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Signs and the Act

§ 1. THE SCOPE OF SEMIOTIC

SEMIOTIC has for its goal a general theory of signs in all their forms and manifestations, whether in animals or men, whether normal or pathological, whether linguistic or nonlinguistic, whether personal or social. Semiotic is thus an interdisciplinary enterprise.

Part of the widespread interest in this area is motivated by the belief that higher-level sign processes (often called symbols) are of central importance in understanding man and his works. Ernst Cassirer called man "the symbolic animal" ("*animal symbolicum*"), instead of "the rational animal" ("*animal rationale*"), and much contemporary work has shown the aptness of this conception.

The term 'semiotic' was adapted by John Locke from the Greek Stoics, who in turn were influenced by the Greek medical tradition that interpreted diagnosis and prognosis as sign processes. Charles S. Peirce (1839–1914), who followed John Locke's usage, is responsible for the present widespread employment of the term 'semiotic'. The terms 'significs' and 'semantics' are also in use, though the tendency now is to use 'semantics' for only one branch of semiotic.

Philosophers and linguists made the main historical contributions to the general theory of signs, but today extensive work in this area is also being done by psychologists, psychiatrists, aestheticians, sociologists, and anthropologists.

§ 2. THE BASIC TERMS OF SEMIOTIC

For present purposes the basic terms of semiotic can be introduced as follows: Semiosis (or sign process) is regarded as a five-term relation— v, w, x, y, z —in which v sets up in w the disposition to react in a certain kind of way, x , to a certain kind of object, y (not then acting as a stimulus), under certain conditions, z . The v 's, in the cases where this relation obtains, are *signs*, the w 's are *interpreters*, the x 's are *interpretants*, the y 's are *significations*, and the z 's are the *contexts* in which the signs occur.

Karl von Frisch¹ has shown that a bee which finds nectar is able, on returning to the hive, to "dance" in such a way as to direct other bees to the food source. In this case the dance is the sign; the other bees affected by the dance are interpreters; the disposition to react in a certain kind of way by these bees, because of the dance,² is the interpretant; the kind of object toward which the bees are prepared to act in this way is the signification of the sign; and the position of the hive is part of the context.

Concerning this formulation of semiosis (or sign process, or sign behavior) several comments are in order.

First, the formulation is not proposed as a definition of 'sign', for there may be things we shall want to call signs that do not meet the requirements of this formulation—I prefer to leave this an open question. The formulation simply gives the conditions for recognizing certain events as signs.

Second, to say that what is signified is not at the moment a stimulus is not to deny that we may signify objects present in immediate experience—as in pointing to the desk upon which I am writing and saying "That is a desk." For 'desk' signifies an object with a rear, an underside, drawers that can be pulled out, etc.—none of which are at the present moment available to my observation. Only some aspects of the desk are directly observed.

Third, while this formulation is behavioral, and such sign behavior is open to objective study, an organism may experience

¹ Karl von Frisch, *Bees, Their Vision, Chemical Senses, and Language* (Ithaca, New York: Cornell University Press, 1950).

² Note the qualification, since not all dispositions occur in sign processes. Independent of signs, there are many dispositions to respond in certain ways to certain things.

and, in the case of human beings at least, may report on its own sign behavior. Nevertheless, a behavioral formulation is more basic than a self-observational formulation, since semiotic must deal with sign processes in animals, in children prior to the acquisition of language, and in personality disturbances where self-observational reports are absent or unreliable. Self-observational reports on sign processes are, however, not ruled out by a behavioral semiotic, since they are themselves a kind of sign behavior.

Fourth, I see no objection to introducing "significations" in this way. They are not "entities" in any objectionable sense, but certain describable aspects of complex behavioral processes in the natural world. As such they can be talked about without being "reified." That the bees are disposed by the dance to seek food objects in a certain context can be observed, just as in other contexts the dance serves to send the bees to explore certain locations as possible sites for a new hive. There is nothing "mythical" about significations when so interpreted.³

Fifth, the context in which something functions as a sign may include other signs, but need not do so.

Sixth, the interpretant, as a disposition to react in a certain way because of the sign (food-seeking behavior or site-probing behavior in the case of bees), has no necessarily "subjective" connotation. Such a disposition can, if one wishes, be interpreted in probabilistic terms, as the probability of reacting in a certain way under certain conditions because of the appearance of the sign. Or, as we shall see later, it can be interpreted as an intervening variable, postulated for theoretical purposes, and controllable by indirect empirical evidence.

§ 3. DIMENSIONS OF SIGNIFICATION

It is widely recognized that signs which are commonly (but not universally) admitted to have signification differ greatly in the kind of signification they have. 'Black', 'good', and 'ought' are obvious examples. There are, however, many ways in which such differences are accounted for.

³ My earlier formulations led to certain objections on this score. See my review of B. F. Skinner's *Verbal Behavior*, under the title "Words Without Meaning," in *Contemporary Psychology* 3 (1958), pp. 212-214.

My suggestion is that signification is tridimensional, and that these three dimensions are explicable in terms of three phases or aspects of action. I shall follow George H. Mead's analysis of an act.⁴

According to Mead, if an impulse (as a disposition to a certain kind of action) is given, the resulting action has three phases: the perceptual, the manipulatory, and the consummatory. The organism must perceive the relevant features of the environment in which it is to act; it must behave toward these objects in a way relevant to the satisfaction of its impulse; and if all goes well, it then attains the phase of activity which is the consummation of the act. Since act and object are correlative in his account, Mead also speaks of the distance properties of the object, its manipulatory properties, and its consummatory properties.

Now, if signs are treated behaviorally, it may be that their significations are related to these three aspects of action and so exhibit tridimensionality. It is proposed that every sign be regarded as having three dimensions, though some signs will be strongest on certain dimensions, and in some cases they will have a null weighting on certain dimensions.

A sign is *designative* insofar as it signifies *observable*⁵ properties of the environment or of the actor, it is *appraisive* insofar as it signifies the consummatory properties of some object or situation, and it is *prescriptive* insofar as it signifies how the object or situation is to be reacted to so as to satisfy the governing impulse. In these terms, usually 'black' is primarily designative, 'good' is

⁴ George Herbert Mead, *The Philosophy of the Act*, Charles W. Morris, ed., with the collaboration of John M. Brewster, Albert M. Dunham, and David L. Miller (Chicago: University of Chicago Press, 1938).

⁵ The term 'observable' is here employed in a fairly narrow sense: "observable directly by sense organs or indirectly by the observation of events which have been observed to act as evidence for events not observable directly by sense organs." The term 'observation' has a wide range of application in the everyday language, and some thinkers will want to dispense with the term in this context, so that semiotic will not seem to set arbitrary limits to the range of signification of signs. Major philosophical views hang upon what are taken to be the limits of signification. These views cannot be discussed in this preliminary formulation. Attention may be called to the analysis of the phases of the referential function of language, in Willard Van Orman Quine's *Word and Object* (Cambridge, Mass: The Technology Press of the Massachusetts Institute of Technology; New York: John Wiley & Sons, 1960), pp. 108-110.

primarily appraisive, and 'ought' is primarily prescriptive. It should of course be recognized that context is always relevant, so that in some contexts 'black' may be primarily appraisive or prescriptive, 'good' primarily designative or prescriptive, and 'ought' primarily designative or appraisive. One cannot tell from the mere inspection of an uttered or written word its strength on the three dimensions. This requires the study of specific action in a specific situation.

Nevertheless, there is some evidence that certain terms do have signification on the three dimensions,⁶ and that there is some agreement as to their relative strengths on these dimensions. In three of my seminars, students were given the form 'X is —', and were told that X was a man. They were then told successively that X was humble, proud, hard, wet, wise, severe, objective, kind, serious, cowardly, and old, and were asked to assign a percentage to each sentence indicating to what extent it was designative, appraisive, and prescriptive. In general, there was considerable agreement in the three groups as to whether a given sentence was, in this context, predominantly designative, appraisive, or prescriptive. Thus all groups thought of 'cowardly' as having considerable strength on all three dimensions, but most strength on the appraisive dimension; and they all thought of 'old' as primarily designative. These results are not scientifically impressive, but at any rate they indicate that experimental studies in this area are possible.

In relation to Mead's analysis of the act, the expectation would be for designative signs to be predominant in the perceptual stage of the act, for here the actor is seeking to obtain information concerning the situation in which he is acting. In the manipulatory stage of action it seems plausible that the signs involved would be primarily prescriptive, signifying how the object or situation is to be reacted to. In the consummatory phase of action, the

⁶ Some readers will object to the use of the term 'dimension' in this connection, and they may prefer such terms as 'factor' and 'respect'. The semiotic "dimensions" are not dimensions in the strictest mathematical sense (as are the value dimensions of Chapter 2). But the values of the variables are partly independent, and while no scale is known which is common to all of them, the values of each dimension are to some extent quantifiable.

signs involved would be primarily appraisive, signifying the consummatory properties of the object or situation.

§ 4. INTERPRETANTS

Since on the present model all signs have interpretants, different kinds of interpretants would occur for the three dimensions of signification. The interpretant of a sign is a disposition to react in a certain kind of way because of the sign. Corresponding to the designative dimension of signification, the interpretant would be a disposition to react to the designated object as if it had certain observable properties. Thus if one is told that there is a black object in an adjoining room, one is set for certain visual experiences on entering the room.

In the case of appraisive signs, the interpretant would be a disposition to act toward a designated object as if it would be satisfying or unsatisfying. Thus if a mother tries to get her child to swallow a teaspoonful of castor oil by saying "nummy num," the child is set for something that he will favor. Since he does not like it when he tastes it, and if the mother continues to talk like this in a variety of situations, the term 'nummy num' will change from a positive appraisive sign to a negative appraisive sign—or the child will come to regard his mother as a liar.

In the case of primarily prescriptive signs the interpretant would be a disposition to act in a certain kind of way to the designated object or situation. If a person trying unsuccessfully to open a door is told that he ought to press down on the knob, he is disposed to perform that kind of action and in most cases to expect that in so performing it he will be able to get out of the room.

It is especially notable that any given sign may in varying degrees operate in all the dimensions of signification, and hence have all the corresponding interpretant dimensions. The sentence "He is a coward" may illustrate this.⁷ Terms like 'black', 'good', and 'ought' are simply cases where certain dimensions of signification and certain kinds of interpretant are predominant. More will be said of such terms later.

⁷ See John Dewey's analysis of 'cowardly' and 'friendly', in *Experience and Nature* (Chicago: Open Court Publishing Co., 1925), pp. 292-293.

§ 5. SUMMARY OF THE ANALYSIS

For the moment let us shift the focus of our attention from the phases of action in Mead's sense to certain general requirements of action. Three requirements will be discussed.

The actor must obtain information concerning the situation in which he is to act, he must select among objects that he will favor or accord positive preferential behavior, and he must act on the selected object by some specific course of behavior. Thus if he is thirsty and finds that tea and coffee are available, he must act preferentially to one of these—say tea—and he must decide whether to drink the tea quickly or slowly, alone or with a companion, and so forth.

These three requirements of action are common to all action, nonhuman and human, and may take place without signs, or with signs at the prelinguistic level, or with linguistic signs in a complex process of inquiry. The behavior of an amoeba may be at the first level, the warning cry of a duck to her ducklings at the second level, and considerable human behavior at the third level. Inquiry will be considered at some length later. Here it need only be noted that appraisive signs operative in inquiry are signs of possible consummatory objects, while appraisive signs at the consummatory phase of the act report on the direct experience of consummation or frustration. The tea appraised in inquiry as nummy-num may or may not be called nummy-num when tasted.

Some of the results of the preceding analysis, in somewhat different terms, are presented in Table 1. The terminology of the interpretant column perhaps needs no elaboration. A possible hypothesis is that the interpretant of primarily designative signs strongly involves (among other things) the sensory nervous system including the sensory projection areas of the cortex, that primarily appraisive signs strongly involve the autonomic nervous system including the memory sections and pleasure centers, and that primarily prescriptive signs strongly involve the somatic (or motor) nervous system including the effector system of the brain. This suggestion of course does not deny that in all cases other aspects of the organism are operative, and since most signs actually

Table 1. Signs and Action Requirements

ACTION REQUIREMENTS	DIMENSIONS OF SIGNIFICATION	INTERPRETANT (DISPOSITION TO RESPOND BY):	
			SIGNIFICATIONS
1. Obtaining information	Designative	Sense organs	Stimulus properties of object
2. Selection of objects for preferential behavior	Appraisive	Object preferences	Reinforcing properties of object
3. Action on object by specific behavior	Prescriptive	Behavior preferences	Act as instrumental

have weights on all three dimensions of signification, it does not imply that the interpretant of a sign is limited to one aspect of nervous activity and its related organic accompaniments. But it does suggest that the tridimensionality of signification is reflected in a tridimensionality of interpretants.

The terminology in the significations column is borrowed from psychology, and it needs some explication. 'Stimulus property' is used here in a wide sense. It includes not merely the characteristics of the object which activate a sense organ but those which might do so under certain conditions (such as on the other side of the moon), and even those properties which though not themselves observable can affect an instrument which is observable (such as the temperature at the surface of the sun). Thus the range of designation is much wider than what can be directly observed.

By 'reinforcing property of an object' is meant the capacity of an object to increase the probability of the performance of a response made to it. Thus when certain kinds of food are tasted by a dog, he will eat them; but when others are tasted, they are spurned. The first kind of food is said to have a reinforcing property, and the second kind of food not to have it. Although such properties are not additional stimulus properties, I see no objection to speaking of them as properties of an object. It is true that they are properties of an object only in relation to an organism, so that an object which has reinforcing properties for the behavior of a dog may not have such properties for the behavior of a cat.

But this is a common situation: we do not hesitate to say that some objects are edible and some are not, though the classification is relative to various kinds of digestive systems. Such properties may be said to be "objectively relative."

To call an act "instrumental" signifies that its performance permits the performance of some other act which an organism is disposed to perform. Thus a hungry animal may get food in an experimental situation if and only if it presses a lever. The act of pressing a lever is then instrumental. The act of pressing down on the doorknob in our earlier example is instrumental to the disposition to get out of the room.

§ 6. THE TERMS 'MEANING' AND 'EXPRESS'

The terms 'meaning' and 'express' have not been introduced as basic terms for semiotic, since they have such a variety of significations and are used in such a variety of ways that it is best not to employ them as basic terms for discussions in this area. But it is of course possible, if one wishes, to introduce them in terms of more basic semiotical terms. Thus it might be said that the "meaning" of a sign is *both* its signification and its interpretant, and neither alone.

In that case merely to say that a certain object has reinforcing properties is not to make an appraisive utterance (i.e., to say something which has appraisive "meaning"). The term 'good', for instance, would therefore have appraisive meaning only if it not merely signified an object as having reinforcing properties but also aroused in its interpreters a disposition to positive preferential behavior toward the object signified. A dietician may say to his patient (perhaps a diabetic) that diet *A* is good and diet *B* is bad without inducing in himself a disposition to eat in manner *A* rather than in manner *B*—the term 'good' is for him then primarily designative, while for his patient, insofar as it disposes him to give preference to diet *A*, the term is appraisive as well (i.e., has appraisive "meaning").⁸

⁸ The term 'good' may even here have an appraisive component for the dietician: if he becomes diabetic, he may then be disposed to diet *A* rather than diet *B* because of what he had previously said to his patient.

Similarly for the term 'ought', in some contexts it is purely designative, and in others it has an appraisive component. It has prescriptive meaning only if it signifies to its interpreter that the act which is prescribed is instrumental and in addition actually disposes its interpreter to perform the act in question. Here, too, the "meaning" of an ought-statement may be different for the utterer and for the person addressed.

In the case of designative "meaning," a sign has such meaning to the degree that the interpreter is disposed to sense-organ activity⁹ of a certain kind to a certain kind of object. Many signs have all kinds of "meaning" in various degrees.

As for the term 'express', it could be introduced in the present scheme in at least two ways. One might say that every sign expresses its interpretant, without signifying it. Or one might say that a sign is expressive to the degree that its *production* is itself taken as a sign by an interpreter of some state of its producer.¹⁰ In this case not every sign is actually "expressive" though it is potentially so. Of course, certain signs (such as a cry of alarm) are much more frequently interpreted as expressive in this sense than are other signs, and these are the signs which some persons perhaps intend by their use of 'expressive'. But all signs may be interpreted as expressive in this second sense of the term, and what is expressed is by no means limited to emotions or attitudes. Hence, the identification of 'expressive' with 'emotive' engenders many confusions which the present analysis avoids.

It might be maintained that the analysis of the act followed here is too simple—that it stresses what the actor does in relation to the object and neglects what the object does to the actor.¹¹ The hungry person not only scans his environment for food objects, manipulates them, and chews them, but the object in turn initiates

⁹ This must be qualified in terms of the earlier comments made upon the term 'observation'.

¹⁰ Of course, in some cases the interpreter of the sign may also be the producer. Abraham Kaplan calls the sign in this case *self-expressive*. It may be noted that not all signs expressive in the first sense of this term are expressive (or self-expressive) in the second sense of the term. In my *Signs, Language, and Behavior* (New York: Prentice-Hall, 1946; New York: George Braziller, 1955), I proposed to use 'expressive' in the second sense, and I still favor this proposal.

¹¹ Howard Parsons called this to my attention. He is at present working out what is involved here.

a very complex set of processes in the organism. It seems suggestive to say that this more passive, more "undergoing" aspect of behavior has its own kind of sign functioning, and that such signs are primarily "expressive." This area certainly demands extensive exploration and may throw considerable light on mythic, aesthetic, and religious symbolism.

When the person eats an apple, he does become passive in a sense, and the apple "acts on him." But to signify what occurs seems to be describable in terms of the designative, appraisive, and prescriptive dimensions of signification. The person may designate what happens to him, he may appraise this, and he may then formulate prescriptions as to his future eating behavior. These signs may have "meaning" and be "expressive" in the sense of the previous discussion. But the question is whether such important analysis will also require the introduction of a new dimension of signification.

§ 7. FORMAL SIGNS¹²

So far, no account has been given of what are often called "logical" or "grammatical" or "structural" signs, to which are attributed logical or grammatical or structural signification (or "meaning"). Examples are terms like 'or', parentheses, and the '-ly' in 'He came quickly'.

In *Signs, Language, and Behavior* such items were called "formators," and an attempt was made to give them a fourth dimension of signification—"formative signification." Thus 'or', in some of its occurrences, was said to signify that an otherwise signified situation had the property of alternativity. Of the statement "The apple is on the first or second shelf of the ice box" one might say that it designates no observable property of apple and icebox, and neither appraises them nor prescribes action with respect to them. Hence, if we mean by 'lexical' those terms which designate, appraise, or prescribe, then 'or' in this occurrence would be non-lexical. Since it does seem to signify something about the signified

¹² The general reader may omit §§ 7 and 8 without losing the central line of analysis.

situation, it might be said to have another type (or dimension) of signification, "formative" signification.¹³

It now seems worthwhile to explore the possibility of maintaining a tridimensional analysis. One of the reasons for introducing a formative dimension of signification is undoubtedly to have a way of explaining the status of formal logic, mathematics, and grammar. Thus if no fourth formative dimension is introduced, there remains the task within a tridimensional analysis of accounting for these statuses.

One possibility, sometimes held, is to regard formators as simply "auxiliary devices" which themselves have no signification but which influence in determinate ways the signification of the sign combinations in which they appear. They might then be called "synsigns." Thus the word order of 'X hit Y', as contrasted to the word order of 'Y hit X', might be regarded as a synsign in this sense, as determining different significations for the two expressions but without having a signification of its own.

Such an analysis may be sufficient to account for some (and perhaps all) of the vague class of items called formators. But there is another possibility, namely of regarding formators as a rather special class of lexical signs, and hence as being analyzable in terms of designative, appraisive, and prescriptive signification. One version of this possibility would be to regard them as metalinguistic signs signifying the signs they accompany. Thus 'or' in '*P* or *Q*' could be interpreted as signifying (in this case designating) the set of pairs of sentences such that at least one of the sentences in a given pair is true. Parentheses would be regarded as designating the expressions around which they occur and prescribing that these expressions are to be treated in a certain way. It is important to realize that there are relations of signification within the field of signs, and not merely to situations outside this field.

I believe that this approach can be carried quite far. Nevertheless, another version of this possibility is to consider (at least

¹³ Most contemporary linguists still speak of "structural meaning," "grammatical meaning," "formal meaning," "linguistic meaning," or the like. The assumption of such meaning has been called in question by Noam Chomsky, in *Syntactic Structures* (The Hague: Mouton & Co., 1957).

some) formators not as metalinguistic (in the sense that they explicitly signify other signs) but as being at a higher level than the signs they accompany (i.e., they presuppose these signs without actually signifying them). Thus in the case of 'or' mentioned above, it might be said that 'or' signifies something about the situation signified by the other signs of the combination in which it occurs; it would be a situation of alternativity and would be responded to in such and such a way ("If you don't find the apple on the first shelf, look for it on the second," etc.). This differs from the analysis first suggested in introducing the notion of *levels in the object language*, and by keeping the signification of formators lexical, it does not introduce a fourth dimension of signification.

§ 8. FORMATIVE DISCOURSE

Though a dimension of formative signification is not regarded as necessary, it is still necessary in semiotic to account for such formative discourse as is exemplified by mathematics and formal logic. Thus ' $2 + 2 = 4$ ' differs from '2 quarts of alcohol added to 2 quarts of water give 4 quarts of liquid'. The first sentence is formative (and analytic); the second is lexical (and synthetic). The first is formally true; the second is empirically false. The negatives of these sentences are, respectively, formally false and empirically true.

It is not my concern here to discuss comprehensively the problems of formative discourse. A suggestion, however, may indicate a direction of possible analysis.

The relation of *analytic implicates* between two signs (or sets of signs) can be introduced as follows: Where the signification of S_1 is contained in or is identical with the signification of S_2 , then S_2 is an analytic implicate of S_1 . Thus in 'Men are animals', 'animals' is an analytic implicate of 'men'. If something is a man, then by the signification of the term 'man' that something is an animal. Similar examples would be found in ' A is A ' and 'Black berries are black'. 'Blackberries are black' is not an example of such a formative sentence. It is an empirical sentence, and at an early stage of the growth of blackberries it is in fact false.

The relation of *contradictory implicates* can be introduced as follows: Where the signification of S_1 is the absence of the conditions which constitute the signification of S_2 , S_1 and S_2 are said to be contradictory implicates of each other. 'Men are not-men', ' A is not- A ', 'Black berries are not-black' are examples of sentences built upon contradictory implicates. By the signification of the signs it is known that if one of the signs applies to something, the other does not; and if one sign does not apply to something, the other one does.

Insofar as discourse is based on analytic implicates, it is analytic formative discourse; and insofar as it is based on contradictory implicates, it is contradictory formative discourse. Mathematical discourse often (or always) is of the former sort, and mystical discourse is often (or always) of the second sort.¹⁴

It is thus possible within the present framework of semiotic to admit a type of formative (as opposed to lexical) discourse, and yet not to introduce a fourth (formative) dimension of signification over and above the designative, appraisive, and prescriptive dimensions. Hence, we need not complicate the analysis of stages of the act to account for formative discourse.

§ 9. THE USES OF SIGNS

Contemporary analyses of signs stress strongly the many uses of signs, especially linguistic signs. But the terms 'signification', 'use', and 'usage', and their relations are conceived very diversely. Some persons identify the signification of a word with how it is used, and some with its usage. 'Use' and 'usage' are at times distinguished, and at times not.

If pragmatics is concerned with the origin, uses, and effects of signs, then to speak of the "use" of a sign presupposes that it already has a signification. Hence, in this framework 'signification' and 'use' are distinguished. 'Usage of a sign', however, if distinguished from 'use', does not suggest to me anything above

¹⁴ See my paper, "Mysticism and Its Language," *Language: An Enquiry into Its Meaning and Function*, Ruth Nanda Anshen, ed. (New York: Harper & Brothers, 1957), pp. 179-187. The paper (in a slightly shorter form) originally appeared in *Etc. A Review of General Semantics* 9 (1951), pp. 3-8.

and beyond the operation of something as a sign within a sign process (or sign behavior). As such, it adds nothing to the account which has been given.

In *Signs, Language, and Behavior* four main uses of signs were discussed. They were then called the informative, valuative, incitive, and systemic uses of signs. Signs may be used to inform someone of the properties of objects or situations, or to induce in someone preferential behavior toward some objects or situations, or to incite a specific course of action, or to organize the dispositions to behavior produced by other signs. There is no necessary selection of such uses in terms of the kinds of signification which signs have. But, in general, designative signs are used informatively, appraisive signs are used valuatively, prescriptive signs are used incitively, and formative signs are used systemically.

The distinguishing feature of work in semiotic in recent years has been the extension of interest into the diversity of dimensions of signification and into the variety of uses which signs perform. Earlier in the century, philosophers were concerned mainly with the designative and formative dimensions of signification as they occurred in science and mathematics.¹⁵ This concern remains, but it has been supplemented by a growing interest in the place that signs have in the manipulatory and consummatory phases of action. Thus attention has been increasingly directed to rituals, myths, morality, art, law, politics, religion, and philosophy. Since these topics involve values, I shall turn now to the theory of value (axiology), the relation of signs and values, and the place of values in human action.¹⁶

¹⁵ Of course this was not true of thinkers such as Ernst Cassirer, who was concerned with all the major forms of human symbolic activity.

¹⁶ Some readers may be interested in how the account of the present chapter differs from that of *Signs, Language, and Behavior*. There is here a different formulation of sign behavior, an attempt to do away with the formative dimension of signification, and in general a greater stress on the dimensions of signification (earlier called "modes of signifying").