

## Resolution of the Pivotal Issue (II): The Positive Argument

( I )

**E**VEN though they admit that only man has a propositional language—that only man names things and makes sentences—the comparative psychologists nevertheless contend that the use of symbols is not confined to man. The behavior of other animals, they repeatedly assert, involves the use of symbols. Since the behavior of other animals is admittedly non-linguistic, they qualify this assertion by distinguishing between verbal and non-verbal symbols, just as they qualify their assertion that concepts function in the non-linguistic behavior of animals as well as in the linguistic behavior of men, by distinguishing between verbal and non-verbal concepts.

It was shown in the preceding chapter that the comparative psychologists equivocate in their use of the word "concept" when they use this word for a theoretical construct needed to explain the observed behavior of animals as well as men. When the difference between concepts and perceptual abstractions is clearly understood, it can be seen that all the experimental evidence advanced by the comparative psychologists can be explained without reference to concept-formation on the part of non-linguistic animals. The only theoretical constructs required for the explanation of non-linguistic behavior are perceptual residues (memories) and perceptual abstractions. The non-verbal mediat-

ing factors operative in the behavior of non-linguistic animals are memories and perceptual abstractions, not concepts. Hence, if there is any theoretical justification for dividing concepts into verbal and non-verbal, that must be derived from human behavior exclusively.

The same criticism applies to the use of the word "symbol" by the comparative psychologists. They use that word without distinction for two quite distinct types of signs—for *signals*, on the one hand, and for *designators*, on the other (i.e., on the one hand, for the type of sign that smoke is when it signifies fire, and, on the other hand, for the type of sign that the word "smoke" is when it signifies smoke). Once the distinction between these two types of signs or signifiers is clearly understood, it will be seen that the behavior of non-linguistic animals can be fully explained in terms of signals and without reference to designators. It can, furthermore, be shown that animals respond to verbal as well as non-verbal signals and that men use both verbal and non-verbal designators. Hence, it is not the distinction between verbal and non-verbal that differentiates human from animal behavior in the use of symbols, but rather the distinction between designators (verbal or non-verbal) and signals (verbal or non-verbal).

Because the word "symbol" has been used by so many writers in so many different senses, I propose to discard it entirely, and to replace it by the word "signifier" or, in shortened form, by the word "sign." [1] The latter is visibly present as the root of the words "signal" and "designator," which I will use for the two main types of signifiers. In these terms, it will be the task of this chapter to show that (1) the behavior of non-linguistic animals involves the use of signals, but never designators; (2) that human behavior involves both; (3) that the functioning of signals in the behavior of non-linguistic animals does not require concept-formation on their part; and (4) that the functioning of designators in human behavior cannot be explained without attributing the possession of concepts to man.

Of these four points, the last two are critical for the resolution of the pivotal issue concerning the difference between man and other animals. The establishment of the third point (that the functioning of signals in the behavior of non-linguistic animals does not require concept-formation on their part) will confirm

the negative argument set forth in the preceding chapter. The establishment of the fourth point (that the functioning of designators in human behavior cannot be explained without attributing the possession of concepts to man) will constitute the positive argument that is needed to complete the resolution of the issue; for it is not enough to show, negatively, that the behavior of non-linguistic animals can be psychologically explained *without employing* concept-formation as a theoretical construct. It is also necessary to show, positively, that the psychological explanation of man's linguistic behavior *must employ* concept-formation as a theoretical construct.

When these two things have been shown, we shall be warranted in concluding that there is a psychological difference in kind between man and other animals—a difference in kind that turns on the use of concepts by man and not by other animals. That conclusion still leaves open the question whether the difference in kind is superficial or radical, as the opposite conclusion would not; for if the same psychological factors or processes, accompanied by differences in degree, could explain linguistic and non-linguistic behavior, we would know that the difference in kind between man and other animals, manifested by man's exclusive possession of a propositional language, was only a superficial, not a radical, difference in kind.

I propose to proceed in the following manner. I will first (in Sections 2 and 3 to follow) establish the distinction between signals and designators by showing how these two types of signifiers function in human behavior. I will next (in Section 4) examine the experimental data bearing on the role of signs in animal behavior, and show that the evidence points exclusively to the signal type of sign, not to designators; and in this connection I will argue that the functioning of signals in animal behavior *does not involve* concepts. Finally (in Sections 5 and 6), I will argue for the conclusion that the functioning of designators in human behavior *does involve* concepts.

The analysis of linguistic behavior that follows is by no means a complete or exhaustive account of human language or of all types of signifiers and all modes of signification. It is restricted to the one distinction that is needed for the present purpose—the distinction between signals and designators. And for this purpose, I will, furthermore, restrict the analysis to the simplest

type of designators, exhibited in man's use of common nouns—the type of designators that a relatively young child employs in his first efforts to attach different names to the different types of objects that confront him. [2]

( 2 )

Let us examine some obvious examples of signals and signaling in human behavior. In terms of these examples, we will be better able to define this type of signifier and this mode of signifying. The examples fall into two groups.

(1) On the one hand, we have such things as clouds signifying rain, smoke signifying fire, or a darkened landscape in daytime, through signifying clouds, indirectly signifying rain. In each of these examples, we have one natural object perceived signifying another natural object that is, at the time, not perceived. Let us call these signs *natural* signals. Men learn their significance from experiences in which the thing signified (the rain or the fire) is related to the signifier in a temporal or causal sequence. These sequences are not invariable. The gathering of clouds is usually, not always, followed by rain; smoke is usually, but not always, produced by the lighting of fires. That is why Aristotle called such signs fallible, reserving the term "infallible sign" for the relatively rare instances in which the sign and the thing signified are natural objects that are invariably and necessarily connected as cause and effect, or antecedent and consequent. [3]

(2) On the other hand, we have such things as a railroad semaphore signifying an unseen train ahead; or a curved line on a highway plaque signifying an unseen curve in the road. In each of these examples, we have humanly invented or instituted signs functioning, when observed, to signify unperceived objects or conditions. Let us call these signs *conventional* signals, to indicate that the sign is not a natural object but man-made.

Natural and conventional signals differ in a number of respects. Whereas natural signals are usually fallible signs, conventional signals always are; there is no necessary and invariable connection between a conventional sign and the thing it signals. Furthermore, even when natural signals are fallible signs, their misleading

character does not derive from intentional prevarication on the part of nature; i.e., when the perceived clouds lead us to expect rain and the rain does not occur, that is not because the clouds have lied to us, but because the natural sequence of rain following clouds is not invariable. Conventional signals, in contrast, can be used intentionally to deceive, as when prankish boys change a highway sign to mislead motorists. And while the meaning of natural signals is usually learned from experience and the meaning of conventional signals is usually learned by explicit verbal instruction, the reverse is also true. A motorist who had not studied the highway manual might learn solely from experience the meaning of the conventional signals posted along the road; so, too, children can be taught the meaning of natural signals by verbal instruction—that clouds mean rain, or that smoke means fire. None of the differences mentioned above affect in the least the mode of signifying that is common to natural and conventional signals. That remains the same whether the meaning of the signal is learned from experience or by verbal instruction, and whether the signal is a fallible or an infallible sign.

In addition to the natural and conventional signals illustrated in the foregoing examples, there are the signals that are elements of human behavior itself. Some of these are natural, some conventional. For example, an involuntary blush is a natural signal, signifying embarrassment; an involuntary scream or roar is a natural signal, signifying fear or anger. In contrast, we have elements of human behavior that are conventional signals, as when a contrived and voluntary gesture comes by custom to signify impatience or displeasure, assent or dissent; e.g., the waving of an arm or the nodding of the head. It will be noted that, in these examples, the thing signified is related to the signal as cause to effect, or antecedent to consequent; whereas in the earlier examples, the signal is the cause or antecedent and the signified the effect or consequent. This difference, as we shall see, does not affect the mode of signifying whereby signs function as signals. The underlying relation is the same whether the perceived signal is the cause or the effect, the temporal antecedent or the temporal consequent, of the thing it signifies.

Perceived signals of all sorts not only signify unperceived objects, happenings, or conditions, but they may also elicit actions

with respect to the unperceived things that they signify. Thus, for example, the clouds that signal rain may elicit the action of carrying an umbrella; the railroad semaphore, the action of stopping the train; the roar of anger, the action of withdrawal; the gesture of impatience, the action of hurrying up. Contrary to the erroneous supposition that is central to the behavioristic account of the meaning of signs in human behavior, the actions thus elicited are *not* integral or constitutive parts of the meaning of the signal, but only adventitious consequences of the meaning. Clouds signify rain in the same way for those who do and do not carry umbrellas when they see clouds and read the signal as meaning rain. The same point can be made for all the other examples of signaling.

It is of the utmost importance to recognize that the action taken is something that *follows the interpretation of the signal*, and therefore falls outside that interpretation; it is, moreover, contingent—it may or may not happen. Whether or not it does, the interpretation of the signal remains the same; in other words, the meaning of the signal is in no way constituted by the action or inaction that follows. [4] The fact that we sometimes infer a person's interpretation of a signal from the action he performs when he has interpreted it does not alter what has just been said. We often make mistakes in such inferences precisely because a person's behavior is itself an unreliable signal of his interpretation or understanding of signals.

We are now ready for a definition of the mode of signification that relates signals to the things they signify. The relationship is that which obtains in ordinary if-then implications. Accordingly, to interpret clouds as signaling rain is to understand that clouds portend rain: *if* clouds, *then* rain. The same holds true for all the other examples given: if a dropped semaphore, then a train ahead; if an explosive roar, then anger in the person emitting the sound; if a nod of the head, then assent by the person nodding his head. For brevity of reference in what follows, I will speak of the mode of signification that signals possess as *implicative meaning*. To say that the perceived signal X signifies or means the unperceived object Y is equivalent to saying *X implies Y*, or *if X, then Y*; and the interpretation of signals is equivalent to making inferences of the sort that Hume described as being grounded in the frequent or customary conjunction of things in experience.

## ( 3 )

What is the mode of signification that relates designators to the things they designate, and how do this type of signifier and mode of signifying differ from signals and signaling? To answer these questions, let us consider some obvious examples of designation in human linguistic behavior.

I must begin by calling attention to the fact that the examples of designators to be given include no natural things, like clouds or smoke, the blush of embarrassment, or the roar of anger. *There are no natural designators; all are conventional*, i.e., man-made and somehow voluntarily contrived. The reason why this is so will not become clear until we understand how designators signify the things they designate.

The only examples that we need consider illustrate two different types of conventional designators. One type consists of words functioning as names, not as ejaculations, outcries, or commands. The other—the non-verbal type—consists of icons, such as the striped pole in front of the barber shop or the figure of a man on the door of a lavatory reserved for men.

Consideration of these non-verbal designators helps us to see at once that designators can function in the same way that signals do—to elicit appropriate actions. The icon on the lavatory door not only designates the character of the room that lies behind the door, but it also usually elicits one sort of action from men and another from women. Though they act in opposite ways, men and women interpret the icon in exactly the same way; if they did not, they would not act in opposite ways. This is conclusive proof that here, as in the case of signals, the action elicited is not a constitutive part of the meaning, but only a contingent and variable consequence of it.

What is true of non-verbal designators holds as well for names, or verbal designators. Anyone who attentively observes the growth of a young child's vocabulary will find that the child is able to designate the objects in picture books, giving different types of objects different names, long before the child has had any direct experience with the objects pictured and long before he has developed characteristically different patterns of behavior appropriate to the different types of objects he is able to name.

He may later learn to respond in quite different ways to the things called boats and the things called airplanes, but since that is long after he is able to use the words "boat" and "plane" significantly, his non-verbal behavioral responses can be no part of the meaning that these verbal designators have for him at first.

When I distinguished a moment ago between words used as designators and words used as ejaculations or commands, I not only wanted to point out that words are not always used as designators, but also to point out that words can sometimes be used as signals. Thus the word "dinner" called out in a loud voice may sometimes function in the same way as the ringing of the dinner bell; and the word "danger" may function on a road sign as does the flashing red light. When they do function in this way, these words have implicative meaning; they function as signals do. But unlike the dinner bell and the flashing red light which never have any designative meaning, the words "dinner" and "danger" have a designative mode of signifying; that is their primary meaning, without which they could not ever serve as signals. If the word "danger" did not, in the first place, designate a certain type of situation, that word could not signal, like the flashing red light, the unperceived situation to which we usually but not always react by avoidance. In short, naming-words are primarily designators and only occasionally and secondarily do they serve as signals; and then only by virtue of their designative meaning.

These things being clear, I can now define the mode of signifying that relates designators to the things they designate. For this purpose I am going to consider only verbal designators, not icons; and among verbal designators, I am going to confine my attention to nouns used as common or general names—the very simplest case of naming.

Just as in the case of signals, where the logical relation of implication helped us to define the way in which a signal means the thing it signifies, so here the logical relations of denotation and connotation help us to define the way in which a designator means the thing it signifies. The denotation of a term is an object attended to—a thing, an event, or an action. But the object denoted by a common or general name is never denoted as an unclassified or unique individual, but always as a classified particular, i.e., a member of this or that class of objects. A descrip-



tion or definition of the class of objects to which the denoted particular belongs constitutes the connotation of the word that denotes the particulars in question. The familiar logical principle, that the denotation and the connotation of a term vary inversely, calls our attention to the fact that as more elements enter into the connotation of a word, the class of objects to which the word applies denotatively becomes more restricted. Thus, for example, the connotation of the word "dog" has more elements than the connotation of the word "mammal," and fewer than the connotation of the word "poodle"; inversely, the word "dog" denotes a more restricted class of objects than "mammal" and a less restricted class than "poodle."

I will subsequently show that this special linkage between the denotation and the connotation of words cannot be explained without reference to concepts and concept-formation. I will also show that the inseparability of denotation and connotation, which is based on the relation of concepts, explains the double use that men can make of common or general names: either (1) to designate a perceived particular as a member of a certain class of objects, or (2) to designate the class of objects itself when no particulars that are members of the class are at the moment being perceived. In the second alternative, it may even be the case that no particular instances of the class can ever be perceived, either because they are imperceptible or because they do not exist. [5]

For the present, however, let us confine our attention to the first and simplest case of designation—the one in which the thing designated is a perceived particular. A man's use of the word "clouds" or "rain" to designate these familiar objects when they are perceived will suffice to draw a sharp line between the denotative meaning of designators and the implicative meaning of signals. The *perceived and existent clouds* signal the *unperceived and as yet non-existent rain*. The perceived word "clouds" designates the *perceived clouds*, just as the perceived word "rain" designates the *perceived rain*. And if we were to extend our consideration to include the connotative as well as the denotative aspect of the meaning of words used as designators, we would go on to say that, whereas the perceived and existent clouds signal the unperceived and as yet non-existent rain, the word "clouds" or "rain" designates clouds or rain, *perceived* or *unperceived*, *existent* or *non-existent*. [6]

## ( 4 )

It was pointed out earlier in this chapter that comparative psychologists and other behavioral scientists claim that "non-verbal symbols" function in the behavior of non-linguistic animals. This claim is closely connected with another claim made by such writers as Osgood, Harlow, Hebb, Nissen, Heron, Herrick, and Otto Koehler; namely, that concept-formation and the use of concepts take place in non-linguistic animals. [7] The second claim would be substantiated if the functioning of the "non-verbal symbols" involved transcendence of the immediate perceptual environment, and so could not be explained except in terms of the use of concepts by the animal.

I now propose to examine these two claims and to show that the second is unsubstantiated. To do so, I must first expose the equivocation that is concealed in the phrase "non-verbal symbol." The psychologists whose position is here being criticized use the word "symbol" as if all "symbols" (i.e., signs or signifiers) were of the same type and had the same type of meaning or significance. As they use the word, a railroad semaphore signaling a train ahead and the word "dog" naming the animal lying in the path ahead are symbols in the same sense; for them the word "dinner" is a symbol in the same sense whether it names one of the three meals that we are accustomed to having each day, or signals, just as the dinner bell does, that a meal is ready to be eaten. Accordingly, it is possible for them to argue that since the non-verbal symbols that function in animal behavior are symbols in the same sense as the words that function in human behavior, it follows that whatever psychological factors or processes explain the operation of symbols must be present in the same way, though not to the same degree, in linguistic and non-linguistic animals.

The argument as stated is seen to be fallacious as soon as its equivocal use of the word "symbol" is pointed out. Once we make the distinction between two quite distinct types of "symbols"—or, in my terminology, between two types of signifiers or signs—the fundamental premise of the argument must be revised as follows. The assertion that the non-verbal symbols that function in animal behavior are symbols in the same sense as the

words that function in human behavior must be replaced by the assertion that the signals (verbal or non-verbal) that function in animal behavior *appear* to be signals in the same sense as the signals (verbal or non-verbal) that function in human behavior. *Whether they are or not depends upon whether they function in precisely the same way in men and other animals.* In any case, the psychologists must concede that, in the behavior of non-linguistic animals, no signs occur that function as designators rather than as signals. Since human words sometimes do function as signals to elicit responses from animals, it cannot be said that words (i.e., verbal signals) do not occur as stimuli in the behavior of non-linguistic animals. But what can and must be said is that no signs having designative significance, whether words or icons, function in the behavior of non-linguistic animals.

The psychologists cannot deny this, for they admit that only man has a propositional language, which is tantamount to admitting that only man names things and makes sentences. But if only linguistic animals (i.e., animals with a propositional language) name things (i.e., use signifiers that have a designative mode of signification), then it would be self-contradictory to assert that the occurrence of signs in the behavior of non-linguistic animals includes the type of sign that is a designator as well as the type of sign that is a signal.

With the equivocation on the word "symbol" removed, we are left with the proposition that signals do appear to function in the behavior of non-linguistic animals. This is a matter of common observation. Anyone who has trained a domesticated animal knows that words of command or restraint elicit appropriate responses of a sort that makes the words look *as if* they were functioning as signals. Long before the era of laboratory research in the field of animal behavior, naturalists observed that perceptible changes in the environment—the darkening sky, the sound of distant thunder, the sudden outcries of other animals, certain smells carried by the breeze or sniffed upon the ground—appear to operate as signals insofar as they elicit responses appropriate to things that are, *at the moment*, not yet present or perceived. These observations have been confirmed by all the experimental work done on animals, especially the work on conditioned responses and on the learning of cues. What the experiments show is that animals can learn to respond to a given stimulus as if it

represented or stood for something that, at the moment, is not perceptually present; e.g., the bell in Pavlov's conditioned-reflex experiment, eliciting anticipatory salivation, appears to function as a signal for the food that is not perceptually present; the shape or color that serves as a cue to the presence of food in one rather than another box appears to function similarly.

We can, for our present purpose, ignore the difference between learned and unlearned cues. For the most part, the field naturalists and the ethologists have studied the operation of unlearned cues—the smell that instinctively elicits the food-getting response, the noise that instinctively elicits the danger-avoiding response, the shape that instinctively elicits responses of approach and association. The laboratory psychologists have almost exclusively studied the operation of learned cues by means of experiments in which the learned cue is a stimulus that has been associated, either by contiguity or succession, with another stimulus that is capable of eliciting a certain characteristic response. Learned or unlearned, cues are stimuli that appear to function as signals—perceived objects that signify unperceived things or events to which the animal starts to react before they are perceived.

I have repeatedly said “appears to function as a signal” in order not to permit the question at issue to be begged. The critical question is whether the learned and unlearned cues that *appear* to function as signals in animal behavior *really* do function in the same way as the signals that operate in human behavior. In order to make the point quite clear, let us for the moment assume that they do.

When, in the human sphere, the dinner bell functions as a signal, the following obtains. The man who out-of-doors hears the dinner bell and who has learned its significance as a signal is made aware of an unperceived event or state of affairs: inside the house, a table has been laid and food is ready to be served. To say that the dinner bell, as signal, means this to him is to say that his interpretation of the dinner bell (i.e., his understanding of the signal's meaning) leads him to think of something he cannot at the moment perceive. He may or may not verbalize the inference that if the dinner bell has rung, then dinner is ready in the dining room. In addition, he may or may not react to the dinner bell by going in to dinner. If he is intensely occupied with other things, he may decide to forego the meal; if his hunger is

intense enough to prevail, he may decide to stop what he is doing and go to dinner. But whether or not he verbalizes the inference and whichever way he reacts, the dinner bell has functioned as a signal if the perceived sound of a certain sort leads him to become aware of or to think of an unperceived state of affairs of a certain sort.

Behavioristic evidence that his perception of the signal has led him to think of the unperceived state of affairs will, of course, take the form of a verbalized statement made by him. That he is able to think of or be aware of an unperceived state of affairs points to the operation in him of some psychological factor that serves to represent that which is not perceptually present. What is this representative factor? (i) It may be a perceptual residue, an image; and this image may be abstract or generalized in the same way that perceptions themselves can be abstract or generalized. (ii) Or it may be a concept.

In the first alternative, the recognition of the particular sound as being of a certain kind (the sound of a dinner bell) involves a perceptual abstraction; and the awareness that a certain type of unperceived situation exists (that dinner is ready) involves the imaginal residue of another perceptual abstraction (the recognition of a certain state of affairs as being dinner). In the second alternative, the perceptual abstraction that enables the man to recognize a certain sound as a dinner bell may also call into operation the imaginal residue of another perceptual abstraction through which he can recognize a certain state of affairs as being dinner; but in this alternative, both may be accompanied by concepts (i.e., of dinner bell and of dinner) that enable him to understand what dinner bells and dinners are like even when no dinner bells are sounding and no dinners are laid before him to be eaten.

Can we tell which alternative is the correct description of the psychological factors in operation when the dinner bell functions as a signal in the human case? Yes, but only on the condition that we have recourse to statements by the man. If he makes statements in which such words as "dinner bell" and "dinner" are used with designative significance to name different types of objects, then, as I will attempt to show in the next section, we can be sure that concepts have entered into his interpretation of the dinner bell as a signal of dinner. But if the man were a totally non-linguistic animal (i.e., completely unable to use words desig-

natively and unable to make sentences), we would have absolutely no grounds for asserting that concepts played a part in the functioning of the dinner bell as a signal. Hence, if we felt the need to posit the operation of a psychological factor that served to represent the unperceived dinner and to mediate between the perceived dinner bell and the overt response of going in to dinner, we would be justified in asserting no more than the presence of a certain type of perceptual residue (i.e., a generalized image of dinners). This would be justified because we know that an animal with perceptual powers can have such perceptual residues.

Now let us turn to a parallel case in the sphere of animal behavior. The bell in Pavlov's conditioning experiment *appears* to function for the laboratory dog as a signal of food, just the the dinner bell appears to function as a signal of dinner in the human case. Since the laboratory dog is a non-linguistic animal, he cannot verbalize for us the inference that if the bell has sounded, food will soon be forthcoming and so it is time for salivation to begin. To attribute such an inference to the animal, in the absence of verbalization, is an anthropomorphic interpretation of what is going on in the animal, an interpretation of the sort that Lloyd Morgan's canon was intended to prevent.

Without attributing to the animal an inference that would be expressed verbally in the sentence "If the bell sounds, then food will soon be forthcoming," can we still say that the sounding bell has the significance of a signal for the animal—that the bell *means* to the animal the imminence of food? To this question I think the answer must be *yes*, in one sense; *no*, in another. Let me explain. The animal's response to the bell in the form of salivation can be taken as an indication that the bell has functioned as a signal of the food to which, if it were perceptually present, the animal would have responded by salivation. But in the human case, as we have seen, the dinner bell functions as a signal of dinner whether the man who hears the dinner bell reacts by going in to dinner or refrains from doing so. In other words, the perceived sound in the human case functions as a signal whether the man's overt non-verbal behavior takes one form or another; whereas the perceived sound in the case of the dog can be said to function as a signal *only* if the dog overtly reacts to it in a certain way. Should the dog fail to salivate when the bell is sounded,

we would have no grounds whatsoever for saying that the bell functioned for him as a signal.

Hence the perceived sound is not a signal in exactly the same sense for the laboratory dog and for the human being. We can regard the bell as a signal for the laboratory dog only when it elicits a certain type of reaction on his part, i.e., salivation. In the absence of that reaction, it is impossible to say that the bell has functioned as a signal. But in the human case, the meaning of the bell as a signal of dinner remains exactly the same whether the man goes in to dinner or refrains from doing so. In this case, the overt behavior—either of going in to dinner or of passing it up—is a *consequence* of the meaning that the signal has for the man, and is not *constitutive* of it. Signals have meaning for men, but they may function without meaning for other animals; hence the perceived sounds are not signals *in the same sense* for the man and for the dog, since to be signals in the same sense, they would have to have meaning *in the same way*, which is clearly not the case.

Nevertheless, we have conceded that signals do function in animal behavior, though in a non-human way. The way in which the sounding bell functions as a signal for Pavlov's laboratory dog can be taken as typical of all cues in animal behavior, learned or unlearned. What is required to explain the functioning of all such cues? Do we need to posit the possession of concepts by non-linguistic animals in order to explain their reactions to cues that involve behavior appropriate to objects which at the time are not being perceived? The answer to this question is, as we have seen, unqualifiedly negative. If, in the human case, we would not be justified in attributing concepts to a man who could not verbalize his interpretation of signals, we are in exactly the same position with respect to non-linguistic animals. Should there be a need to posit some psychological factor that serves to represent the unperceived object or situation to which the animal reacts under the stimulation of a signal or cue, the only thing we are justified in positing is a perceptual residue in the form of a generalized image of that which is at the moment unperceived. [8]

With this, the negative phase of the argument can be concluded. We saw in the preceding chapter that the experimental data on animal learning that involves delayed responses and detours or

that involves perceptual abstraction and generalization can be explained without attributing concept-formation to non-linguistic animals. We now see that the functioning of learned or unlearned cues in animal behavior can also be explained without reference to concept-formation on the part of non-linguistic animals. If the cue is learned, the mechanism of the conditioned response together with the mechanisms of reinforcement and inhibition suffice to explain the animal's behavior in response to the cue as a signal, to which it responds without any apprehension of the signal's meaning. If the cue is unlearned, the mechanisms that underlie species-predictable behavior (i.e., instinctive patterns of response) suffice to explain the animal's behavior in response to the cue as a signal, again without any apprehension of the signal's meaning. In either case, if there is need to posit a psychological factor that is representative in function and that serves to mediate between stimulus and response, the need can be satisfied by a factor that falls within the range of the perceptual powers possessed by animals, i.e., by a perceptual residue in the form of a generalized image.

The psychologists who go beyond this to posit concepts and concept-formation in animals can do so only by ignoring a whole series of facts: *first*, that two kinds of signs operate in the behavior of linguistic animals (signals and designators), whereas only signals, verbal as well as non-verbal, appear to be present in the behavior of non-linguistic animals; *second*, that the signals which appear to be present in the behavior of non-linguistic animals are not signals in the same sense and do not have meaning in the same sense as the signals that function in human behavior; and *third*, that unless the meaning of the signal is or can be verbalized in the human case, the functioning of signals in human behavior does not require concept-formation for its explanation, and so *a fortiori* concept-formation is not required to explain the functioning of signals in the behavior of non-linguistic animals.

( 5 )

What remains to be seen is that concept-formation and concepts must be posited as theoretical constructs in psychology in order to explain the functioning of designators in human behavior.



Though designators may be either verbal or non-verbal (i.e., words or icons), we can for the purposes of the present argument confine our attention to verbal designators, and to the simplest type of these—such common or general names as “dog,” “mammal,” “poodle,” etc.

Since the signs that function as designators are all conventional signs, they are all in the first instance *meaningless* marks or sounds that, as such, have no natural relation to the things that they come to designate. Clouds have a natural relation to rain, and smoke to fire; but the word “cloud” and the word “rain” have no natural relation to the phenomena they designate. The denotative and connotative meaning of a word is something that is acquired by a physical mark or sound when it is used as a name or designator. By acquiring designative significance, the originally meaningless mark or sound becomes a meaningful word. The physical mark or sound not only acquires or gets meaning; it may also undergo change in meaning, and even lose its meaning; moreover, the same physical mark or sound may be meaningful for some men and meaningless for others; and even for those for whom it has meaning, its meaning is seldom the same. All of this makes abundantly clear that the designative significance of a word is *separable* from its physical being as a mark or sound.

How, then, does a meaningless physical mark or sound acquire the denotative and connotative meaning whereby it becomes a meaningful word that is able to function as a name or designator? It may be thought that the physical mark or sound gets its meaning as a naming-word from the object that it is used to name. Thus, for example, by repeatedly attaching a certain sound to particular instances of a certain kind of object, or by repeatedly affixing a certain mark to pictures of instances of that kind of object, the child is taught to use this sound or this mark as the name or designator for that kind of object. According to this explanation, the sound or mark “dog” becomes a meaningful designator of a certain kind of quadruped by being imposed frequently enough either upon particular instances of that kind, or on pictures thereof.

Is this explanation correct? If the sound or mark “dog” were the only vocable or notation that could be imposed as a name on the objects that it designates, it might look as if that vocable or notation acquired the designative meaning of the word “dog”

directly from the perceptible objects on which it had been imposed as a name with sufficient frequency to make the connection habitual. But we can and do use other vocables and notations for the very same objects, and these also become meaningful names. I have a whole series of meaningful words to name or designate the animal lying at my feet: "poodle," "dog," "quadruped," "mammal," and so forth. These meaningful words do not have the same meaning; they vary in connotation and denotation; but their connotation and denotation are such that each of these words functions to designate or name this particular object that is now perceptually present to me; and, in addition, each would serve to designate or name an indefinite number of other perceptible instances of the same class. According as the denotative and connotative content of the meaning changes from word to word, the class of objects designated thereby also changes, and so also the perceived or perceptible instances to which the word can be significantly applied as a name.

These things being so, it would appear to follow that a meaningless mark or sound cannot get its meaning from the perceived or perceptible objects to which it is attached or on which it is imposed as a name. For if it could, why would not the words "poodle," "dog," and "quadruped" all have the same meaning, since all can be used to name the same perceived object, or other perceptible objects of the same kind? To which it may be answered that since the word "poodle" is used to name some dogs (i.e., dogs of a certain kind), but not all dogs, and since the word "dog" is used to name some quadrupeds (i.e., quadrupeds of a certain kind), but not all quadrupeds, they differ in meaning even when they designate one and the same object—the perceived quadruped lying at my feet. It may then be said that the denotative and connotative meaning which each of these words has when it functions in any particular case as a designator for a perceived object is not derived from that perceived object, but from the whole class of objects to particular instances of which it is applied as a name.

This shift in the explanation of how a given meaningless mark or sound gets the meaning that it has when it functions as a name or designator leaves something more to be explained. A class of objects is not itself an object of perception. As we saw in the preceding chapter, even when, through the attainment of per-

ceptual abstractions, we acquire the disposition to recognize this or that perceived object as being of a certain kind, we do not thereby have the disposition to understand what that kind of object is like, both when the object is perceived and when it is unperceived, or even when it is imperceptible. We saw, furthermore, that, in contradistinction to a perceptual abstraction, a concept is a disposition to do more than recognize that a perceived object is of a certain kind; it is primarily a disposition to understand what that kind of object is like. From this distinction between what perceptual abstractions and concepts enable us to do, we are led to two conclusions concerning the ultimate source of the meaning that is possessed by our common or general names when they are used as designators.

The first conclusion is negative. We first saw that the meaning of the word "dog" cannot be derived from the perceived object to which this word is applied as a name, because the words "poodle" and "quadruped" can also be applied to the same object as names, and the three words, when so applied, each have a different meaning. We then saw that the differing denotative and connotative meaning of these three words is connected with the fact that each designates a different class or kind of object, the perceived or perceptible instances of which are not co-extensive. If this leads us to say that the meaning of the word "dog," as also the meaning of the word "poodle" or of the word "quadruped," is derived from a certain class of objects, we must also admit that a class of objects is not itself a perceptible object. All we can ever perceive is a particular instance of a class, but not the class itself. A perceptual abstraction, the highest attainment of our perceptual powers, enables us to recognize that a perceived particular is an instance of a certain class or kind, but no more than that. It does not enable us to understand, either in the presence or in the absence of perceived particulars, what that class or kind of object is like. Hence, we are forced to the negative conclusion that the designative meaning of our common or general names cannot be explained by reference to any psychological attainment within the reach of our perceptual powers.

The second or positive conclusion is simply that our having concepts can explain what our having perceptual abstractions fails to explain. Our concept of dog and our concepts of poodle and of quadruped enable us to understand what each of these

three kinds or classes of objects is like, and it is that understanding itself which confers denotative and connotative meaning on the word "dog" and on the words "poodle" and "quadruped," when these words are used as designators. None of these concepts is simple. Each is formed by the conjunction, disjunction, and negation of a number of concepts; and one set of concepts thus related constitutes our conception of dog, another set our conception of poodle, and still another our conception of quadruped. [9]

Accordingly, we are not only able to understand what poodles are like, but also to understand why all dogs are not like poodles. It is through having such understanding that we are able to use the words "poodle" and "dog" with different connotative, and hence with different denotative, meaning, and so even when we use them as designators for the same perceived particular, we are saved from the mistake of supposing that the words have the same meaning by the fact that we also use them as designators for different classes of objects.

If the meaning of our common or general names were derived from the perceptual abstractions whereby we are able to recognize that a perceived particular is of a certain kind, we would never be able to use them, as we do, in the absence of any perceived instances of the class or kind, to designate the class or kind itself to which perceptible particulars belong. Nor would we have at our disposal, as we do have, the use of words to designate classes or kinds of objects that are intrinsically imperceptible, as are many of the theoretical entities posited in the natural sciences. That we are able to use common or general names as designators in all these ways is possible only because, over and above perceptual abstractions, we have concepts to confer meaning on them.

To be sure that what has just been said is clear, let me summarize it by returning to the simple case of the three words—"poodle," "dog," and "quadruped"—all used to designate the animal lying at my feet, yet each used with a different meaning, as is evident from the fact that "dog" can be used to designate objects that "poodle" cannot be used to name, and similarly "quadruped" can be used to designate objects that "dog" cannot be used to name. Since the animal lying at my feet is and can be perceived in only one way, it cannot be the object *as perceived* that confers meaning on the three words that I can use to desig-

nate it, for if that were the case, the three words would be identical in meaning. But the perceived object can be conceived in a wide variety of ways, and so it is the object *as conceived* in one way, another way, and in yet another, which confers different meanings on each of the three words that I use to designate it. In short, common or general names that function as designators of perceived objects, but have different connotative and denotative significance as designators, get their different meanings from the perceived objects *according as these objects are differently conceived*. If I could not conceive or understand the perceived object lying at my feet in different ways—as a poodle, as a dog, as a quadruped, as a mammal, as an animal, and so on—I could not use a whole set of different words to designate it, each with a different meaning, i.e., a different denotative and connotative significance.

This simple case of using different common or general names to designate a perceived object clearly establishes the proposition that designators derive their denotative and connotative significance from concepts, not from percepts, perceptual residues, or even such perceptual attainments as perceptual abstractions. But the proposition thus established covers more than the simple case with which we have been dealing. It covers the case in which we use words to designate a class of objects, no particular instance of which is at present being perceived; and it also covers the case in which we use words to designate a kind of object that is intrinsically imperceptible, such as the theoretical entities posited in the natural sciences, the objects of mathematical theory, certain objects of philosophical thought, and so on. In view of this, the proposition should be more comprehensively formulated in the following manner: *a word that is a common or general name can be used to designate anything that we are able to conceive, whether or not it is perceived and whether or not it is perceptible.*

( 6 )

The foregoing account of the source of the significance possessed by the words that function as designators in human language restates a traditional triadic analysis of the meaning of designators. The three elements are as follows: (1) the sign or

signifier—the physical mark or sound that is originally meaningless and that is conventionally instituted to serve as a name or designator; (2) the object signified, which may or may not be perceived, and may or may not be perceptible; and (3) the significance or meaning itself, through which or whereby the sign designates the object signified. The first and originally meaningless element becomes meaningful and is able significantly to designate the second element, the object signified, *only through the mediation of the third element*—the significance or meaning. [10]

In other words, that which is itself meaningless and acquires a meaning gets its meaning from that which *is* itself a meaning. If it were to acquire its meaning from something else that had a meaning only through having acquired it, we would be involved in an endless regress that would make the acquirement of meaning inexplicable or unintelligible. The inescapable distinction underlying this last statement is the distinction between *having* a meaning and *being* a meaning: signs and signifiers of all types—both signals and designators—only *have* meaning. Meaning is adventitiously attached to them. They can *be without* meaning; they can *get* meaning and they can *lose* it, or the meaning that they have can *change*. One thing that *has* meaning may *get* its meaning from something else that also *has* meaning, as one word often gets its meaning from other words. But whence do these other words that *have* meaning get their meaning? There is no satisfactory answer to this question unless there are in the world some entities that simply *are* meanings—entities the very being of which is to mean, entities which, therefore, do not ever get, lose, or change their meaning.

If the reader has followed the analysis given above of the meaning possessed by the words that are used as designators in human speech, he will know that the source of all the meanings possessed by anything which has, gets, loses, and changes its meaning lies in concepts, for concepts *are* meanings. To say that concepts *are* meanings precludes saying that concepts *have* meaning, or that their meanings can be *altered, enlarged, contracted*, etc. In the process of concept-formation, we can change our concepts, form new ones, relate them differently, and so on; but when we do so, we change the meanings in our possession, not the meanings of our concepts. Since each concept that we have is a

meaning that we possess, it is obviously improper to ask about the meaning of a concept, or to ask about its connotation or denotation. Such questions are properly asked only about signs that *have, get, lose, or change* their meaning, not about concepts that *are* meanings. [11]

It is precisely because concepts *are* meanings that they can confer connotative and denotative significance on the meaningless vocables or notations that, by acquiring meaning from concepts, come to have the significance they do have when they function in human speech as designators. This analysis applies to those words which function as signals, but derive their significance as signals from their primary significance as designators. Does it also apply to conventional signs, verbal or non-verbal, that do not function as designators and have only the significance of signals? And does it apply as well to such natural signs as clouds or smoke that *cannot function as designators, yet do have meaning as signals?*

The answers to these questions were anticipated earlier in this chapter where it was pointed out that under certain circumstances, men, like other animals, react to signals, natural or conventional, without being able to verbalize the implicative meaning that relates the signal to the object it signifies—without being able to say “If X, then Y.” In such circumstances, the signal may function as it does in the case of non-linguistic animals: either (a) meaninglessly or (b) with a “meaning” that is nothing but the response elicited by the signal or cue. But when a signal has meaning prior to and quite apart from the reaction it elicits; when the meaning it has remains the same whether it elicits this response or that; when, therefore, the response elicited, whatever it is, is consequent upon the meaning of the signal, not constitutive of it; and when the meaning of the signal can be verbally expressed in a statement of the form “If X, then Y,” then we cannot explain how the signal in question *has* such meaning for us except in terms of the concepts that confer such meaning upon it.

Two alternative possibilities just mentioned above with regard to the functioning of cues in the behavior of non-linguistic animals deserve a word of further comment. (a) One alternative is that they function meaninglessly and their functioning can be described and explained without reference to meaning; e.g., when a laboratory dog, having gone through a process of condi-

tioning, salivates at the sound of the bell, the bell, functioning as a substitute stimulus for the salivary reflex, operates as a cue without signifying food. On this hypothesis, it would be illicit anthropomorphizing to attribute to the animal an interpretative act that amounts to its saying to itself "If the bell rings, then food will soon be forthcoming, and so I had better start salivating now." The bell elicits salivation *without meaning food*. (b) The other alternative is that, in the behavior of non-linguistic animals, signals or cues do have meaning, but only in that special sense of "meaning" in which the "meaning" of a signal is nothing but the response that the signal elicits; e.g., the meaning that attaches to the bell for the conditioned laboratory dog is identical with the salivary response that it makes. On this hypothesis, the bell has no meaning prior to and apart from a response by the animal. On neither hypothesis does the bell function as a signal for the animal as the dinner bell functions as a signal for the man who *first* interprets it as signifying or meaning food and *then* responds in one way or another.

The critical point here is that the word "signal" is being used equivocally when, on the one hand, it is applied to the cues that function in the behavior of non-linguistic animals either (a) meaninglessly or (b) with a meaning that is nothing but the response elicited (e.g., salivation); and when, on the other hand, it is applied to the signals that function meaningfully in human behavior and function meaningfully by signifying or meaning the object (e.g., food) to which one or another response is then made. In addition, the word "meaning" itself is being used equivocally when, on the one hand, with regard to the behavior of non-linguistic animals, it is said that such substitute stimuli or learned cues as the laboratory bell have meaning; and when, on the other hand, in the case of human behavior, it is said that such signals as the dinner bell or the fire bell have meaning.

( 7 )

At the end of Chapter 10 we reached the conclusion that the experimental and ethological evidence concerning the behavior of non-linguistic animals does not require us, for the purpose of explaining the manifestations of animal intelligence and learning,



to attribute to non-linguistic animals concept-formation and concepts. The power of perceptual thought (including perceptual residues, such as images, and perceptual attainments, such as perceptual abstractions) suffices to explain the observed phenomena.

At the end of Section 4 of the present chapter we reached the conclusion that the power of perceptual thought also suffices to explain the functioning of signals, verbal or non-verbal, in the behavior of non-linguistic animals. Since non-linguistic animals do not use verbal designators, since they do not react to verbal designators as designators, but only as cues, and since the functioning of cues, verbal or non-verbal, can be adequately described in terms of the instinctive or learned responses that they elicit, *without reference to meaning*, their functioning can be satisfactorily explained without attributing concept-formation and concepts to non-linguistic animals.

To these two negative conclusions we must now add the positive conclusion that, in the behavior of man, the only linguistic animal, the functioning of signs—both verbal and non-verbal, and both signals and designators—cannot be explained without attributing concept-formation and concepts to human beings. By “the power of conceptual thought” we mean no more than the ability to form, have, and use concepts. A man’s use of the concepts that he has formed and possesses is manifested in his verbalized interpretation of signals, in his use of words to name or designate objects (perceived, perceptible, or imperceptible), and in his making of sentences that explicate the meanings of their constituent words. Hence, to say the very least, we cannot explain man’s observed linguistic behavior without positing the power of conceptual thought and attributing this power to man. [12]

We have now affirmatively answered the question: “Do linguistic and non-linguistic animals differ *psychologically* in kind?” The difference lies in the fact that man has and non-linguistic animals do not have the power of conceptual thought, which is just another way of saying that we can explain the behavior of non-linguistic animals without attributing the power of conceptual thought to them, but we cannot explain the linguistic behavior of men without doing so. [13]

Since the power of perceptual thought is present in both men and other animals, a number of interesting psychological corollaries follow from the fact that non-linguistic animals exercise

their powers of perceptual thought without the contribution that would be made by the simultaneous exercise of the power of conceptual thought; whereas in man the power of perceptual thought is seldom exercised without the co-operative functioning of the power of conceptual thought. Since these corollaries, however interesting, have no direct bearing on the question at issue, and since they might divert us from the one point with which we are concerned, I will discuss them in an appended note rather than here. [14]

That man differs psychologically in kind from non-linguistic animals, by virtue of his exclusive possession of the power of conceptual thought, still leaves quite open the question whether man's difference in kind is radical or only superficial. It is to that question that we turn in the chapters to follow.