An Excerpt from "Psychology in Physical Language"

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2 The Forms of Psychological Sentences

The distinction between singular and general sentences is as important in psychology as in other sciences. A singular psychological sentence, e.g. "Mr. A was angry at noon yesterday" (an analogue of the physical sentence, "Yesterday at noon the temperature of the air in Vienna was 28 degrees centigrade"), is concerned with a particular person at a particular time. General psychological sentences have various forms, of which the following two are perhaps the most important. A sentence may describe a specific quality of a specific kind of event, e.g. "An experience of surprise always (or: always for Mr A, or: always for people of such and such a society) has such and such a structure." A physical analogy would be: "Chalk (or: chalk of such and such a sort) always is white." The second important form is that of universal-condition statements concerning sequences of events, that is, of causal laws. For instance, "When, under such and such circumstances, images of such and such a sort occur to a person (or: to Mr A, or: to anyone of such and such a society), an emotion of such and such a sort always (or: frequently, or: sometimes) is aroused." A physical analogy would be: "When a solid body is heated, it usually expands." Research is primarily directed to the discovery of general sentences. These cannot, however, be established except by means of the so-called method of induction from the available singular sentences, i.e., by means of the construction of hypotheses.

Phenomenology claims to be able to establish universal synthetic sentences which have not been obtained through induction. These sentences about psychological qualities are, allegedly, known either a priori or on the basis of some single illustrative case. In our view, knowledge cannot be gained by such means. We need not, however, enter upon a discussion of this issue here, since even on the view of phenomenology itself, these sentences do not belong to the domain of psychology.

In physics it sometimes seems to be the case that a general law is established on the basis of some single event. For instance, if a physicist can determine a...
certain physical constant, say, the heat-conductivity of a sample of some pure metal, in a single experiment, he will be convinced that, on other occasions, not only the sample examined but any similar sample of the same substance will, very probably, be characterize by the same constant. But here too induction is applied. As a result of many previous observations the physicist is in possession of a universal sentence of a higher order which enables him in this case to follow an abbreviated method. This higher-order sentence reads roughly: "All (or: the following) physical constants of metals vary only slightly in time and from sample to sample."

The situation is analogous for certain conclusions drawn in psychology. If a psychologist has, as a result of some single experiment, determined that the simultaneous sounding of two specific notes is experienced as a dissonance by some specific person A, and he infers (under favorable circumstances) the truth of the general sentence which states that the same experiment with A will, at other times, have the same result. Indeed, he will even venture - and rightly - to extend this result, with some probability, to pairs of tones with the same acoustic interval if the pitch is not too different from that of the first experiment. Here too the inference from a singular sentence to a general one is only apparent. Actually, a sentence inductively obtained from many observations is brought into service here, a sentence which, roughly, reads: "The reaction of any specific person as to the consonance or dissonance of a chord varies only very slightly with time, and only slightly on a not too large transposition of the chord." It thus remains the case that every general sentence is inductively established on the basis of a number of singular ones.

Finally, we must consider sentences about psycho-physical inter-relations, such as for instance, the connection between physical stimulus and perception. These are likewise arrived at through induction, in this case through induction in part from physical and in part from psychological singular sentences. The most important sentences of gestalt psychology belong also to this kind.

General sentences have the character of hypotheses in relation to concrete sentences, that is, the testing of a general sentence consists in testing the concrete sentences which are deductible from it. A general sentence has content insofar and only insofar as the concrete sentences deducible from it have content. Logical analysis must therefore primarily be directed towards the examination of the latter sort of sentence.

If A utters a singular psychological sentence such as "Yesterday morning B was happy," the epistemological situation differs according as A and B are or are not the same person. Consequently, we distinguish between sentences about other minds and sentences about one's own mind. As we shall presently see, this distinction cannot be made among the sentences of inter-subjective science. For the epistemological analysis of subjective, singular sentences it is, however, indispensable.

3 Sentences about Other Minds

The epistemological character of a singular sentence about other minds will now be clarified by means of an analogy with a sentence about a physical property.

defined as a disposition to behave (or respond) in a specific manner under specific circumstances (or stimuli). To take an example: a substance is called "plastic" if, under the influence of deforming stresses of a specific sort and a specific magnitude, it undergoes a permanent change of shape, but remains intact.

We shall try to carry out this analogy by juxtaposing two examples. We shall be concerned with the epistemological situation of the example taken from psychology: the parallel example about the physical property is intended only to facilitate our understanding of the psychological sentence, and not to serve as a specimen of an argument from analogy. (For the sake of convenience, where the text would have been the same in both columns, it is written only once.)

A Sentence about a property of a physical substance.

Example: I assert the sentence P1: "This wooden support is very firm."

Mr. A is now excited.

There are two different ways in which sentence P1 may be derived. We shall designate them as the "rational" and the "intuitive" methods. The rational method consists of inferring P1 from some protocol sentence P1 (or from several like it), more specifically, from a perception-sentence about the shape and color of the wooden support.

A Sentence about a condition of some other mind.

Example: I assert the sentence P1: "Mr. A is now excited."

In order to justify the conclusion, a major premise O is still required, namely the general sentence which asserts that when I perceive a wooden support to be of this color and form, it (usually) turns out to be firm. (A sentence about the perceptual signs of firmness.)

The content of P1 does not coincide with that of P1, but goes beyond it. This is evident from the fact that to infer P1 from P1, O is required. The cited relationship between P1 and P1 may also be seen in the fact that under certain circumstances, the inference from P1 to P1 may go astray. It may happen that, though P1 occurs in a protocol, I am obliged, on the grounds of further protocols, to retract the established system sentence P1. I would then say something like, "I made a mistake. The test has shown that the support was not firm, even though it had such and such a form and color."

when I perceive a person to have this facial expression and handwriting he (usually) turns out to be excited. (A sentence about the expressional or graphological signs of excitement.)

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In practical matters the intuitive method is applied more frequently than this rational one, which presupposes theoretical knowledge and requires reflection. In accordance with the intuitive method, \( P_1 \) is obtained without the mediation of any other sentence from the identically sounding protocol sentence \( P_2 \).

"The support is firm."

"A is excited."

Consequently, one speaks in this case of immediate perceptions of properties of substances, e.g., of the firmness of supports.

of other minds, e.g., of the excitement of A.

But in this case too the protocol sentence \( P_2 \) and the system sentence \( P_1 \) have different contents. The difference is generally not noted because, on the ordinary formulation, both sentences sound alike. Here too we can best clarify the difference by considering the possibility of error. It may happen that, though \( P_2 \) occurs in my protocol, I am obliged, on the basis of further protocols, to retract the established system sentence \( P_1 \). I would then say "I made a mistake. Further tests have shown that the support was not firm, although I had the intuitive impression that it was."

that A was not excited, although I had the intuitive impression that he was."

The difference between \( P_2 \) and \( P_1 \) is the same as that between the identically sounding sentences \( p \) and \( P_1 \): "A red marble is lying on this table," of an earlier example (see Erkenntnis, vol. II, p. 460 (The Unity of Science, p. 92)). The argument of that article shows that the inference of \( P_1 \) from \( p_2 \), if it is to be rigorous, also requires a major premise of general form, and that it is not in the least simple. In so far as ordinary usage, for convenience's sake, assigns to both sentences the same sequence of words, the inference is, in practice, simplified to the point of triviality.

Our problem now is: what does sentence \( P_1 \) mean? Such a question can only be answered by the presentation of a sentence (or of several sentences) which has (or which conjointly have) the same content as \( P_1 \). The viewpoint which will here be defended is that \( P_1 \) has the same content as a sentence \( P_2 \) which asserts the existence of a physical structure characterized by the disposition to react in a specific manner to specific physical stimuli. In our example, \( P_2 \) asserts the existence of that physical structure (microstructure) of the wooden support that is characterized by the fact that, under a slight load, the support undergoes no noticeable distortion, and, under heavier loads, is bent in such and such a manner, but does not break.

of Mr. A's body (especially of his central nervous system) that is characterized by a high pulse and rate of breathing, which, on the application of certain stimuli, may even be made higher, by vehement and factually unsatisfactory answers to questions, by the occurrence of agitated move-

ments on the application of certain stimuli, etc.

On my view, there is here again a thoroughly analogous between the examples from physics and from psychology. If, however, we were to question the experts concerning the examples from their respective fields, the majority of them nowadays would give us thoroughly non-analogous answers. The identity of the content of \( P_2 \) and of the content of the physical sentence \( P_1 \) would be agreed to as a matter of course by all physicists.

The contrary view which is most frequently advocated by psychologists is that "A sentence of the form of \( P_1 \) asserts the existence of a state of affairs not identical with the corresponding physical structure, but rather, only accompanied by it, or expressed by it. In our example:

\( P_1 \) states the support not only has the physical structure described by \( P_2 \), but that, besides, there exists in it a certain force, namely its firmness.

This firmness is not identical with the physical structure, but stands in some parallel relation to it in such a manner that the firmness exists when and only when a physical structure of the characterized sort exists.

Because of this parallelism one may consider the described reaction to certain stimuli - which is causally dependent upon that structure - to be an expression of firmness.

Firmness is thus an occult property, an obscure power which stands behind physical structure, appears in it, but itself remains unknowable."

P1 states that Mr. A not only has a body whose physical structure (at the time in question) is described by \( P_2 \), but that - since he is a psychophysical being - he has, besides, a consciousness, a certain power or entity, in which that excitement is to be found.

This excitement cannot, consequently, be identical with the cited structure of the body, but stands in some parallel relation (or in some relation of interaction) to it in such a manner that the excitement exists when and only when (or at least, frequently when) a physical, bodily structure of the characterized sort exists.

Because of this parallelism one may consider the described reaction to certain stimuli to be an expression of excitement.

Excitement, or the consciousness of which it is an attribute, is thus an occult property, an obscure power which stands behind physical structure, appears in it, but itself remains unknowable."

Excerpt from "Psychology in Physical Language"
This view falls into the error of a hypostatization as a result of which a remarkable duplication occurs: besides or behind a state of affairs whose existence is empirically determinable, another, parallel entity is assumed, whose existence is not determinable. (Note that we are here concerned with a sentence about other minds.) But – one may now object – is there not really at least one possibility of testing this claim, namely, by means of the protocol sentence p₂ about the intuitive impression of the firmness of the support? the excitement of A?

The objector will point out that this sentence, after all, occurs in the protocol along with the perception sentence p₁. May not then a system sentence whose content goes beyond that of p₂ be founded on p₁? This may be answered as follows. A sentence says no more than what is testable about it. If, now, the testing of p₁ is consistent in the deduction of the protocol sentence p₂, these two sentences would have the same content. But we have already seen that this is impossible.

There is no other possibility of testing p₁ except by means of protocol sentences like p₁ or p₂. If, now, the content of p₁ goes beyond that of p₂, the component not shared by the two sentences is not testable, and is therefore meaningless. If one rejects the interpretation of p₁ in terms of p₂, p₁ becomes a metaphysical pseudo-sentence.

The various sciences today have reached very different stages in the process of their deconstruction from metaphysics. Chiefly because of the efforts of Mach, Poincaré, and Einstein, physics is, by and large, practically free of metaphysics. In psychology, on the other hand, the work of arriving at a science which is to be free of metaphysics has hardly begun. The difference between the two sciences is most clearly seen in the different attitudes taken by experts in the two fields towards the position which we rejected as metaphysical and meaningless. In the case of the example from physics, most physicists would reject the position as anthropomorphic, or mythological, or metaphysical. They thereby reveal their anti-metaphysical orientation, which corresponds to our own. On the other hand, in the case of the example from psychology (though, perhaps, not when it is so crudely formulated), most psychologists would today consider the view we have been criticizing to be self-evident on intuitive grounds. In this one can see the metaphysical orientation of psychologists, to which ours is opposed.

Is Consciousness a Brain Process?

U. T. Place

The thesis that consciousness is a process in the brain is pushed forward as a reasonable scientific hypothesis, not to be dismissed on logical grounds alone. The conditions under which two sets of observations are treated as observations of the same process, rather than as observations of two independent correlated processes, are discussed. It is suggested that we can identify consciousness with a given pattern of brain activity, if we can explain the subject's introspective observations by reference to the brain processes with which they are correlated. It is argued that the problem of providing a physiological explanation of introspective observations is made to seem more difficult than it really is by the "phenomenological fallacy," the mistaken idea that descriptions of the appearances of things are descriptions of the actual state of affairs in a mysterious internal environment.

I. Introduction

The view that there exists a separate class of events, mental events, which cannot be described in terms of the concepts employed by the physical sciences no longer commands the universal and unquestioning acceptance among philosophers and psychologists which it once did. Modern physicalism, however, unlike the materialism of the seventeenth and eighteenth centuries, is behavioristic. Consciousness on this view is either a special type of behavior, "sampling" or "running-back-and-forth" behavior as Tolman has it, or a disposition to behave in a certain way, an itch, for example, being a temporary propensity to scratch. In the case of cognitive concepts like "knowing," "believing," "understanding," "remembering," and volitional concepts like "wanting" and "intending," there can be little doubt, I think, that an analysis in terms of dispositions to behave is...

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