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## The Pivotal Issue: Language and Thought

( 1 )

I SAID in the preceding chapter that the observed fact of man's unique linguistic performance was pivotal in the discussion, not only because it is the one fact that everyone accepts, but also because it falsifies the view that man differs from other animals only in degree, and supports the contrary view that he differs in kind as well as in degree. As the evidence stands at present, we need not further consider the question whether man differs only in kind or also in degree. That question is now closed. But another question remains quite open—whether the difference in kind is superficial or radical; and this question, as I pointed out, gives rise to two issues with which we shall concern ourselves in the remaining chapters of Part Two.

The first of these issues is constituted by the disagreement between (a) those who maintain that the underlying psychological factors or processes are exactly of the same kind in both linguistic and non-linguistic animals, and (b) those who deny this, maintaining on the contrary that man has the power of propositional speech because he has the power of conceptual thought, whereas the non-human animals lack the power of propositional speech because they lack the power of conceptual thought.

The second issue is constituted by the disagreement between

(a) those who, first of all, affirm that man alone has the power of conceptual thought, and then maintain that this intellectual power on man's part can be adequately explained by reference to neurological mechanisms and processes, and (b) those who deny this, maintaining on the contrary that conceptual thought requires for its explanation some factor in addition to the action of the brain.

Both disagreements relate to the question whether the difference in kind between linguistic and non-linguistic animals is superficial or radical. If, in the first case, the proponents of the view that exactly the same kind of psychological processes or factors are operative in linguistic and non-linguistic animals, though not to the same degree in both, are then able to show that it is the higher degree of these same factors or processes that accounts for man's unique linguistic performances, they have taken a long step toward showing that the difference in kind between linguistic and non-linguistic animals is only superficial. It only remains for them to show that there is a critical threshold in the continuum of degrees, above which linguistic behavior is possible, and below which it is not. Showing this does not preclude them from also maintaining that the critical threshold in the psychological continuum is paralleled by the critical threshold in the neurological continuum. Most proponents of the view here being considered do, in fact, appeal to differences in degree of brain magnitude and complexity in order to account for the difference in degree of the psychological factors and processes that are operative in both linguistic and non-linguistic animals. In other words, they regard the difference in kind between linguistic and non-linguistic animals as superficial in two respects: *first*, by reference to the underlying *psychological* continuum of degrees; and *second*, by reference to the even more fundamental *neurological* continuum of degrees.

Because of this, their opponents on the psychological level do not succeed in showing that the difference in kind is radical if they merely show that human language cannot be explained in terms of the same psychological processes or factors that are operative in non-linguistic animals. In order to establish a radical difference in kind, it is not enough to show that certain psychological processes or factors are present in man that are not present in non-linguistic animals. Should they succeed in showing only

this, they do no more than remove one of the two grounds on which the difference in kind can be regarded as superficial; namely, the explanation of it by reference to a psychological continuum of degrees. The other ground remains untouched. Even if the power of conceptual thought, present in man and absent in non-linguistic animals, explains man's unique linguistic performance, the presence of conceptual thought in man and its absence in non-linguistic animals may itself be fully explained by the fact that man's brain is above a critical threshold in a continuum of degrees of neurological magnitude and complexity. If it can be so explained, then the difference in kind between linguistic and non-linguistic animals remains superficial, in spite of the fact that we have here not only a behavioral difference in kind but also a psychological difference in kind, i.e., a difference between the kind of psychological factors that must be posited to explain linguistic behavior and the kind of psychological factors needed to explain non-linguistic behavior.

It should now be clear why the first of the two disagreements constitutes the pivotal issue in this inquiry. Unless the first disagreement is resolved in favor of those who maintain that man and man alone has the power of conceptual thought, the second issue does not arise. If those who contend that different degrees of the same psychological processes or factors are operative in linguistic and non-linguistic animals are able to establish that contention, then they have also made it impossible to maintain that there is a radical difference in kind between man and other animals. No further consideration of the adequacy or inadequacy of the neurological explanation of human behavior is needed in order to answer the question whether man's difference in kind is radical or superficial. It *cannot be* radical. Only if it *can be* radical, must we go on to consider whether, in fact, it *is*. Since it *can be* radical only if it is *not* true that the same psychological processes or factors are operative in man and other animals, a negative resolution of the first issue is required before we turn our attention to the second.

Given that negative resolution of the first issue, we are then obligated to resolve the second before we can answer the crucial question about man's difference: Is it superficial or radical? To resolve the second issue, as we have seen, requires us to determine whether the neurological explanation of conceptual thought is

or can be adequate or, in the very nature of the case, cannot be. If the second issue cannot be resolved, the crucial question about how man differs remains open; if it can be resolved in favor of *either* alternative, then the question is closed and an age-old dispute is settled with what, in my judgment, are serious practical and theoretical consequences.

( 2 )

I have now formulated the two issues that will be treated in subsequent chapters and shown why the first of these is pivotal. But I have not yet indicated the parties that confront one another in these disagreements. It may help the reader to keep track of what is going on if he knows the general character of the opponents and is acquainted with the names of the leading figures in each case—some at least, if not all. Some have already been mentioned and their views examined; others will now be named for the first time, and their views briefly documented.

In the first and pivotal issue, the comparative psychologists and other behavioral scientists are proponents of the view that the psychological explanation of man's exclusive possession of propositional speech renders his manifest difference in kind from non-linguistic animals superficial, not radical. Leading contemporary figures in this group are the psychologists Harlow, Hebb, Osgood, Schneirla, Nissen, Leeper, Heron, Scott, and Razran. They are joined by such biologists as Rensch, Herrick, and Carlson; such ethologists as Thorpe; and such sociologists or anthropologists as Linton, Goldenweiser, and Hankins. [1]

On the other side of the first issue we have, among contemporary scientists, mainly the paleoanthropologists such as Julian Huxley, Mayr, Simpson, Dobzhansky, Oakley, Washburn, Teilhard de Chardin, and Carrington. They are joined by such neurologists as McCulloch, Crichtley, Lashley, Halstead, and Lord Brain; such comparative psychologists as Maier, Bitterman, Lilly, Craik, Bruner, Hunt, Klüver and, perhaps Köhler; such ethologists as Lorenz, Portmann, and Schaller; and by the sociologist Leslie White. [2]

In the second issue, almost all contemporary scientists—espe-

cially those in the fields of neurology, physiology, evolutionary biology, psychology, anthropology, and other social sciences—swell the ranks of those who maintain that an adequate neurological explanation can be given of the difference in kind between linguistic and non-linguistic animals. It includes scientists on both sides of the first issue; in short, almost every scientist who, by adherence to evolutionary principles, is committed to the view that if man differs in kind, the difference must be superficial, either on psychological or neurological grounds, because a radical difference in kind would be incompatible with man's phylogenetic continuity with the rest of animal life. Here there is some point in naming the few exceptions among twentieth-century scientists. They are mainly biologists, such as Sinnott, Dixon, and Jonas; or, what is even more striking, leading neurologists, such as Sherrington, Sperry, and Penfield. They express, in varying ways and degrees, quasi-philosophical doubts about the possibility of an adequate neurological explanation of man's distinctive behavior and its underlying psychological factors. To this extent, they can be regarded as adversaries of the prevailing scientific view that whatever is different about man amounts to no more than a superficial difference in kind. [3]

In the foregoing enumerations, I have omitted reference to two groups—the philosophers, on the one hand, and the computer technologists and experimenters with artificial intelligence, on the other. While the latter seldom speak directly to the first issue, they clearly align themselves with the prevailing scientific view on the second; more than that, it is a major aim of their experimental work to support that view. I will name them and discuss their views in Chapter 14.

As for the philosophers, who certainly play a significant part in the dispute of this mixed question, I have already indicated in Chapter 4 where the leading figures in Western thought stand. The materialists among them, either the atomistic and mechanical or the dialectical materialists, stand opposed to man's being radically different in kind from other things; and so, if the questions at issue were put to them, they would take the affirmative side on either the first or the second issue. Among the others, those who regard man as radically different in kind would, if confronted with the two issues in their current state, deny that

the psychological processes or factors are the same, except for differences in degree, in men and other animals; and they would also deny that the action of man's brain can adequately account for the activities of his mind. When they conceive man as the only rational or logical animal, they are asserting more than his exclusive possession of a propositional language; they are affirming his exclusive possession of intellectual powers which are the underlying cause of his ability to name things and utter sentences that are true or false; and beyond this, most of them hold that man's power of understanding and his power of free choice involve an immaterial or non-physical factor that makes him radically distinct in kind from other living things.

There remains to mention the philosophers of our own century who approach the question in the light of the scientific evidence that is available and who are cognizant of the division of scientific opinion on the two issues with which we are concerned. On the first issue, I think it is fair to say that most of the leading figures in contemporary philosophical thought who speak to the question at issue are opposed to those scientists who maintain that, though markedly differing in degree, the same psychological processes or factors are operative in men and other animals. On the second issue, the balance shifts somewhat in the opposite direction; at least, that is my reading of the current literature that bears on the subject. Here there tends to be something more like an equal division of opinion—one group of philosophers espousing the prevailing scientific belief that man's behavior and psychological processes can be adequately explained in neurological terms; another group questioning, challenging, or arguing against that view.

I have refrained from enumerating the names of the aforementioned philosophers because I think it will be more appropriate to do so in later chapters where I shall report and discuss their theories. But here, in the concluding section of this chapter, I am going to cite the opinions of a number of twentieth-century writers in support of the position that man possesses intellectual powers not possessed to any degree by other animals. Most of these writers are philosophers; but some are scientists whose views have not yet been examined. This will complete a preliminary survey of the division of opinion on the first issue, and prepare for a resolution of that issue in the chapter to follow.

## ( 3 )

In contrast to the pre-Darwinian philosophers whose diverse views were examined in Chapter 4, the philosophers whom we shall now consider all carry on their thinking within the general context of evolutionary theory. They are, in varying degrees, acquainted with the relevant scientific data; some of them explicitly comment on recent experimental work and criticize the theories advanced to explain the phenomena described; others are concerned with reconciling traditional philosophical notions with current scientific ones. For them, the question about man is certainly a mixed one, involving both science and philosophy. They can hardly be dismissed as incompetent by reason of ignorance. In the brief survey of their views that follows, I am going to summarize their opinions on three critical points that bear on the pivotal issue; but first I would like to indicate their reasons for thinking that man differs in kind with respect to intellectual traits not manifested by other animals.

The group includes William James, Henri Bergson, John Dewey, and Ernst Cassirer of an earlier generation; and among those more recently at work, it includes H. H. Price, Jonathan Bennett, Peter Geach, and Wilfred Sellars (the first three Oxford and Cambridge men, the last a professor of philosophy at Yale University). With them, because of the affinity of their views on the three critical points mentioned above, I have associated an Austrian philosopher, Karl Popper, a British neurologist, Macdonald Crichtley, and an American sociologist, Leslie White.

With the exception of Popper, all explicitly assert that man and other animals differ in kind; and some of them—James, Cassirer, Bennett, Sellars, Crichtley, and White—do so in the context of discussing or adverting to the distinction between a difference in kind and a difference in degree. [4] Again, with the exception of Popper, all concur in their description of two behavioral indices of the difference in kind between man and other animals. One is man's directly observable linguistic behavior. The other is man's transcendence of the immediate environment, his emancipation from the perceptual present, which is directly observable in the actions of men with regard to objects—past, future, or totally non-temporal—that do not exist in the perceptual field

of the moment. They contrast this with the behavior of all other animals which, as most students of animal behavior concede and some, notably Schaller and Köhler, explicitly affirm, is confined to immediate or *slightly delayed* reactions to stimuli in the present perceptual field.

"With animals," Dewey writes, "an experience perishes as it happens, and each new doing or suffering stands alone." Man lives not, "like the beasts of the field, in a world of purely physical things but in a world of signs and symbols." It is this "which marks the difference between bestiality and humanity, between culture and merely physical nature." [5] According to Bergson, "man is the only animal whose actions are uncertain, who hesitates, gropes about and lays plans in the hope of success and the fear of failure. He is alone in realizing that he is subject to illness, alone in knowing that he must die. The rest of nature goes on its expanding course in absolute tranquility. Although plants and animals are the sport of chance, they rely on the passing hour as they would on eternity." [6]

Professor Price points out that the verbal thinking that is distinctive of man is "to a very considerable degree . . . independent of the perceived environment." [7] Expanding on this point, he writes:

The autonomy of rational beings depends upon the use of symbols, and especially on the use of words. . . . This is what makes such beings independent in some degree of their physical and perceptually presented environments. . . . Such autonomy is beyond the reach of even the most accomplished sign-cognizant. And here, if anywhere, is the difference in kind between men and the lower animals. . . . Animal learning, with the responsiveness to signs which results from it, is a primitive form of induction, as Hume noticed. But the lower animals do not seem to rise to the independent or autonomous thinking which the use of symbols makes possible. Their thinking always remains "tied." And so, though we must not deny that they think, we hesitate to call them thinkers. [8]

The fact that men can make, and make quite separately, universal statements and also statements about past singular instances



reveals, according to Jonathan Bennett, their transcendence of that which is both present and particular. He contrasts this with the pattern of present stimulus and present or slightly delayed response that characterizes the entire repertoire of animal behavior. And for him man's distinctive rationality, though it depends on his having a propositional language, consists in a power of judgment and inference that explains the way in which he uses language, but is not itself fully explained by the fact that he has the power of speech. [9]

Ernst Cassirer, while maintaining that, "in spite of all the efforts of modern irrationalism," the traditional "definition of man as an *animal rationale* has not lost its force," prefers "to define him as an *animal symbolicum*. By so doing," he writes, "we can designate his specific difference, and we can understand the new way open to man—the way to civilization." He goes on to say, "without symbolism, the life of man would be like that of the prisoners in the cave of Plato's famous simile. Man's life would be confined within the limits of his biological needs and his practical interests; it could find no access to the 'ideal world' which is opened to him from different sides by religion, art, philosophy, science." [10]

These writers then explain the observed phenomena—man's linguistic behavior and his behavior with respect to objects not perceptually present in his immediate environment—by reference to his possession of abilities that cannot be directly observed, but which, in their opinion, *must be inferred* in order to explain the behavior in question, and *need not be inferred* in the case of other animals precisely because they do not manifest such behavior. They attribute to man and to man alone an intellectual power that they variously name the power of "rational," "symbolic," "autonomous," or "conceptual" thought. (If I adopt the last of these adjectives to designate that which distinguishes human from animal thought, which, in contrast, can be called "perceptual," I also attach to it a meaning that includes whatever is included in the connotations of the other three adjectives. [11]) However it is named, it is the power that man exercises in naming things, in uttering sentences that can be true or false, in making judgments about their truth or falsity in the light of relevant evidence and arguments, in stating inferences and giving reasons, and in developing, as Cassirer points out, mathematics, art, science, his-

tory, philosophy, religion, the state, and all the other institutions of civilized life. [12]

While, in view of such opinions on their part, they concur in asserting an underlying psychological difference in kind between man and other animals, they do not all agree that this difference in kind is radical rather than superficial. Cassirer, Geach, and Bennett simply fail to discuss this point. In terms of his views on other subjects, James can be presumed to favor the position that the difference in kind is radical; as Bergson and Dewey, on the contrary, can be similarly presumed to regard it as superficial. And three of these authors—Sellars, Crichtley, and White—give us explicit indications that, in their view, man's difference in kind does not involve a basic discontinuity in nature or in phylogenetic development. [13]

On the critical side, these writers make three contributions to the contemporary consideration of the mixed question about man. *First* and foremost is their distinction between what might be called two modes of meaning or significance. This has, as we shall see presently, a direct critical impact on the equivocal use of the word "symbol" by the comparative psychologists—to cover, *without distinction*, both the elements of human speech and what they call "non-verbal symbols" in animal behavior.

James and White call attention to the fact that only men invent or institute signs or symbols by *convention*, whereas the signs that animals respond to or employ are *natural* elements in their experience or behavior. [14] White and Crichtley introduce a distinction between two types of *signifiers*—between what they call "signs" in animal behavior and what they call "symbols" in human behavior. [15] This distinction is much more clearly expressed and more fully developed by Cassirer, Price, and Popper.

Cassirer distinguishes between the *signals* that function *operatively* in animal behavior and the *symbols* that function as *designators*, *describers*, or *referents* in human behavior. Having pointed out that symbols "which have an objective reference or meaning" are totally absent from animal behavior, [16] Cassirer then goes on to say:

Symbols—in the proper sense of the term—cannot be reduced to mere signals. Signals and symbols belong to different universes of discourse: a signal is a part of the physical

world of being; a symbol is a part of the human world of meaning. Signals are “operators”; symbols are “designators.”  
[17]

Using the word “sign” where Cassirer uses the word “signal,” Price makes the same distinction between the functional meaning of signs and the designative, descriptive, or referential meaning of symbols; [18] and he is at great pains fairly to state and yet incisively to criticize the efforts of the behavioristic psychologists and others to reduce symbols to signs or, what is in effect the same, to try to account for the significance of human words and for their significant use entirely in terms of what he calls the “sign theory” of meaning. [19]

Following proposals first made by Karl Bühler in 1918, Popper distinguishes four functions of language: “(1) the expressive or symptomatic function; (2) the stimulative or signal function; (3) the descriptive function; [and] (4) the argumentative function.” While admitting that there may be still other functions, such as the prescriptive or the advisory, Popper then asserts “that these four functions mentioned constitute a hierarchy, in the sense that each of the higher ones *cannot* be present without all those which are lower, while the lower ones *may* be present without the higher ones.” This leads him to his criticism of behaviorism, or what he calls a “causal physicalistic theory of linguistic behavior,” with respect to which he enunciates two theses. One is that “any causal physicalistic theory of linguistic behavior can only be a theory of the two lower functions of language”; the other, that “any such theory is therefore bound either to ignore the difference between the higher and the lower functions, or to assert that the two higher functions are ‘nothing but’ special cases of the two lower functions.” [20] The relevance of Popper’s criticism to the question at issue will be seen in the light of the thesis, not enunciated by him, but by Cassirer, Price, Crichtley, White, and others that the two higher functions of language are manifested only in human linguistic behavior, and that animal communication—insofar as it is learned behavior and not instinctive—consists solely in performances that are comparable to the two lower functions of human language (i.e., expressive cries and stimulative signals).

The words “sign” and “symbol” are so variously used in the

literature—as well as so often misused—that I will, in what follows, employ other terms to express the critical distinction made by such philosophers as Cassirer and Price and by such scientists as Crichtley and White. I will use “signals” and “designators” for the two types of signifiers, each having a distinct mode of meaning or significance. The cry of an animal in danger operates as a warning signal to other members of the group, eliciting appropriate alertness on their part: the word “danger” used on a roadway sign operates in the same way for human beings; but human beings also use the word “danger” as a name to designate, describe, or refer to a whole class of threatening situations perilous to life and limb. That non-verbal signals are operative in animal behavior and that both verbal and non-verbal signals are operative in human behavior are facts beyond question. But there is no evidence whatsoever of the functioning of designators except in human linguistic behavior.

The *second* critical point made by these contemporary philosophers, and by such scientists as Crichtley and White, turns on their making a sharp distinction between perceptual and conceptual thought. This distinction is implicit in the observation that animal thinking is confined to the perceptual present, whereas human thinking transcends the immediate environment and extends not only to objects in the remote past and the remote future but also to objects that have no temporal locus whatsoever. Precisely because they are incapable of conceptual thought, animals, these writers contend, are not only (1) incapable of sentence-making that includes statements about the past and future, (2) unable to fabricate tools for remote future use, (3) devoid of a cumulative cultural inheritance that constitutes a long historical tradition, but they are also (4) incapable of any behavior that is not rooted in the perceptually apprehended present situation.

I have used the word “thought,” as Price and many others do, with measured equivocation to cover both perceptual and conceptual thinking, in order to express the critical point here being considered. The question is not whether animals can think, any more than it is, as we shall see later, whether machines can think. Animals can certainly think, in the sense of learning from experi-

ence, generalizing, discriminating, and abstracting, solving problems by trial and error or by insight, and even, as Price, following Hume, points out, making inductive inferences from empirically learned cues or signals. The evidence is both plain and ample that they *can think in all these ways*. But it is equally plain from the observations of their behavior, in the laboratory or in the field, that they *cannot think in any of the following ways*: they cannot think about objects that are not perceptually present as well as about those that are; and with regard to objects of thought, present or absent, they cannot make judgments or engage in reasoning (i.e., think that such and such *is* or *is not* the case, or think that *if* such and such is the case, *then* so and so is not).

Among the authors whom we are here considering, William James is, of course, a most astute observer and analyst of the difference between perceptual and conceptual thought. [21] Two of the more recent writers—Geach and Bennett—not only sharpen the distinction, but also ably defend it with reference to experiments on generalization and perceptual abstraction in animals, and on problem-solving by trial and error and by insight.

Geach argues that the experiments that demonstrate an animal's capacity to recognize triangles or to discriminate between triangles and quadrangles (functioning as perceptible cues or stimuli) do not indicate that the laboratory animals have formed concepts of triangularity and quadrangularity. In his view, the laboratory data can be adequately explained without positing concept-formation in animals. To do so is to confuse perceptual abstraction on the part of animals with human concept-formation which, Geach convincingly shows, does not consist in a process of abstraction at all. [22]

Bennett argues that animal learning and problem-solving, whether by trial and error or by insight, does not involve any of the steps that constitute human reasoning from experience—the process whereby human beings either establish an empirical conclusion or refute one. Since that always involves the separate acknowledgment of a timeless universal, on the one hand, and of particular instances of past occurrence, on the other, animals, whose apprehensions are limited to the immediate perceptual present, cannot possibly engage in the kind of thinking that consists in giving reasons *pro* or *con*. And, Bennett further contends,

behavior that involves giving or receiving reasons cannot be causally explained by reference to empirical sequences. In his view, there can be no behavioristic account of human rational behavior, as there can be of animal learning and problem-solving, in terms of causal connections between stimuli and responses or by reference to the causes at work in the formation of the conditioned responses or the imprintings that represent the modifications of animal behavior through repeated experience. [23]

The analyses offered by Geach and Bennett, together with the adverse appraisal that they make of the significance of the experimental data on animal behavior with which they are acquainted, amount to a refutation of the interpretation placed upon these data by a large number of comparative psychologists, especially those of behavioristic persuasion. Geach and Bennett are, in effect, saying that the data *can be adequately explained* without attributing either concept-formation or rational judgment to animals. Hence, to posit the presence in animals of non-verbal concepts, non-verbal judgments, and non-verbal processes of reasoning is to violate the very principle of parsimony on which the behavioristic psychologists are themselves so insistent. Not to attribute the power of concept-formation and of rational judgment to man is an equal and opposite violation of the other side of Occam's two-edged razor, since human linguistic behavior—naming things and uttering sentences that can be true or false—*cannot be adequately explained* without positing the power of conceptual or rational thought on the part of men.

The *third* critical point—again made most clearly by Geach and Bennett, though it is also adumbrated by Price's analysis of concepts and their manifestation—concerns the relation of language and thought. Is human language the cause of conceptual thought; conceptual thought, the cause of human language; or is each, in some reciprocal fashion, the cause of the other? The scientists who comment on the relation of human language and conceptual thought permit themselves to say either unclear or contradictory things about which is the cause and which the effect. Some regard language as prerequisite to conceptual thought; some regard conceptual thought as independent of and prerequisite to language; and some try to have it both ways,

making each the cause of the other without explaining how this can be so. [24]

This matter cannot be clarified without carefully distinguishing between necessary and sufficient conditions, on the one hand, and between *causae cognoscendi* and *causae essendi*, on the other. To say that observable linguistic behavior on the part of man is a cause of our inferring or knowing (*causa cognoscendi*) that men have the unobserved and, in principle, unobservable power of conceptual thought is *not* to say that man's having a propositional language is the cause (*causa essendi*) of his having the power of conceptual thought. As both Geach and Price point out—one by reference to clinical data on aphasia and related speech disorders, the other by reference to the common experience of un verbalized thought that directs or seeks out linguistic expression [25]—conceptual thought is not inseparable from the private use of language in subvocal soliloquy, nor from its public use for the purpose of communication.

Viewed in terms of necessary and sufficient conditions, it can be said of man's propositional language and his power of conceptual thought that each is a necessary condition of the other, but that neither is the sufficient condition of the other. In other words, the fact that a man's concepts, viewed dispositionally, consist, in part at least, in his ability to use words significantly, and the fact that his ability to make up names and to frame sentences greatly enhances his conceptual thinking, do not, taken together, show that language and thought are inseparable; nor do they show that man's having the power of conceptual thought can be fully explained (sufficient condition) by his possession of a propositional language, or that man's having articulate speech can be fully explained (sufficient condition) by his possession of conceptual thought. What is reciprocal here in the relation of language and thought is only that each is a necessary—a *sine qua non*—condition of the development of the other: man could not exercise his power of articulate speech unless he had the power of conceptual thought; he could but barely exercise his power of conceptual thought did he not have the use of words and sentences. [26]

With respect to all three critical points, it is important to point out that they leave quite open the question of whether man's

unique possession of conceptual thought—an indispensable prerequisite of his unique linguistic performance and his transcendence of the perceptually present environment—*can* or *cannot* be fully explained in terms of underlying neurological mechanisms and processes.