

II. CURRENT ISSUES IN THE PHILOSOPHY OF MIND

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THE philosophy of mind is one of the most active fields in philosophy today, and it has changed so drastically in the last twenty years, that many of the traditionally central topics and theories have been transformed almost beyond recognition, and new concerns now loom that have no clear ancestors in the old tradition. An assessment of current work requires an understanding of recently evolved assumptions about the burdens and goals of the field, which can best be provided by a brief history of the shifts of outlook in recent years.¹

I. INVESTIGATING THE LANGUAGE OF MIND

The new era in philosophy of mind can be dated from the publication in 1949 of Gilbert Ryle's *The Concept of Mind* (93). In that book Ryle argued that the philosophy of mind rested on a colossal error, a "category mistake" that had in effect given birth to a whole field of investigation—the philosophy of mind—where none ought to be; the questions composing the inquiry were so radically misconceived that straightforward attempts to answer them ineluctably led to nonsense. Before Ryle there had been *theories* of mind—such redoubtable "isms" as idealism, materialism, neutral monism, epiphenomenalism, interactionism—contending in an arena of shared assumptions about the nature of the problem defining the field: the mind-body problem. Ryle suggested there was no such problem at all, but only a confusion bred in an injudicious and insensitive use—or abuse—of the ordinary language we use in everyday life to aver the familiar facts of mentality that comprise the data for any investigation or science of the mind.

A careful *analysis* of the ways of common talk about the mind would dissipate the confusions, dissolve the problems, and thus render otiose both dualism and its negation, monism, and among varieties of monism, both idealism and its opposite,

materialism, in short all the rival metaphysical views that had been the chief product of the field. Ryle's work was the major entry of what came to be called *ordinary language philosophy* into the philosophy of mind, and its influence should be measured not by a census of converts (philosophies seldom display their influence by attracting proponents, but rather by remaining controversial for long periods of time), but by the fact that for more than a decade after the appearance of *The Concept of Mind*, *theories* of mind were unfashionable to the point of extinction. Theories were held to be the creations of those who had failed to see that the problems—at least the problems philosophers were equipped to address—arose from mistaken and naive assumptions about the way mind-words worked in the language. Theory-construction was replaced by the much more cautious and modest activity of "conceptual analysis": the delicate and persistent, if informal and unsystematic, canvassing of the idioms of ordinary language, the collective product of which is a broad and still largely unsystematized array of acutely observed distinctions and nuances, adduced in the course of making usually quite small points about various mental concepts. At its best, in the work of Ryle, Wittgenstein, Austin and Anscombe (5, 8, 10, 93, 117), this method uncovered deep conceptual issues that still shape current thinking and will continue to do so. At its worst, like the worst in any field, it produced mountains of trivia, but in the middle there was a good deal of very clever and useful work, whose point was seldom to solve problems and almost never to advance general theories, but typically to alert the incautious to the existence of more problems and distinctions than one would have expected (43, 63, 73, 94, 113, 114, 115, 116). There seemed in those days to be very little in the way of a substantial generalization that could be defensibly advanced.

The basic tactic then was "semantic ascent" (85);

¹ This overview was originally commissioned by the American Journal of Psychiatry, which eventually declined it on the grounds of being "much beyond" its readership, in spite of my efforts at explanation. I trust that the somewhat elementary tone of the paper is explained by this fact about its originally intended audience. I am indebted to Ned Block, Jeff Tilton, Bo Dahlbom, and Sue Stafford for valuable criticisms of earlier drafts of this paper.

when one runs into perplexities when talking about things (in this case, minds, sensations, thoughts and the like) it often helps to shift one's focus and talk about how to talk about those things, about "what one would ordinarily say" under various circumstances, or (if one is not enthralled by *ordinary* language) what one *ought to say* under various circumstances. There is no denying the value of the tactic, as the great work in the field amply demonstrates, but contrary to the creed of many at the time, it has not turned out that *all* the problems in philosophy of mind evaporate under linguistic analysis, and it is fair to say that a great deal of the researches into ordinary idiom failed to produce anything more important or enlightening than an intense appreciation for the subtlety of English expression. Moreover, although semantic ascent excuses one from expounding or defending an "ism", it does not permit one to operate innocent of assumptions, assumptions which ultimately implicate one in something rather like a theory. Typically (for Ryle, Malcolm, Anscombe and many others) the tacit theory was "logical behaviorism", the view that the truth of ascriptions of mental states and events implies and is implied by the truth of various statements purely about behavior. There were dissenters from this view: Strawson (108) for instance apparently committed himself to a cryptic revival of the *double-aspect theory* (a *person* is not to be analyzed into a body plus a mind, but is nevertheless a proper subject of both mental and physical attributes) and on Shaffer's analysis (99) ordinary language was held to incorporate dualism.

This tendency to evince theory in the course of conceptual analysis had the effect, at least in its most virulent forms, of squandering the useful indirectness of semantic ascent altogether, and bodies of doctrine emerged that looked suspiciously like the old metaphysical theories about the *things* (minds, sensations, thoughts, . . .), though generated from considerations scrupulously restricted to *words* ("mind", "sensation", "thought", . . .). This was not a happy development. Perhaps you can learn all about the *concept* of a horse by studying the way we ordinarily use the word "horse", and no doubt you can learn a great deal about horses from studying the concept of a horse (since much of what people *think* is true of horses is embodied somehow in our concept), but in the end there are some left-over facts about horses of non-negligible interest and even puzzlement that can be discovered only by looking at a horse or two, or at least by reading the works of those who have taken the trouble to do this.

II. PHILOSOPHY OF MIND NATURALIZED

Ordinary language philosophy of mind has now played itself out to the point where it can be comfortably viewed as a historical phenomenon. As an essentially critical and reactive discipline, it was bound to die of its own successes when it had run out of important errors and confusions to diagnose, while its infirmities became more apparent as it descended into trivia. Although its most characteristic doctrines and methods have been widely rejected or abandoned, its contributions to current thinking are positive and pervasive. Most important, the new way with words really did destroy the traditional way of composing a philosophical theory of mind. The traditional theorists were guilty, as charged, of making aprioristic generalizations, which were nothing if not the products of (ill-considered and un-self-conscious) conceptual analysis, mixing these with a handful of casual introspections and observations about normal people's experiences and powers, and promoting the mixture to the status of metaphysical verities about the essences of things mental. If there were to be theories of mind at all, they were not to be produced by the old armchair methods, so the philosopher of mind had three choices: abandon philosophy and pursue empirical theories in the domain of psychology or brain science, abandon theory and settle for the modest illuminations and confusion-cures of purely linguistic analysis, or become a sort of meta-theorist, a conceptual critic of the empirical theories advanced by the relevant sciences. It is this last conception of the enterprise, where it is seen as a branch of philosophy of science, that dominates the best work in the field today. Its most salient difference from both the traditional theorizing and the ordinary language approach is its interest in the theories and data of psychology, the brain sciences, artificial intelligence and linguistics.

In 1932, H. H. Price's classic work, *Perception* (77) contained a succinct apology for the philosopher's ignorance of science: our grounds for believing the physiological accounts of perception "are derived from observation, and mainly if not entirely from visual observation". But the reliability of observation is just what is at issue for the epistemologist, and "since the premises of Physiology are among the propositions into whose validity we are inquiring, it is hardly likely that its conclusions will assist us." So long as one is engaged in a Cartesian attempt to justify all knowledge from scratch, from whatever minimal foundation can be protected from syste-

matic skepticism, this familiar rationale can be maintained (though it provides no good reason not to peek at physiology), but such foundationalism in epistemology and philosophy generally is now on the wane, replaced by a "naturalistic" attitude (not a theory) that assumes from the outset that by and large our quotidian beliefs are true and warranted, that epistemology can learn from psychology, and that the best way to derive the canons of justification is to see how good science is done. (The attitude is well expressed by Quine, one of its most influential promoters, in "Epistemology Naturalized" (86).)

The danger of this drift might seem to be that it leaves philosophy with no standpoint from which to launch truly radical critiques of current science, but this is probably a misconceived worry, for the history of science suggests that revolutions in scientific thought must be internally bred. Still, the claim that the new naturalism is a capitulation to the excessive prestige of modern science has something to be said for it, though it should not be forgotten that philosophy's current friendship with science is not a novelty. The great philosophy of the 17th Century, for instance, was in intimate communication with the contemporaneous birth of modern science and contributed as much to that infancy as it gained in return. In any event, philosophers have discovered a vein that will be mined, very probably to the mutual enlightenment of science and philosophy.

While this emergence from the intellectual isolationism of the recent past is thus a logical development out of the best in the linguistic analysis tradition, it nevertheless required the rejection of a troika of doctrines central to that tradition: verificationism, logical behaviorism, and what might be called conceptual conservatism. In its most exigent form, verificationism is the doctrine that the method of verifying the application of a term just *is* its meaning: in its milder forms verificationism maintains that claims that cannot in principle be verified are senseless. This surviving brainchild of logical positivism is a plausible enough doctrine until one gets severe or doctrinaire about what is to count as verifiability, as typically happens. Consider, for instance, this simplified statement of the notorious "problem of other minds". How do I know that other people have minds? I cannot directly see or otherwise sense their minds (as I can introspect my own); all I have for data are observed facts about their behavior. Perhaps their behavior is good inductive *evidence* for the existence of their minds. But it could not be, for in order to establish that it

was good evidence, we would have to have *confirmed* cases of the co-occurrence of such behavior with other minds, and this requires, *per impossibile*, an independent method of verifying the existence at those times of those other minds. As the slogan had it, something can be a *symptom* of *x* only if something else is the *criterion* of *x* (1, 54). Criteria were thought to be not (merely) *empirically reliable* but rather *logically sufficient* or at least *decisive* or "certainty-providing" indicators of whatever they were criteria for. Then, since an appeal to ordinary language shows that the claim that there are other minds is not senseless (the man in the street knows full well there are other minds), it must be verifiable, and since the only evidence by which to verify it is behavioral, and since symptomatic evidence is logically dependent on criterial evidence, *there must be purely behavioral criteria for all (meaningful) claims about other minds*. Thus is logical behaviorism born of verificationism. But now suppose some mental item, say *pain*, does have purely behavioral criteria. That means that the assertion that someone is in pain is really (logically equivalent to) a statement about that person's behavior or dispositions to behave. But no statement about inner physiological happenings could be logically equivalent to a statement just about a person's overt behavior, so the truths of physiology, whatever they turn out to be, are *irrelevant*—except symptomatically—to the truth of claims about pain. Since the concept of pain has behavioral criteria, it cannot also have physiological criteria. Were scientists to propose physiological criteria for pain, they would be "proposing a new concept" of pain, and anything they told us about *their* sort of pain would not be about our *ordinary* concept of pain at all. Science cannot revise or improve on ordinary concepts, but is bound to abide by the criteria of use enshrined in ordinary language, on pain of either changing the topic or talking nonsense. Thus is conceptual conservatism born out of logical behaviorism.

The development of this line of thought in the literature was immeasurably more subtle, guarded, and attenuated by provisos and acknowledgements than the sketch of it given here (see e.g., (54)) and of course there was much in it that was true, but it lent support to a dubious claim; if psychologists and neurophysiologists thought they could study the mind, they were wrong; the study of mind was the study of (ordinary) mental *concepts*, and since these had ordinary behavioral criteria of application, once these criteria had been adumbrated by philosophers, there was nothing left to do. This

message was intolerable even to many of the adherents of the method of ordinary language analysis that had led to this embarrassing result. It was the work of many hands to dismantle the edifice of argument and assumption that led to this impasse but the whole process is graphically epitomized by Putnam's classic attack (79) on Malcolm (59, 60), by Fodor's polemics against Ryle (38, 39) and by Chihara and Fodor (16).

III. THE IDENTITY THEORY AND ITS DESCENDANTS

The first proclaimed alternative to logical behaviorism to draw serious attention was the identity theory of mind: minds are brains, and the contents of minds—pains, thoughts, sensations, and the like—just *are* (identical with) various happenings, processes and states of our brains. The early papers supporting the identity theory, by Place, Feigl, Smart, and Armstrong (7, 31, 32, 76, 101, 103), had the flavor of manifestos, and their point was to secure as directly as possible what was deemed to be the requisite conceptual foundation for a purely physicalistic or materialistic science of the mind, a bulwark against both the impertinent dismissals of the logical behaviorists and the metaphysical excesses of dualistic alternatives.

(Since it is widely granted these days that dualism is not a serious view to contend with, but rather a cliff over which to push one's opponents, a capsule "refutation" of dualism, to alert if not convince the uninitiated, is perhaps in order. Suppose, with the dualists, that there are non-physical effects (or accompaniments) of brain events. Then either the occurrence of these effects has itself *no effect whatsoever* on subsequent events in the brain (and hence behavior) of the person (epiphenomenalism), or it does (interactionistic or Cartesian dualism). In the former case the postulation of the non-physical effects is utterly idle, for *ex hypothesi* were the effects to cease to occur (other things remaining the same), people would go right on making the same sorts of introspective claims, avowing their pains, and taking as much aspirin as ever. Even more vividly, were a person's epiphenomena to be gradually delayed until they ran, say, ten years behind her physical life, she and we could never discover this! In the latter case of interactionistic dualism, since the occurrence of *non-physical* events (events having temporal location and presumably particular-person dependency but lacking spatial location and mass-energy) would be required to trigger un-

problematically physical events in the brain, the conservation laws of physics would be violated. Either way, one pays an exorbitant price for dualism.)

The identity theory was to be an empirical theory, conceptually outlined by philosophy but with the details filled in by science, and its ontology was typically presumed to include only scientifically well-credentialed entities—no *élan vital*, no psi forces, no ectoplasm, only brain cells and their biochemistry and physics. The identity theory's defining claim, the claim that mental events are not merely parallel to, coincident with, caused by, or accompaniments of brain events, but *are* (strictly identical with) brain events, divides people in a curious fashion. To some people it seems obviously true (though it may take a little fussing with details to get it properly expressed), and to others it seems just as obviously false. The former tend to view all attempts to resist the identity theory as motivated by an irrational fear of the advance of the physical sciences, a kind of humanistic hylephobia, while the latter tend to dismiss identity-theorists as blinded by misplaced science-worship to the manifest preposterousness of the identity claim.

This antagonism has created a very large literature over the last fifteen years—much of the best of it (7, 20, 23, 31, 32, 34, 52, 65, 76, 88, 101, 103, 110), is anthologized in Borst (15)—and out of it has emerged a panoply of sophistications that leave the original bluff identity theory far behind while advancing basically unrevised its basic project of providing a conceptual pedigree for the physical sciences of the mind. The difficulties encountered by the identity theory can be divided without major loss and distortion into three basic areas: problems arising from Leibniz's law, problems about generalization, and abstract logical puzzles about the identity relation.

It is Leibniz's law that makes identity a stronger logical relation than mere similarity, co-occurrence or equivalence. It states that "x is identical with y" entails that *whatever* is true of the thing denoted by "x" is true of the thing denoted by "y" and vice-versa. The principle is unassailable, since in the case of any true identity "x" and "y" will denote the very same thing, and whatever is true of that thing is true of it, whatever it is called. But now suppose some thought of mine is witty, or profound, or obscene; the identity theory must then claim that some brain process or event (the brain process or event identical with that thought) is witty, profound or obscene, and at least at first glance brain processes don't seem to

be the type of thing that could be witty or profound or obscene, any more than they could be the square root of 7 or loyal or capitalistic. One reply to this objection, variously expressed and defended, is: take another glance, and you will see that a brain process *can* be witty or profound or obscene in just those cases where it happens to be a thought. Not all events in the brain are thoughts—some are just metabolic events, for instance, and they cannot be witty, but they are not the only brain events. Of course the success of this position depends heavily on having an account of what it could be about a brain process or event that made it a thought (and one thought rather than another), and as we shall see, there are important problems in this area. (Another plausible reply to the objection distinguishes the thought as *event* from the thought as *content* or *proposition*, and claims that such features as wittiness properly apply to the content, not the event, but again, this position is no stronger than one's theory of the individuation of events by their content.)

There are in any case apparently harder problems raised by Leibniz's law (55). Suppose I am subjected to visual stimulation that subsequently produces in me a round, orange after-image. There is no round, orange image on my retina of course. Are we to suppose that there is a round, orange brain event or brain state that is identical with my after-image? Nothing that is not round and orange can be identical with something that is round and orange, so either my after-image is identical with some round, orange brain-state (which no one believes, I trust), or my after-image is not round and orange (could we claim it just seemed to be?), or my after-image is something (mental) other than—in addition to—any brain event and hence the identity theory is false, or there simply are no such things as round, orange after-images. It is no doubt tempting to anyone unfamiliar or unimpressed with the conceptual horrors of dualism to abandon the identity theory at this point, and admit after-images and their ilk to his ontology as extra non-physical, epiphenomenal by-products of brain activity, but this is just what the identity theorist refuses to do (19). The favored step instead is the last one: to deny that there are, strictly speaking, any such things as after-images at all. What there are, we are told, are havings-of-after-images, or experiences-of-after-images, and *these* are neither round nor orange. The difference between experiencing an orange after-image and experiencing a green after-image is not that the former experiencing is orange while the latter is green (19, 23, 93, 101, 103, 104). This move calls into question

what might be called the normal semantics of ordinary mind-talk. We speak, casually and ordinarily, using words like "pain," "image," "belief," "brainstorm," "hunch," etc., as if these words were unproblematic referring expressions denoting perfectly real items in our minds (whatever they are). But perhaps our ordinary talk embodies a fossilized myth-theory, and once science teaches us what is really happening in our heads, we will abandon the search for referents for our ordinary mind-terms, just as we have abandoned our search for mermaids, witches, and demons. We talk as if there really were such things as after-images, and so there seem to be; we also talk as if the sun really rose in the east, and so it seems to, but science can render the former mode of expression, like the latter, metaphorical. This line of reasoning can lead in the extreme to a variety of positions often gathered under the rubric of the "disappearance form" of the identity theory: science will not *discover the identities* of the problematic mental items, but rather those items will disappear as candidates for identification as a more sophisticated scientific picture supercedes the old (23, 34, 88, 109).

The second set of problems with the identity theory concerns generalization. These problems arise because the normal role of identity claims in theories is to permit generalization. (If this cloud is identical with a collection of water droplets, then so perhaps are the others; if this gene is a DNA molecule, the tempting hypothesis to test is that all genes are.) But it is far from clear that the identity theory could—or should—provide us with *any* generalization beyond its umbrella claim that every mental item is identical with some brain item or other. Suppose Mary thinks about π at noon, and the identity theorist claims that Mary's thought is identical with her noontime brain process p (having defining physical features F, G, H, . . .). It is not remotely plausible to suppose that every *thought about π* is a brain process with features F, G, H, . . ., if only because there is no reason to suppose intelligent creatures elsewhere in the universe would need to share our neurophysiology or even our biochemistry in order to think about π (81). It is not even plausible that every *human thought about π* , or even every *thought of Mary's about π* is identical with a brain process falling into a class specifiable solely in terms of the physical features of the members. It would seem to be a burden of any theory of the mind that it tell us what it is about thoughts that makes them thoughts, and what it is about thoughts about π that makes them thoughts about π , and it does not

appear that the general features we are looking for are physical features. The *weak* reply that the identity theorist can make is that all he needs to claim in order to avoid dualism is that each *particular* mental event (each "token") is some brain event or other (no mental event is a *non-physical non-brain* event). Thus we distinguish a "token" identity theory from a "type" identity theory, and abandon the latter in philosophy of mind. Perhaps no one today supposes that *types* of mental items can be distinguished directly by purely physical features, but almost no one any longer supposes this was a reasonable goal of physicalism (20). The *strong* reply goes beyond the avowal of a token identity theory and claims that the sought-for distinguishing marks of the types of mental items are definable in terms of *causal* roles filled (7, 52), or in terms of the *logical* states of the abstract Turing machine "realized" by a human being's nervous system (78, 80, 81, 82, 83), or in terms of the *functional* roles filled (37, 38, 39). As the differences between these three views have been sorted out, and deficiencies noted and corrected, a single widely shared view has emerged called *functionalism*: mental states are functional states, that is, states individuated by their functional role within the whole system. To say that a particular belief, or pain, for instance, is a particular functional state, is to say that anything, regardless of its composition, chemistry, shape, or other physical feature, that fulfilled the same functional role in a functionally equivalent system would be the same belief, or pain, and nothing that fulfilled such a functional role could fail to be such a belief, or such a pain. Functionalism has become the dominant doctrine in philosophy of mind today (that is, it is the only theory being widely criticized and defended in the journals), and hence will receive more detailed discussion below. It should be already clear that this sort of functionalism has little to do with the brand of functionalism encountered in sociology or anthropology.

The third area of investigation initiated by the identity theory concerns the logic of the identity relation itself. It was initially supposed by Smart and other early defenders of the identity theory that the concept of identity was perfectly safe and well understood. It was a common tactic to elucidate the identity theory of mind by drawing analogies to presumably innocent and familiar identities encountered in less puzzling quarters, such as the identity of lightning bolts with electrical discharges in the air, the Morning Star with the Evening Star, genes with DNA molecules. These, however, turn

out not to be unproblematic at all. One may even wonder if any identity claim is ever unproblematic. As the disanalogies, distinctions and perplexities about identity itself began to multiply, the problem of identity took on a life of its own as a logical and metaphysical issue, and the researches no longer illuminated in any specific way the problems of mind. This was partly due to the diminishing reliance by physicalistically inclined philosophers of mind on any notion of identity at all. The disappearance form of the identity theory is after all misnamed; it is really not an identity theory but only a physicalistic alternative to the identity theory, and as Putman observed in his earliest exposition of functionalism (78), the question of whether to *identify* a logical state of a (realized) Turing machine with its concrete realization in hardware is a relatively idle metaphysical concern. When the two tactics, the disappearance view and functionalism, are put together—as there are strong reasons to do (29, 30)—whatever identities are still left to acknowledge concern rather curious and abstract entities. (For instance, one might be left claiming that the *state of affairs* of Tom's having a pain was identical with the *state of affairs* of his brain being in some particular functional situation.) At this point, the initial motivation for proclaiming *identities*, to save us from the ghostly items of dualism, has vanished.

So it was something of an anachronism when, in 1971, Saul Kripke included a startling "refutation" of the identity theory of mind as an illustrative by-product of his extraordinarily influential, even revolutionary, new account of necessity, designation, and identity (50, 51). Kripke's argument depends on some technical innovations. A "rigid designator" is an expression that designates the same entity "in all possible worlds". Thus "Benjamin Franklin" is a rigid designator, while "the inventor of bifocals" is not, though in *this* world they designate the same individual. Kripke argues convincingly that all proper identity claims are composed of terms that are rigid designators and hence when they are true, they are true not contingently, but necessarily. The application to philosophy of mind comes when he argues that expressions such as "my pain" and "my brain state" are both rigid designators, but identity claims composed of them could not be *necessarily* true, hence could not be true at all. (Cf. 62). Kripke's argument is subtle and ingenious and repays careful study, but it has not commanded assent. Even if one accepts Kripke's new theory of identity and necessity, his arguments to show that

the relevant terms are rigid designators are not only vulnerable to straightforward exception, but seem to require assumptions that modern materialists (such as Armstrong) had already been at pains to deny (33, 58). In retrospect, Kripke's argument can be seen not to have revitalized dualism, but only to have given materialists more and possibly better (deeper) reasons for shunning certain tempting identity claims they had already for the most part learned to avoid.

IV. WHY FUNCTIONALISM?

As befits a view that is the prevailing favorite, functionalism has much to be said for it. Not only does it seem satisfactorily to evade the philosophical objections to all the other forms of materialism, but it is particularly well-suited to serve as the conceptual underpinning for current work in psychology, linguistics, and cybernetics or artificial intelligence. All of these disciplines operate somewhat self-consciously at a certain level of abstraction, and functionalism provides the rationale and justification for just such a strategy. In a way, there is nothing new about it. Psychologists as diverse as Freud and Skinner have shared the basic functionalist tactic: just as Freud eventually realized that any claims he might make about the physical location, composition, or operation of his functionally distinguished entities, the id, ego, and superego, were premature speculations, so Skinner, while granting that no doubt there were *some* internal, physiological mechanisms subserving reinforcement, has abjured speculation or commitment on that score, and settled, with Freud, for mapping the predicted consequences under a variety of circumstances of functionally characterized interactions.

(Skinner, of course, has been less clear than Freud about the fact that he has been committed to a functionalistic model of internal processes. He thinks his peripheralism evades that "charge." That he should worry on this score at all is an embarrassment to philosophers for had he and the other behaviorists not drunk so deeply at the well of logical positivism and the fashionable "operationalism" and "instrumentalism" of that era, they would not have been motivated to constrain their theorizing within such a paralyzing and misguided notion of rigor. Twenty years after logical positivism and even its obituaries have been all but forgotten by philosophers, its dogmas are alive and healthy in the textbooks of behaviorists. It is with some modesty and trepidation, then, that philosophers of mind

currently urge their doctrines on their colleagues in other fields. It appears, by the way, that history is about to repeat itself. Now that philosophers of mind have finally succeeded in banishing their fear of internal, "para-mechanical" theoretical entities, a fear they learned from Ryle (27, 39, 93), Roy Schafer (96) has taken Ryle's strictures to heart, and bids fair to initiate an era of Rylean logical behaviorism in psychoanalytic theory. The by now standard arguments against Ryle's behavior-dispositional analyses (they utterly fail to ramify or generalize; they are either obviously false or "saved" by *ceteris paribus* clauses that render them vacuous) seem at least at first glance to transfer intact as criticisms of Schafer.)

More specifically, functionalism provides the conceptual under-pinnings for current work in cognitive psychology, psycholinguistics and artificial intelligence modeling. In these disciplines one research strategy can be characterized in terms of (one version of) Chomsky's distinction between competence and performance: given a specification of a certain sort of competence, say a discriminative competence, or a linguistic competence, the task is to devise a performance model—often a computer simulation program—that exhibits that competence (usually artificially isolated and hedged in various ways) and if possible has a claim to "psychological reality" as well (27, 39). That is, getting the cat skinned at all can be a major accomplishment; getting it skinned in the way people seem to get it skinned is even better. This sort of research strategy permits highly abstract constraints and difficulties to be explored (how could *anything* learn a natural language? how could *anything* achieve a general capacity for pattern recognition in an unsterotypical environment?) without worrying about the mechanics and the biochemistry of concrete "realizations" in the head, while at the same time not abandoning the fundamental physicalistic constraint that one's functionally described systems be *somehow* physically realizable (25). At its most general and abstract, this sort of research merges with research in epistemology and philosophy of mind, and it is precisely at this meeting ground that the most promising and exciting work is being done today (e.g., 39, 45, 64, 84, 92, 95).

Of course functionalism has its skeptics and critics (11, 12, 47, 56, 57, 66, 90, 100), and the most unsettling problems wear surprisingly traditional garb. First there are problems about the *qualia* of experience, the way it feels to be conscious, and second, there are problems—alluded to earlier—about how

a functionally individuated state or event can have *meaning* or *content* in some presumably full-blooded sense required of mental entities. How could a functional state be a pain, and how could a functional state be a thought about *pi*?

V. QUALIA

There is no satisfactory definition of *qualia*, which seems to have become the pet term in the discussions, but the requisite general sense of what qualia are supposed to be is easily captured by an example which figures centrally in the current discussion. Suppose that when you look at a clear "blue" sky you see what I see (insofar as color goes) when I look at a ripe apple, and vice versa, and so forth through all the colors of the spectrum. Your perceived spectrum is, let us say, a systematic inversion of mine. But since you learned the use of color words just as I did (your parents pointed up at the sky and said "blue," etc.) our use of color words would be indistinguishable, and since we will both associate the color of glowing iron from the blacksmith's hearth with heat, and the color we perceive ice to be with cold, even our secondary descriptions of color (red is a warm color, blue is cool, etc.) might match. In fact, with regard to perceived colors and other qualia such as pains, tickles, sounds, aromas and tastes, do we have any evidence at all, or reason to believe, that any two people experience similar qualia under similar perceptual circumstances? This, the "inverted spectrum" thought experiment, is not new. It was a popular argument among the verificationists who took the "self-evident" unverifiability-in-principle of the hypothesis to mark the meaninglessness of the initial assumption that there are inner sensations or "raw feels"—to use a term philosophy took from the psychologist, Tolman—of the requisite sort at all. As Wittgenstein said, "An 'inner process' stands in need of outward criteria" (117), and although the exegesis of this remark is controversial, it is easy and common to interpret this as an expression of logical behaviorism, an assertion of the incoherence of any doctrine that admits private sensations or experiences of qualia.

It has often been pointed out that today's functionalism is a spiritual descendent of logical behaviorism. Where the logical behaviorists said that being in pain was a matter of behaving or being disposed to behave in a particular way, the functionalists say that being in pain is a matter of being in a functional state of a certain sort—viz., a state that *inter alia* disposes one to certain behavior under

certain conditions. From one vantage point, the only difference between the two doctrines appears to be the functionalist's willingness to abandon peripherality (by countenancing explicitly internal functional states), and the concomitant willingness to define function not just in terms of dispositions to behave, but also in terms of dispositions to change functional state. If, as Skinner says, the skin is not that important a boundary, if internal state-switching counts as behavior, then functionalism is just logical behaviorism in new clothes. It is not surprising then that in the headlong rush away from the verificationism of the recent past, philosophers should attempt to turn the inverted spectrum argument on its head and show that functionalism commits the sin of verificationism by failing to grant sense to something that (clever argument reveals) does make sense: the hypothesis of spectrum inversion (11, 12, 56, 100). In a similar vein, Nagel has argued (66) that there are certain undeniably meaningful hypotheses about our inner lives and the inner lives of others, about "what it is like to be" a person or a dog or a bat, of which functionalism can give no account.

The strategy of the debate is transparent. The lovers of qualia attempt to establish that functionalism unavoidably *leaves something out*: the wonderful tastes, tones and colors that make life worth living. The functionalists attempt to show that they have not left anything *real* out, and that the alternative to functionalism can only be some insupportable variety of epiphenomenalism. The issue is not yet resolved, nor will it be resolved by the straightforward victory of one side or the other in a purely conceptual debate. The burden for functionalism is inseparable from the burden of the variety of cognitive theories for which it provides the conceptual underpinnings. If an empirical psychological theory develops that is both strongly confirmed and predictive of the rich variety of phenomena of consciousness, we can inspect it for an answer to the question. If it contains a theoretical role for something like qualia, we shall "countenance" qualia in our ontology, but as theoretical entities, not epiphenomena; if no such role appears to be filled, then the very power of the theory will undermine the intuitions that now make the denial of qualia so counterintuitive (26, 29). If no functionally conceived theory proves up to handling the undisputed facts about consciousness, then that failure of empirical theory, and not any purely philosophical argument, will show that functionalism does in fact leave something out. The philoso-

phical investigations of the issue are not entirely parasitic, however, on the advance of empirical research; they can illuminate the terrain, revealing blind alleys and pitfalls, without attempting to dictate the solution.

VI. INTERNAL REPRESENTATION AND THE PROBLEM OF MEANING

A similar supportive role can be seen for the philosophical contributions to the other main perplexity facing functionalistic theories in psychology: the problem of meaning or content. No problems of philosophy have received more, or more expert, attention in recent years than the problems of meaning, and an overview summarizing the work in that area would have to be book length. (There are several fine anthologies of recent work [21, 22, 36, 46, 106].) Almost all of it is at least indirectly relevant to the problems of mind, and some of it is of central importance.

In the late 19th Century Franz Brentano claimed to have discovered the feature that sundered the mental from the physical: Intentionality. Mental phenomena, he said, differed from physical phenomena in always being directed upon an object, (the object of thought or desire or perception . . .) or related to a content (the content of a hope or thought or belief, . . .). This was a special sort of relatedness, for the objects of mental phenomena enjoyed a curious sort of "inexistence". I can want a sloop without there being a sloop I want; the object of my desire is "Intentionally inexistent" (which does *not* mean deliberately inexistent: Intentionality has nothing directly to do with what one intends to do). In the 1950's, Chisholm (17) revived Brentano's notion of Intentionality and (using the tactic of semantic ascent to great effect) turned it into a feature of *language*: the sentence we typically use to talk about mental events have certain peculiarities of logic. Chisholm attempted to characterize those peculiarities of logic in such a way that his distinction between Intentional and non-Intentional *sentences* mirrored Brentano's distinction between Intentional and non-Intentional *phenomena*. In the ensuing years, Intentionality, viewed as a logical feature of certain classes of propositions, has been exhaustively and fruitfully studied, though it is fair to say that no very broad unanimity has been achieved about the precise definition, status, or role of Intentional discourse (18, 24, 48, 53, 85, 97, 98, 112). Interest in Intentionality has survived the disagreements and difficulties surrounding its defini-

tion not only because it represents an unresolved perplexity of logical theory, but because intuitively it does mark an important divide in our conceptual scheme, though not quite the divide Brentano supposed. The Intentional idioms of our language are roughly those Russell called the idioms of propositional attitude; these idioms typically take "that"-clauses and hence form complex, but not truth-functional, propositions out of others: e.g., "Tom believes that it is raining" contains the proposition "it is raining", but the truth value of the whole is independent of the truth value of the enclosed proposition. *Roughly*, again, the Intentional idioms are those idioms in our language that relate people, their parts, their acts, their artifacts to *propositions*. Rougher still, we use Intentional idioms to endow things—any sorts of things at all—with *meaning*: if we want to say what Tom believes, what the sentence means, what the frog's eye tells the frog's brain, what is innately and tacitly known by the infant language learner (107), what the ego is trying to keep from the superego, what information is stored on the tape, what Houston is signalling to Mariner IV, we use Intentional discourse. A theory of Intentionality, then, would be a theory that made explicit the conceptual ties between these various cognitivist, information-theoretic, semantic approaches, and that set down the constraints and assumptions involved in the ascription of Intentionally characterized features to things. That there are very deep problems here can be brought out by considering cognitive psychology.

What unites cognitive psychologists and distinguishes them best from other theorizers in psychology is their willingness to view the individual not simply as a system of functionally individuated parts or subsystems, but of *Intentionally* individuated parts, parts whose functions are to "say that *p*", "remember the *q*", "figure out that *r*"—to encode, store, transmit or transform parcels of information. In fact it is their use of Intentional idioms in their science that best marks them off from the behaviorists, in particular Skinner, who has typically misconceived the difference as one between dualists ("mentalists") and materialists (24, 25, 28). Cognitive psychologists have generally thought that their use of information-talk is not only proper and well grounded in the mathematical rigor of information-theory and computer science, but positively a great step forward in the fruitful conceptualization of psychology, and so in the end it will be, I believe, but it is not unproblematic. To say that the function of some system is to carry certain information from a

to *b* is not just like saying the function of the tube is to carry lubricant to the bearing, or the function of the teletype is to convey symbol strings from place to place. Moving information about is not so easily conceived, or if, for some special sense of information, it is thus easily conceived, one has purchased the simplicity at the cost of postponing solution to the central problem of Intentionality, as a little thought experiment will show.

Suppose you find yourself locked in a windowless room, with two walls covered with flashing lights, two walls covered with little buttons, and a note telling you that you are imprisoned in the control center of a giant robot on whose safety your own life now depends. Your task is simply to guide the robot through its somewhat perilous environment, learning to discriminate and cope with whatever comes along, finding "nourishment" and safe haven for the robot at night (so you can sleep) and avoiding dangers. All the *information* you need is conveyed by the flashing lights, and the robot's motor activity is controllable by pushing the buttons. To your dismay, however, you see that none of the lights or buttons are labeled. You can't tell whether the insistently flashing light in the upper left corner is warning danger, signaling a "full belly," informing you of the location of the sun, or requesting grease for a heel bearing. You don't know whether when you push a button and the light goes out, you've scratched an itch, occluded your view of something, or destroyed an attacker.

Clearly, if that is all you are given to go on, your task is impossible; if you succeeded in guiding your robot through the day it would be sheer luck. Yet in one sense (and a very familiar sense to cognitive psychologists) all the information you need is conveyed to you. For we needn't suppose the lights are mere repeaters of peripheral stimulation; their flashing can represent the products of perceptual analysis machinery as sophisticated as you wish, and similarly the output can be supposed to initiate devious actions guided by hierarchical sub-routine systems informed by multi-layered feedback. In short, the entire array of systems devised by the cognitivist psychologists could be built into this robot, so that it conveyed to its control center highly mediated and refined information, and yet, though in one sense the information would be there, in another more important sense, it would not. Yet the task described is in a sense just the brain's task; it has no windows out which it can look in order to correlate features of the world with its input.

The problem of the control room could be solved

for you, of course, if all the lights and buttons were correctly labeled (in a language you knew), but this can hardly be the brain's solution. The job of getting the input information *interpreted* correctly is thus *not* a matter of getting the information translated or transcribed into a particular internal code unless getting the information into that code is *ipso facto* getting it into functional position to govern the behavioral repertoire of the whole organism. This is the problem of meaning that must eventually be faced by any theorist who wishes to appeal to "internal representations" as explicative of psychological phenomena. Some recent work in philosophy directly addresses this issue (23, 27, 29, 39, 45, 64, 84, 92, 95) and this literature depends to various degrees on the fundamental work on meaning that has developed in response to such central themes as Quine's thesis of the indeterminacy of radical translation (85), Austin's work on speech acts (9), and Grice's account of non-natural meaning (40, 41). A particularly active controversy within the area of internal representation concerns the nature of the supposed vehicles of representation: are they propositional (like sentences) or imagistic or analogical (like pictures or maps) or are there other sorts of "data structures" with no familiar analogues among external vehicles of representation? Work by philosophers in this area merges quite smoothly with that of psychologists and cyberneticists (e.g., 64, 84), and one can expect this unforced interdisciplinary exchange to produce some genuine advances in outlook in the next few years.

VII. OTHER AREAS OF CURRENT ACTIVITY

This survey of current work is intended to capture the main lines of inquiry, but has left some work unmentioned that is not at all peripheral. For instance, the perplexing status of "introspection" has been carefully studied in a growing literature on "privileged access" and the presumed "in corrigibility" of introspective reports (2, 3, 6, 7, 23, 29, 42, 49, 61, 72, 89, 91, 102, 111), and philosophers have usefully turned their attention to specific issues arising in other fields, such as Sperry's split-brain cases and the various claims being advanced about the different roles of the cerebral hemispheres (e.g., 67), and the physiology of pain (30, 74, 75). There has also been a rediscovery of Freud (118), and in particular the problem of self-deception has provoked some excellent work (35, 44, 87, 105). The "minds and machines" literature has evolved from its early preoccupation with the question "can

computers think?" (e.g., 4) into a much more detailed and informed examination of conceptual issues at the heart of current research in artificial intelligence and automata theory (e.g., 13, 14, 68, 69, 70, 71). An optimistic prognosis would be that these various strands of inquiry will coalesce into a fairly stable and broadly accepted understanding of the conceptual underpinnings of the functionalistic

and physicalistic approach to the mind, but if one attends to the great diversity of opinion in the field, the deep difficulties that can already be seen to attend such a view, and the lesson of history, a more realistic prediction would be that this still fragmentary and tenuous consensus will prove as evanescent as its predecessors and be replaced by a currently unimagined set of doctrines and problems.

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