

MIND AND COGNITION

A Reader

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NOTES

- 1 "The Relation of Tongue Movements to Internal Speech," *Journal of Experimental Psychology*, 1925. Her experiments are very inconclusive. Tongue movements were recorded by a compound system of delicate levers. Her setup could probably be depended upon for positive results, but the method was too inexact to serve as a basis for negative conclusions. No instrument less sensitive than the string galvanometer can be depended upon for negative results. Her saying that because she could find by the use of this method no correlation between tongue movements and internal speech, therefore "this leaves only the hypothesis that the activities are intra-neural, and do not necessarily involve complete motor expression at each stage of the process" – is in need of modification.
- 2 In most artists and in most critics of art there is little of that mastery of technique that comes from a lifetime of study with daily improvement as the goal. The artist draws around him an admiring group or a patron and stops improving at the adolescent level. Hence most artists are children – not intelligent at all. Most of the hokum comes from patrons who think they understand art. It is their all-admiring attitude toward even a budding artist that keeps the artists children. If the so-called 'high-brow' patrons and observers of art would only admit that they have no other basis for judging art than that it stirs up *visceral* (and at times manual and verbal) reactions, then we could not have criticized their pretensions. On this basis, good art for the child of five is one thing, good art for the Hottentot is another, good art for the sophisticated few in New York is still another.
 Still more hokum comes from the so-called art and dramatic critics. There really should be no art or dramatic critics. Our visceral reactions – the final touchstone of artistic judgments (at least of the so-called critics who are not artists themselves) – are our own. They are all we have left in the way of responses that have not been under the steam-roller process of society. From an emotional standpoint, my criticism of a picture, a poem, or the playing of a piece of music is as good as anybody else's. If I had to pass a critical judgment upon a work of art, a picture for example, I should do it experimentally. I should arrange to let crowds of people from all walks of life wander one at a time into a well-lighted room. I should have rival stimuli about, such as magazines, knick-knacks of one kind or another, two or three pictures on the wall, including the one I wanted to have judged. If an individual under observation spent time at this picture, if he showed some emotional reaction such as grief, joy, rage, then I should put him down as reacting positively to it. At the end of the day I should be able to say: "The so-called art critics will say your picture is terrible, the children will not look at it, the women are shocked by it, but the travelling salesmen chuckle with glee over it. It will be a failure if you exhibit it; I should advise you to send it to some sales manager and let him hang it over his desk." What I am trying to say is that there is a vast amount of charlatanism both in the making of art objects and in their so-called appreciation. Assuming that you are a real journeyman at the job – that is, you have passed your apprenticeship at the trade – whether you are recognized as a good artist or not depends largely upon whether you can get an admiring group around you, whether Mr and Mrs X have discovered you (and you may have been dead a hundred years or more before they do it) and made a hero of you.
- 3 Many of the introspectionists' terms should be similarly turned back upon them. For example, attention. The behaviorist, if he felt inclined, could "explain" attention and define it and use it, but he doesn't need the word. The introspectionist, even James, has to define it in terms of vitalism as an active process that selects this or that from other happenings. Such terms, of course, only slowly die out. Until they are dead someone will always be criticizing the behavioristic explanation for inadequacy.

An Excerpt from "Psychology in Physical Language"

RUDOLF CARNAP

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

This excerpt is reprinted from R. Carnap's "Psychology in Physical Language" first published in *Erkenntnis* 11 (1932–33).

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 characterizable 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, 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 deducible 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.)

<i>A Sentence about a property of a physical substance.</i>	<i>A Sentence about a condition of some other mind.</i>
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Example: I assert the sentence P_1 : "This wooden support is very firm."	Example: I assert the sentence P_1 : "Mr. A is now excited."
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There are two different ways in which sentence P_1 may be derived. We shall designate them as the "rational" and the "intuitive" methods. The *rational* method consists of inferring P_1 from some protocol sentence p_1 (or from several like it), more specifically, from a perception-sentence

about the shape and color of the wooden support.	about the behavior of A, e.g. about his facial expressions, his gestures, etc., or about physical effects of A's behavior, e.g. about characteristics of his handwriting.
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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.)	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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The content of P_1 does not coincide with that of p_1 , but goes beyond it. This is evident from the fact that to infer P_1 from p_1 O is required. The cited relationship between P_1 and p_1 may also be seen in the fact that under certain circumstances, the inference from p_1 to P_1 may go astray. It may happen that, though p_1 occurs in a protocol, I am obliged, on the grounds of further protocols, to retract the established system sentence P_1 . 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."	that A was not excited, even though his face had such and such an expression."
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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 thoroughgoing analogy 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.

and of the content of the psychological sentence P_1 would be denied by almost all psychologists (the exceptions being the radical behaviorists).

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*.

P_1 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 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.

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 – which is causally dependent upon that structure – to be an *expression* of firmness.

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

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

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."

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 p_2 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 p_1 . May not then a system sentence whose content goes beyond that of P_2 be founded on p_2 ? This may be answered as follows. A sentence says no more than what is testable about it. If, now, the testing of P_1 consisted in the deduction of the protocol sentence p_2 , these two sentences would have the same content. But we have already seen that this is impossible.

There is no other possibility of testing P_1 except by means of protocol sentences like p_1 or p_2 . If, now, the content of P_1 goes beyond that of P_2 , the component not shared by the two sentences is not testable, and is therefore meaningless. If one rejects the interpretation of P_1 in terms of P_2 , P_1 becomes a metaphysical pseudo-sentence.

The various sciences today have reached very different stages in the process of their decontamination 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.

2

The Identity Theory

Is Consciousness a Brain Process?

U. T. PLACE

The thesis that consciousness is a process in the brain is put 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,¹ 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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