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PATRICK SUPPES

DEDUCTION. See FORMAL SYSTEMS AND THEIR MODELS; LOGIC, MODERN.

DEFINITION. The problems of definition are constantly recurring in philosophical discussion, although there is a widespread tendency to assume that they have been solved. Practically every book on logic has a section on definition in which rules are set down and exercises prescribed for applying the rules, as if the problems were all settled. And yet, paradoxically, no problems of knowledge are less settled than those of definition, and no subject is more in need of a fresh approach. Definition plays a crucial role in every field of inquiry, yet there are few if any philosophical questions about definition (what sort of thing it is, what standards it should satisfy, what kind of knowledge, if any, it conveys) on which logicians and philosophers agree. In view of the importance of the topic and the scope of the disagreement concerning it, an extensive re-examination is justified. In carrying out this conceptual re-examination, this article will summarize the main views of definition that have been advanced, indicate why none of these views does full justice to its subject, and then attempt to show how the partial insights of each might be combined in a new approach.

All the views of definition that have been proposed can be subsumed under three general types of definitions, with, needless to say, many different varieties within each type. These three general types will be called "essentialist," "precise," and "linguistic" types, abbreviated as "E-type," "P-type," and "L-type," respectively. This classification is not intended as a precise historical summary, but merely as a useful schema for stating some of the problems and disputes. Thus, some outstanding philosophers may very clearly belong to one of these types. Others who, for the purposes of this article, are placed in a certain class hold positions varying considerably from the presentation to be given. It must therefore be borne in mind that not all the criticisms that will be made apply to all philosophers included in the class being criticized. Writers whose views of definition fall largely under the E-type include Plato, Aristotle, Kant, and Husserl. Those who support P-type views include Pascal, Hobbes, Russell, W. V. Quine, Nelson Goodman, Rudolf Carnap, C. G. Hempel, and most contemporary logicians. Supporters of L-type views include John Stuart Mill (in part), G. E. Moore (in part), Richard Robinson, and most members of the school of linguistic analysis.

According to essentialist views, definitions convey more exact and certain information than is conveyed by descriptive statements. Such information is acquired by an infallible mode of cognition variously called "intellectual vision," "intuition," "reflection," or "conceptual analysis." Descriptive views agree with essentialism in that definitions are incontrovertible, but account for their infallibility by denying that they communicate information and by explaining them as symbolic conventions. Although linguistic views agree with essentialism that definitions communicate information, they also agree with descriptive views that they reject claims that definitions communicate information that is indubitable. The linguistic position is that definitions are empirical (and therefore corrigible) reports of linguistic behavior.

ESSENTIALISM.

An essentialist account was first proposed by Socrates and Plato. Socrates is renowned for having brought attention to the importance of the concept of "virtue." His favorite type of question, "What does [virtue, justice, etc.] mean?" became the characteristic starting point of philosophical inquiry. But Socrates did not make clear what kind of answer he was looking for. In Plato's Euthyphro Socrates is reported to have said that the kind of answer he expected to his question "What is piety?" was one giving an explanation of "the general idea which makes all piety things to be pious" and "a standard to which I may measure actions." He did not explain, however, what he meant by "idea" and "standard.

Earlier (Plato's Phaedo) he seemed to suggest that knowledge has two kinds: (1) ideas, the mental forms, and (2) opinion, the empirical knowledge that one has concerning objects in the external world. On this view, knowledge is essentially the discovery of ideas, and to know is to fully understand (to be acquainted with) the essence of an idea. Thus, Socrates asked a man who was asked to come to the philosophers to explain what a chair is in order to find out "what it is in essence;" and in saying that a chair is "a piece of furniture in one piece, and in which a man put his feet without his legs being below him," he assumed that the essence of a chair is that it is something that is one, has feet, and serves the purpose of furniture in which one puts one's feet. These considerations present two essentialist definitions, or "definitions of essence," that are rather similar. The first term, chair, is essentialized as a piece of furniture in one piece and having a purpose; the second, essence or definition of the term, chair, is the essence of the essence of the term, chair. The account is adequate, in the sense that it is consistent and reduces the number of similar chairs to one whose essential properties are those of the chair itself, and that the chair itself is the essence of the essence of the chair. The account is illusory, however, in the sense that the chair itself is not the essence of the chair itself, and that the chair itself is not the essence of the essence of the chair. The account is also incomplete, in the sense that it does not provide a full account of the essence of the chair, and that the essence of the essence of the chair is not the essence of the essence of the chair.
how one produces an "idea" or a "standard" when one is defining a term. Richard Robinson, in his book Plato's Earlier Dialectic (p. 62), has suggested that the question "What is X?" is more ambiguous than Socrates realized and that it may be answered in all sorts of ways, depending on the context in which it is asked.

Plato. Plato's attempts in his later dialogues to explain the meaning of the Socratic question "What is X?" constitute the celebrated Theory of Forms, the trademark of Platonic metaphysics and epistemology. In a passage of central importance (Republic VI), Plato distinguished two kinds of objects of knowledge (sensible things and forms) and two modes of knowledge (sense perception and intellectual vision). Sensible things are objects of opinion, while abstract forms are objects of philosophical knowledge. Physical objects, shadows, and images are imperfect and ephemeral copies of forms; our perceptual knowledge of them is an inaccurate approximation to our knowledge of their abstract archetypes. Definitions describe forms, and since forms are perfect and unchanging, definitions, when arrived at by the proper procedure, are precise and rigorously certain truths. Empirical statements describe objects of perception and are therefore not only more or less reliable approximations to truth.

Models and copies. Plato's analogy between definitions and empirical descriptions—an analogy upon which all E-type theories of definition rest—is supplemented by a second analogy between the relation of a model to a copy and the relation of a definition to an individual predication. This analogy was suggested by Socrates when he asked for "a standard to which I may look and by which I may measure actions." Plato describes the process of coming to know as if it were like the procedure of a craftsman producing a piece of sculpture or a house. The sculpture is a "copy" of the subject who models for it; the house is in one sense a "copy" of the architect's blueprint, in a somewhat different sense a "copy" of a small-scale model, and in still a third sense a "copy" of the idea in the mind of the builder. Plato's frequent references to the arts and crafts in his exploration of conceptual problems indicate that the analogy of the model—copy relation plays a central role in his theory of knowledge.

Thus, Platonic essentialism provides two sets of answers (both of which rest on metaphors) to the questions "What kind of statements are definitions?" "What purpose do they serve?" and "How are they to be judged as good or bad?". It suggests primarily that definitions are descriptions of objects that are somehow analogous to tables, chairs, and other familiar things; that these definitions serve the purpose of providing descriptive information about their objects; and that they are confirmed by a mode of cognition somehow analogous to sense perception, yet independent of the sensory organs. Secondly, Platonic essentialism specifies the relation between objects of definitions and those of empirical descriptions by characterizing the former as models of which the latter are "copies."

Adequacy of the model metaphor. Metaphors are apt or unapt, illuminating or misleading, according to two criteria: (1) the number and importance of the known points of resemblance between the things compared and (2) the number and importance of previously unnoted facts suggested by the metaphor. To what extent does Plato's metaphor of the unseen model satisfy these criteria?

The primary term of comparison in Plato's metaphor is the abstract form or universal that a definition allegedly describes. The secondary term is the model for a painting or, alternatively, a tailor's pattern. As the painter looks to his model and the tailor to his pattern, the philosopher can look to the forms for the specifications that identify things as instances of one class rather than another, as well as for exact information about the properties of that class.

What are the known points of resemblance between forms and models, on which this metaphor is grounded? Merely to ask this question is already to see that the metaphor is defective from the start, since there cannot possibly be any literal points of comparison. The Platonic forms, unlike models and patterns, have no observable properties by virtue of which they can be said to "resemble" anything at all. Thus, if the model metaphor has any value, it must lie entirely in what the metaphor suggests, rather than in its literal grounds.

Primarily, the model metaphor suggests that definitions and their corollaries constitute all there is to knowledge. Whenever a question of fact or of judgment is raised in the Platonic dialogues, it is treated as a problem of definition. For example, when, in the Euthyphro, Socrates and Euthyphro argue about the propriety of a son's prosecuting his father for murder, Socrates proceeds as though the issue could be settled by arriving at a clear definition of piety—as though one could then look at the definition, look at the action, and decide whether they coincide. We can identify a portrait or a garment by comparing it with its model or its pattern, but we cannot classify and judge an action in the same way. Description and evaluation are seldom matters of identification by comparison with a pattern. In this respect Plato's essentialism is misleading rather than illuminating.

The metaphor of the unseen model also suggests that definitions provide us with precise and rigorous knowledge in the way that blueprints make possible a high degree of uniformity and precision in productive arts such as architecture. But definitions increase precision only when they change the original meanings of words for technical purposes. Generally speaking, a definition can be no more precise than the concept it defines, at the risk of shifting to a different concept. Our concept of what constitutes an adult is vague; if we try to make it precise by specifying an exact age at which childhood is divided from adulthood, we merely lose sight of what we started out to talk about by replacing the concept of maturity with that of having passed a certain birthday.

The model metaphor is not entirely misleading; it suggests at least one genuine resemblance between the terms it compares. The relation between definitions and empirical descriptions is, in one respect, rather similar to the relation between portraits and their models. We judge a portrait (to some extent) by noting whether the portrait looks like the model; we verify the empirical description "This table is round" by looking at the table to see whether it has the properties definitive of tables and of roundness. But if we are asked, "Is that person a good
model?” or “Is that definition a good definition?” we
cannot look toward anything of which the model is himself
a portrait, and we cannot look at a definitional form of
which the particular definition is itself an instance.
Definitions are not evaluated in the same way as empirical
descriptions, just as models are not judged in the same way
as their portraits. Thus the analogy between definitions
and empirical descriptions from which Platonic essential-
ism starts eventually contradicts itself.

Aristotle. One can find in Aristotle’s works anticipations
of every later theory of definition, but he gave high priority
to his own brand of essentialism, whereby he explained
the nature of “real” as distinguished from “nominal” (that
is, prescriptive or linguistic) definition. Like Plato, Aristot-
le stressed the similarity between definitions and state-
mments of fact, and he asserted that definitions convey
precise and certain information. But Aristotle employed a
different supporting metaphor to explain the special nature
of definitions. The most noteworthy feature of his many
discussions of definition is his insistence that a real
definition should provide a causal explanation of the thing
defined. In the Physics, Aristotle distinguished four types
of causes—formal, material, final, and efficient. He charac-
terized the first three types as “internal,” while efficient
causes are (usually) “external” to their effects. Internal
causes are not available to public inspection, but must be
discovered in abstract intuition. The causal explanation
provided by a real definition is in terms of one or more of
these three internal types of cause.

Definition and causality. It is not easy to explain just
what Aristotle meant by “internal cause.” Part of what he
seems to have meant is that, unlike “incidental” causes,
internal causes are necessary for their effects. But it is by
no means clear what sense of necessity is involved in this
instance. To explain this necessity as causal would be a
case of circular reasoning. On the other hand, to say that
the necessity is logical seems only another way of saying
that the effect is definable in terms of its cause, which is
again circular reasoning. As an example of a causal
definition, Aristotle defined a lunar eclipse as the privation
of the moon’s light because of the interposition of the earth
between the moon and the sun (Posterior Analytics 90a).
This example confirms the suggestion that for something to
be an internal causal is for it to be part of a definition. But
the difficulty then arises that definition has been explained
by internal causality, internal causality by necessity, and
necessity by definition. Thus, Aristotle’s eclipse leaves us
in the dark about definition.

Classification and explanation. The trouble is that the
idea of internal causality is a metaphor. An essential cause
is not “internal” to the thing defined as a kernel is inside a
nut, but only metaphorically “inside.”

This metaphor suggests two important but dubious
principles: that scientific knowledge consists entirely of
definitions and their corollaries and that systematic
classification is identical with theoretical explanation. If to
define a term is, at the same time, to provide a causal ex-
planation of what it denotes and if the classification of a
thing in terms of its species and differentia is sufficient for
deducing the laws of its behavior, then the work of
scientific inquiry is completed when a comprehensive
system of classification has been constructed. Thus, Aristot-
le wrote in the Posterior Analytics (90b) that “Scientific
knowledge is judgment about things that are universal and
necessary, that the conclusions of demonstration and all
scientific knowledge follow from the first principles” and
that “the first principles of demonstration are definitions”
(italics added).

That scientific knowledge is not entirely derivable from
a set of definitions and that systematic classification is only
one small aspect of scientific procedure need hardly be
argued. Aristotelian concepts of causality and explanation
have been almost completely expunged from modern
science, and causes are conceived of in quite different
ways. But it is not the archaic character of Aristotle’s use of
“cause” and “explanation” that concerns us here. It is
largely a matter of terminological convenience whether we
continue to use these words in the Aristotelian manner or
confine them to the procedures of modern physical
science. In regard to the problem of clarifying the func-
tions and criteria of definitions, however, Aristotle’s claim
that definitions reveal the internal causes of their definienda must be criticized not as a false, but as a mis-
leading, metaphor, for it dissolves the very distinctions
which it is intended to explain—namely, the distinction be-
tween definitions and empirical statements of fact, that
between the method of evaluating definitions and the
method of confirming factual hypotheses, and that between
the distinctive functions of definition and the general aims
of scientific inquiry.

Ideas and concepts. A third metaphor that has been
employed in the support of E-type views of definition
originated in Cartesian dualism. Descartes himself leaned
toward a prescriptive account of definition, which will be
considered later. But Locke, Kant, Husserl, and other
philosophers who accepted the Cartesian division between
the “inner world” of the mind and the “outer world” of
physical events took the essentialist position that philo-
sophical inquiry should provide information about a spe-
cial set of objects ("ideas" for Locke, Hume, and Husserl;
"concepts" for Kant, Heinrich Rickert, and G. E. Moore)
decipherable by an infallible mode of cognition ("reflection" for Locke and Husserl; "analysis" for Hume,
Kant, Rickert, and Moore).

According to Locke, the outer world of material objects
and their motions is describable by the laws of physics,
while the inner world of ideas is describable by the laws
of psychology that are discovered by reflection on the con-
tents of the mind. These contents are simple and complex
ideas; the task of philosophy is to analyze complex ideas
into their simple elements and to describe their mode of
combination.

Kant distinguished between “analytical” and “syn-
thetic” definitions, regarding the former as the identifica-
tion of the simple elements (predicates) out of which con-
cepts are formed by the understanding and the latter as
the formation of rules of serial order that provide the
synthetic a priori postulates of mathematics and physics.
The philosophers under consideration, like their prede-
cessors, assumed that definitions convey knowledge of ob-
objects (ideas, images, essences, concepts, or meanings) whose special nature guarantees precision and certainty and that this remarkable kind of knowledge is acquired through a special mode of cognition (reflection, introspection, intuition, or conceptual analysis). The literal content of the private-world metaphor thus seems to be identical with that of the essentialist metaphors already considered. The differences between the private-world and essentialist metaphors (other than terminological ones) must be sought in the suggestive implications of the metaphor. But there is an important difference between philosophers such as Locke, Hume, and Husserl, who reserve the word "definition" for conventions of word usage and do not consider their introspective analyses of ideas to be definitions, and those such as Kant, Rickert, and C. I. Lewis, who regard philosophical definitions as products of conceptual analysis.

Both groups employ the Aristotelian distinction between real and nominal definitions, except that members of the first group avoid calling the results of their introspective studies "definitions" because they think of them as descriptions of the workings of the mind analogous to descriptions of a clock that has been taken apart for inspection. They think of the special mode of cognition by means of which they discover how simple ideas are organized into complex ideas as inner vision or grasp, which is analogous to sight and touch. But members of the more abstractly minded group compare the special faculty by which real (or analytic or explicative) definitions are discovered to the experience (familiar to logicians and mathematicians) of recognizing logical relation, rather than comparing it to any type of sense perception. They speak of "understanding the meanings of words," of "logical analysis," of "understanding what is contained in a concept," rather than of seeing or grasping the "contents of the mind." There are, then, two kinds of world imagined by these theorists: a world of privately visible or tangible ideas, sense data, secondary qualities, and so forth and a world of abstract concepts or meanings. Some, like Kant, Husserl, and, most systematically, C. I. Lewis, posit both kinds of worlds.

What then do these two metaphors suggest, and how illuminating are their implications? The metaphor of the private world of sense data that is allegedly described by definitions of complex ideas suggests that such definitions, like reports of hallucinations, dreams, and other private experiences, must be taken at face value (provided that they are sincerely and consistently expressed), since they cannot be checked by public observation. This would account for the unchallengeable character of definitions and their analytic corollaries, in contrast to the corrigibility of empirical statements. But this view deprives definitions of any claim to objective validity and entails that every person has a right to his own definitions, in the same way that everyone has a right to his own dreams.

The metaphor of the world of concepts and meanings also attributes a self-certifying character to definitions but fares better with respect to the common-sense fact that we balk at some definitions and accept others—for the recognition of logical relations, no matter how intuitive, is a socially shared experience. We immediately and privately understand, see, or grasp that a statement of the form \( P \cdot Q \) implies a statement of the form \( Q \), but we can also argue the fact and summon evidence (in the form of postulates of a logical system) to prove it. But this metaphor, which of all those we have considered comes closest to not being a metaphor at all and blends imperceptibly into a prescriptive concept of definition, suggests both too much and too little. It suggests that definitions are logical truths and possess logical certainty. But although some definitions are worse than others, all logical truths are normatively equal. Moreover, the metaphor fails to indicate how definitions can be evaluated other than by their formal consistency (the standard by which we confirm a system of logical truths). Yet a definition of a cow as a three-legged animal would be universally rejected on grounds having nothing to do with inconsistency. The denial of a logical truth can be shown to involve a contradiction, but the denial of a definition leads to contradiction only if one has already accepted the definition. Although consistency is a sufficient condition for a system of logical truths, it is merely a necessary condition for sound definitions; yet no additional conditions are provided by logistic phenomenology.

**PRESRIPTIVISM**

E-type views claim that definitions are statements and that they make assertions that can be pronounced true or false. Essentialists, however, have difficulty explaining how and why definitions differ from ordinary statements of fact, and hence they fall back on metaphors. P-type theories avoid this trouble by denying that definitions are statements of any kind. The prescriptivist assimilates definitions to imperative sentences rather than to declarative sentences and endows them with the function of syntactic or semantic rules for prescribing linguistic operations.

There are two main varieties of prescriptivism. The nominalist variety explains definitions as semantic rules for assigning names to objects, while the formalist variety regards definitions as syntactic rules for abbreviating strings of symbols. P-type views of definition can be traced back to the Greek Sophists and Skeptics, but this article will concentrate on the modern sources of these views. The rebirth of science in the seventeenth century was accompanied by a sweeping rejection of medieval thought, in particular the medieval concept of definition as the penetration by metaphysical intuition into a realm of changeless forms. The nominalist theories of language employed by Sophist and Cynic contemporaries of Plato to undermine belief in the objectivity of knowledge, and again by the more radical medieval Scholastics to subvert the control of theology over science, became, in the seventeenth century, a cornerstone of the reconstruction of knowledge on a new scientific foundation.

Seventeenth-century writings on definition are not entirely free of the influence of classical essentialism. Seventeenth-century prescriptive theories of definition try to avoid the obscurities of essentialism by repudiating the informative role of definitions, but they cannot provide
adequate criteria for distinguishing good definitions from bad without presupposing some sort of informative role for them.

Nominalism. For Bacon and Hobbes, definitions possessed a therapeutic function, as a means of clearing up or avoiding ambiguous, vague, and obscure language. Regarding semantic confusion as the main source of intellectual trouble, they proposed to clear the way for a new system of knowledge by subjecting existing concepts to the test of definitional reduction to observable and measurable properties. Definition was thus a surgical knife for cutting away metaphysical encrustations, as described by Bacon in paragraph 59 of the Novum Organum:

But the idols of the market-place are the most troublesome of all: idols which have crept into the understanding through the alliances of word and names, and this it is that has rendered philosophy and the sciences sophistical and inactive. Whence it comes to pass that the high and formal discussions of learned men end oftentimes in disputes about words and names: with which it would be more prudent to begin, and so by means of definitions reduce them to order.

Thomas Hobbes also stressed the clarifying role of definitions, taking geometry as his model. In the Leviathan he wrote:

Seeing then that truth consists in the right ordering of names in our affirmations, a man that seeketh precise truth had need to remember what every name he useth stands for... or else he will find himself entangled in fards as a bird in lime twigs. And therefore in geometry, which is the only science which it hath pleased God hitherto to bestow on mankind, men begin at settling the significations of their words: which settling of significations they call definitions, and place them in the beginning of their reckoning.

Definitions thus clear up ambiguities and “settle significations,” rather than communicate information about a realm of essences. They are introduced at the beginning of inquiry, as in geometry, rather than at the culmination of inquiry, as in metaphysics and Aristotelian natural science.

According to Hobbes, all knowledge consists in the “right ordering of names in affirmation.” A proposition connects one name to another, and an inference adds or subtracts one proposition from another. The structure of scientific thought thus maps the structure of the physical world. It would seem then that, for Hobbes, all scientific knowledge is derivable from definitions. Yet Hobbes also stressed the role of perception in knowledge. The solution to this paradox lies in Hobbes’s conception of naming. All inquiry is deductive except for the assignment of names to things, and it is to the assignment of names that we must look for the empirical sources of knowledge. But it follows that definitions as assignments of names must be as informative for Hobbes as they are for Plato or Aristotle. This conclusion leads to a further paradox, for, according to Hobbes, definitions provide no information at all; they express conventional decisions to use particular signs as names of particular objects.

There is an ambiguity in Hobbes’s account of definitions that must hamper any attempt to reduce definitions to assignments of names. In order to make definitions entail all the propositions of scientific knowledge, Hobbes had to include, in the notion of naming, all the cognitive functions that we ordinarily distinguish from naming. He first compared the highly abstract and sophisticated definitions of concepts in mathematics and natural science to simple naming procedures such as baptism. Then, in order to account for the conspicuous differences between the two kinds of procedures, he was compelled to reinsert into the notion of naming the very distinctions he set out to eliminate. The reduction of definitions to assignments of names only appears to solve the problem of whether definitions are informative: It first suggests that definitions are as arbitrary as acts of naming and then suggests that naming is, after all, not always arbitrary.

Early formalism. Although the language used by the Cartesians of the seventeenth century in discussing definitions was similar to that of Bacon and Hobbes, their emphasis and direction of interest was different. Bacon and Hobbes were primarily concerned with the role of definitions in achieving semantic clarity, the Cartesians were more interested in the role of definitions in deductive inference. They developed a conception of definitions as theoretically dispensable abbreviations whose value lies solely in the notational economy they make possible. Cartesian references to “names” are rather misleading since, unlike Hobbes, the Cartesians did not regard assignment of names as the initial and fundamental process of inquiry from which the rest of knowledge is derived. This role was taken over by axioms and postulates which relate “simple” (i.e., indefinable) terms to each other, definitions then being introduced as rules for substituting brief expressions for logical complexes of simple terms.

Descartes did not give much attention to the subject of definition. In rejecting classical syllogistic logic as the framework of scientific inference, he abandoned the emphasis on terms or classes as the basic units of inference in favor of propositional units. The simplest inference became, for Descartes, the intuitive recognition of the implication of one proposition by another. Consequently, postulates replaced definitions as the foundation of deductive science, and essential definitions ceased to represent the highest goal of knowledge.

Pascal’s analysis of the nature and function of definitions made explicit the view of definition implicit in Descartes’s theory of knowledge. The main elements of Pascal’s discussion are formalistic. However, it is not free of ambiguity with respect to the purely notational role of definitions as against the informative role ascribed to them by essentialists.

Pascal’s theory of definition is expounded in a brief essay, De l’Esprit géométrique (Oeuvres, 14 vols., Léon Brunschvicg and E. Boutroux, eds., Paris, 1904–1914). He began by distinguishing two types of definition, définitions de nom, which he claimed to be the only type appropriate in science, and an unnamed type which seems to be what Aristotle called “real,” the type favored by essentialists, about which he therefor says nothing more.

Définitions de nom are said to be “mere impositions of names upon things that have been clearly indicated in
perfectly intelligible terms," as, for example, the definition of "even number" as "number that can be divided by two without remainder." Such definitions, Pascal claimed, are conventional labels that need have nothing in common with the things they name. They communicate no information about their nominata, expressing merely the decision of the writer to use them in the prescribed manner. The sole limitation on définitions de nom is that they be internally and mutually consistent.

When he discussed the methodology of definition, Pascal no longer regarded the relation between language and reality as purely conventional. We must make sure "not to define things that are clear and are understood by everyone." Geometry provides the model for definitional procedure. "It does not define such things as space, time, motion, number, equality . . . because these terms so naturally designate the things to which they refer, for those who understand the language, that the intended clarification would be more likely to obscure them than to instruct." One might think that, in saying "space naturally designates" its referent, Pascal meant that the word "space" is so familiar that everyone understands what it signifies. But why, then, should he interdict any definition of "space"? If definitions are notational conventions, there could be no objection to stipulating a new use of the word. Indeed, the ordinary use of "space" is quite different from its technical use in mathematics. Why, then, is it improper to define either the ordinary or the mathematical use? Surely, Pascal was not thinking of the word "space," but of space itself as an irreducible entity that cannot be analyzed into simpler components, and if so, then he was thinking of definition not as a notational convenience, but as an informative mode of analysis.

The Cartesian theory of knowledge by which Pascal was guided conceives of the world as a system of elements combined according to mathematical laws to form complex objects and events. While Descartes stressed the analytical reduction of complex propositions to simple ones (i.e., axioms), Pascal joined definitions to axioms as the basis from which the deductive reconstruction of science should start. But common to all the Cartesians is the assumption that knowledge is a mathematical mapping of the structure of nature. In the light of this epistemological atomism, the conventional character attributed to definitions contrasts sharply with the requirement that they correspond to an antecedent natural order—a requirement that leads back to essentialism.

Modern formalism. The formalistic conception of definitions as rules of notational abbreviation was only vaguely anticipated by seventeenth-century philosophers, who failed to separate this purely syntactic procedure from epistemological considerations such as mapping the order of nature. Only in recent times have formalistic discussions of definition been purified of epistemological assumptions, by (among others) Russell, Whitehead, W. V. Quine, Rudolf Carnap, C. C. Hempel, and Nelson Goodman. But it remains doubtful whether this purely formalistic view either is or can be consistently maintained.

Russell and Whitehead, in *Principia Mathematica* (Vol. I, p. 11), define a definition as follows:

A definition is a declaration that a certain newly introduced symbol or combination of symbols is to mean the same as a certain other combination of symbols of which the meaning is already known . . . . It is to be observed that a definition is, strictly speaking, no part of the subject in which it occurs. For a definition is concerned wholly with the symbols, not with what they symbolize. Moreover, it is not true or false, being the expression of a volition, not of a proposition.

This characterization of definition is not consistently syntactical. It defines "definition" in terms of sameness of meaning, while claiming that a definition "is concerned wholly with the symbols, not with what they symbolize." Later in the same passage, Russell and Whitehead declare:

In spite of the fact that definitions are theoretically superfluous, it is nevertheless true that they often convey more important information than is contained in the propositions in which they are used. This arises from two causes. First, a definition usually implies that the definiens is worthy of careful consideration. . . . Secondly, when what is defined is . . . something already familiar . . . . the definition contains an analysis of a common idea. (Ibid., p. 12)

The first and last sentence in the passage above express a nonsyntactical attitude toward definitions. Definitions turn out to be highly informative, and we seem to have returned to an essentialist view of the matter. But a further qualification has been attached, namely, "when what is defined is . . . something already familiar." In fact, two types of definition are being considered, one being a rule of notational abbreviation and the other an "analysis of an idea." But if some definitions are "analyses of ideas" and are highly informative, then these are the important kinds of definitions, and the formalist view proclaimed at the outset loses its force.

Similar difficulties attend the efforts of other modern logicians to deal with the problem of definition from a purely formal point of view. Thus, W. V. Quine, after asserting that "a definition is a convention of notational abbreviation," qualified his statement as follows:

Although signs introduced by definition are formally arbitrary, more than such arbitrary notational convention is involved in questions of definability; otherwise any expression might be said to be definable on the basis of any expressions whatever. . . . To be satisfactory . . . a definition . . . not only must fulfill the formal requirement of unambiguous eliminability, but must also conform to the traditional usage in question. ("Truth by Convention," in H. Feigl and W. Sellars, eds., *Readings in Philosophical Analysis*, New York, 1949, p. 252)

Nelson Goodman took the same position and fell into the same difficulties:

In a constructional system . . . most of the definitions are introduced for explanatory purposes. . . . In a formal system considered apart from its interpretation, any such definitional formula has the formal status of a
convention of notational interchangeability once it is adopted; but the terms employed are ordinarily selected according to their usage, and the correctness of the interpreted definition is legitimately testable by examination of that usage. (The Structure of Appearance, p. 3)

In common with many other logicians, Quine and Goodman distinguish between the function of definitions "in a formal system" and their function when the system is interpreted—that is, when definite meanings are assigned to the symbols of the system. But this distinction overlooks the fact that from a purely formal standpoint, there is no such thing as a definition at all. Before it is interpreted, the formula which we interpret as a definition is just a string of marks. From a "purely formal standpoint," not only is there no difference between a definition and a notational abbreviation, but there is no difference between a definition and any other kind of formula. There are only various strings of marks, some permitted by the rules of formation of the system, others excluded by these rules. Consequently, the distinction made by Quine and Goodman between definitions in a formal system and those in an interpreted system is seriously misleading.

Rudolf Carnap and C. G. Hempel have tried to clarify the difference between informative definitions and mere notational abbreviations by distinguishing between "old" and "new" concepts. Definitions of old concepts are called "explications" by Carnap and "rational reconstructions" by Hempel, while both call definitions of new concepts "notational conventions." When we are "explicating" or "reconstructing" a concept, our definitions are subject to evaluation by the criteria of conformity to usage and increase of precision (Rudolf Carnap, The Logical Syntax of Language, p. 23). When definitions are introduced solely for the purpose of abbreviation, only the criterion of consistency applies. One must therefore wonder why Carnap and Hempel should bother to call notational abbreviations "definitions," since they have nothing whatever in common with explications.

Perhaps the answer to this question lies in the logical difficulties lurking within the notion of explication. What does it mean to "reconstruct" or "explicate" a concept, and what precisely is the difference between "old" and "new" concepts? If definitions of old concepts must conform to established usage, are they not true or false statements about language usage, in which case the distinction between definitions and empirical statements disappears? These problems lead naturally into the linguistic theory of definition.

LINGUISTIC THEORIES

Anticipations of a linguistic view of definition may be found in classical writings (for example, in Aristotle's discussion of "nominal definition") and in the nominalist and formalist positions previously considered. But while early nominalism, attempted to reduce all the varied functions of words to that of proper names and thus to reduce meaning to the arbitrary assignment of a name to an object, formalism added linguistic considerations as an inessential afterthought. The first step from nominalism to an L-type view proper was taken by John Stuart Mill, although his formulations are permeated with elements of both nominalism and essentialism. A further step was taken by C. E. Moore, but Moore's discussion also contains a heavy strain of essentialism. The clearest formulation of the linguistic view was provided by Richard Robinson in his book Definition, which has the distinction of being the only book in the English language devoted to this subject.

In his System of Logic, J. S. Mill defined "definition" as follows: "The simplest and most correct notion of a Definition is, a proposition declaratory of the meaning of a word; namely, either the meaning which it bears in common acceptation, or that which the speaker or writer... intends to annex to it" (10th ed., p. 86).

Mill then explained that a definition is a "verbal proposition" that "adds no information to that which was already possessed by all who understood the name (defined)—a tautology that Mill mistook for an important observation. But, unlike the thoroughgoing prescriptivist, Mill did not regard definitions as purely conventional stipulations, at least insofar as terms in general use are concerned:

It would, however, be a complete misunderstanding of the proper office of the logician in dealing with terms already in use, if we were to think that because a name has not at present an ascertained connotation, it is competent to anyone to give it such a connotation at his own choice. The meaning of a term actually in use is not an arbitrary quantity to be fixed, but an unknown quantity to be sought. (Ibid., p. 91)

At this point, Mill conceded that some definitions are not mere "declarations" but convey some kind of information about "unknown quantities to be sought." Mill gave two reasons for this departure from prescriptivism. The first consideration involves him in a tug of war between nominalist and linguistic theories. "Since names and their significations are entirely arbitrary, such (verbal) propositions are not, strictly speaking, susceptible of truth or falsity, but only of conformity or disconformity to usage or convention; and all the proof they are capable of is proof of usage" (ibid., p. 92).

In this instance, Mill first denied and then asserted that definitions are informative. If "all the proof they are capable of is proof of usage," then they are capable of proof after all, despite his initial disclaimer of this possibility.

Mill's second reason for ascribing at least a quasi-informative function to some definitions resembles, to some extent, the phenomenalist conception of definition as analysis of complex ideas into simple constituents. Mill wrote:

A name, whether concrete or abstract, admits of definition, provided we are able to analyze, that is, to distinguish into parts, the attribute or set of attributes which constitutes the meaning both of the name and of the corresponding abstract. . . . We thus see that to frame a good definition of a name in use is not a matter of choice but of discussion. . . . not merely respecting the usage of language, but respecting the properties of things, and even the origin of these properties. (Ibid., p. 91)

The source of Mill's shifts of emphasis and inconsistencies lies in the ambiguity of his notion of meaning. At
times he identified the meaning of a term with the object it 
"names," at other times with the customary usage of the 
word, and at still other times with an abstract object or 
"idea" capable of being divided into simpler parts. Thus, 
depending on which conception of meaning he had in 
mind, he thought of a definition as the stipulation of a 
name, a report of linguistic usage, or the analysis of a com- 
plicated idea into its constituent parts.

G. E. Moore. The extent to which G. E. Moore's ap- 
proach to definitions can properly be called "linguistic" is 
debatable. Moore placed less stress on the linguistic aspect 
of definition than later philosophers such as Ryle, Straw- 
son, and Robinson, who were influenced by Moore's ana- 

tactical method. For Moore, as for Socrates, the clarification 
of language was only a means toward the discovery of 
deep philosophical truths. But there can be no doubt that 
Moore inspired others to concern themselves with lan-
guage and that his painstaking attention to the nuances of 
words was the most distinctive feature of his work.

In his *Principia Ethica*, Moore characterized "analyti-
cal" definitions (the kind produced by philosophical 
analysis) as follows: "Definitions of the kind that I was 
asking for, definitions which describe the real nature of the 
object or notion denoted by a word and which do not 
merely tell us what the word is used to mean, are only 
possible when the object or notion is complex" (p. 7).

In order to indicate the kind of descriptive information 
that he expected philosophical definitions to provide, 
Moore offered an example that is as misleading as it is 
famous: "When we say . . . 'The definition of horse is 
'a hoofed quadruped of the genus Equus,' . . . we may 
mean that a certain object, which we all of us know, is 
composed in a certain manner: that it has four legs, a head, 
a heart, a liver, etc., all of them arranged in definite rela-
tions to one another" (*ibid.*, p. 8).

This passage is curious; it suggests that an analytical 
definition lists the physical parts of the thing defined. The 
example, however, gives the species and differentia of the 
class of horses but does not mention any physical parts. In 
commenting on this passage in his *Reunion in Philosophy* 
(p. 184), Morton White has observed that Moore shifted 
inaudiently from logical to physical complexity.

In later writings, Moore maintained that concepts are the 
proper subject matter of definition. "To define a concept," 
he wrote, "is the same thing as to give an analysis of it" 
("Reply to My Critics," in *The Philosophy of G. E. Moore*, 
pp. 664–665). It is not easy to tell just what Moore meant 
by "concept analysis." For the analysis of a concept, he 
offered three criteria which add up to the relation of syno-
nymy of expressions. Thus, despite his explicit effort to 
find an informative function for definitions that goes be-
yond the explanation of how words are used, it is not unre-
asonable to conclude that all that his obscure notion of 
"analyzing a concept" finally comes to is linguistic
clarification. In denying that analytic definitions "merely 
tell us what the word is used to mean," Moore was reject-
ing the view that definitions are generalizations about 
common usage and suggesting that they have a more ex-
planatory function. But he never made clear what that 
function is.

In the only full-length volume in English devoted to the 
study of definition, Richard Robinson formulated a purely 
linguistic account of definitions as reports of word usage. 
But he thought it necessary to supplement his main view 
with a "stipulative," or prescriptive, account. The reasons 
for his vacillation are that reports of usage are empirical 
generalizations, while definitions are, if acceptable at all, 
necessary truths, and that stipulations are uninformative, 
while definitions are highly informative. Thus, neither the 
linguistic nor the prescriptive interpretation accounts for 
all features of definitions. But the mere juxtaposition of 
the two can hardly overcome the defects of each taken sepa-
rately.

**A PRAGMATIC–CONTEXTUAL APPROACH**

Linguistic theories of definition brought needed atten-
tion to the close relation between definitions and the 
meanings of words, but they erred in identifying meanings 
either with objects or concepts allegedly denoted by words 
or with linguistic usage. A correct theory of definition 
would unite the partial insights of E-type, P-type, and 
L-type views without relying on misleading metaphors, 
denying the obvious informative value of definitions, or 
reducing definitions to historical reports of linguistic 
behavior.

Why should essentialists and linguistic philosophers 
claim that definitions convey knowledge, while prescrip-
tivists deny that they do? In some sense of the word 
"knowledge," anyone would agree that definitions com-
municate knowledge. The problem is to identify a special 
sense of "knowledge" that is appropriate to definitions but 
does not require us to postulate obscure essences or to 
reduce definitions to historical reports. This special kind 
of knowledge may be knowledge of how to use words 
effectively. Use, unlike usage, is functional. As Gilbert 
Ryle has observed, there are misuses and ineffective uses, 
but there is no such thing as a misusage or ineffective 
usage ("Ordinary Language," in *Philosophical Review*, 
Vol. 42 1953). Usage is what people happen to do with 
words and is determined by habits, while use is what 
should be done with words and is governed by rules. To 
explain the right use of a word, as distinct from merely 
reporting its usage, a definition must give the rules that 
guide us in using it. In this respect definitions are rules, 
rather than descriptions or reports.

All three traditional theories of definition assume, mis-
takenly, that if definitions convey knowledge, then the 
knowledge they convey is of the same type as that con-
veyed by ordinary statements of fact. Essentialists con-
clude that the knowledge conveyed by definitions is 
descriptive knowledge of essences, linguistic philosophers 
conclude that it is descriptive knowledge of language 
usage, while prescriptivists maintain that definitions do 
not convey knowledge of any kind. There has been a 
strikingly similar three-way dispute over the status of 
value judgments: nonnaturalists hold that value judgments 
convey knowledge of an abstract realm of "values"; natu-
nalists maintain that they convey knowledge of observable 
causal relations; and emotivists assert that they convey no 
knowledge whatsoever. Arguments about whether defi-
nitions and value judgments convey true or false infor-
mation mistakenly presuppose that all information must be of the descriptive type, thus overlooking the fact that cookbooks, military manuals, Sunday sermons, and do-it-yourself instruction sheets all convey, in various ways, the kind of normative information that Ryle has called "knowledge-how" in *The Concept of Mind* (Ch. 2). Practical or ethical advice may be regarded as stating rules that inform us how to act effectively, while definitions provide rules that inform us how to speak or write effectively. In either case it may be said that the information conveyed is subject to being evaluated as good or bad, but not to being verified as true or false.

Applications of a contextualist view. The three views of definition distinguished above fail to provide adequate criteria for distinguishing good definitions from bad ones. The assumption that the criteria of a good definition can be stated independently of the specific context in which the definition is offered and the purpose it is intended to serve. But no brief list of criteria can be given that would enable us to judge at sight whether a definition is adequate. The most we can do on a general level is to classify the kinds of rules of use that definitions provide, the kinds of discursive purposes they serve, and to say generally that definitions are good if and only if they serve the purpose, for which they are intended.

Thus, an evaluation of a definition must begin with the identification of the point or purpose of the definition, and this requires knowledge of the discursive situation in which the need for the definition arises. We use words to incite ourselves and others to action, to express and share emotions, to draw attention to things, to memorize, to make inferences, to evoke and enjoy images, to perform ceremonies, to teach, to exercise, and to show off. It is when we are unsure of the most effective use of an expression for one of these purposes, that we seek a definition.

Linguistic rules. Rules governing the uses of words can be sorted into three main types: (1) referring rules, which aid us in identifying the things or situations to which a word may be applied; (2) syntactical rules, which govern the ways in which a word may be combined with other words to form phrases and sentences; and (3) discursive rules (the most difficult to formulate), which indicate when we may use language metaphorically (as in poetry) and when we must use it literally (as in science), as well as indicating differences of category or logical type (for example, the rule that one cannot predicate human qualities such as intelligence of inanimate things such as machines) and indicating when a word should be used in one sense rather than another (for example, "space" in mathematics as distinguished from physics). Discursive rules are the genuinely philosophical rules.

Rules for defining. The practical value of any account of the nature of definition is to be found in the clarity of the standards it provides for judging when a definition is good or bad. How does the pragmatic—contextualist account fare in this respect?

A number of rules of thumb for evaluating definitions have become canonical in the literature on the subject despite the fact that they make no clear sense in terms of any of the traditional views. The following rules can be found in practically every textbook on logic. They were first suggested by Aristotle in his *Topica* and have survived without change by sheer weight of tradition:

1. A definition should give the essence or nature of the thing defined, rather than its accidental properties.
2. A definition should give the genus and differentia of the thing defined.
3. One should not define by synonyms.
4. A definition should be concise.
5. One should not define by metaphors.
6. One should not define by negative terms or by correlative terms (e.g., one should not define north as opposite of south, or parent as a person with one or more children).

Significance of the rules. Rule 1, which makes sense only according to the essentialist theory, is nevertheless accepted by many writers who hold a prescriptive or linguistic view of definition, although these writers usually mean that a definition should indicate the properties that define the meaning of the term in question rather than those that just happen to hold true of the objects to which the term applies. But in such a case, the rule is vacuous; it asserts only that a definition should define rather than describe.

Rule 2 deserves its high status only if one accepts Aristotle's extension of biological classification to metaphysics, but it retains a limited value when it is reinterpreted in linguistic terms. We may understand "genus" to mean what Ryle has called the logical grammar of a term. The term defined need not be the name of any natural species or, for that matter, any object whatsoever. In defining words like "function," we do not identify a class of objects. We define a function as a certain type of relation, thus indicating that whatever can be said about relations in general can also be said about functions in particular. We thus provide a rule of syntax governing the word "function," indicating with what other words it may be combined. The differentia of function—namely, that the relation is many—one between two variables—is a referring rule (criterion of identification) that helps us to identify the situations or formulas to which the term "function" may be applied. But it is wrong to think that the genus and differentia are necessary for a good definition. What must be stated in a definition varies with the definition's purpose. The genus may already be known and only the differentia needed or vice versa. Moreover, there are types of definition, such as contextual and recursive definition, that cannot be expressed in genus—differentia form. Contextual and recursive definitions provide rules for substituting a simpler expression for each of an infinite number of complex expressions of a given type.

Synonyms. The rule that forbids defining by a synonym makes sense only on the contextualist view of definitions as rules of use, although it has long been cited by supporters of the traditional views. The same books that cite this rule also insist that the definiendum must be logically equivalent to the definiens. But a synonym is just an expression that is logically equivalent to a given expression. The trouble seems to be that the term "synonym" is employed in a vaguely restricted sense to signify not just any logically equivalent expression, but a very brief one. Thus, we often find the injunction, "Do not define a word by a single other word." But this formulation, while
sufficiently clear, is misleading. Is a two-word definition, such as "phonograph disc" for "record," a case of defining by a synonym or not? Just how many words may the definiens contain if it is not to violate this rule?

To make matters worse, the prohibition of synonyms is inconsistent with rule 4, which demands that a definition be concise; indeed, the more concise the definiens, the more it looks like a synonym. However, we can understand a rule only if we know what specific purpose the rule is intended to serve. A contextualist view of definitions provides the following solution to the conflict between conciseness and nonsynonymity.

Single-word definitions are seldom useful because if a person does not know the rules governing the definiendum, he is not likely to know the rules governing the definiens. The more words there are in the definiens, the more likely it is that those for whom the definition is offered are familiar with some of the words and thus understand some of their rules of use. Everyone has experienced the frustration of looking up a word in a dictionary and being confounded by some equally unfamiliar synonym.

But why should definitions be concise if the greater the number of words, the greater are our chances of at least partial comprehension? One obvious answer is that brief explanations are easier to remember. A second answer is that a lengthy definiens is more likely to suggest some rules of use that are inessential to the definiendum. But the most important consideration has to do with the kind of discursive context in which the definition is employed. In mathematics and in other formal contexts such as jurisprudence and contractual language, the purpose of most definitional equations is to abbreviate discourse or notation. In such cases it is a virtue rather than a defect for the definiens to be long and complicated, since it is precisely this fact that makes the definiendum worth introducing as an abbreviation. Moreover, the complexity of the definiens is less likely to produce confusion in technical contexts because of the great pains taken to preserve consistency and precision of language. In contrast, the rule of conciseness is more appropriate to informal discourse, in which definitions are intended to translate or otherwise clarify an expression unfamiliar to some of the participants. In informal discourse, the definiens should be brief, while in formal contexts, the longer and more complicated the definiens, the more useful the definition. Clearly, one can make little sense of criteria of good definitions without specifying the context in which and the purpose for which a definition is needed.

**Figurative language.** Why should a definition avoid figurative language? This traditional injunction is probably a result of the concentration of classical philosophy on formal discursive contexts such as mathematics and natural science, in which figures of speech are usually out of place. But in informal contexts such as conversation, literature, public debate, and even the less technical discussions of scientists, figurative language may well be the most effective way of getting a point across, and it is certainly the only way to define expressions whose meaning is essentially figurative (for example, "fathead" may be defined as "a fool puffed up with vanity"). No literal definiens can do justice to the nuances of natural discourse, as every translator knows from bitter experience.

**Negative and correlative terms.** Why not define by the use of negative or correlative terms? This injunction, in contrast to rule 5, holds for informal discourse and becomes senseless when applied to formal discourse. It is perfectly proper in mathematics or logic to define "−p" as "the negation of p" or to define "F⁻¹(x)" as "the inverse of the function F(x)." The reason for prohibiting negative and correlative definitions in informal contexts is that a person who is unclear about the rules of use of the definiendum would be just as puzzled about the rules of use of a negative or correlative definiens.

**Meaning equations.** In the light of the preceding discussion, it is advisable to look again at the problem of synonymy. It has already been noted that every meaning equation—that is, every definition of the form "E" means (or means the same as) "x, y, z"—provides a definiens that is synonymous with its definiendum. The very point of the definition is to assert this synonymy and thus to transfer the rules of use already known to govern the definiens to the presumably less familiar definiendum. In order to make sense of the traditional injunction against synonymous definitions, we found it necessary to interpret the synonymy in question as a special and restricted subtype of synonymy, measured by the number of words in the definiens. But although it is absurd to require that a meaning equation must not offer synonyms (in the general sense of "synonym"), it is quite sensible to cast doubt on the usefulness of meaning equations. Meaning equations provide a kind of definition misleadingly called "explicit," in contrast to axioms and postulates, which are frequently regarded as "implicit" or "partial" definitions.

It is unfortunate that meaning equations have come to be called "explicit" definitions, because their function, as we have seen, is to transfer rules of use from definiens to definiendum without articulating the rules in question, so that the rules remain implicit. The most explicit kind of definition, the kind that actually states the rules governing the use of an expression, is a very complicated matter. Outside of technical contexts, it is doubtful whether complete definitions of this kind can ever be provided. On the other hand, it is just as doubtful whether a complete articulation of all the rules of use of the definiendum need be given. We seldom, if ever, require more than one or a few rules of reference, logical grammar, or relevant discourse that happen to be obscure to us in a particular context. Thus, meaning equations are frequently neither the most valuable nor the most appropriate kind of definition. In technical discourse, contextual, recursive, and operational definitions play a far more important role than mere notational abbreviations. And in nontechnical contexts, such as teaching a child or a foreigner the use of a word, definitions by illustration, by enumeration of instances or enumeration of subclasses, and by an indefinite number of other devices (depending on the ingenuity and linguistic sensitivity of the parties concerned) are usually more appropriate and effective than meaning equations. The evaluation of specific definitional procedures remains an important task for philosophically minded experts in each field of discourse and inquiry.
DEGREES OF PERFECTION, ARGUMENT FOR THE EXISTENCE OF GOD. The proof for the existence of God from degrees of perfection, sometimes called the Henological Argument, finds its best-known expression as the fourth of Thomas Aquinas' "Five Ways" in his Summa Theologiae Ia, 2, 3. It is here quoted in full:

The fourth way is based on the gradation observed in things. Some things are found to be more good, more true, more noble, and so on, and other things less. But comparative terms describe varying degrees of approximation to a superlative; for example, things are hotter and hotter the nearer they approach what is hottest. Something therefore is the truest and best and most noble of things, and hence the most fully in being; for Aristotle says that the trues things are the things most fully in being. Now when many things possess some property in common, the one most fully possessing it causes it in the others: fire, to use Aristotle's example, the hottest of all things, causes all other things to be hot. There is something therefore which causes in all other things their being, their goodness, and whatever other perfections they have. And this we call God.

Comparatives and superlatives. A distinctive feature of the Fourth Way is the principle that "comparative terms describe varying degrees of approximation to a superlative; for example, suppose "whiter than" is such a comparative term. The judgment that bond paper is whiter than newsprint would then be more adequately expressed as "The color of bond paper is closer to pure white than is the color of newsprint."

"The color of bond paper is closer to the color of newsprint than the color of newsprint is close to the color of lemons," and here "closer to" obviously does not describe a degree of approximation to pure white. If "closer to," used to compare colors, does describe degrees of approximation to a superlative, the superlative must be the greatest possible similarity between colors, that is, qualitative identity of colors. Perhaps the initial judgment should then be expressed as "The similarity between the color of bond paper and pure white is closer to the greatest possible similarity than is the similarity between newsprint and pure white."

But here there is still a comparative term, "closer to," used to compare similarities between colors. It seems impossible to define a comparative term by means of a superlative without using another comparative term, and we are on our way to an infinite regress. If all comparative terms describe degrees of approximation to a superlative, then any comparative judgment implicitly refers to infinitely many superlatives.

But perhaps not all comparative terms describe degrees of approximation to a superlative. Suppose "closer to" (as used to compare colors) does not, and therefore the infinite regress can be cut short. Then "closer to" can be used to define "whiter than," and the definition need not refer to pure white, or to any other superlative. This is a reason for denying that "whiter than" describes a degree of approximation to a superlative. The definition runs as follows: