

SELECTIVE PERCEPTION

THOMAS A. RUSSMAN

Catholic University of America

IN THE YEARS SINCE THE PUBLICATION of Wittgenstein's *Philosophical Investigations*, two developments in fields not strictly philosophical have taken the momentum from positivism: discovery (1), in the history of science, the increasing realization that the scientific enterprise is largely governed by what Thomas Kuhn called "paradigms"; discovery (2), in the neurosciences, the increasing understanding of the high degree of selectivity involved in, for example, the physiological process of visual perception. The purpose of this paper is to examine some implications of these two developments and estimate to what extent they push us toward Wittgensteinian or neo-Kantian views. My contention will be that they push us in these directions less than at first might appear and that their chief thrust is in another direction entirely.

Discovery (1) was a fatal blow to the Baconian conception that science begins with neutral observations, is ruled by nothing but what is given, and proceeds thence to permanent conclusions via an assured method of induction. Rather, scientific observation is guided by theory; out of the infinite possibilities of all that could be observed, a given theory makes some of these observables "interesting" by predicting their connection with a larger body of knowledge about the world. Interesting observations, designed to verify the theory in hand, are the ones sought by scientists, who characteristically require elaborate and exact apparatus to conduct these observations. What is even more scandalous from the viewpoint of the positivist scientific mythology, the hold of a current theory is sometimes so strong as to cause the dismissal of experimental discoveries that are vindicated later. In retrospect, such initially unappreciated discoveries are viewed as having been "premature." They were at first dismissed or even denied because they could not be connected fruitfully with contemporary canonical knowledge. Contrary to Baconian and positivist assumptions, the use the scientific community makes of canonical guides for its research is not an aberration—it precisely maximizes the objective of furthering knowledge of the world. Without paradigms to guide

research, there would be no way for scientists to decide how to spend their time in a way likely to be profitable. Without some basis for deciding between the relevant and the irrelevant, lack of focus would result in a lack of direction and discipline. A discovery is premature if there are no theories yet available to show why the discovery is important. When such a theory is produced, a premature discovery can be recovered. In principle, nothing of value need be lost; meanwhile, under the lead strings of current theories, much wasteful digression is avoided, and a sense of progress and even excitement is maintained. This view of science has been rendered commonplace by Thomas Kuhn, Michael Polanyi, and others.¹ It destroys the myth of a neutral science. We will try to see what other philosophical implications it has.

Discovery (2) received its initial impetus in the 1950s through scientific analysis of the visual pathways in the brains of cats. Stephen Kuffler² discovered that the function of retinal ganglion cells is not to register light just as it comes but, by summarizing responses from "on" and "off" regions of the retina, to register the relative contrast between light and dark. Later, Hubel and Wiesel³ discovered further stages in the selective activity of the visual neurons, this time in the cortical neurons themselves. Some cortical neurons were found to register only light and dark contrasts along straight lines, others to register only straight line corners, still others only straight line ends, etc. How far does this selecting and combining of the neuronal responses go? There is certain to be a limit far short of finding a special neuron for every complex structure we are able to distinguish visually. One point of philosophical significance has already been made, however. There are undoubtedly innate structures of the nervous system that determine what we shall be visually aware of. And talk of innate structures conditioning knowledge *a priori* appears to vindicate Continental rationalist epistemology (from Descartes through Kant to contemporary phenomenology), as opposed to English empiricist epistemology (from Locke through Hume to contemporary positivists). Indeed, Kant's claim that Euclidian geometry is most "natural" to man seemed strongly supported by the neuronal emphasis of straight-line sensitivity.

I want to say three things about the implications of these two discoveries for philosophical discussion:

(a) These discoveries argue for selective perception of reality, not construction of a phenomenal reality.

- (b) They do not argue against all forms of foundationalism.
(c) They help to undermine arguments for a Transcendental Ego.
I will discuss these claims in order.

To insist that an organism is active rather than passive in its perceiving of the world is not to imply that it constructs its world or that it is aware only of a phenomenal world distinct from things-themselves. There is a great difference between selecting and constructing. I want to maintain that theories are both selected and constructed but that observational objects are selected and *not* constructed.

What does it mean to say that a particular scientific observation is theory-laden? It probably means a number of things. It means first of all that the observation was made because there was a theory that predicted that certain things would be seen by means of the observation. The theory's role is likely to be so important that it is extremely unlikely that the observation would have been made without that theory's (or some theory's) guidance. It also means that what is observed is likely to be understood or interpreted in light of this guiding theory. In other words, the theory will make connections between what is observed in a particular observation and what is observed in other observations. It will make these connections by means of appeal to underlying, invisible structures, structures toward which, at some advanced stage in a theory's confirmation, scientists feel entitled to adopt a realistic attitude. My claim that observations are selected, not constructed, whereas theories are both selected and constructed, does not imply that unobservable structures, entities, interactions, etc., are necessarily unreal or less real than observable ones. Scientists can have very good reasons for claiming that theoretical descriptions of such unobservables do indeed *fit* underlying structures that evade our direct observation.

An example will help make clear why I claim that none of the above implies that theory-laden observations have constructed objects. Suppose I notice that my billfold is missing and decide to look for it in the vicinity of a chair where I have been sitting. Suppose that, after looking between the cushions and on the floor around the chair, I finally find the billfold. My discovery of the billfold lying on the floor next to the chair was guided by my conjecture (theory) that it would likely be lying somewhere on, in, or near that chair. Of all the sights around waiting to be gazed upon, I chose to search the carpeting in this small corner of the room

because I had conjectured that my billfold would be found there. Furthermore, the presence of the billfold seen lying on the floor next to the chair is understood in terms of my conjecture. It had apparently fallen from my pocket as I removed or replaced my coat at that chair. So, out of many possible fields of observation, my theory picks out a small corner of a room, and, out of many possible explanations of the presence of my billfold next to the chair, my theory connects it with my actions there shortly before. The observation is theory-laden in this sense. However, the billfold seen lying next to the chair is not a construct, not some sort of phenomenal object. It is just a thing-itself, the billfold itself. My conjecture might have been exactly as it was and the billfold *not* been there. Theory guides (selects) and interprets observations; it does not construct observational objects.

Typical scientific observations differ in one important way from the billfold case. They require sophisticated apparatus. Such apparatus, or instruments, do not, however, produce a constructed observational object. The fact that an observable object may turn up only in the form of a photograph or an image on a screen does not show that it is, in the relevant sense, constructed. Photographs and screen images are no more phenomenal in the Kantian sense than are billfolds and chairs. They are things-themselves that visually present other things-themselves. The fact that the photograph or screen image may record things that cannot be seen by the naked eye presents no insuperable epistemological problem, so long as the projecting mechanism is correctly understood and the photograph or image interpreted accordingly. Any apparatus or instrument is subject to evaluation as a means of selective observation and can be rejected as unreliable if it cannot deliver to observation the part of the universe the investigator, guided by hunches and theories, wants.

The Euclidian emphasis of the visual nervous system does not bring about an *a priori* construction of phenomenal objects. It merely indicates that not all aspects of the world are equally available to human sight. This has long been known to be true of the color spectrum, only a small part of which is visible. But this limit upon visual sensitivity implies selection, not construction. The process of evolution has led to the survival of this range of sensitivity; but light waves of the visible spectrum, although selected, are nevertheless features of the world itself. The same can be said of light and dark contrasts along straight lines. Emphasizing these

characteristics of the world possibly had some advantages for survival as compared with other kinds of neuronal emphases, but these characteristics are nevertheless features of the world. They just happen to be among the features to which we are most sensitive and of which we are most readily made aware.

My claim in this first section has been that those who are convinced that there is a distinction between the phenomenal and the noumenal, and that what we are aware of in visual experience are not things-themselves, have no support from the two discoveries I have been discussing. These discoveries do not, as one might think, revitalize old arguments for the noumenal-phenomenal split. To insist that they do would require an attack upon the distinction between selection and construction as I have begun to lay it out. Until such an attack is successful, I will be obliged to contend that those who believe Kantian phenomenalism is revitalized by support from these discoveries have made the following mistake: having limited their choices to empiricist passive neutrality and Kantian active construction, they view the defeat of the former by these two discoveries as a triumph for the latter.⁴ But this is nothing but the fallacy of incomplete alternatives. The distinction between selection and construction reveals another alternative.

This distinction offers important resistance to the recent tendency to minimize the difference between theory and observation. I have claimed that theories are constructed but observations are not: no matter how theory-laden an observation may be, its objects are not the constructs of the observer's theory nor of his nervous system. More of what this means will become clear in the next section.

Discoveries (1) and (2) do not argue against all forms of foundationalism. They do, of course, argue against any form of foundationalism that assumes perception to be an entirely passive affair that allows utterly unselected data to wash over the human consciousness. Empiricists and positivists have been constantly accused of describing perception in these too-passive terms. Their view of perception was put to nice ideological use: all ways of knowing that did not start from perception in the way the positivists said they should were disparaged as unscientific. But if selection is a part of acts of perception from the very beginning, then the perceiver is never a passive mirror of the outer world, nor do his observations have the extreme sort of neutrality that empiricists and positivists have not generally been careful to avoid. But ideological use can be

made of this point as well—with the effort to deny that knowledge has any foundation in observation and with the claim that what justifies a belief is never anything more than its coherence with other beliefs. The selectivity of perception shown by discoveries (1) and (2) does not support this last contention. If it is to be supported, it must be supported on other grounds entirely.

Wittgenstein's *Philosophical Investigations* begins with a criticism of Augustine's view that, as small children, we learn language one word at a time by first attaching words to physical objects. Wittgenstein's criticism is clearly right: we cannot know the meaning (or use) of *chair* or *dog* without also knowing a great deal more besides; i.e., we cannot understand one word of English without understanding many other words, as well. But, granted this, it is still possible that the process of language learning begins with awareness of physical objects. In other words, Wittgenstein has shown that it is impossible to have the concept "chair" or "dog" without having many other concepts; he has not shown that it is impossible to see a chair or a dog without having a concept for it. The latter claim goes beyond linguistic points about language learning and resorts to the Kantian assumption of some chaotic sense manifold that needs to be put in order by concepts, before perceptual consciousness of anything can take place. Discoveries (1) and (2) provide no argument for this last claim. I am quite willing to challenge any Wittgensteinian to demonstrate how Wittgenstein's linguistic arguments show any such thing. Until such a demonstration, I have sufficient room to lay out the following rough schema for language learning based on preconceptual awareness of physical objects. In what follows I will concentrate on visual awareness only.

At first a child is unable to distinguish individual physical objects. This seems to be due, at least in part, to the overconnection of light-receptor neurons and cortical neurons. In creatures having binocular vision, the first days of open-eyed, postnatal existence are spent getting each eye to see the same visual field that the other eye sees. This adjustment is possible because each eye's visual system is at first overconnected. Each cortical cell at first receives impulses from light receptor cells that are "wrong" for it as well as from those that are "right" for it. The reason for this overconnectedness is to allow the visual system to select the "right" connections by a process similar to trial and error. The connections that are wrong are finally eliminated, while the ones that are right

are retained. When this is achieved, vision has become clear, and both eyes are able to focus on the same visual space. This adjustment process, made possible by the original overconnection, brings about a level of precision in binocular vision that, it seems, would be otherwise unattainable. By the time the wrong connections have been selected out and the eyes are able to work in concert, focusing together on the same things, visual perception of those things has begun.

A linguistic (or conceptual) framework is an extremely complex network of linguistic (or conceptual) connections and associations. Such a framework, I am claiming, has its foundation, both its origin and its justification, in perception. The process of developing such a framework begins with preconceptual awareness of medium-sized physical objects. Augustine was wrong if he thought that, upon first seeing a chair preconceptually, one can associate with it the extremely complex meaning or usage of *chair*. But even though such great leaps to very complex associations do not take place, it seems reasonable to assume that small steps to simple associations *do* take place. This level of association is at first at such a primitive level that we may not care to recognize it as "conceptual" or "linguistic" at all. From the start the child focuses selectively. Objects moving across its field of vision tend to capture its attention. It focuses on things that are within its reach and are therefore able to supply the usual infantile gratifications. These various selected objects begin to repeat in the child's visual experience, and the child associates the same things or similar things with their relevant predecessors and responds accordingly. The internal vehicles of these associations should probably not be called "concepts" or "words," but in the case of the human child they are at least harbingers of concepts and words. With the help of parental teachers and continued experience, the child develops increasingly complex associations. It begins to utter "words" on cue, but still perhaps without sufficient linguistic versatility for them to be considered equivalent to *our* words of the same sound. These early "words" do not make up a private language in any extreme or problematic sense. Some mothers claim to be good at knowing what their children mean by these "words." We cannot rule out this possibility *a priori*. The process continues until the child's versatility reaches a level that betokens a complexity of associative ability sufficiently rich that we have no more qualms admitting that the child speaks our language and thinks with concepts much like our own.

On this view, Augustine was wrong but not completely wrong. He was wrong to underestimate the complexity of language and therefore of language learning. He was right to assume that a child can be aware of things prelinguistically and to assume that a child learns language and develops concepts by starting with the things it sees. The path of associations that leads from these initial conscious experiences to the full-blown use of language is undoubtedly longer and more difficult than Augustine may have imagined, but it starts and ends where he thought it did. It starts with preconceptual, linguistic awareness of objects.

Without assuming empiricist (nonselectively neutral) perceptions, nor a simplistic, Augustinian marriage of word to object, I have argued that perception is the foundation-origin of language learning. My account also paves the way for the claim that perception can serve as the foundation-justification of beliefs. If my earlier claim that observational objects are selected, not constructed, is correct, and if I am now right in claiming that the concepts by which we know perceptual objects are the products of preconceptual associations of those objects, then the primacy of observation in the process of justification remains intact. My theory or linguistic framework may direct my attention to a particular small area of the world, but my belief that my billfold will be found there may be falsified, not by my theory or framework, but by the world I see. Yet, to have seen my billfold there would have justified my belief that it was there. It might be rejoined that I cannot *know* what it is I see unless I have a conceptual framework by means of which to know it. Indeed. But the framework itself initially arose by means of perceptions of the world. So the foundational role of perception, which puts our theories in touch with the world, is preserved.

One final point before moving to the next section. There is a standard objection to the kind of foundation-origin of language I described above. According to this objection, one cannot associate similar things without knowing that they are similar. And one cannot know that things are similar without having the concept "similar." But one cannot have the concept "similar" without having many other concepts, as well. The conclusion is that the associative process I described cannot get off the ground. The faulty premise in this objection is the claim that one cannot associate similar things without knowing that they are similar. The most casual observation of the behavior of small children and animals

makes it quite clear, it seems to me, that this premise is false.

Discoveries (1) and (2) help to undermine three arguments in favor of a Transcendental Ego.

Argument (i): The Transcendental Ego is necessary to explain the unity of consciousness.

The problem of explaining this unity results from Hume's failure to do so. In *A Treatise of Human Nature* Hume had said that people "are nothing but a bundle or collection of different perceptions." He added, "All our distinct perceptions are distinct existences. Did our perceptions either inhere in something simple or individual, or *did the mind perceive some real connection* among them, there would be no difficulty in the case." But for Hume there is no such thing as an underlying substance, nor is there a real connection among distinct existences. Thus, there is no basis whatever for the unity of a single consciousness through time.

Kant accounted for the needed unity of consciousness by appeal to "transcendental unity of apperception." This transcendental subject was postulated by Kant because it produces "systematic unity in the laws of empirical employment, and extends our empirical cognition, without ever being inconsistent or in opposition with it." Kant concluded that, given the great usefulness of the ideal, transcendental self, "it must be a necessary *maxim* of reason to regulate its procedure" according to it.'

This and all other arguments Kant used for the Transcendental Ego are practical arguments: i.e., the Transcendental Ego is postulated to solve problems that, it seemed to Kant, could be solved no other way. If, however, it can be shown that these problems are themselves the result of mistakes, then the solutions too will appear misguided and superfluous. My argument will be that the Transcendental Ego was presented as a solution to just such mistaken problems.

In the present case, Hume's description of fragmented consciousness is the mistake. Human consciousness is not fragmented but bound together by what I will call "continuity of perspective." Parts of this continuity of perspective were explored earlier in my discussion of the ways in which paradigms guide observation and the innate determinants of visual perception. The paradigms or theories that are being currently presupposed or questioned give my current thoughts and experiences continuity of focus. Biological continuities in the mechanism of perception—causing color blindness, near-sightedness, auditory acuity, etc.—translate into con-

tinuities in the quality of perception. But there are many other elements that contribute to our sense of the continuity of perspective between one moment of awareness and the next. I observe the world from a continuous spatial location. Even if I move about, my moving and resting are experienced as part of a coherent trajectory through space, a trajectory that maps my location and unifies the spatial perspectives that flow into and out of one another in my experience. Emotional propensities, bodily strengths and limitations, spheres of human association—all contribute to the complex continuities that cannot be accurately described as a mere “bundle or collection” of “distinct existences.” Thus the problem Hume posed was the result of a misstatement of the data of consciousness. And Kant’s solution to that problem, the binding of consciousness by a Transcendental Ego behind the scenes, appears unnecessary. If an underlying substance is needed to explain the continuities in perspective I have described, we need look no further than the individual person himself, complete with the usual physical and mental characteristics.

This last point carries us into argument (*ii*): The Transcendental Ego is necessary to provide an ultimate subject of awareness. For Kant, all objects of all kinds of awareness are phenomenal, not noumenal. Therefore, any awareness we have of ourselves as bodily—as having brains, as having genes, and so on—is an awareness of phenomenal appearances. Similarly, any introspective awareness of our inner states is an awareness of phenomenal appearances. Phenomenal appearances are objects of awareness, but awareness also requires a subject. The subject of awareness must be more than an appearance: it is that to which all appearances appear. The name for this more-real-than-appearance subject is the “Transcendental Ego.”

I have claimed that discoveries (1) and (2) argue only for the selection of observational objects, not for their construction. Kant’s phenomenal appearances, on the other hand, *are* constructed; and Kant laid out an elaborate mechanism that, he claimed, constructs them. But if the objects of perceptual awareness are not the products of construction, they are not appearances at all. But then the premise in Kant’s argument that asserts—rightly, in my opinion—that the ultimate subject of awareness must be more than an appearance does not force the conclusion that this ultimate subject of awareness must be other than the person (complete with brain, etc.) whom we see. That vis-

ible person is already more than appearance, and therefore we need nothing else to serve as an ultimate subject.

Argument (iii): The Transcendental Ego is necessary to explain human freedom.

Kant argued that the assumption of human freedom is both a practical necessity and a speculative possibility. From this he concluded that the assumption is justified. I agree with Kant that, if the assumption of human freedom is a practical necessity and a speculative possibility, the assumption is justified. I also agree that the assumption *is* a practical necessity, for reasons that are perhaps no more than extensions of the ones Kant himself gave. But my reasons for thinking it to be a speculative possibility are very different from Kant's. Kant believed that we are determined *a priori* to perceive the world (which Kant said is phenomenal) deterministically—to therefore see visible people as determined in their actions and not free. Kant's Transcendental Ego is not part of the phenomenal world, however. It may, therefore, be nondetermined and provide a basis for freedom. Thus, freedom is for Kant a speculative possibility.

If I have been right all along to insist that perception is selective and not constructive, then there are no overriding *a priori* reasons why everything and everyone in the world (which I say is not phenomenal) has to be subject to complete determinism. Possibly some things are and some things are not. At any rate, it is not a question to be solved *a priori*. Nor is it cogent to argue that, since the rest of the universe is completely determined, it is parsimonious to assume that human actions are completely determined too. One might as well argue that, since the rest of the universe is nonliving, it is parsimonious to assume that plants and animals are nonliving too. Quick arguments for general determinism are nothing but *a priori* assumptions or questionable generalizations from the determinism found in the rest of nature. The present states of psychology and the neurosciences leave plenty of room for the possibility of human freedom. Kant rightly claimed that the speculative possibility of human freedom coupled with the practical necessity of assuming it constitute a justification for that assumption. But it is a justification that does not require the presence of a Transcendental Ego.⁶

Discoveries (1) and (2) have important antipositivist implications for philosophical thought. They helpfully emphasize that perception is not passive and neutral, but active and selective. The distinc-

tion between selection and construction, however, prevents an overcompensation in the Kantian direction. This distinction also helps to avoid a fundamental proposition that empiricists and Kantians have had in common and that Kant inherited in large part from Hume: that those things of which we are aware in perception are ideas, phenomena, or *sensa*—and not things-themselves. My argument here has hardly been a comprehensive refutation of that proposition. But that now-gathering refutation will finally put an end to one of philosophy's most captivating digressions.

1. Thomas Kuhn, *The Structure of Scientific Revolutions*, 2d ed. (Chicago: University of Chicago Press, 1970). My favorite brief statement of the position is by Michael Polanyi, "The Potential Theory of Adsorption," *Science* 141 (Sept. 13, 1963): 1010-13.

2. Stephen W. Kuffler, "Discharge Patterns and Functional Organization of Mammalian Retina," *Journal of Neurophysiology* 16 (1953): 37-68. Later experiments with monkeys showed the same result. D. H. Hubel and T. N. Wiesel, "Receptive Fields of Optic Nerve Fibers in the Spider Monkey," *Journal of Physiology* 154 (1960): 572-80. See also Hubel, "The Visual Cortex of the Brain," *Scientific American*, Nov. 1963.

3. D. H. Hubel and T. N. Wiesel, "Receptive Fields, Binocular Interaction, and Functional Architecture in the Cat's Visual Cortex," *Journal of Physiology* 160 (1962): 106-54.

4. This line of argument is found quite explicitly in the writings of the molecular biologist and structuralist Gunther Stent of the University of California, Berkeley, in "Limits of the Scientific Understanding of Man," *Science* 187 (Mar. 24, 1975): 1052-55, and in "Cellular Communication," *Scientific American* 227 (Sept. 1972): 50-51. The fact that structuralists in general tend to see the choice in these terms has the following testimony of Jean Piaget:

Structuralism, it seems, must choose between structureless genesis on the one hand and ungenerated wholes or forms on the other; the former would make it revert to that atomistic association to which empiricism has accustomed us; the latter constantly threaten to make it lapse into a theory of Husserlian essences, Platonic forms, or Kantian *a priori* forms of synthesis. [Jean Piaget, *Structuralism*, trans. Chaninah Maschler (New York: Basic Books, 1970), p. 9].

5. *Critique of Pure Reason*, A671, B699.

6. The preceding discussion assumes that human freedom and universal determinism are incompatible. I agree with Roderick Chisholm ("Agency," in *Person and Object* [LaSalle, Ill.: Open Court, 1976]) that they are incompatible. Chisholm's analysis makes it clear, it seems to me, that compatibilism either denies freedom, denies determinism, or is simply the result of confusion. But the issue is a tough one, and I do not offer an analysis here.