through an ethical glass which furnishes distorted values. As for the former, introspection through the glass of meaning, that is the besetting sin of the descriptive psychologist. Let us take a few instances.

Herbart was a man of considerable musical gifts. It is, therefore, not surprising that he chose to work out his theory of ideational fusion in the concrete medium of the tonal scale. Yet what an array of absurdities do we find in his pages! The opposition fraction of the second is 2/10, that of the fifth 7/5: the second fuses seven times as well as the fifth! Moreover, the octave is the lower limit of fusion; fundamental and first overtone are absolutely dissimilar! Strike the octave, and you have "zwei sehr leicht zu unterscheidende Töne"! And Volkmann blindly follows the Master. "Grundton und Sekunde unterscheiden wir im gleichzeitigen Vorstellen nicht mehr." Such statements are palpably in conflict with fact; but I do not doubt that Herbart and Volkmann made them 'on the ground of introspection.' Yes! they were introspecting, not the Is, but a logical Should-reasonably-be; the theory was ready, before introspection began, and, when [p. 292] the time came for introspection, an idea representative of the octave or fifth or second, a logical meaning, stood in the path of direct vision, and they saw crookedly.

The same thing is true of all those psychologists who seek to force an elementary will-process, a conation, upon the structure of mind. Anatomy fails to reveal a will-element : the verdict of the experimentalists is unanimous. Nevertheless, the existence of such an element is, in not a few psychologies, attested by 'an accurate introspection.' The discrepancy is readily explained. Will is an admitted fact of functional psychology; therefore, there should be some trace of it in structure. The 'accurate introspection' is observation, not of the Is, but of the logical Should-reasonably-be; meaning has, again, clouded fact.

It is needless to multiply illustrations. It is worth while, however, to differentiate these cases of faulty introspection from the terminological confusions that occur, alas! in all forms of psychological literature. When the experimental psychologist speaks of a 'sensation of weight' or of a 'sensation of resistance,' he is, doubtless, speaking confusedly. The sensation is neither a genetic nor a functional unit, but a unit of structure. 'Resistance' and 'weight,' on the other hand, are functional terms. Such collocations are, therefore, to be avoided, so far as language allows of their avoidance. They need not, however,-- as a rule, they do not -- carry with them the real and far-reaching errors that follow from perverted introspection.

2. 'But how,' it may be asked, 'do you propose to avoid perversion? You accept functional psychology as a department of psychological science, and predict that it will some day fall under the experimental method; you are, therefore, called upon to show how the Is-for can be rightly (psychologically) introspected.' Professor Caldwell, it is true, denies the experimental psychologist any place in a conference upon mental function. But, not to shelter myself behind this dictum, I reply: Introspection of the Is-for must be the introspection of the Is-for-the-psychophysical-organism. What are the organism's mental tools? To what simplest type

or types may they be reduced? How delicate is their work and how wide their limits of efficacy? These are, I think, psychological questions: while the questions how and to what extent the tools are being and have been employed for the procurement of results in the worlds of truth, goodness, and beauty are questions of logic and ethics and æsthetics. The line will, of course, be hard to draw with any degree of rigidity; the student of logic and ethics and æsthetics will hardly fail of interest in functional [p. 293] psychology, and the psychologist will not refrain from psychologizing till he has traversed his domain of thought to its uttermost boundary. But there certainly is a point at which the psychology of cognition, feeling, and will ends, and the sciences of logic, æsthetics, and ethics begin; a point at which general value, value for the organism, 'function' in the widest sense, is replaced by special value, value for knowledge or conduct or art. And I am sure that, when psychologists have their "Hermann's *Handbuch*," there will be a volume devoted to the exposition of mind as a system of functions of the psychophysical organism.

An appeal to the concrete may, perhaps, be of service in this connection. I offer the following instances as approximations to the distinction that I have in mind, though I fully realize that the edges of the distinction have been left rough in nearly every case. We have, then, in Wundt's recent theory of visual space perception (optical illusions) a piece of structural psychology: in Lipps's theory, a piece of functional psychology; in the æsthetic theory which follows directly from this last, the change from general to special values. Külpe's chapter on centrally excited sensations is structural, Ebbinghaus's monograph on memory, functional psychology; the chapter on memory in Hobhouse's *Theory of Knowledge* takes us over into logic. Wundt's *Bemerkungen zur Associationlehre* is written from the structural standpoint; the current association 'laws' of the textbooks are functional; Bradley discusses association from the standpoint of the logician. Or again: the analysis of attention is anatomical work; the doctrine of apperception belongs to a functional psychology; while we see, *e.* g., in the first volume of Wundt's *Ethics,* the application of the doctrine to the problems of the science of conduct. The line of division, I repeat, cannot be rigidly drawn; I should myself regard some part of Bradley's and Hobhouse's work as falling within the scope of functional psychology. But the fact that different men mark the boundary-line at different places does not mean that there is no boundary-line at all.

3. Professor Caldwell complains that I use the structural elements "as if they were real things," after I have stated that they are "artifacts, abstractions, usefully isolated for scientific ends, but not found in experience save as connected with their like." I had supposed that any reader who was bent upon understanding my paper would be able to 'reconcile' these positions for himself, and so did not labor the point in my discussion. There is not the least contradiction between statement and usage. [p. 294]

The structural elements are abstractions, in the sense that they are obtained by abstraction and analysis from concrete experience, from our immediate mental *Erlebnisse.* If they were not abstractions, there would be no need of the delicate mechanical appliances and elaborate experimental methods employed for their determination. Were they genetic units, they might, on occasion, appear alone, even to a superficial examination; we might find them, as we find the single-celled organism, *e.*g., in the white blood-corpuscle of the living human body. Were they simplest 'bits' of mind, like the atomistic sensations of the older associationism, they might also appear alone: gold is found as pure nugget, and not only in the quartz matrix. As Wundt puts the matter: "Psychical elements, in the sense of absolutely simple and irreducible constituents of the process of mind, are products not only of an analysis but also of an abstraction, the possibility of which is due solely to the fact that the elements are, in reality, variously interconnected."

But these abstractions are " isolated for scientific ends." The chief end is, of course, furtherance of the understanding of the structure of mind. It is clear, then, that the elements must be ' real things ' in the sense (1) that they do not transcend mental structure, do not contain anything not already contained in the concrete *Erlebnisse,* and (2) that they do not fall short of mental structure, do not omit anything contained in these *Erlebnisse.* The abstract tonal sensation, *e.*g., can serve no scientific end if it is not adequate, as elemental constituent,

to the structure of the musical chord: the 'sensations' of the doctrine of tonal fusion must be identical with the 'sensations' of the doctrine of tonal sensation. Otherwise there is no passage from the structurally simple to the structurally complex. Or, to put the same thing in a different way, the structural psychologist must be able to say: "Give me my elements, and let me bring them together under the psychophysical conditions of mentality at large, and I will guarantee to show you the adult mind, as a *structure,* with no omission and no superfluity." Abstractions these elements are, but abstractions from the real, and in so far participating in reality. Any argument that runs its course upon the plane of structure has the full right to regard them as 'real things,' and to pit them as real against rival claimants to the rank of structural element. Professor Caldwell's structural will-process, if it existed, would be just as much abstraction, and just as much real thing, as are the acknowledged processes of sensation and affection.

4. Professor Caldwell complains of my terminology. I regret that [p. 295] this should have caused him trouble. Writing from page 457on, under the rubric of structure, I had thought that the phrases 'elementary mental processes' (p. 457), 'last things of mind' (p. 459), and 'elements' (p. 462), would be understood as strictly synonymous. They are to be thus understood. Some explanation is, perhaps, called for, as to the use of the term 'process.'

Historically, the term 'process' was imported into modern psychology by way of reaction against the preceding psychological atomism. It is one of Wundt's great services to systematic psychology that he banished the 'idea' as *unvergängliche Existenz,* and set in on place the 'idea' as *Vorgang,* that in every context he substituted *psychisches Geschehen* for *psychisches Sein.* The term 'process' has been so universally accepted by experimental psychologists, that there is, certainly, some danger of its indiscriminate and unreflecting use. My own employment of it, however, was conscious and purposed. I count duration among the constitutive attributes of sensation: the reason being that a sensation which should lack duration is not adequate, in my opinion, to the structure of mind. The duration of sensation is not, of course, a mere permanence, a *Beharrlichkeit;* it is that temporal rise-poise-fall which is normal to each sensational quality, and which occupies a longer or a shorter period from one sensation quality to another. Unless our tonal sensations, *e.*g., possess a duration of this kind, we cannot obtain, by the bringing together of tones under any conditions, the phenomena of clang-tint. What Stumpf calls the "*eigenthümliche Art und Dauer des An- und Ausklingens*" is a characteristic which is reduced to its lowest structural terms in the 'duration' of tonal sensation. But such a characteristic constitutes the element a process. If Professor Caldwell still finds it difficult to think of a 'process' as a 'fact of structure,' I can only suppose that he is pressing an unwarrantably literal interpretation upon a form of speech which I have distinctly stated to be metaphorical (REVIEW, VII, 450), and conceiving of mental 'structure' as strictly analogous to the 'structure' of the zoölogist or the architect.

It remains to mention, under this head, that the element of the structural psychologist is nothing -- does not exist -- apart from its constitutive attributes. Let any one of these assume the zero value, and the sensation, *e.*g., ceases to exist; there is no sense-substance. The attributes have been variously and at times not too happily named: I find the expressions *Empfindungsbestandtheil, Bestandttheil der reinen Empfindung, immanentes Moment, unabtrennbares Merkmal, nähere Bestimmung der Empfindung unerlässliches Bestimmungsstück, qualitative* [p. 296] (etc.) *Beschaffenheit der Empfindung,* 'attribute,' 'determinant,' 'characteristic,' 'aspect,' etc., etc. All are practically synonymous, though a writer not infrequently selects one rather than another to suit the immediate context. I have made some slight attempt, as Professor Caldwell may know, to simplify and standardize psychophysical nomenclature. But he who desires to have a voice in psychophysical questions must even take the literature as it is, and not await the advent of a reformed terminology.

5.· How Professor Caldwell can have come to think that I differentiate the subject-matter of functional and structural psychology -- as if there were a structurally disposed mind, for one thing, and a functionally disposed, for another -- I cannot imagine; unless, indeed, in 'purposely overlooking' some of my statements, he has unconsciously overlooked others. On pp. 451, 462, and 465 are express indications of the fact, implied throughout, that one and the same mind is to be examined by both the anatomical and the physiological methods. So far am I from any

theory of bifid mentation, that a discrepancy between the results of these methods would necessitate a revision of my whole psychological system. By functional analysis I am led to believe that the root-function of mind is given with the simplest will-process (impulse, *Trieb);* by structural analysis, that the morphological elements are given with the sensation and the affection. The two beliefs are absolutely congruent: two different lines of thought have converged at a single point. On the other hand, I suppose that those who accept Professor Muensterberg's structural monism must, if they are consistent, represent a functional intellectualism. Unless one's thinking is to go on in separate, argument-tight, mental compartments, one must seek to bring functional psychology into line with structural, and psychogenesis into line with both. Whether an ultimate synthesis of fact and method in all three disciplines will be possible is a matter rather for the metaphysician than for the scientific man to decide. But, at any rate, there should be no more conflict among the various psychologies than there is between the embryology, morphology, and physiology of biological science.

Here I take leave of Professor Caldwell, and (for the time, at least) of psychological classification. It should never be forgotten that the distinction of structural, functional, and genetic psychology is based upon, imaged in, terms of biological analogy; and that analogy is sure to halt somewhere, however far it may serve as guide to thought. I have myself found the distinction eminently useful, and I think it may be useful to others also. As was hinted above, it throws some light [p. 297] upon the issue of intellectualism *vs.* voluntarism; it will be found to throw still more upon the arguments urged for and against parallelism and interaction. But it is, after all, no more than a working schema, by which one's present knowledge may be temporarily arranged -- a schema to be ruthlessly discarded so soon as a better is proposed.

I turn to Professor Herrick's paper on "Material *vs.* Dynamic Psychology."[3] Professor Herrick, a neurologist, here urges upon the psychologist the "frank adoption of a dynamic method," for the reason that this is "an era of dynamism in physical science." Psychologists have been " narrow in their preparation, and are consequently uninfluenced by the recent change of base on the part of molecular physics and [by?] higher mathematical concepts."

It is only too true that we are all 'narrow in preparation.' Few scientific men would refuse to admit that they could do better work in their own field, if only they knew more physics and chemistry, more mathematics, more biology and psychophysics. Life is short, and science is wide. But I am a little comforted, on behalf of the psychologist, when I turn back a few pages from Professor Herrick's article, and find Professor Ladd saying that " the demand, or the hortation for another step toward the ideal of unity, is generally issued at present by some one of the particular sciences to those others which lie nearest its own door.... All this reminds one of the current practical proposals to effect a unity of the Church, which, in the thought of each particular denomination, takes the form of an 'embracement' of all the other denominations, by that particular one making itself the universal." True, Professor Ladd declares that he has found more of scientific reserve and caution among the best men in the physico-chemical and biological sciences than he has among his fellow psychologists. But I doubt whether this experience is to be elevated to the rank of a general rule. If it is, Professor Herrick has now furnished an excellent exception, whereby Professor Ladd may prove it.

For it is not the case that experimental psychology has given "admittedly small" results, "so far as facts are concerned," during the last ten years. On the contrary, the wealth of new facts is so great that it is difficult for one mind to grasp them all. Even the American output for the single year 1898 -- to say nothing of the French and German -- embodies a considerable number of new facts, some of which are of prime theoretical importance. Professor Herrick should be sure [p. 298] of his data before printing his generalizations. How, indeed, he can have read through even the single published part of Ebbinghaus's *Grundzüge,* and still maintain that our crop of facts is scanty, I fail to understand; just as I fail to understand his ascription of complete consequence in the discrimination of fundamental points to Jodl's otherwise admirable book (*cf.* Martius's *Besprechung* in the *Zeitschrift*). And why must the experimental method furnish a 'point of view'? A point of view lies behind every method, dictates the application of the method; and the point of view is invalidated or confirmed by the results which

the method brings to light. But a method does not 'give ' a point of view. What the points of view are, which lie behind the various modes of treatment of psychological problems, I have endeavored to indicate in this and in my previous paper.

Professor Herrick goes on to raise the epistemological difficulty of the substrate, the question of the matter-substance for physical forces, and of the soul-substance for mental processes; and gravely calls the psychologists' attention to Ostwald's Lübeck address. Now, in the first place, it is really a matter of indifference, for ordinary laboratory work in physics and psychology, whether the investigator believes or does not believe in a substantial matter and a substantial soul. Moreover, although it may some day come to pass that the laws of the physical universe submit themselves to formulation in terms of energy and of energy alone, that day is certainly far distant (*cf.* Bolt and Helm). We may eagerly expect it: but it is not here. And thirdly, it is at least open to discussion whether, even if we unreservedly accept a theory of energetics as furnishing the most satisfactory explanation of the physical universe, we are thereby committed to an interpretation of mental process, the vehicle of our knowledge of physical energy, as itself in some way a form of energy. Again, one wishes to be informed more nearly as to Professor Herrick's conception of a dynamic psychology. How would a psychology work out, in energy-formula? How would it differ from existing systems? For we have psychologists, as it is, who speak much of 'psychische Kraft' and its limits and distribution. Finally, the question of dynamism apart, this difficulty of a substrate in which processes shall inhere or reside is, thanks to Wundt and Avenarius among others, a difficulty that no longer confronts us. Professor Herrick is a day or two behind the epistemological fair. Similarly, his remarks on parallelism, so far from seeming "obscure by reason of their unfamiliarity," seem to me to be essentially commonplace, and obscure only by reason of their formulation in terms of an unfitting analogy. [p. 299]

Professor Herrick writes as a well-wisher to psychology, and his psychological *aperçus* have the value that criticisms from a competent worker in a related field must always have for the professed student of the mind. But we shall confess our debt to him a great deal more willingly, if he will be a little less sure of our general scientific ignorance, and a little less didactic in his manner of addressing us.

E. B. TITCHENER.

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Footnotes

[1] *Psychological Review,* March, 1899, pp. 189 ff.

[2] This REVIEW, September, 1898.

[3] *Psychological Review,* March, 1899, pp. 180 ff.

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