LANGUAGE, as a function of man, is a frequent subject of inquiry in the course of Aristotle's scientific investigations; for language not only has a natural basis in man's bodily organs and psychological powers, but it is, in turn, one of the natural bases of the virtues and of social and political relations, and it constitutes the natural means of imitation in the art of literature and the matter of which literary works are formed. In addition to such inquiries into the foundations of language in human organism, moral agent, and aesthetic object, Aristotle turns his attention to questions concerning the operations of language, for it can be put to various uses, and it can in any of them contravene as well as accomplish the purpose to which it is directed. Finally, on the background of these considerations of language as natural phenomenon and as rational instrument, Aristotle analyzes the arts of language in terms of symbolic properties and linguistic structures. Logic, rhetoric, and poetic are none of them purely "verbal arts" in Aristotle's philosophy: they are based on the natural properties of words, which are determined by physiological organs and physical medium, as well as on the conventional meanings which are determined by human reason and desire; they take into account the purposes for which men use language as reflected in the intentions of the speaker, the susceptibilities of the audience addressed, and the nature of the communications for which it serves as medium; and they treat, finally, of discourse in its various forms and relative to its proper parts. Language, as natural phenomenon, is part of the subject matter of the sciences— theoretic, practical, and productive. Language, as conventional medium adequate to, or at variance with, the purposes for which man uses it, is both an instrument and a problem in the formation of these sciences and in the development and acquisition of knowledge, virtues, and arts. Language, as artificial composition and symbolic structure, is the end of the numerous arts which are employed in scientific demonstrations, practical communications and regulations, and aesthetic compositions.

Since language is part of the subject matter in practical and productive as well as theoretic scientific investigations, the discussion of language and even the meanings of the basic terms of that discussion extend far beyond purely material or verbal problems. The physical sounds which man uses to convey meanings and the physiological organs by which the sounds are produced are objects of physi-
words as various as "speech," "statement," "definition," "argument," "reasoning," and "reason"; but its practical extensions in ethics involve regulative aspects, and λόγος has seemed to some scholars to have lost in that context the significance of both "speech" and "reason" and to have come to mean "rule," "formula," "ratio," "rational principle," and "reasoning." Language is, finally, a subject matter in the productive sciences, both in the sense that words and expression are the matter from which the concrete compositions of poetry, literature, and all varieties of communication and

1 Cicero conceived logic or dialectic to consist in ratione et in disserendo or, more simply, as disserendi ratio; it consisted of two arts which covered the whole field of ratio et oratio—an art of discovery and an art of statement or judgment (cf. De finibus iv. 4, 8). Men are distinguished from other animals by the possession of reason and speech (De officiis i. 4, 11-12). Medieval writers learned from Isidore of Seville to associate speech and reason on Greek authority: cf. Etymologiae ii. 24, 7: "λόγος enim apud Graecos et sermonem significant et rationem." Cf. a R. McKeon, "Rhetoric in the Middle Ages," Speculum, XVII (1942), 15.

In his article, "On the Meaning of λόγος in Certain Passages in Aristotle’s Nicomachean Ethics," (CR, XXVII [1913], 113-17), J. Cook Wilson undertook to show from a survey of a large number of important passages that the word means neither ‘definition’ nor ‘rule’ but always ‘Reason’ in Aristotle’s use of it in ethics. "The conclusion then is that in all the passages reviewed λόγος means Reason in one of three senses: either (1) reason as the faculty of reason, or principle of reason in the soul, or (2) reason as reasoning; or (3) reason as what is reasonable, in the sense of the deliverance of reason—reason as ordaining the moral law, reasoning as imputing it, or the moral law itself as a form of reason." (p. 117). The use of Reason to translate λόγος seems to J. L. Stocks to involve the term in such monstrous ambiguity as to suggest the desirability of eliminating it, if Mr. Wilson’s thesis is well grounded, from our philosophical vocabulary. He argues ("On the Aristotelian Use of λόγος: A Reply," CQ, VIII [1914], 9-12) that λόγος means the end of action, that is, the plan, ideal, or intention, or else the form of action, that is, its principle or soul, but never reason. Aristotle’s use of λόγος in psychology, on the other hand, seems to Mr. Stocks evidence that Aristotle was saturated with Platonism: it is a matter of indifference whether the term be translated "form" or "ratio," provided form be understood to be separated or isolated from matter ("λόγος and μορφή in the De anima," JP, XXXIII [1914], 182-94). In 1915, when the Oxford translations of the Great Morals, the Eudemian Ethics, and On Virtues and Vices were published, W. D. Ross, general editor of the Oxford translation, prefixed to them a brief Preface in which he chided the translators for rendering λόγος, "in the traditional way, as ‘reason.’ Personally,” he goes on, “I doubt whether this rendering is ever required, but the final choice in such a question rests with the translators.” Ten years later he called attention, in another brief Preface set before his own translation of the Nicomachean Ethics, to the difficulty of translating terms like λόγος and μορφή which are just crystallizing into technical meanings. He translated λόγος by expressions like "rational principle," "rational ground,“ "reasoning," "argument," "rule," "rule of life."
expression are formed and in the sense that the form in each variety of composition is found in the analysis of its proper λόγος or argument.

Language has many uses to which it has been put by man and many purposes which it may serve, and although these uses have as natural basis the properties and effects of language, its meanings are determined by habit and convention. The criteria which are pertinent to the judgment of statements intended to serve the various purposes of linguistic use are themselves various, and although any given statement may happen, in its various contexts, to achieve several purposes, it is possible to separate those purposes and indicate the considerations pertinent to judging their achievement. In the theoretic use of language the criteria are to be found in adequacy to the expression of a subject matter; in the practical use of language the criteria are to be found in the effect of language or reason in the moral control of desires and convictions, while the related criteria of rhetoric are in appropriateness to the effect intended to be produced in an audience of a particular character; in the poetic use of language the criteria are to be found in the qualities achieved in the work of art. A scientific composition may be considered in terms of its effect on an audience or in terms of its intrinsic beauty; or a poem may be treated in terms of its truth, its popularity, and its social effectiveness; but even such shifts of consideration depend on the possibility of differentiating those properties of a statement which make it theoretically significant, practically effective, and poetically beautiful.

The use of symbols as instruments of scientific inquiry and proof depends both on the nature of things, which the symbols must express translucently without distortion due to the peculiarities of the symbols or the passions or convictions of minds, and also on the properties of symbols by which such expression is possible. The end of scientific inquiry is to make the statement of principles and conclusions approximate accurately the nature and divisions of things: when this is done, according to Aristotle, “argument” (λόγος) and “form” (εἶδος) become equivalent expressions. The achievement of truth, then, depends not only on knowledge of the form in things but also on awareness of the properties of language which make it possible to reproduce the form in argument: the characteristics of individual words and terms, their combinations in assertion and proposition, and the rules for their use as end and middle terms in argument and inference. This identity of form and statement can be achieved, not by measuring particular propositions against actual circumstances which they are meant to designate, but by discovering essential connections and causal laws and by relating particular propositions to the universal propositions which state such laws. The danger of error and fallacy in the search for scientific proofs arises from the obvious fact that the principles of an argument are not always statements adequately based on the nature of things; sometimes they are the expression of widely received opinion and sometimes distortions of received opinion, and sometimes, when the principles are true expressions of opinion, the conclusions only seem to follow from them as verbally plausible consequences. The use of language as a logical instrument can be differentiated into demonstrative, dialectical, and sophistical modes, each with its appropriate problems and canons. The analytic of demonstration or the use of language in the processes of scientific in-

1 Metaphysics iii. 2. 996b5-8; viii. 4. 1044b12-13; On the Soul l. 1. 403b24-25, 403a1-2; ii. 2. 414a4-14.
quiry and proof is therefore concerned with the adequation of language to the nature of the classes of things appropriate to the various sciences. The topical analysis of statements and arguments or the use of language in the processes of dialectical question and answer is directed to clarify the implications of opinions more or less commonly held and to discover new propositions and principles, and it is not confined to a definite class of subjects but is universal. Sophistic differs from dialectic because of the moral intention of the sophist and the consequent differences of his use of language rather than because of a difference of the faculty or art, which he shares with the dialectician, of manipulating words and opinions.

The use of symbols as instruments of practical action depends on expressing the rule of rationality in individual action and on communication and control in communal action. Moral action depends on the rule of right reason (δικαιοσύνη), and right reason differs from scientific truth, since it is concerned with the purposes, circumstances, and ends for which the prudent man may formulate the rule of what should be done, rather than with the natural causes or universal propositions by which the scientist may formulate the law of what happens always or for the most part. Political action depends on communication, and community depends on the existence or formulation of right laws. Yet arguments may also be used as persuasion to any conviction or purpose without due concern with objective moral standard or political circumstance; and the rhetorical use of words is therefore distinct from ethics and dialectic, although it has affinities with and likenesses to both, and it is sometimes wrongly confused with politics. Rhetoric is like dialectic and unlike the practical sciences of ethics and politics in not being limited to any one subject matter; but "rhetoric" is unlike "dialectic" in that it may refer not only to the knowledge of an art but also, like "sophistic," to the moral purpose with which the art is used. When principles are established by consulting opinions and probabilities rather than by direct inquiry into the nature of things, the proof is dialectical rather than demonstrative or scientific, and any argument may be applied dialectically to a variety of subject matters. When the consideration of justice and the good is based on commonplaces determined by the opinions of men, rather than on a consideration of moral habits or social institutions, the influence of discourse is rhetorical rather than moral or political, for arguments may be found by the use of rhetoric for and against any action or any end. The application of discourse to its subject matter is achieved differently in the theoretic and the practical sciences; and it is possible to shift from principles warranted by subject matter in either theory or practice to principles warranted by appeal to opinion—to a statement of probability dialectically grounded in the consensus of men or of scientists or to a statement of expediency, justice, or honor rhetorically grounded in the circumstances and the convictions and emotions of particular audiences and groups of men. In both dialectic and rhetoric, moreover, a further shift of argument is possible from the authority of widespread and well-grounded opinion to the distortion of opinion or the manipulation of consequences derived from opinion; this shift in the moral attitude toward the opinions and words used constitutes the difference between dialectic and sophistic and distinguishes one of the possible modes of rhetoric.

The use of symbols as matter and means of artistic production, finally, de-
pends on the properties of symbols as such, their use symbolically for the presentation of thought and the representation of action, and the organization of symbols in the “argument” (λόγος) of a literary work. Language is the means of imitation in literature; it is the matter from which a poem is constructed; and the form of the poem, however much it may depend on the subject treated, is achieved by devices which may be recognized in the manner and organization of the expression. The characteristics of words as sounds, rhythms, and styles are the particular concern of this use of language; and, whereas they are also pertinent to achieving rhetorical ends, the prose of rhetoric is differentiated from poetic discourse by its closer approximation to ordinary speech. The characteristics of words as symbols, however, are no less important; and the poetic use of language is similar to the practical, since the element of thought in tragedy—to take the example on which Aristotle has stated his position most fully—may be defined as saying whatever can be said or what is appropriate to the occasion, and not only do the speeches in tragedy fall under the arts of politics and rhetoric, but language is the means of relating the thoughts of a character to his actions. Finally the action in a play, like the subject matter in a science, is presented by the argument (λόγος) or plot (μίθος). The problems and faults, like the devices, of poetic composition are distinct from the similar difficulties encountered in the theoretic or practical uses of language. Impossibilities and improbabilities are faults in the poetic treatment of actions; but they may be justified if they serve the ends of poetry by making the action more astounding; and, in general, a convincing improbability is preferable, for the purposes of poetry, to an unconvincing possibility.

Moreover, if the poet’s description is not true in fact, it may be convincing as a representation of what the object ought to be; and if it is neither true nor a presentation of what ought to be, it may be defended if it is in accordance with opinion. Again, if what is said and done is not morally right, it may be defended as appropriate to persons and circumstances. Finally, other problems of aesthetic and literary criticism are found in the need of recognizing the strange words the poet may use, of understanding his metaphors, and, in general, of interpreting the language of his text, as well as in those problems of clarity, accuracy, and appropriateness for which analogues may be found in logic and rhetoric.

Once the nature of language and the variety of its uses have been recognized, it is possible to treat language in terms of the art of constructing “arguments.” For any analysis of discourse, whatever the theory on which it proceeds, must ultimately treat the constitution of a body of words in terms of its structure and appropriate parts. Since Aristotle differentiates a great variety of “arguments,” he seeks different structures and parts in the analysis of arguments, depending on the purpose for which the argument has been constructed. Demonstrative, dialectical, and sophistic “arguments” all have the ostensible purpose of formulating true or probable statements, and the criteria of their construction are in some reference to the facts. The parts of such arguments are univocal “terms” combined as nouns and verbs in “propositions,” which are true or false, and “syllogisms,” in which inference is made from the truth, necessity, or probability of certain propositions to that of others. In rhetorical “arguments” or speeches, it is possible to separate the consideration of arguments from that of style, that is, questions of what ought to be said.
from questions of how it ought to be said; but the criteria of both must be sought in reference to the audience, and only secondarily to the subject of discourse as determined by the audience. The parts of rhetorical arguments, like the parts of logical propositions, are nouns and verbs; but, since the connections in rhetorical argumentation are frequently verbal rather than inferential, conjunctions assume great importance; and, since metaphorical terms may be added to literal terms for purposes of persuasion, the construction of metaphors is of particular interest to prose writers. In the combination of statements into enthymemes and examples, proofs and apparent-proofs, and, finally, into speeches, the great stylistic virtues are clarity and appropriateness. Poetic “arguments” or plots are statements of action in narrative or dramatic form and are dependent, therefore, on the verbal expression of thought as representation of character. The criteria for the construction of the plot are to be found neither in the adequacy of the representation to what happens to be the case nor in the moral or practical responses of audiences, but in the structure which is achieved in the interplay of action, character, and thought pertinent to the poetic end. The parts of such “arguments,” since they depend not only on connections demonstrated between facts or expressed between statements but also on connections perceived between the sounds and inflections of words, include the letter and the syllable as well as words—the conjunction, the article, the noun, and the verb—the cases of words and the speech (λόγος) itself; they go beyond the metaphorical expressions of rhetoric to the more unusual words proper to poetry, but not to prose, combined in more inclusive metaphorical statements, and the poem itself may be viewed as a speech resulting from conjunction of speeches.

Aristotle treated language, as subject matter, in the several sciences adapted to the investigation of the physical medium and organic production of sounds, the psychological bases of meanings, the practical use of discourse and communication, and the artistic production of literature. The variety of dimensions suggested in the scientific analysis of language as a physical, biological, psychological, moral, political, and poetic phenomenon indicates the variety of purposes to which language is put and the variety of sources from which criteria of its use may be sought for different purposes: from the subject matter of the discourse; the intentions, ideas, feelings, or purposes of the speaker; the susceptibilities or expectations of the hearer; the standards of excellence set by prudence for action or discovered in the object of art. The nature and uses of language determine the three arts of language—logic, rhetoric, and poetic—which Aristotle, following the implications of his philosophy, organized as separate arts. In each he initiated manners of analysis which were long influential in the development of the art and meanings which were long attached to many of its fundamental technical terms. Aristotle did not, however, set up a philosophy of language or a science of symbols or signs. Significances are not natural, although both signs and what is signified may be; and there is no natural symbolic entity apart from the natural phenomena of language and its theoretic, practical, and productive uses. In the philosophy of Aristotle, sciences and arts are differentiated by their subject matters and purposes, and the several uses of language lead to the differentiation of logic, rhetoric, and poetic as the proper arts of language. The historical treatment of
Aristotle's contributions to the linguistic and symbolic aspects of these arts has usually been conditioned by the supposition on the part of scholars and historians that there is a proper approach to language or a unified science of language—philology, grammar, psychology, logic, or semantics—and even in that history of reactions to Aristotle that goes by the name of "Aristotelianism" or "Aristotelian scholarship," Aristotle's treatment of language has been criticized both for separating language impossibly from its functions and for making it depend inseparably on commitments concerning things other than pure language. His logic has been censured as formal or verbal or even as restricted to the peculiarities of the Greek language and, not less frequently or more plausibly, as departing from linguistic or symbolic analyses in the interests of an irrelevant and stultifying anthropology, psychology, or metaphysics.

The criticisms of Aristotle’s analyses of language depend on bringing together what Aristotle says in various contexts and sciences without consideration of the functional differentiations in the analyses. The treatments of many particular subjects, so assembled, seem confused and contradictory, and they have therefore been presented as evidence of stages of evolution to a more recent scientific truth or away from an earlier Platonic truth. Thus grammarians, when they examine the history of their subject, usually assign Aristotle an important place in the development of the "parts of speech"; but they are puzzled both because his enumeration of four parts (conjunction, article, noun, and verb) makes it difficult to explain how he could have observed so many parts of speech and no more and also because he expounded his views most extensively in the Poetics, as if he did not realize that the parts of speech belong to grammar or philology. Yet a comparison of his enumerations of parts of speech—four in the Poetics, three (noun and verb, to which conjunction is added) in the Rhetoric, and two (noun and verb) in On Interpretation, to which a third, the definite article, is added, but without great logical significance, in the Prior Analytics—suggests that the numbers depend on differences in the "parts" found in speech as it serves the ends of poetical construction, rhetorical persuasion, and logical demonstration and that none of these senses would be strictly pertinent to the analyses of formal grammar.

The problems of language have, however, been generalized in the history of philosophy to assume philosophic as well as philological universality. This may happen in either of two ways: the characteristics of language may be assimilated to some variety of things or processes, or the nature of things may be found to be basically linguistic or discursive. Discourse and symbols may be made into subjects to be treated in an independent science or in an architectonic science which takes the place of metaphysics in a system of speculation; or the investigation of metaphysical, psychological, and moral problems may disclose in the proper subject matters of those problems peculiarities of discourse dissociated from their original verbal connotations. These two tendencies have been prominent in the major philosophic controversies of the ages, and they have therefore, not un-

naturally, contributed to the confusion of interpretations of Aristotle's method. The extension and analogizing of language transformed speculation concerning the nature of the Trinity and the implications of statement into disputes concerning the problem of the Logos in theology and the problem of the "universal" in logic during the Middle Ages; during the seventeenth and eighteenth centuries language was again an intrusive factor in the discussion of the development and nature of the human understanding, for Hobbes could conclude that understanding is nothing else than conception caused by speech and Berkeley that the proper objects of Vision are the Universal Language of Nature; and in modern discussions Behaviorists reduce thought to speech and Positivists undertake to resolve the fundamental problems of science by abandoning metaphysics and epistemology to construct a language of language.

It is tempting to suppose that highly elaborated doctrines of writers like Aristotle are treated adequately as stages toward distinctions and sciences which they did not express or describe and that their theories are lisping anticipations of later contradictory theories of the same matter. It is a supposition which has wide currency in the philosophic treatment of what other men say, and it has the authority of Aristotle's own practice in treating the scientific doctrines and philosophic theories of his predecessors. Unfortunately, it entails the disadvantages of distortion: the details of the doctrine must be ignored except as they fit another conception of science and other basic principles; and discrepancies between the doctrine analyzed and the criteria imposed must be interpreted as evidence of inconsistencies among the stages in the development of the author's position and as marks of the gradual crystallization of what later became technical terms and concepts. But if the philosophic use of history distorts earlier philosophies to purposes for which they were not conceived, the historical examination of philosophies may serve to reconstruct a past philosophy in its own terms, not as a stage to other philosophies, but as a rival to them and a source of theories which might be set in opposition to theories later current. Aristotle's analyses of language are worthy of such treatment precisely because his particular statements have in many cases been influential, but his theory has not been followed. He treated the phenomena of language in great detail, yet he did not construct a single science of language—a universal grammar, a symbolic logic, a semantics, or a physiological psychology. He did not construct a symbolic analysis based on formal rules of construction and operation without concern with actual content or historical usages, nor did he build a linguistic structure intended to duplicate the contextures of thought, concatenations of nervous system, or organizations of things. His theories are carefully drawn in opposition to these theories, which had currency later, and many of the confusions attributed to him result from reading his doctrines from the point of view of such theories, which are often modern forms of ancient positions which he thought to be erroneous. Aristotle's examination of the scientific basis of language serves both to prevent philosophic or semantic reductions of language to things, thoughts, or operations and also to discriminate among the arts those in which language is an instrument of knowledge and control relative to natural processes and things, those in which it is a medium of communication and understanding relative to men, and those in which it is a form of edification and pleasure relative to human products.
The natural basis of "language" (λόγος) is "voice" or "articulate sound" (φωνή); and voice, in turn, is to be distinguished both from its articulation in "speech" (διάλεκτος) and from its natural basis in "sound" (φόνος). The distinction is, in part, one of sounds and, in part, one of meanings. Voice is the matter of language, and man is peculiarly endowed among animals, since he alone makes use of voice in language. Sounds are produced by anything which is capable of setting in motion a single mass of air which is continuous from the impinging body to the organ of hearing, and sounds are therefore studied in the psychological investigation of the sense of hearing, but voice is a special kind of sound made by an animal, for it is a sound with meaning and is dependent, therefore, on the possession of special organs and on their operation, which is a function of the soul. Teeth, lips, and tongue have, among other purposes, a function in the production of articulate sounds. Language consists, on the material side, of the combination of sounds called "letters" (γράμματα) produced in voice by lips, teeth, tongue, and other organs; and, although other animals than man can utter indivisible sounds and have voices, man, and after man some birds, are peculiarly equipped to utter letters. The study of the mechanisms for the production of voice is part of biology; but the differences of letters, such as the distinctions between vowel, semi-vowel, and mute, as well as the nature and extent of these differences in syllabic combinations, are the subject of inquiry in the science of "metrics." Inanimate things as well as some animals—insects, mollusks, crustaceans, fishes—produce sounds but no voice; and among animals which possess tongue and lungs, the voice varies with the species: oviparous quadrupeds have feeble voices; small birds are more vocal than the larger birds; viviparous quadrupeds utter vocal sounds of different kinds, but have no power of converse. Voice is essential to speech, but not all animals who have voices have the power of speech; and, although the use of voice by animals and birds might be called a kind of speech, speech in a strict and full sense is peculiar to man. Voice and speech differ, moreover, according to locality. Whereas voice strictly, as characterized by pitch and the kinds of sounds produced, is identical in the animals of the same species, that variety of articulated voice which might be called their "speech" differs according to differences in locality both among animals possessed of similar voices and even among animals of the same species. Men, as members of the same species, possess the same voice or range of vocal sounds, and they agree likewise in the possession of language or the use of vocal sounds to convey significances; yet they differ from each other in the multiplicity of their speeches and forms of language.

"Voice" (φωνή), as it has been seen to be a kind of movement of the air or a kind of sound produced by an animal, may finally, since imagination as well as sound is required in voice, be defined as a kind of significant sound (σημαντικός τις φόνος).
minimum unit of significance is therefore
voice considered as individual word, pos-
converted of meaning itself but composed of
parts which are meaningless, and it makes
no assertion except in combination with
other words, actual or understood. "Ass-
tion" (λόγος)—phrase, sentence, or
proposition—is therefore the minimum
unit of significance in another sense, for
the assertion relates one word to another,
and an assertion may be considered true
or false. The assertion (λόγος) is defined,
therefore, as composite voice with mean-
ing or significant composite voice (φωνή
συνθετή σημαντική), some parts of which
may have meaning by themselves, as the
noun and the verb which are united in a
single assertion are themselves composite
significant sounds; but some parts of the
assertion have no independent meaning.14
The investigation of language is not ex-
hausted, therefore, in the examination of
sounds and marks or the rules for their
combination; for the examination of
meanings and their structures discloses
the rationale of the rules for the combina-
tions of words. The characteristics of lan-
guage include those meanings which are
set forth in arguments intended to express
the nature of things, and rules for the
scientific use of language reflect in this use
a natural "discourse of the mind." Mean-
ings are also disclosed in actions which
show the influence of a "rational prin-
ciple," and the reflections of the wise man
and the communications of men are part,
in this use, of a social discourse. Meanings
depend, finally, on the arresting character
and freshness of words and metaphors;
and the artist imitates and constructs, in
this use, thoughts, characters, and actions
by devices of style and artificial dis-
course. The scientific, the practical, and
the artistic uses of language all depend on
characteristic significances which attach
to language as much as on the properties
of voice by which those significances are
expressed and conveyed. The fact that
Aristotle finds an extension beyond purely
verbal materials and combinations in each
of these three uses of language has proved
puzzling to critics who are convinced that
the "nature" Aristotle should have an
"empirical" or nominalistic theory of lan-
guage or that all his statements about lan-
guage should form part of a single lin-
guistic science. Moreover, in addition to
these three uses, which find some anchor-
age for language in the nature of things,
there are also the devices of dialectic,
rhetoric, and sophistic, which depend on
traits of language, tenets of opinion, and
probabilities of occurrence and which ad-
ance, influence, and endanger science,
action, and art.

In the scientific use of language, when
propositions and arguments are properly
constructed, they are symbolic of ideas in
the mind; and those ideas flow in a dis-
course comparable to the verbal discourse
in which they are expressed. When the
purpose of discourse is to record and com-
municate knowledge, words express
thoughts which image things, and knowl-
edge is set forth in proofs whose principles
are tested in things. Both thought and
words are constituted into kinds of dis-
course. Yet it is possible to treat the two
separately; and Aristotle occasionally
notes, when he is using language as an
example or refuting fallacious arguments,
that the discourse which is said to be a
discrete quantity is the discourse (λόγος)
expressed in sound, or that those who
argue for the sake of argument can be con-
vinced only by refuting the argument
(λόγος) as expressed in voice and words.15
On the other hand, he argues, when it is a

14 On Interpretation 2. 16.19-20; cf. also Poet. 20.
1456b20–1457a30.

15 Categories 6. 4.34–35; and Metaph. IV. 5. 1009a18–
22.
question of scientific proof, that demonstration is addressed not to the verbal discourse but to the discourse (λόγος) within the soul. No syllogism is addressed to the outer discourse, since we can always raise verbal objections to anything expressed in words, but we cannot always object to the inner discourse. That inner discourse consists of mental experiences or, as Aristotle likes to put it, of what the soul undergoes, the passions of the soul. The discourse expressed in sound and voice is symbolic of these passions, much as written discourse is symbolic of spoken. There is, however, an important difference between the two discourses. The passions of the soul, which are symbolized in verbal discourse, are natural occurrences, for the reaction of the organism to stimuli in sensation and emotion follow natural laws and they are therefore the same for all men, as are the things of which our experiences are the images; verbal discourse, on the other hand, is significant only by convention, for no noun or verb has its meaning by nature. The discourse of the soul not only is the source of the meanings attached to the articulations of verbal sounds but also gives verbal discourse, by supplying it with meanings, a kind of natural status in the things concerning which it may be true and in the minds on which it may be effective or informative. The discourse of the soul and verbal discourse are in a sense the same discourse, since words are symbolic directly only of thought, and therefore discourse—λόγος—may signify speech or thought, and there is no sharp line to separate the formula expressive of meaning from the meaning expressed in formula.

Language and thought are closely related, and linguistic meaning is not distinct from psychological meaning. Indeed, in some modern theories the closeness of the relation is taken to be an identity in the sense that there is no thought beyond verbal discourse and no meaning as such apart from the symbol and the thing signified. Aristotle, on the other hand, separated thought from perception because of consequences in thought of the operation of discourse. The perception of the proper objects of sense is always free from error, since an animal truly perceives what it perceives, and whether or not the object is as it is perceived is a further question dependent on judgment as well as on perception. Thought, on the other hand, may be true or false, for thought is found only where there is discourse of reason (λόγος). Imagination is shown to be distinct, in like fashion, from perception, discursive thought, and opinion, because, for one thing, opinion, unlike imagination, is accompanied by belief, belief by conviction, and conviction by discourse of reason, and there are animals which possess both sense and imagination without discourse of reason. On the other hand, Aristotle queried the scientific basis of the division of the soul into parts or faculties, even by means of differences that take into account the rational or discursive powers of man; and he criticized Plato’s division of the soul into the calculative (λογιστικόν), the passionate, and the desiderative, as well as the popular division into the rational (ὁ λόγον ἔχων) and the irrational (ἄλογον), since the possible and defensible bases of differentiation are infinite. On functional grounds, however, powers and potentialities in general may be divided into two kinds, the rational (μετὰ λόγου) and the irrational (ἄλογον). All rational potentialities are capable of

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16 Posterior Analytics i. 10. 70b24–27.
17 Interpret. 1. 1643–6 and 2. 16.27–29.
contrary effects, as the medical art can produce both disease and health; for the medical art is a science or formula pertinent, in different ways, both to the object proper to it and to its contrary or privation. A single irrational potentiality, on the other hand, produces only one effect, as the hot is capable only of heating.21

In the practical use of language, when actions are directed to an end or when standards are examined or promulgated, the rules of action are instances of “discourse” which might be translated into action or elaborated by verbal exposition or given force as social enactment. When the end of analysis and discourse is action, the standard for action is determined in thought and communicated in discourse. As the passions and thoughts of the mind are constituted a kind of discourse when examined in scientific inquiry, so discourse is made a kind of rational principle and rule when employed in practical action. It is important for the analysis of human actions in ethics, therefore, to recognize that man alone possesses discourse, reason, and science; and, consequently, the distinction, which Aristotle describes as one made in popular discussions, between the rational and the irrational parts of the soul, seems to him adequate to serve as foundation to the analysis of the virtues, however unsatisfactory it may be as a psychological theory. It supplies a functional interrelation of habits, inasmuch as the irrational part may be further subdivided into a vegetative part, which is not subject to habituation and in no way shares in the rational principle, and an appetitive part, which shares in the rational principle, in the sense of being amenable to it and obeying it.22 The differentiation of intellectual from the moral virtues is based on this distinction. The irrational part of the soul is contrasted to the rational not only in cognitive but also in conative functions, and the prescription of rational rule is therefore opposed to the rule of passion, appetite, and desire,23 while desire itself, like the irrational soul, may be differentiated into two kinds, one in accordance with reason and the other irrational.24 The rule of reason in the irrational soul, moreover, implies a differentiation of the use of reason and discourse as they apply to changing things in action and production from their use as they apply to eternal things in inquiry into natures and causes; for that difference in subject matter and purpose constitutes the distinction both between the calculative and the scientific parts of the rational soul (τὰ λόγον ἔξωτα) and between practical and theoretic arguments (λόγοι).25

Politics and ethics are not independent sciences, according to Aristotle, but supplementary approaches to the common problems of the good life. Virtue in the individual is determined by the rule of reason, and the associations of men are made possible by discourse. The good man is the same as the good citizen only in the good state; and then the discourse which determines the institutions of the state embodies and transmits the rule of reason, which sets the standard for virtue. Three things make men good and virtuous: nature, habit, and reason (λόγος). Animals lead a life of nature, and, although some

21 Metaph. ix. 2. 1046$^{36}$—$^{24}$ and 5. 1047$^{35}$—$^{15}$. Cf. also Interpr. 13. 22$^{36}$—$^{23}$6, where the question is not limited to internal powers or principles of change but is extended to logical possibility in general, and some irrational potentialities are found also to admit of contrary actualizations, as, for example, a thing might either be cut or not be cut.


23 Pol. i. 5. 1254$^{4}$—$^{9}$ and 1254$^{20}$—$^{24}$; iii. 4. 1277$^{4}$—$^{7}$; On the Soul iii. 10. 433$^{5}$—$^{13}$.

24 Rhetoric i. 11. 1370$^{18}$—$^{27}$.

ARISTOTLE'S CONCEPTION OF LANGUAGE

are also influenced to an extent by habit, man alone possesses reason. The moral as well as the political problem is to bring nature, habit, and reason into harmony, for men often act contrary to their habits and their nature because of their reason. The effectiveness of legislation is dependent on human nature; habit and reason, on the other hand, are affected by education. Nature's part does not depend on us, and the direct influence of reason in teaching and argument is not great with all men. Yet, directly or indirectly, reason is essential to the virtuous life. Happiness implies reason and cannot be without reason (λόγος), and moral virtue is defined as a mean determined in accordance with a rational principle (λόγος) or as a prudent man would determine it. Therefore, to live as one should is to live according to reason, for the standard of virtue is right reason, and the excesses of incontinence and of vice are both contrary to right reason. Socrates had been in error when he identified the virtues with reason (λόγος), but in refuting that error Aristotle pointed out that, though not identical with it, virtues do involve or depend on reason. The moral virtues are habits of acting in accordance with right reason; and the dictate of right reason about such matters, as distinguished from the habit of acting according to right reason, is prudence.

Art and prudence, the intellectual virtues of the calculative part of the soul, which is concerned with processes of change, are defined, respectively, as a productive habit, in accordance with true reason (λόγος), and a practical habit, in accordance with reason (λόγος) and true, relative to human goods; and science is likewise a habit. Science is one of the three intellectual virtues of the scientific part of the soul, whose objects are necessary and eternal: all sciences can be communicated by teaching and what is scientifically known must be learned, either inductively or deductively. Learning depends on words, and even among the animals some are capable of receiving instruction from each other or from man, provided they possess the faculty of hearing or are at least able to distinguish the differences of sounds and signs. Hearing makes the greatest contribution accidentally to prudence, for speech (λόγος), which is the cause of instruction, is heard, not in itself but accidentally, since speech is composed of words and words are symbols, while it is only the sound and the voice that are heard. In the practical science of politics, on the other hand, discourse makes association possible by furnishing a means of communicating man's conceptions of expediency and justice:

The reason why man is more of a political animal than bees or any other gregarious animal is clear. For nature, as we say, does nothing in vain, and man alone of the animals possesses speech (λόγος). Mere voice (φωνή), to be sure, is a sign of pain and pleasure, and is therefore present in other animals (for their nature has been developed so far as to have perception of the painful and the pleasant and to make signs of those perceptions to one another), but speech is for the sake of making clear the expedient and the inexpedient, and

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28 Ibid. i. 7. 1098a3–17.
29 Ibid. vi. 6. 1109a36–1107b2.
30 Ibid. i. 3. 1095b8–11; 13. 1102b14–25; ii. 2. 1103a31–34; iii. 5. 1114a26–30; 11. 1118b18–20; 12. 1119b12–17; iv. 5. 1125a33–1126a1; lx. 8. 1169b3–6.
32 Ibid. vi. 13. 1144a28–30.
therefore likewise the just and the unjust; for it is the peculiar property of man, distinguishing him from other animals, that he alone has perception of good and evil, of just and unjust, and the like, and it is the community in these things that makes a family and a state.38

Discourse is therefore essentially connected with the practical as well as the theoretic sciences: as it is an indispensable instrument in the acquisition of knowledge, so, too, as verbal means of communication, it is essential to the community of shared values and institutions, and, as rational principle, it is the standard of virtue and action.

In the artistic use of language, when words are used as matter for poetic composition, the forms of poetry may be viewed in terms of the plots which are the soul of poetry or of the arguments (λόγοι) in which the plots are developed. When the end of composition is the production of a poem, language both constitutes the parts and determines the whole; and thought is expressed, character is conveyed, and ultimately action is set forth or narrated by means of words. Voice (φωνή) and language (λόγος) are among the means of imitation used in the various arts, language with the pleasurable accessories of rhythm and harmony being proper to the art of tragedy.39 The natural basis of poetry is therefore imitation, while the literary means of imitation, or the matter from which the poem is constructed, is expression in language (ἐν λόγω). The origin of poetry is due to two causes found in human nature. Imitation is natural to man from childhood, and one of his advantages over the lower animals is that he is the most imitative of all creatures and learns at first by imitation. It is also natural for man to delight in works of imitation. To be learning something is one of the greatest of pleasures not only to the philosopher but also to the rest of mankind, and the reason for the delight one takes in an imitation is that one is at the same time learning. Moreover, the sense of harmony and rhythm, like imitation, is natural to man.40 The original differentiations into kinds of poetry, however, were determined by differences in the poets and their preferences among kinds of actions to be represented.41 The origins of the poetic use of language are thus not unrelated to the inquiry and learning which motivate its scientific use; the differentiation into kinds is determined by considerations, not of genera of subject matter but of individual character; and character, in turn, is determined by discourse and thought in their practical use. Poetry is therefore distinguished from theory and practice by the pleasure proper to the poem itself, in which the unity is constituted by argument and plot (λόγος καὶ μῦθος) expressed in language (λόγος) and in which the diction, in turn, may be viewed as a whole and analyzed into eight parts (among which assiduous grammarians have found four "parts of speech"), ranging from the letter which is the element of diction, through the syllable, the conjunction, the article, the noun, the verb, and the case to the speech itself, which is composite significant sound, so defined that the definition of a word or a simple assertion and the Iliad as a whole, as well as any intermediate unit of discourse, may be viewed as a single speech (λόγος).42

[To be concluded]

38 Pol. i. 2. 1253a7–18.
40 Ibid. 4. 1448b4–24.
41 Ibid. 1448b24–27.
42 Ibid. 20. 1456b20–21 and 1457a23–30; cf. also On Generation and Corruption i. 4. 315a14–16.
ARISTOTLE'S CONCEPTION OF LANGUAGE AND
THE ARTS OF LANGUAGE (Concluded)

RICHARD McKEON

II. THE OPERATIONS OF LANGUAGE:
HUMAN THOUGHT AND ITS
EXPRESSION

Language is treated among the sub-
ject matters of the theoretic, prac-
tical, and productive sciences. It is
related to its bases in the organism and the
soul of man; its practical efficacy as rule
of prudence and as instrument of com-
unication is examined in determining the
proportion which is sought in virtuous ac-
tion and the bond of justice by which
states are held together; its artistic realiza-
tions are discovered in the constructions
of poetry. Yet in each of these sciences in
which it is a subject matter language is
also an instrument of inquiry and state-
ment, and, in addition, it serves other
functions beyond these scientific uses. The
analysis of things is presented in language;
and, when language is used scientifically,
criteria by which to test statement and
argument are sought in the subject mat-
ters which the sciences treat. Even the
language of science, moreover, may be
viewed not only in terms of its adaptation
to the processes of inquiry and proof rela-
tive to the subject matter of the sciences
but also in terms of its development in ac-
quision and use relative to processes in
the mind of the inquirer and in terms of
its elements and combinations relative to
the symbolic system employed in stating
and formulating the results of inquiry.
The uses of language, however, do not all
follow the model of scientific inquiry and
proof, nor are they limited to the devices
by which science is acquired and set
forth. In its scientific uses, language, as
well as the thought it expresses, is made to
conform as closely as possible to a subject
matter. Language may also express a nor-
mative rule for action which, if success-
fully performed, may alter the actual situ-
ation; and the criteria for such rules of
action must be sought in potentialities
that may or may not be actualized or in
communities that may or may not be es-
tablished or that may be preserved or de-
stroyed. Language may, again, be deter-
mined by the relation between speaker and
audience, and the criteria for expression
no less than the conception of subject
matter must then be sought in thoughts
and emotions already possessed or to be
conveyed. Language may, finally, find its
efficacy primarily in the instrumentalities
of words and style, even to the extent of
making the improbable seem plausible and
the unconventional acceptable; and the
criteria for thought and the conception of
nature must then be sought in the develop-
ment of the argument and in the ele-
ments and combinations by which it is
expressed. The development of an argu-
ment may thus be determined by science
or by prudence or by art—or by dialecti-
cal, sophistical, or rhetorical supplements
or approximations to such developments
—and thoughts and occurrences may be
set forth in expressions determined by con-
sideration, real or apparent, of truth and
probability or of justice and expediency
or of form and pleasure. Arguments (λόγου)
are used not only for proof and teaching
but also for persuasion and regulation, for
communication and artistic construction.
The variety of the uses of language and
of criteria for the judgment of those uses
depends on the same characteristics of
language as make possible fallacy and error, vice and sophistry, artistic license and fault. Since language is the peculiar function of an animal who possesses a soul, that is, the imagination requisite for the imposition of meanings, as well as the special organs requisite for the production of voice, the marks of meaning may be found in the analysis of language as a symbolic structure or in the analysis of thought as expressed in language or in the analysis of things as signified by thought. The discourse of the mind, which is expressed in verbal discourse, may serve to organize thought, action, or production; but to do so it must discover a rational order in things or impose such an order.

The characteristics of discourse are thus traced back to mental powers and physical processes, and, indeed, the significance of the word λόγος is extended from statements in language to include in its meaning thoughts in minds and forms in things. But if language may be identical with reason, it may also be used contrary to reason; statements may correspond with what is essential in things, and they may also be false and contrary to fact; and, although art may be based on what has happened and although it has moral and political effects, the presentation of the improbable and the morally wrong may be artistically preferable to the true and the better. However language is used—to express the results of impartial inquiry, to communicate purposes or persuade to action, or to arouse the pleasure proper to discourses artistically contrived—the symbolic function is to be found in the relation of language to what is expressed, but the determination of that relation may turn on considerations of subject matter or of emotions and purposes or of form.

There is no simple equivalence between discourse and things. At each stage of the combination of words into statements and arguments or of the decomposition of arguments into their parts, language may be dissociated from any strict reference to things. Words may be ambiguous; assertions may be amphibolous; discussions and inquiry may be pursued for no other purpose than for the sake of the argument. The problem is, in part, a problem of the meanings of terms; in part, a problem of the combination of terms in assertions; in part, a problem of the grounds for the assertion of the principle or conclusion of an argument. A term may have a single meaning or several; a statement may be about a single thing or several; an argument may proceed from the reason, the fact, or simply from what was said. But even when a “single” word or a “single” statement is about “one” and the “same” thing, the words “one” and the “same,” as used either in discourse or in the analysis of discourse, may have many meanings, and there are as many senses of “being” as there are of “one” and the “same.” These differentiations of statement and being are essential preliminaries to discovering the respect in which the being or nature of a thing may be identical with the statement of its nature; and these essential differentiations—of meanings of statements and of kinds of being—can, in turn, be made only by examination of the uses of words.

In general, things may be one in four different ways: in number, in species, in genus, or by analogy. A thing is one in number whose matter is one; things are one in species or form (elbos) whose definition (λόγος) is one; things are one generically when they fall in the same category; and things are one analogically when they are related as a third thing is to a fourth. The latter forms of unity are always found when the former are, but the former are not always present in the latter: things
that are one in number are all one in species, while not all things that are one in species are one in number; but things that are one in species are all one in genus, while things that are one in genus are not all one in species but are all one by analogy; and things that are one by analogy are not all one in genus. Or, again, the senses in which a thing may be said to be "one" may be classified by consideration of indivisibility of motion, on the one hand, and indivisibility of thought and formula, on the other. There are, once more, on this basis of classification, four senses in which a thing may be one: (1) the naturally continuous, and in this sense those things have more unity and are prior, whose movement is more indivisible and simpler; (2) the whole, and in this sense a thing is one because its movement is one and indivisible in place and time; (3) what is one in number, and in this sense the individual is indivisible; and (4) what is one in form or species, and in this sense the universal is indivisible in comprehension and knowledge. A thing may be the "same" if it is one in number, that is, in matter; or if it is one in both number and formula, that is, in matter and in form; or if the formula of its primary essence is one.

A thing is shown to be one in number when a variety of forms of appellation are substituted one for another in application to it. Those appellations may have an essential or an accidental relation to one another in the thing. An individual thing or a thing which is one in number is signified most strictly when the two words have the same definition, as "clothes" and "garment" may be applied to the same thing; or when a word and one of its definitions is used, as "animal that walks on two feet" is the same as "man." But a property may be used in the same fashion, as when "what can acquire knowledge" is called the same as "man"; and even an accident will serve to identify an individual, as when "the man who is sitting," or "who is musical," is called the same as "Socrates." A distinction must be made, therefore, between "signifying one thing," as is done when the words applied to a single thing have the same meaning, and "signifying with respect to one thing," as is done when words like "white," "musical," and "Socrates" are used to signify the same person. Consequently, even when terms designate the same object, the connection between the terms must be investigated; and if a point has been proved about "clothes," the identity of "clothes" and "garment" must be demonstrated before the conclusion can be applied to "garment." Indeed, one of the errors of philosophers like Heraclitus and Lycophron consisted in supposing that all things are one in the same sense as "clothes" and "garment," that is, in the sense of possessing a single definition.

Individual things or things one in number are never predicatable of a subject, although some varieties of individual things may be present in a subject. Terms which signify individuals, therefore, serve primarily as subjects of propositions; and the problem of scientific demonstration may be said to consist in relating such terms to predicates whose relation to them as subjects is established by inference from essential definitions and necessary premises. The problem must be viewed both in terms of the statement possible of an existent individual and in terms of the existence signified by a uni-

42 Metaph. v. 6. 1016b31-1017a3.
43 Ibid. x. 1. 1052b15-18.
44 Ibid. 3. 1054a32-33.
45 Topics i. 7. 1039b29 and vi. 11. 149b3-4; cf. also Metaph. iv. 4. 1006b34-35 and 1006b25-27.
46 On Sophistical Refutations 6. 168b23-33; Metaph. iv. 4. 1006b25-34; Physics iii. 2. 203b10-16.
47 Phys. i. 2. 185a19-25.
48 Cat. 2. 1b3-9.
versal. What is one in number and in concrete existence is differentiated into what is many in formula, for any individual thing is subject to inquiry in many sciences; and what is one in formula is present in many existent things. What is one in formula is the universal, and what is one in number is the individual. In the search for principles in science, either may be considered indivisible and prior to the other. The individual is prior as an element, that is, as matter in the composite, while the universal is prior as form. The individual or element is indivisible in time, while the universal is indivisible in formula. The element is found by differentiating things into their ultimate parts; the universal states the unity which constitutes the form of the whole. The error of earlier philosophers in treating principles consisted, therefore, in their failure to distinguish what is one in formula from what is one in number or to treat either adequately.

Things are one in form or species when they have a single formula or definition. A definition may serve to identify a thing which is one in number; it may be applied to two or more members of a single species; and if it is the essential definition, it is not only the statement of the form and the formal cause but also the principle of all proof and change and, as such, is presupposed in the scientific use of efficient, final, and material causes. The discovery

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60 *Metaph.*, xiii. 8. 1084b2-23. W. D. Ross undertakes to explain away the distinction between indivisible in formula and indivisible in time, on the ground that it is unintelligible and unexampled in Aristotle's usage. Commenting on 11. 1084b15-16, he argues that "an opposition of 'indivisible in ἄρχον' and 'indivisible in time' would be quite unparalleled in Aristotle, and no reasonable meaning can be attached to it"; and then, making use of Bekker's punctuation of the passage, he interprets it to say that the universal and the individual or element are both principles because they are both indivisible, but the manner of their priority as principles is of different kinds, one being prior in formula, the other in time (Aristotle's *Metaphysics*: A Revised Text with Introduction and Commentary [Oxford, 1924], II. 452-53). He does not avoid the difficulty by shifting from indivisibility in time and formula to priority in time and formula, since the universal and the element are prior in different senses precisely because they are indivisible in different senses. There is no difficulty in finding Aristotle's statement of this or of interpreting its meaning or even of recognizing the reasons for his changing modes of expressing the distinction. Aristotle's customary way of stating the general distinction is that in all cases the one is indivisible either in quantity or in kind (*Metaph.*, v. 6. 1016b23-24) or that in all cases things are one either because the motion is indivisible or because the formula is indivisible (ibid. x. 1. 1052a26-81). Depending on the context and the problem in hand, Aristotle treats the contrary of "divisible in formula or form" as "divisible in quantity" or, more particularly, in some variety of quantity, such as "number," "motion," "time," or "place." There is no inherent difficulty in interpreting the meaning of either "indivisible in formula" or "indivisible in time." Any formula is in itself, as formula, divisible, but a thing is one in formula when the formula states its essence; and therefore, in a process in which a thing changes in size, the thing may be said to be the same in formula at the beginning and end of the process (ibid. 1016b22-23). A thing is one in time either in the sense that it is continuous, since the continuous has its own motion and the motion is one when it is indivisible in

time, or in the sense that its substratum is one, as the various things that are melted have a single substratum, such as air or water (ibid. 1016a5-24). Between these two extremes of form and matter, there are the cases of individuals which are one in form and number and of substrata which are one in form. Particular problems determine the selection of time or place as the discriminating quantity of that which is one in number. Thus, in treating common sense, when Aristotle is concerned to show that both the power and the time of its exercise are indivisible, he does so by differentiating "indivisible in being" from "indivisible in place and in number," for he concludes that common sense is divisible in being (inasmuch as it perceives two separate objects at once in discriminating between them) but in that perception it is undivided in place and in number (On the Soul III. 2. 426b24-427b7). His problem in chap. 8 of Book xiii of the *Metaphysics*, where he is refuting the Platonists' conception of ideal numbers, on the contrary, is to show that they have failed to distinguish between the two varieties of principles and that the One would have to be a principle in both senses, as form or substance and as part or matter, and thus be indivisible both in formula and in time.

61 *Metaph.*, xiv. 1. 1087b9-18; i. 5. 980a18-987a2.

62 In the enumeration of the kinds of causes, ἄρχον is usually equated with the formal cause (cf. Phys. ii. 3. 194b26-29; *Metaph.*, iii. 2. 996b1-14; vii. 4. 1044a36-37; xi. 3. 1070a21-22). On the other hand, the principle of all proof is substance (cf. *Metaph.*, vii. 9. 1034a50-81). Moreover, when causes are used as middle terms, the definition is implicated in each of the causes (cf. Post. Anal. ii. 11. 94a20-94b26). The dependence of causal proof on form and ἄρχον is worked out in detail by L. Robin, "Sur la conception aristotélienne de la causalité," Archiv für Geschichte der Philosophie, XXIII (1909-10), 1-28 and 184-210.
of substance is therefore an essential part of the investigation of being, process, knowledge, and statement, for substance is prior in all senses: in formula, in knowledge, and in time.53 To signify the achievement of this identity of the principles of proof, knowledge, and being—since the principles of things and processes must be knowable and statable in the degree that science is possible—Aristotle joins the term “formula” (λόγος) to terms like “definitory” (διάρθισις),54 or “substance” (όνομα),55 or “essence” (τὸ τί ἔσται),56 or “essential” (τὸ τί ἐστι)57 to signify “essential definition”; and he uses “formula” in juxtaposition with and as synonym for “substance,” “essence,” “form,” “species,” and “actuality.”58 The discovery of such definitions depends on the solution of problems of language and, even more, of problems of fact; for the unity of a definition is not merely a unity by continuity or conjunction of statements, like the Iliad, but of the essential inherence of a predicate in a subject because of the unity of the thing, and nothing which is not a species of a genus will have an essence.59 The thing and the formula, however, are wholes; and the correspondence between them is such that parts of the formula correspond to parts of the thing, even though there are parts of the thing which are not represented in the formula and parts of the formula which do not represent parts of the thing.

All scientific statements are either definitory or demonstrative, and the problems of scientific method turn on the relation of definition to demonstration,60 for that relation has a bearing both on the relation of knowledge or statement to existence and on the relation of premise to conclusion. All the characteristics of discourse, including those which make possible the correspondence of statement to things, may be deduced from the possibility of relating statements about a thing to statements of what it is or that it exists. Since they are the principles of that inferential relation, the principle of contradiction—that the same attribute cannot at the same time belong and not belong to the same subject in the same respect—and the principle of excluded middle—that there cannot be an intermediate between two contradictories, but of one subject we must either affirm or deny any one predicate—are the most certain of all principles, both best known and nonhypothetical. They cannot be demonstrated, but the consequences of denying them can be shown by examining the implications of any statement which is made. Discourse and reasoning depend on definition or limitation: a starting-point of demonstration which is not itself demonstrated, for discussion and reasoning are destroyed if a reason is asked for everything;61 a finite number of meanings for any given word, in order that a single meaning may be conveyed,62 and a finite number of predications...
tions, which depend on differentiating the essential definition of a thing from accidental predication about it. The limitations set in discourse are, at the one extreme, individuals, to which discourse may be applied as subjects, and, at the other extreme, principles, which state the reasons for affirming predicates of subjects in the flow of discourse. There can be neither definition nor demonstration of sensible individual substances, because they have matter whose nature makes them capable of being or of not being. The individual is neither matter nor formula alone, but matter and formula; and science therefore treats both of existing things in their universal aspects and of universal laws of being and process in their existential applications by treating the formula in its generality. The formula, however, may include matter, not the individual matter of the concrete thing but the matter which is the potentiality of the processes proper to the thing, as the definition of "snub," as distinguished from "concave," includes "nose" without being dependent on reference to individual noses. The definitions of the physical sciences are of this sort. Or the formula may be independent of the matter in which the form must exist, as "concave" may be defined without reference to what is concave. The definitions of the mathematical sciences are of this sort. The causes and principles of the different things studied in the different sciences are different. Even those principles which the sciences share are the "same" only universally and analogically, not literally; and therefore it is only analogically that there are three elements and four causes and principles of all things. Yet for that very reason it is important that there is but one heaven, since the universe as a whole and the processes in it are one as a concrete thing as well as in form, and the unmovable first mover is one both in formula and in number. The subject matter of metaphysics includes, and is determined by, forms which are and are known without matter, for the analysis of the first cause is based, in the investigation of the scientific grounds and principles of things, in the knowledge of things, and in the statement of that knowledge, not as they are, or are known, or are stated in their proper species and according to particular sciences, but universally and qua being. Many of the universal terms employed in metaphysical inquiry, like "being" and "unity," are the same and are one thing in the sense that they are implied in one another but not in the sense that they are explained by the same formula or definition. If there were no forms which exist without matter or if there were eternal forms for all things that exist, there would be no need for metaphysics as a science distinct from physics. These opposite forms of the confusion of physics and metaphysics Aristotle attributed to Democritus and Plato, for both of whom reduction is possible because the distinction between mathematics and physics is ignored, in one case, by reducing bodies to mathematical forms and their combinations and, in the other, by making numbers independent existences.

Both physics and mathematics require separation in thought and definition of what is inseparable in fact. Despite the differences between physical and mathematical definitions, to which Aristotle refers repeatedly and briefly in his numerous developments of the difference between "snub" and "concave," physics re-

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quires separation by thought or definition of the forms of changing things from the matter from which they are inseparable in number, and mathematics requires like separation by thought or definition of quantity from the same matter from which it likewise is inseparable in number. Moreover, the further inquiries in each require further separation by definition or formula of what is inseparable in fact or number. Thus motion may be one generically (in this sense any instance of "locomotion" is one generically with any other instance of locomotion, but generically different from "alteration," which is motion in quality rather than in place); or it may be one specifically (in this sense "whitening" is generically the same as "blackening" but differs from it specifically, and every instance of blackening is specifically the same with every other instance of blackening); or it may be one absolutely, that is, essentially and numerically (and it is in this sense that investigation is possible of "that which" is in motion, "that in which" the motion takes place, and "that during which" it occurs). The analysis of motion and time, conceived in this absolute, that is, concrete, sense, requires a consideration of points and moments in which a differentiation must be made between what is one in number and what is one in thought or formula. A "point" marked off in the motion of any thing is a single point, although it is not single in formula, since it must be considered both as a finishing-point relative to what came before and as a starting-point relative to what is to come. In like fashion, the "now" is the same in each of its instances and underlying all its relations; but, since it is the measure of time, it is in another sense different, for it is relative to the before and after, and in that respect differs in formula and in what is predicated of it. Time is always at a beginning and at an end, and in much the same fashion the "convex" and the "concave" in the circumference of a circle can be separated in thought and formula, although they are inseparable in number. Finally, the problem of whether the parts of the soul are separated, as are the parts of the body or any other divisible thing, or whether they are separable by definition but are by nature inseparable, like convex and concave in the circumference of a circle, may be put aside as irrelevant in ethics and be taken up in psychology; and the parts of the soul, which are differentiated by their powers, in turn, include an irrational part and are possessed of a rational principle or formula.

As substance in the sense of the concrete individual is distinct from substance in the sense of the universal definition, so, too, the rational process by which universals are known is distinct from the sensitive processes by which particulars are experienced; and the same word, λόγος, is used to signify "definition" as contrasted to concrete thing and "reason" as contrasted to sense. The universals of science are differentiated from the particulars of sense as that which is better known in nature in contrast to that which is better known to us; and the effort of science is therefore to bring the evidence of sense and the evidence of argument or reason into conformity and agreement. Aristotle's scientific works are dotted with passages in which he tries to supplement

69 Gen. and Corrup. 1. 5. 320b17-25.
70 Phys. v. 4. 227b3-228a3.
71 Ibid. viii. 8. 262b19-21 and 263a12-14.
the results of experience and observation by arguments and definitions in an effort to base the credibility (πιστις) of theory on both sense and reason (λόγος).77 Reason or argument, on the one hand, is a source of explanations not accessible to sense; and, on the other hand, since it is concerned with universals, it is not held to the minuteness and precision of unrelated detail present to sense.78 Aristotle's criticisms of his predecessors turn on the inadequacy of their arguments to treat of the data of experience or on their reliance on arguments without having collected all the information that can be gathered through sense or on the discrepancies between their arguments and the evidence of sense and experience; and he praises Democritus for the thoroughness of his reduction of all phenomena to a single argument.79 He often shows, in particular, that the testimony of sight is in conformity with the consequences of his argument in questions of astronomy, meteorology, and anatomy; and there is evidence that he used illustrations for purposes of proof in his biological writings.80

Yet, in spite of the fact that reason and experience may be in agreement, what is prior in reason or formula is not prior according to sensation, and one and the same formula applies to many individual things, which are external to the soul (whereas universals are in a sense internal) and which are differentiated by matter or by place and time.81 Argument or reason is therefore opposed to experience as

knowledge of universal to knowledge of individual:82 the inductive process, which begins from sense and the individual, or from what is confused but more observable to us, leads to reason and the universal, or to what is clearer according to argument:83 and a demonstration which proceeds from the rational principle or definition is contrary and supplementary to a demonstration by induction.84 What is better known in the order of argument is contrasted to what is better known to sense, moreover, even in the case of scientists who have been led astray in their arguments and theories,85 while the “appearances” or “phenomena” (φαινόμενα) which are observed by sensation or admitted by opinion are contrasted to arguments, sometimes as what appears to us even though it is contrary to fact and sometimes as what is verified as actually occurring.

The fashion in which Aristotle uses phenomena to supplement arguments, recognizing that the one may be illusory and the other fallacious, is well illustrated in his discussion of what we have come to call the “fifth element” and what Aristotle called the “first of the bodies.” He remarks after his demonstration of the existence and qualities of this first and simple body that these conclusions will be clear to anyone who credits the assumptions he has made; and then he adds that his argument or theory (λόγος) seems to confirm phenomena and to be confirmed by them.86 He goes for data concerning the phenomena to common opinion, to sense experience, and to common meanings of words. He appeals, first, in support of his

78 Meteorol. i. 7. 344b5–6; Pol. vii. 7. 1328b19–21.
79 Phys. viii. 3. 258b22–29; Gen. and Corrup. i. 8. 324b32–325b23; Metaph. i. 5. 986b31–987b2.
80 On the Heavens 1. 5. 272b5–7; Meteorol. i. 6. 343b29–33; Parts Anim. iv. 5. 679a37–680b3.
81 Metaph. v. 11. 1018b32–34; xli. 8. 1074b33–35; Post. Anal. i. 31. 87b28–35; On the Soul ii. 5. 417b19–28.
82 Metaph. i. 1. 981b12–24.
83 Post. Anal. ii. 19. 100b1–3; On the Soul ii. 2. 413a11–16.
84 Post. Anal. i. 18. 81b35–39; 24. 86b29–30; cf. also Meteorol. i. 8. 378b13–14, 20–21.
85 Phys. i. 5. 188b30–189a9.
86 On the Heavens i. 3. 270a1–25.
Aristotle’s Conception of Language

theory of the “first body” to the common conceptions which all men, barbarians and Greeks, have of the existence and nature of the gods. Arguing, second, that the evidence of the senses is sufficient to convince us within the limits of human certainty, he points out that the record of astronomical observation shows no change in the scheme of the outermost heavens. Finally, the common name, aether, handed down from our distant ancestors, is evidence, since the name is derived from the fact that it “runs always” for an eternity of time, that they conceived of the first body in much the manner that Aristotle had expressed, for, he adds, the same manner of speaking has recurred in men’s usage again and again. Phenomena, as generally accepted, are probable; they are known through the senses and can be checked in the scope and unanimity of recorded observations; and the history of beliefs and of language supplies information concerning what has appeared to be the case to men. The ideal of science, stated in terms of phenomena, is to have arguments and phenomena agree; and theories are refuted either because they ignore the phenomena or are inconsistent with both phenomena impartially observed and valid contradictory arguments. The test by means of phenomena is used, moreover, in practical as well as in theoretical arguments, as when both occurrences and arguments are used to demonstrate that the legislator should direct all his military as well as his civil measures to the provision of leisure and the establishment of peace.

To possess an argument (λόγος) or to follow consequences in accordance with an argument, therefore, may be to have a reasonable and intelligible analysis pertinent to checking the facts, establishing scientific knowledge, and discovering grounds of sure belief; it may simply signify the possession of a doctrine or opinion, more frequently false than true; and, finally, it may refer to the subject matter or topic of inquiry, or the form of disquisition or disputation consequent on inquiry and synonymous with syllogizing, reasoning, or conversing.

The organization of propositions and the processes of reasoning cannot be made to duplicate in all details the structure of things and the phenomena of becoming, and it is easily possible to reason erroneously even from sound principles and to misinterpret accurate observations. Reasoning rests on statements, mental or verbal, and consists in following through to other assertions from what has been stated; refutation is reasoning which leads to the contradiction of a given proposition. There is no simple means of avoiding the danger in both reasoning and refutation that the principle may seem to be true and the inference may seem to follow in the words or even in the interpretation of the words, and yet principle and conclusion may reflect nothing in fact. We cannot exhibit the things themselves in argument or avoid recourse to symbolic devices, and undue skepticism concerning the discrepancies between the changing

67 On the Soul ii. 2. 414a25; On Youth and Old Age 4. 469a23–29; Metaph. xiv. 1. 1087b2–3; Rhet. ii. 22. 1396b3–7, 31–b11; Pol. i. 5. 1254b20–21.

68 Meteorol. ii. 5. 362a12–14; On the Soul ii. 7. 418a23–24.

world and the generalities of statement reduces its proponent to the predicament of Cratylus, who did not think it right to say anything but confined himself to wiggling his finger in designation of things.94

Since it is impossible to discuss by bringing in the things themselves, and since we use names in the place of things as symbols for them, we suppose that what follows in the names, follows in the things as well, just as we suppose for calculators in the case of their counters. The two cases [of names and things], however, are not alike, for names are finite as is the sum-total of assertions, while things are infinite in number. It is necessary therefore that the same assertion and a single name have several meanings. Accordingly, just as those who are not clever in manipulating their counters in calculation are taken in by those who are expert, in the same fashion those who are unacquainted with the force of names in the case of arguments commit paralogisms, both when they themselves discuss and when they listen to discussion of others. For this reason, then, as well as for others to be stated later, there are both syllogism and refutation which are apparent but not real.95

Just as the device of examining the opinions of men is a useful preliminary to discussing the principles of things, so, too, the examination of the senses in which words are used is an important preliminary to understanding the meanings of statements and the natures of things. The shift from science or demonstration to dialectic is from principles grounded in the nature of things to principles based on the authority of those who hold them; and the shift from dialectical to sophistical argumentation is from beliefs to deceptions which can be explained only by examining the psychological and linguistic processes of those who are deceived and the moral intentions of those who perpetrate the deception. There are good reasons which induce some people, like the Sophists, who make money from apparent but unreal wisdom, to take advantage of this appearance of reasoning and refuting.

Sophistical refutation may produce the false appearance of an argument either by means of language (and this may be done in six different ways: by the ambiguity of individual words or by an indeterminateness of phrase, such as amphiboly, combination, division of words, accent, or form of expression) or by fallacies that are independent of language (and these all depend on changing the interpretation of what is said, such as the use of an expression absolutely or with some qualification of respect or place or time or relation or on making more than one question one).96 Deceptions which depend on the form of expression (λέξεις) result from likeness in discourse, for it is difficult to distinguish what is signified by the same statement and what by different statements; and the man who can make those distinctions, Aristotle adds, is close to the understanding of truth. This kind of deception, which results from the use of an expression to denote what does not belong to an object or a class as if it did, occurs more readily when we are engaged in an inquiry with others than when we proceed alone, for common inquiry is conducted by means of language, while individual inquiry is carried on as much by means of the object itself. Yet a man is likely to be deceived, even when inquiring alone, when he takes language as the basis for his inquiry, for the deception arises from the likenesses suggested by the language used rather than from the things signified.97

The lists and analyses of different meanings of words, which form an integral part of Aristotle's arguments in the sciences, serve the purpose, not merely of conventional classification of usages or

94 Metaph. iv. 5. 1010-7-15. 95 Soph. Ref. 1. 165-6-10. 96 Ibid. 4. 165-23-168-16. 97 Ibid. 7. 169-22-2.
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arbitrary selection of a definition to be employed, but of avoiding equivocation and determining the application of word to thing. The thing signified may be single and the same in number, species, or genus, and there is a place even for analogical terms; the danger is in ambiguity or equivocation, in which the same word is used with two or more meanings or essential definitions. In its changed meanings the word applies to different things, and ambiguity may therefore occur by neglecting any of the important differentiations found in the examination of language as an instrument for stating the nature of things. One of the most frequent forms of ambiguity is the application of a word to things which have the same physical constitution or observable form but which differ, in that one lacks the power or function proper to a thing of such constitution or form: in this fashion a living and a dead or artificial hand, eye, or animal are the same only in name. Similarly, a word may be applied to the abstract universal and the physical particular, as “circle” may mean circle in general or an individual circle involved in matter. Or a word may be applied to matter and the passions which matter undergoes, as when bronze becomes hot or fluid, we call the bronze “hot” and “fluid,” and the hot and the fluid “bronze.” Or the equivocation may arise from applying a word to a whole and its part, as in the case of a blood vessel. Again, a word may have a different meaning as applied to different things and a different contrary to each of those meanings, as “sharp” is the contrary to a “flat” note or a “dull” edge, and similar shifts are involved when it is applied to flavors and angles. Finally, a word may be purely and completelyequivocal, as when things happen wholly by chance to possess the same name. These differentiations are of particular importance in establishing the property of a thing or in refuting statements of alleged properties or in setting up a definition, particularly in the physical and biological sciences, where a word may mean the composite substance or the actuality or form, as “animal” may be thought to mean “a soul in a body” or a “soul.” The fundamental errors of both Democritus and Plato may be specified by identifying the ambiguities on which they depend, for Democritus identified form with configuration without recognizing that a living and a dead hand possess the same configuration or that a physician in a painting and a flute in a sculpture, in spite of their names, cannot perform the functions proper to physician and flute, while Plato separated the Form and the sensible so completely that, despite contentions of Platonists to the contrary, the Idea of a thing and a particular instance of it have in common only the name they share. Although discourse (λόγος) is, in one
sense, synonymous with thought (διάνοια), it is also, in another sense, not only distinct from thought but even contrary to it. The same method of discussion, consequently, is not suited to all opponents, for some stand in need of persuasion and others of compulsion. In the one case, the thought rather than the expressed argument must be met, and the thought is often based on difficulties derived from observation of the sensible world: refutation in such discussions should be directed to removing the source of error or ignorance. In the other case, those who argue for the sake of argument (λόγος) can be convinced only by emending the argument as expressed in words;\textsuperscript{110} for it is possible to speak rightly in a sense and still think wrongly or be ignorant in another sense, since one's words may have a defensible meaning if properly qualified.\textsuperscript{111} Sometimes similar arguments are advanced by those who hold a conviction and those who merely assert the position without conviction;\textsuperscript{112} sometimes it is utterly impossible to believe what is asserted, as, for example, in the case of the assertion that the same thing is and is not, which some people think Heraclitus made; and, in general, a man does not necessarily believe what he says.\textsuperscript{113}

Aristotle finds many instances in the doctrines of earlier philosophers\textsuperscript{114} in which a position is held, not because it resolves a difficulty, but merely for the sake of argument;\textsuperscript{115} and, conversely, one of the signs which he adduces to show that scientific demonstration must proceed from necessary premises is the objection which we raise against any professed demonstration, that its major premise is not a necessary truth, either because we think it impossible absolutely or at least for the sake of argument.\textsuperscript{116} When a point is a matter of indifference to the inquiry in hand, it may be assumed for the sake of argument,\textsuperscript{117} but some limitation must be put on such modes of argument because of their effect, not on the argument, but on the hearer. It is dangerous, thus, to maintain some positions—such as that pleasure is the good and that to do injustice is better than to suffer it—because resentment is inspired if one is thought to maintain them, not for the sake of argument, but because one really thinks them to be true.\textsuperscript{118} Even the use of language that flows from knowledge is no guaranty of its meaning, for scientific proofs and the verses of Empedocles can be uttered by men under the influence of the passions, and those who have just begun to learn a science can string together scientific phrases without knowing the science.\textsuperscript{119} Indeed, one usually has recourse to a long story (λόγος), like those which slaves tell, when one has nothing sound to say.\textsuperscript{120} The rule in interpretation, conversely, is to seek meanings in content or intention rather than in the accidents of words; and, even in the case of law, the rule of equity bids us be merciful to the weaknesses of human nature, to think less about the laws than about the man who framed them, and less about what he said (λόγοι) than about what he meant (διάνοια).\textsuperscript{121}

It is useful, for dialectical purposes, to have examined the number of meanings of a term both for the sake of clarity and to insure that our reasonings be in accordance with the actual facts and not ad-

\textsuperscript{110} Metaph. iv. 5. 1009\textsuperscript{a}18-25.  
\textsuperscript{111} Ibid. 1009\textsuperscript{a}30-36.  
\textsuperscript{112} Ibid. 6. 1011\textsuperscript{a}6-13.  
\textsuperscript{113} Ibid. 6. 1011\textsuperscript{b}1-3; 7. 1012\textsuperscript{b}5-7.  
\textsuperscript{114} Phys. i. 2. 185\textsuperscript{a}5-12.  
\textsuperscript{115} Post. Anal. i. 6. 74\textsuperscript{b}18-21.  
\textsuperscript{116} Nic. Eth. vi. 13. 1144\textsuperscript{a}28-33.  
\textsuperscript{117} Top. viii. 9. 160\textsuperscript{a}17-22.  
\textsuperscript{118} Nic. Eth. viii. 3. 1147\textsuperscript{a}18-24.  
\textsuperscript{119} Metaph. xiv. 3. 1091\textsuperscript{a}5-9.  
\textsuperscript{120} Rhet. i. 14. 1374\textsuperscript{b}10-16.
dressed to the terms alone. Such examination helps one also both to avoid being misled and to mislead by false reasoning. The latter manner of verbal discussion, however, is not proper even to dialectic, and dialecticians should resort to it only when the subject of discussion cannot be treated in any other way; \(^{122}\) and it is justified then, under the rule that against an objector who sticks at nothing the defense should stick at nothing. \(^{123}\) The demonstration of the ambiguity of their terms is not an effective device against people who argue eristically, and they must be treated, not as refuting but as merely appearing to refute, for arguments are solved in such discussions by appeal to general estimation rather than to truth; but ambiguities should be removed from definitions in most discussions, and even against Platonists the demonstration that some of Plato's definitions do not apply to the Ideas is a useful argument. \(^{124}\) Nonetheless, even in the treatment of fallacies and sophistical refutations, where the argument which turns on words alone is the commonest and most usual source of fallacies, \(^{125}\) the distinction between arguments directed against the expression and arguments directed against the thought is absurd, for any pertinent treatment of the expression, even when the words are used ambiguously, is directed against the thought; \(^{126}\) and, conversely, in the fallacy of many questions, when several problems are made into one, the refutation is purely verbal and therefore no refutation. \(^{127}\)

In scientific discourse the formula is considered in relation to its subject matter, and the adequacy or truth of statement is tested by reference to things. Statements, including scientific propositions, may also be considered in relation to men, and the adequacy or effectiveness of statement is measured by the conviction or belief produced. The conviction of one who has acquired scientific knowledge is unshakable; \(^{128}\) but, even if what is said is based on the most exact knowledge, it does not always produce conviction, for scientific argument (διὰ κατὰ τὴν ἐπιστήμην λόγος) implies instruction, and there are audiences who are unaffected by scientific reasons as there are people whom one cannot instruct. \(^{129}\) If discourse is used for the purposes of science and for the attainment of truth, the proposition is constructed to express a reason or an argument adequate to the form of the thing, and all three—statement, reason, and form—may be signified by the same word, λόγος. If discourse is used for the purposes of communication and for the inducement of conviction, the effectiveness of reasons and the conception of subject matter are both determined by the constitution and predisposition of the audience. Three kinds of persuasion are furnished by speech (λόγος): the first depends on the character of the speaker, the second on putting the hearer into a certain state of mind, and the third on the speech (λόγος) itself in so far as it proves or seems to prove. \(^{130}\)

What is true and what is just have a natural tendency to prevail over their opposites and to be more persuasive; but, whereas the end of inquiry and proof is to bring formula, knowledge, and thing into coincidence, persuasion is produced if the speech is delivered in a manner which arouses confidence in the speaker or if the passions of the hearers are aroused by the speech or if a truth or apparent truth is

\(^{122}\) Top. 1. 18. 108b18–37. \(^{123}\) Ibid. v. 4. 134a3–4. 124 Soph. Ref. 17. 176a11–176b28; Top. vi. 10. 148a14–22. 
\(^{125}\) Soph. Ref. 1. 165a3–6. 
\(^{126}\) Ibid. 10. 170b12–171b2. 
\(^{127}\) Ibid. 30. 181b19–24. 
\(^{128}\) Post. Anal. 1. 2. 72a32–84. 
\(^{129}\) Rhet. 1. 1. 1355a24–29. 
\(^{130}\) Ibid. 2. 1356a1–4.
established in the speech by means of arguments apparently suited to the subject matter. To employ these means of persuasion the speaker must be capable (1) of syllogizing or reasoning, (2) of understanding characters and virtues, and (3) of understanding the passions and how they are aroused. The art of rhetoric, which is the study of means of persuasion, is therefore closely related to ethics and politics; and the manner of their relation may be seen, as was true also of the relation of logic to the theoretic sciences, by the derivative meanings attached to the word λόγος by the extension of "discourse" to the rational processes pertinent to the functions of speech. In scientific discourse the effort is to discover a formula or reason or form; λόγος is contrasted as reason, in this enterprise, to both sensation and the concrete thing, in spite of the fact that verbal discourse may be in contradiction with reason. In practical discourse the effort is not to know virtue but to make men virtuous, and virtue is determined by the rule of right reason; λόγος is contrasted as reason, in this enterprise, to character and passion, in spite of the fact that words may be determined by passion and action may be determined by words or passions rather than by reason. Rhetoric is therefore not an instrument of ethics and politics, although it is useful; and its scope, like that of dialectic, which likewise derives its principles from opinions and common-places, is not limited to any one subject matter but is universal. The criterion for rhetorical performance is not found in right reason, which determines the virtues of men and their relations under law, but in the common-places by which arguments are selected appropriate to speaker, occasion, and audience. Logic is an instrument of the sciences, since it treats of the construction and demonstration of formae which express the nature and processes of things. Rhetoric, as a faculty of persuasion, treats of the construction of arguments, plausible to the occasion, which fix opinions and may lead to action. The "argument" of rhetoric is adapted to the character of the audience; the "reason" of the practical sciences determines what the character of individual men and the laws of the association of groups of men ought to be.

Reason (λόγος) is related to nature differently in the discovery of truth and the achievement of good. Truth is found in nature, reason, and statement; men are good by nature, habit, or reason. Speech may be contrary to reason in both: it may be the statement of fallacious argument and false conclusion, and it may be the consequence or the cause of immoral habits and actions. Reason may persuade to actions contrary to both nature and habit, and the problems of ethics and politics are determined by the fact that the good is achieved when nature, habit, and reason are in harmony; and yet, although man alone possesses reason, teaching and argument are not effective with all men. As a consequence, the problems of action must be treated in terms both of the moral habits of individuals and of the political constitutions of states. Moral virtue is a habit determined relative both to the nature and to the circumstances of the individual and also to the rule of right reason. Reason may rule the irrational impulses of anger, wishing, and desire by means of habit, although only the prudent man is able to discern the rule of reason. Reason and mind are the end toward which nature strives in men. The state is a community, not merely of living beings, but of like beings, aiming at the best life possible. The various kinds of states and the many forms of government are deter-

mined by the various qualities of men and the many ways in which they seek happiness. The state is a natural composition and not a mere mixture; and conditions which determine its nature and unity, therefore, are not necessarily its organic parts but, rather, their ratio (λόγος) relative to the functions of the state with respect to such things as food, the arts, arms, revenue, religion, and decisions with respect to what is for the public interest and what is just in men's dealings with each other. Justice, which is the expression of that ratio or proportion, is a virtue in the individual and the bond of union of the state.

Right reason (λόγος) as it influences the formation of character and the promulgation of law, therefore, has analogies both to the definition (λόγος) in which the nature of things is stated in the physical sciences and the formula (λόγος) in which the proportions of quantities are stated in the mathematical sciences:

What affirmation and negation are in thought (διάνοια), pursuit and avoidance are in desire; so that since moral virtue is a habit concerned with choice, and choice is deliberate desire, therefore both the reason (λόγος) must be true and the desire right, if the choice is to be good, and the desire must pursue just what the reason asserts. Now this kind of thought and truth is practical: the good and the bad functioning of the intellect which is theoretic, and not practical nor productive, are truth and falsity respectively (for this is the work of every intellectual power); but the good functioning of the power which is practical and intellectual is truth in accordance with right desire.

Similar considerations are relevant to the consideration of political problems, for law is reason (νοῦς) unaffected by desire. Consequently, one way of forming a virtuous character is by instruction and education; and the possibility of political organization is to be found in the possession of speech, which permits man to differentiate the expedient and the inexpedient, the just and the unjust. Moreover, among the virtues there are those concerned with the interchange of words and deeds (λόγοι και πράγματα) in social intercourse—friendliness, which turns on a calculus of pleasures and pains; truthfulness, which depends on neither belittling what one has nor claiming more than one has; and ready wit and tact—as well as the virtues of the part of the soul which possesses reason (λόγος). Similarly, as the state depends on speech and instruction for the formation of the virtues of its citizens and the promulgation of laws appropriate to its constitution, so the art of politics determines which of the sciences should be studied in a state, which sciences each class of citizens should learn, and up to what point they should be taught. The art of rhetoric, as a final consequence, may use speech adapted for the purposes of persuasion to the characters of men as they are and to the passions which may be incited in them.

Discourse may be considered, finally, not only in relation to its subject matter or to men but in relation to the structure and unity which a work of literature possesses when viewed as a concrete whole (όνομα) composed of form and matter. Poetry is an imitation of things as they are or ought to be, and each kind of poetry produces its proper pleasure; but it is also a whole, complete in itself, with a beginning, middle, and end and with all the organic unity of a living creature. Aristotle therefore analyzes tragedy—and, by

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134 Nic. Eth. v. 1–5. 1129a3–1134b16; Pol. i. 2. 1253a29–38; ii. 9. 1280b7–12; ii. 11. 1282b1–13; iii. 16. 1287b25–b65.
136 Pol. iii. 16. 1287b32.
implication, the other forms of poetry and the fine arts in general would submit to similar analyses—in terms of a whole consisting of six parts: plot, character, diction, thought, spectacle, and melody, of which two are derived from the means, one from the manner, and three from the object of imitation. Discourse not only supplies the matter from which the tragedy is constructed, since it is expressed in language (λόγος) with pleasurable accessories, but also the form, since the argument or plot (λόγος καὶ μῦθος) is the end, the principle, and the soul of tragedy;¹⁴¹ the poem itself, moreover, may be viewed in its unity as a single speech (λόγος). Four of the parts of tragedy, to which melody and spectacle are added, repeat thus in the new interrelations pertinent to the artistic use of speech the elements that went into the determination of its scientific and practical use. The things, thoughts, and formulae of scientific speech have become the plot (which is a combination of incidents or things—πράγματα),¹⁴² the thought, and the diction; while the reason, habit, and actions of ethics have become the thought, character, and plot. These alterations are signs of a change in the criteria pertinent to the use of language in art; for, whereas in science consideration of the attributes of things, one in number or in reason, furnished criteria for statement, and in action consideration of the proportions of habits and circumstances depended on the rule of reason in the determination of virtues and laws, in art considerations of plot, character, and thought may yield justification for the statement of the impossible and the portrayal of the immoral.

Tragedy is an imitation of action. In the natural order of things there are two causes of action: thought and character; and the agents of an action necessarily have distinctive qualities of character and thought, since it is from these that we ascribe certain qualities to their actions.¹⁴³ Tragedy is essentially, however, an imitation not of persons but of action and life, of happiness and misery. The action of a play, consequently, is not for the sake of the characters, but the characters are included for the sake of the action.¹⁴⁴ Statement and action, in turn, serve to differentiate thought and character. Thought is defined as saying whatever can be said or what is appropriate to the occasion. The speeches in tragedy, therefore, fall under the arts of politics and rhetoric; and the older poets are said to have made their personages discourse like statesmen, the moderns like rhetoricians. Thought carries with it in tragedy reflections of the traits observed in scientific inquiry, for thought is shown in all that the characters say when proving or disproving some particular point or enunciating some universal proposition. Character, on the other hand, carries with it the traits of moral decision, for it reveals choice by making clear the kind of thing a character chooses or avoids where the choice is not obvious, and consequently character is conveyed only in those speeches (λόγοι) which express choice or avoidance.¹⁴⁵ Character is therefore revealed by speech or action,¹⁴⁶ while thought includes all the effects of language, with the requirement only that it be shown to be consistent with action.

In thought are included whatever effects are to be produced by language. Some of these effects are proof and refutation, the arousing of emotions (such as pity, fear, anger, and the like), and again amplification and diminution. But it is clear that in the incidents also, when effects of pity or terror or amplification or probability are to be produced, the same rules must

¹⁴¹ Ibid. 6. 1450b22-23, 38-39.
¹⁴² Ibid. 1450b5, 22, 32-33, 37; 14. 1453b2-3.
¹⁴³ Ibid. 1449b36-1450a7.
¹⁴⁴ Ibid. 1450b15-29.
¹⁴⁵ Ibid. 1450b4-15.
¹⁴⁶ Ibid. 15. 1454b17-19.
be used. The only difference is that the effects in action must be apparent without explanation, whereas the effects in language are produced by the speaker and arise from his language. For what would be the use of a speaker, if things were apparent in the fashion in which they should be and not because of the statement?  

Yet, in the construction of that combination of incidents or things which constitutes the plot, argument and plot (λόγος και μύθος) are used as synonymous terms; and, like the soul, in which the rational should rule the irrational part, the plot or story (λόγος), in the interests of probability, should never be made up of improbable or irrational parts (μήπος ἀλογος). The speech (λόγος) is the most inclusive part of diction (λέξεις), and the poem as a whole, in turn, is a single speech (λόγος), formed by the conjunction of many speeches.

III. THE ARTS OF LANGUAGE: HUMAN STATEMENTS AND THEIR STRUCTURE

The differentiation of the scientific, practical, and artistic uses of language serves to isolate the criteria that are relevant to the consideration of statements as argument and proof, as incitation to action or influence to good, and as artistic form and aesthetic object. Such distinctions do not depend, however, on classifying statements in fixed genera, as if they had natural forms, definitions, and species. A work which is essentially poetic may be practical in its effects on the characters of men and scientific in its statement of incidental arguments; and it may therefore be considered, so long as attention is directed either to practical consequences or to theoretic precision, in terms of other criteria than those of poetry. Poetry is treated as such in the Poetics; its educational function is taken up in the Politics; the statements and arguments of poets and of characters in poetry are analyzed in the Rhetoric; the moral situations and moral aphorisms of poets are used in the Nicomachean Ethics; and poetry and mythology are quoted as evidence in the Metaphysics. In like fashion, ethics and politics, though practical in character, are dependent on the conclusions and distinctions of theoretic sciences like psychology, and arguments in the practical sciences are subject to the criteria of logical demonstration. Science, in turn, may be considered relative to man as virtue to be pursued in life rather than as knowledge to be acquired relative to a subject matter; and considerations of order and style are not irrelevant to the verbal and symbolic forms in which the theoretic and practical sciences are set forth. These interrelations may be recognized, once the differentiation of linguistic functions has been made; and, what is more important, the consequences of substituting one set of criteria for another may then be stated unambiguously.

A poem, thus, may be considered in terms of its own unity, its effect on audiences, or its imitation of actual things. To consider a poem in itself, however, is to consider what Aristotle calls its “proper pleasure,” that is, its effect on an audience so constituted and informed that its reactions may be traced to causes proper to the work of art, but not necessarily on an audience taken at random, which might react to qualities accidental to a poem or its circumstances. The examination of such reactions without some control to relate the reactions of the audience to qualities in the poem would furnish information concerning audiences rather than insight into the work of art. To consider a poem in itself is likewise to consider it as an organization of incidents, a development of characters, and an expression of
thoughts, and all of these are effective as imitations of nature and of life; but they are effective not as a literal report of what actually occurs but as an artistic representation which has a life of its own and a probability which does not depend on historical accuracy.

A scientific argument, similarly, may be considered in terms of its adequacy to the facts, its effect on those who examine it, and its own structure of development. To consider a demonstrative argument in terms of its adequacy to the facts, however, is to trace it to first principles, which are indemonstrable. Principles which are believed by all men or by a consensus of scientists competent in the field are taken as true; yet the arguments to justify the acceptance of the principle scientifically are derived from the nature of things rather than from the authority of scientists, although that may be sufficient grounds for the belief of laymen. To consider a demonstrative argument in terms of its adequacy to the facts is likewise to trace the steps of its proof and the meanings of its terms; but the structure of symbolic organization and the assumed definitions are determined neither by the nature of the symbols themselves nor by arbitrary conventions and modes of operation but by the structure of things examined in the inquiries of the sciences.

A rhetorical argument, finally, may be examined in terms of its probable effects on an audience, its adequacy to its subject matter, or its formal structure. To consider a rhetorical speech in terms of persuasion, however, is also to examine the subject matter treated, not as it is according to the conclusions of the most competent experts and scientists, but as it may be presented most effectively to a given kind of audience. To consider a rhetorical speech in terms of persuasion is likewise to consider its organization and structure, not as a work of art or as a demonstration of science, but in terms of the appropriateness of the style and arrangement to the audience and circumstances of the speech.

The various uses to which language is put are thus subject to three arts of language—logic, rhetoric, and poetic—in which different purposes and different criteria select different aspects of language to constitute different wholes from different parts. Poetry may be distinguished from prose, and the prose of rhetorical metaphor may be distinguished from the prose of literal logical proposition, by characteristics that can be found in the least parts of which statements are composed, as well as in the causes of unity which bind parts into organized wholes. Those characteristics of treatise, speech, and poem; of syllogism, enthymeme, and plot; of interpretation, communication, and style; and of proposition, sentence, and verse reflect in the qualities and structure of language the uses to which language is put and the relation of language to the thought expressed and to the subject matter treated.

In the sciences the concern is with statements literally true of some subject matter, and the least part of the discourse with which the logician is concerned is therefore a “term” or a word with a definition. Words which are used univocally, that is, when both the word and the definition answering to the word are the same, are carefully differentiated from words which are used equivocally, that is, when a common name has different definitions, and from words which are related derivatively, that is, when words have different terminations but one is derived from the other. On the basis of those distinctions it is possible to enumerate ultimate categories of terms by considering their manner of definition, predication, derivation, contrariety, or variation in degree. Once nouns have been differentiated from verbs by considerations of predication and time, a sentence
may be defined as a significant portion of speech, some parts of which have an independent meaning as an utterance, though not as the expression of a judgment. The concern of logic is limited to propositions, that is, sentences which are true or false; and all other sentences, such as prayers, commands, threats, or all statements considered in any function other than their expression of truth or falsity, are relegated to the study of rhetoric or poetic. A premise is a sentence affirming or denying one thing of another, and a syllogism or an argument is constructed by so relating two premises that one term may be affirmed or denied of all or of some of another term because of the relations of those two terms to a third term. Moreover, the affirmation or denial in the premises and the conclusion may be merely stated or may be stated to be necessary or probable.

A science, viewed in terms of the data of experience and the processes of inquiry, may be treated as a collection of terms and the interrelations among them: subjects of which attributes happen to be asserted, consequents which follow from their assertion, and attributes inconsistent with them. The principles of the science will be found in that collection of terms, but as argument and proof the science is dependent on the pre-existent knowledge from which the conclusion follows in teaching or demonstration. Since scientific knowledge cannot be other than it is, the truth obtained by demonstration will be necessary; and scientific demonstration must be an inference from necessary premises, that is, from premises in which the attribute is true in every instance of its subject, essential and not accidental to its subject, and universal. We may, to be sure, fall into error in supposing our conclusion to be primary and universal, but the search for scientific principles is an inquiry into essential definitions of the various genera of things and into the causes of inherence of attributes in the subjects in which they are found.

The logician is concerned with the examination of the conditions of proof and definition, for, although demonstration and scientific knowledge treat of necessary laws and invariable connections in things, it is possible to state the origins from which principles are derived and the grounds on which they are tested as well as the ways in which conclusions are derived validly from them in any science; and, although the sciences are distinguished from each other by their subject matters, principles, and methods and although demonstration cannot move from one genus of things to another, the logic of propositions and proof is common to the sciences. The entire analysis, not only of premises and demonstrative syllogisms but also of terms, depends on the assumption of a difference between essential and accidental predication based on a difference between substance and accident in existence. The demonstration of the existence of substance is the task of the metaphysician, and the subject of his inquiry includes the relation of statement to things, not, however, as the logician considers that relation but as an inquiry into their relative status as two instances of existence and into the implications derived from the nature of statements which are valid for the conditions of being. Examination of the principles of the sciences, which are proper in each case to the genus of things studied in each science, leads the metaphysician to the examination of the most certain principles of all things, which are both best known and nonhypothetical—the principle of contradiction and the principle of excluded middle. These principles are strictly indemonstrable, but they are subject to negative demonstration by reductio ad absurdum, since any

15 Interpret. 4. 17•1–7; cf. Post. 19. 1456b8–13.
statement whatsoever, including statements about substance and accident, can be shown to depend on assuming them. The basic truths which are common to several sciences are one, not literally but by analogy, since they are used differently in application to the particular genera of the different sciences. A principle of limitation may therefore be applied in the mathematical and physical sciences, since it is not the function of a scientist to demonstrate the existence of his subject matter or to solve difficulties that do not arise, truly or falsely, from the principles of his science. The differentiation of the theoretic sciences, which have as their end simply to know, depends on differences found in the things which constitute their subject matter, but it can be stated in terms of differences in their principles and in the necessity of their conclusions.

One large class of things exists "by nature," and such natural or physical things are distinguished from the products of art by the possession of an internal principle of motion and rest. They move and remain stationary in place according to fixed principles; some of them increase or decrease in size as a result of biological processes; some change in the qualities they possess and are generated and pass away. These natural things include compound inorganic bodies and their constitutive elements, plants and their parts, animals and their parts; all such objects are studied in the sciences of physics, which are, in turn, differentiated into the various subdivisions of physical, biological, and psychological inquiry, according to kinds of natures and motions. In general, the concern of physics with "natures" is reflected in its definitions and principles, for they are never purely formal but always include consideration of matter and motion, and they are arrived at by induction from the changing things of experience. The surfaces and volumes, lines, points, and numbers, which are the subject matter of mathematics, are contained, like the properties studied by the physicist, in physical bodies; and, indeed, they are also treated as physical properties rather than as mathematical entities in the various branches of physics. The mathematician, however, treats them differently from the physicist, for, although they cannot exist apart from matter and motion in fact, they can be abstracted in thought and treated separately in science. The definitions of mathematics therefore involve no reference to matter but are related to physical definitions as "curved" is to "snub"; and the principles of mathematics depend on this peculiarity of quantity which makes it alone among the properties of things susceptible of abstract scientific development. Quantities, so understood, include not only numbers, points, lines, surfaces, and solids but speech, time, and space, and the mathematical proposition takes its most characteristic form as a formula which states a proportion or an equality. Things and their qualities may be arranged in serial order or in proportions; and, in addition to the inferential consequences which follow concerning quantities in mathematics, proportions may be found in the consideration of motions, the genera of animals, the nature of justice in the physical and practical sciences, in analogies which yield insight into the likenesses of things in metaphysics, and in metaphors which have both rhetorical and poetic uses. Finally, those forms which not only can be known but also can exist apart from matter and motion are studied in First Philosophy or metaphysics. The concern of metaphysics with being as such, therefore, involves inquiry not only into the ultimate principles of knowledge and the ultimate causes of existence and change but also into the principles of order, the unmoved movers, which, themselves exempt from the muta-
bility of which they are the source and formulation, determine the interrelations of the universe, and among which God is supreme. The general differentiation of forms according to their existence and intelligibility in matter and apart from matter determines the differences among the definitions and principles, and therefore among the methods of inquiry and proof, in the three theoretic sciences—physics, mathematics, and metaphysics.

All three of the theoretic sciences, despite differences in their subject matter and, consequently, in their principles, treat of that which cannot be other than it is—that is, with the necessary rather than the contingent. Scientific propositions must be necessary, not merely probable; but necessity may be either "simple" or "hypothetical." Simple or absolute necessity is found in the relation of properties and definitions or essences, which imply each other and which are never found separate one from the other. Both the processes of physics and the inferences of mathematics require departure from this simple necessity to two varieties of hypothetical necessity. Both involve assumptions, which, if granted or satisfied, yield necessary conclusions; but the direction of the hypothetical reasoning is precisely opposite in the two sciences: in mathematics from antecedents to consequents, in physics from consequents to antecedents. In mathematics if the premises are granted or are established, the argument can be shown to follow necessarily, but the premises are not necessarily true if the conclusion which is shown to follow from them is known to be true. In physics, if a process or motion has been completed, the antecedent steps can be shown to have occurred necessarily, but it does not follow from the existence of the antecedent stages that the effect must necessarily follow. The conclusions of mathematics are thus necessary and universal, even though its subject matter does not exist as it is known, for the antecedents may be shown to be necessary only if the relation is abstract; and the conclusions of physics are necessary and universal, even though they treat of that which happens always or for the most part, for the consequences follow necessarily only if the causes are unimpeded. Necessity in all three sciences depends on the discovery of essence: in metaphysics the discovery of essence is made in analogies, in mathematics it is stated in axioms, in physics it depends on matter; in all three the establishment of necessary propositions is a problem of definition and of the causes of the inherence of properties.

The subject matter of the practical and productive sciences does not permit as much precision as is possible in the theoretic sciences. The definitions of the virtues and of tragedy are not statements of the essences of "natural" things but rather of the formation of things which may be changed by human decision and choice, and the knowledge of either may be a means of generating them or of determining the characteristics they should have. Knowledge of falling bodies will not affect the law of their fall, but it may lead to the institution of an art for their utilization or control. Knowledge of the causes of appetites and passions will not affect the psychological laws of their incidence, but it may lead by action and habituation to a virtue which will control or suppress them. Definitions in the practical and productive sciences are therefore not strict definitions by genera and differentia, since there are no precisely drawn or natural species of virtues, institutions, or art-forms, but definitions can be formed by consideration of causes in nature or man and of parts in the habit or artificial object. Principles cannot be formulated as necessary, but they can be found in the
rule of right reason in action and in the forms suited to achieve ends in art. The method of the statesman in ethics and politics and the method of the critic in poetic depend on the use of a logical method analogous to that employed by the theoretic scientist, while differing from it as the method of one theoretic science differs from that of another, that is, in the manner in which principles are established and in the significances attached to terms in definitions. Both action and production lead to verbal arts, however, which are distinct from the practical and the productive sciences. Rhetoric has close connections with the subject matter of ethics and politics and with the method of dialectic; but it may construct arguments for either of two contrary positions, and it is without limitations to subject matter, being in this respect like dialectic and unlike the sciences; and it may employ means of persuasion which go beyond the formal limits of dialectical argumentation. Poetry may construct arguments similar to those of politics and rhetoric, but both are employed to make actions and characters plausible; and the use of diction in the construction of a poem is distinct from the use of inductive and deductive syllogisms, by which the nature of poetic devices is examined in the science of poetic.

Both dialectic and rhetoric employ "common-places" in the establishment and refutation of arguments. The common-places of dialectic, however, are used to set up or test definitions of terms, their genera, the properties asserted of them, and the accidents that may be connected with them. Dialectic explores defensible relations among terms as such; and in this function it may be a preliminary to, or even a part of, scientific inquiry. The common-places of rhetoric, on the other hand, serve to arrange subject matters as they might be presented and to prepare arguments as they might be effective, preliminary to inquiring into the styles and organizations of speeches appropriate to arguments chosen with reference to the circumstances and tendencies of particular kinds of hearers. The treatment of rhetoric, consequently, falls into three distinct, though related, parts, two concerned with what should be said as pertinent, first, to the relation of subject matter and audience and, second, to the relation of speaker and audience, and one concerned with language conceived as the manner of presenting what should be said.

Rhetoric is not bound to a single definite subject matter but is universal; and the better one succeeds in establishing propositions proper to a subject matter, the more one departs from the proper concern of rhetoric with words and forms of reasoning suited to persuasion and enters one of the special sciences concerned with definite subjects. There are, nonetheless, three kinds of rhetoric, determined by the three classes of listeners to speeches; and their subject matters are determined, in turn, not by intrinsic characteristics but by the operations of persuasion proper to such subject matters, the times of their occurrence, and the ends envisaged in persuasion. Political or deliberative oratory consists in urging us to do or not to do something; it is concerned with the future; its end is to establish the expediency or harmfulness of a proposed course of action. Forensic or legal oratory consists in attacking or defending somebody; it is concerned with the past; its end is to establish the justice or injustice of some action. Epideictic or ceremonial oratory consists in praising or censuring somebody; it is concerned with the present; its end is to prove a man worthy of honor or the reverse. In each of these fields the orator will equip himself with common-places from which to derive argu-

153 Rhet. ii. 22. 1395b24—1396b3.
154 Ibid. iii. 1. 1403a15—22.
ments for or against any pertinent position. When persuasion is achieved by proof or apparent proof, it makes use of two means: the enthymeme, which is like the syllogism in dialectic, and the example, which is like induction in dialectic. Since rhetoric is concerned with such matters as we deliberate upon without arts or systems to guide us, its arguments deal with what is, in the main, contingent. The materials of enthymememes are probabilities and signs, and probabilities are distinguished from signs in the field of contingent things in a fashion similar to the distinction of propositions that are generally true from those that are necessarily true in science. A probability is a statement of what usually happens, and it is related to any instance as a universal is related to a particular; signs are related to the statement of which they are signs as antecedent to consequent or cause to effect: the sign is infallible if the reasoning is from universal to particular (as when fever is taken as a sign of illness), but it is fallible if the reasoning is from particular to universal (as when fast breathing is taken as a sign of fever). Rhetorical reasoning is directed to a choice between alternatives for action, and it proceeds from signs and probabilities and from opinions accepted by our judges; dialectical reasoning is directed to the separation of essential from accidental predication, and it proceeds from opinions generally accepted; scientific demonstration depends on essential premises, since one does not have reasoned knowledge of conclusions derived from accidental premises even when they are invariable signs, and on true and primary premises, which are believed on the strength not of anything else but of themselves. Arguments in the physical sciences deal with the relations of antecedents and consequences. Although these relations are found in occurrences which are not necessary but take place for the most part, as heavy bodies usually fall, they can be related to necessary laws by definitions which determine essential nature and by hypothetical propositions which bear on occurrences, as heavy bodies may be distinguished from light and the laws of falling bodies in the absence of restraining forces may be stated universally. In rhetoric, on the other hand, as well as in dialectic, the more correctly a particular subject is handled, the further the argument departs from rhetoric and dialectic.

A statement or argument is persuasive and credible because there is somebody whom it persuades. In dialectic the principles of discussion are found in the distinctions between definition, genus, property, and accident; but in rhetoric they are derived from the view of the facts which the speaker can make acceptable to his audience, and the example, enthymeme, and maxim must therefore be considered in terms of a second group of common-places which bear, not on the plausibility of arguments relative to the alternatives presented, but on their plausibility relative to the persons addressed. In dialectic no separate consideration of the audience is required, but rather, since the opposition is between the consequences of the hypotheses entertained, the intrusion of a bias of opinion or a particular interpretation of statements can be exposed as fallacious reasoning. In rhetoric, on the contrary, the audience addressed determines both the subject matter appropriate to its interests in the particular common-places proper to the classification and treatment of the facts and also the principles that may be used effectively in the general common-places appropriate to the arguments.

154 Rhet. 1. 1. 155b35-155c2; Pr. Anal. II. 27. 70b3-138; Post. Anal. I. 6. 75a28-37; Soph. Ref. 5. 167a8-20.
155 Top. 1. 1. 100b25-101a23.
157 Rhet. 1. 2. 135b8-26.
Finally, and for much the same reason, the style and the arrangement of a rhetorical speech form a separate consideration in rhetoric, for, when language may be metaphorical as well as literal, words are an additional means of persuasion and their effective use depends on additional criteria found in the correctness, impressiveness, appropriateness, and rhythm of language. Scientific demonstration must be expressed in univocal terms and literal statement, and the criteria of expression, like those of thought, are determined by considerations of adequacy to the subject matter of the demonstration. Dialectical proof and refutation are directed to removing ambiguity, and the virtues of language are determined by the intellectual processes by which properties and definitions are separated from accidents. Rhetoric, however, has three separate problems in the use of language for persuasion, for the effects of argument depend not only on the plausibility derived from (1) adapting the argument to the issue and (2) making it acceptable to the audience but also on (3) the style in which the argument is set forth and the arrangement of the statement and proof.

The language of poetry is distinct from that of prose; and, although oratorical prose at first took on a poetical color in writers like Gorgias, poetic may be distinguished from rhetoric by differences in the uses of the common resources of language and metaphor which distinguish poetic and rhetorical styles, in turn, from the literal predications and proofs of logic. The poetic use of language is not defined, however, by the use of verse and poetic rhythms but depends on the nature of poetry. A medical or physical theory does not become poetry by being stated in verse, but the nature of poetry is to be found in imitation, while science consists in demonstration from necessary and primary principles. Nor is the distinction between history and poetry in the fact that one is written in prose and the other in verse; for history is not made poetry by being turned into verse, but history describes the thing that has been, while poetry describes the possible, and the statements of history are therefore singulars, while those of poetry are of the nature of universals.

The possibility of science depends on argument which flows from definitions or formulae of what is essential in the nature of things; the possibility of poetry depends on a plot or argument which imitates what is possible of occurrence. Since questions of existence in general involve questions of unity and since to be is to be one, the differences in the constitution and existence of sciences and poems may be seen in the differences in the conditions of their being one. A single science deals with one genus of things, and a single poem represents one action. In short, the unity of a science is based on the nature of a kind of thing, while the unity of a poem reflects the completion of a kind of happening. The differences between these two sources of unity may be seen by contrasting the marks of unity found in the proofs of science with those found in the plot of poetry and by comparing the sources of necessity and probability on which each is grounded.

The unity of demonstrative proof is additive, that is, it is found in the parts and in the combinations of parts into wholes, by the opposition of terms, prior and posterior, and the interposition of middle terms; and for this reason Aristotle is careful to state the conditions

159 Poet. 1. 1447b16–21.
which mark the single term, the single proposition, and the basic premises peculiar to each science. Science depends on the discovery of middle terms to account for properties of things or connections among things. A science may therefore grow without endangering its unity, not by the interposition of fresh middle terms, since the true cause of the connection is sought, but, by the apposition of fresh extreme terms and, consequently, by the addition of new conclusions. There may, however, be more than one demonstration of one connection, but in each case the true cause of a connection is the proximate and not the universal cause. The unity of a poem, on the other hand, is organic, that is, it depends on the completeness of the work as a whole possessed of a beginning, middle, and end. The other parts of the poem—characters, thought, diction, melody, and spectacle—depend on the primary part, plot, which is the life and soul of a tragedy; and the incidents which make up the single action of the plot are so related to the whole that the transposition or omission of one of them will disjoin and dislocate the whole. The other parts of a tragedy may be arranged serially after plot, according to their effectiveness in achieving the end of the poem: second after plot come the characters, and, indeed, some suppose erroneously that the unity of a plot consists in having one man as its subject; third comes thought; fourth, diction; and, of the remaining two, melody is the greatest of the pleasurable accessories of tragedy, and spectacle, though an attraction, has the least to do with the art of poetry. The unity sought in the practical sciences is achieved in the character of the individual man and the constitution of the state. Rhetoric has analogies to the methods of all sciences: theoretic, practical, and productive. It is similar to logic in that persuasion is effected by argument: the parts of a speech are the statement of the case and the proof, and these are comparable to the statement of a problem and the demonstration; the relevant parts of speech in both rhetorical and logical argument are the noun and the verb; but the greater dependence of rhetoric on verbal connections gives the conjunction an importance for rhetoric which it does not have for logic; and the unity is additive, in the sense that the speech has no natural definition or determination of unity, and the style of prose must be either free-running, in which the parts are united by nothing except the connecting words, or periodic, in which the speech is composed of periods, complete in themselves, and the periods may, in turn, be further divisible into members. The criterion for determining the unity of the period is not derived, as the criterion for the unity of a proposition is, from consideration of its subject matter but rather resembles the marks of the unity of a poem; for a period is a portion of speech that has in itself a beginning and an end, being at the same time not too big to be taken in at a glance. But rhetoric differs from both logic and poetic in that a speech has no least parts comparable to the univocal terms of scientific demonstrations and no organic whole comparable to the plots of dramas; for the

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163 Cat. 1.16-19; 4.1.25-27; Interpret. 2.16.19-27; 3.16.6-8; Pr. Anal. 1.1.24.16-18; 26.30.33-34; 47.15.49-28; Post. Anal. 1.19.22.11.10-84.2; Top. 1.15.106.1.107.27.
165 Pr. Anal. 1.1.24.18-27.
166 Post. Anal. 1.9.75.37-76.30.
167 Ibid. 1.12.78.14-21; 32.88.3-29.
168 Ibid. 1.29.87.15-18; 11.18.99.9-14.
169 Post. 6.1450.b.5-20; 8.1451.30-35; 23.1459.b.17-24.
170 Rhet. ill. 13.1414.b.36.
171 Ibid. 2.1404.26-27; 5.1407.10-30—11-14; 6.1407.37-1408.1; 9.1409.24-27; 12.1413.b.31-34. Dionysius of Halicarnassus and Quintilian are authorities for the later tradition, built on these passages, that Aristotle enumerated three parts of speech: the noun, the verb, and the conjunction.
172 Ibid. 9.1409.24-332.
subject matter of oratory is not treated by scientific analysis and definition, in which terms acquire unique meanings, or by the devices of artistic imitation, in which plots acquire necessity or probability, but by the common-places of persuasion, in which the facts and their interpretation in argument and the use and manner of narration are all determined by reference to particular audiences.

In the theoretic sciences the truth obtained is necessary because of its dependence on knowledge of essential definitions and causes. A scientist occasionally makes use of arguments from probability or from signs, although neither provides demonstrative or scientific knowledge. Moreover, since a probability is a generally approved proposition—that is, what men know to happen or not to happen, to be or not to be, for the most part thus and thus— recourse to probability without other supporting evidence is usually an indication of a dubious extension of doctrine explicable only by taking into account the position or information of the scientist; a sign, on the other hand, is a demonstrative proposition, necessary or generally approved, based on the coexistence and interrelation of things; and, although it is not necessary knowledge or based on causes, even when the connection is invariable and therefore necessary, it is a useful heuristic device preliminary to scientific inquiry or a substitute for scientific knowledge when causes are not to be found.

Nature forms only part of the subject matter of the practical sciences, however, for men are good and virtuous by habit and reason as well as by nature, and art and education are designed to fill up the deficiencies of nature. We deliberate about things that are in our power and subject to our choices and desires, not about things that happen by necessity or by nature or by chance; and therefore deliberation and action are concerned with things that happen in a certain way for the most part but in which the event is obscure, and with things in which it is indeterminate. In such matters reason and habit, rather than nature, necessity, or chance, may be causes; and the end of ethics and politics is to bring character and reason to bear on matters of choice. Rhetoric is concerned with the same matters; but in ethics and politics action is influenced by reason through the formation of moral character and the institution of law, while in rhetoric action is influenced by persuasion suited to existing characters and conceptions of institutions. Since the persuasions have to do with contingent things, they are based not on universal laws but on probabilities and signs, on opinions held and coincidences observed.

The function of the poet, finally, is to describe, not what must happen or what has happened (and he will seek, therefore, neither scientific necessities and signs based on the nature of things nor historical probabilities and signs based on actual occurrences), but what might happen or what is possible, setting it forth as necessary and probable (and he is therefore, on the one hand, concerned, like the historian, with actions peculiar to individuals and their circumstances, while, on the other hand, his statements are universal, like those of the philosopher). The necessary statements of science are based on

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174 Cf. Phys. iv. 8. 314v23; Meteorol. i. 8. 346s30; 14. 351v19; 352s2; Gen. Anim. iv. 1. 765s27–28; Metaph. iv. 3. 1060s32.
175 Pol. vii. 13. 1332a38–b11; vii. 17. 1337a1–3.
176 Nic. Etô. iii. 3. 1112a18–b11.
the discovery of a "universal" attribute, that is, an attribute which belongs to every instance of its subject and to every instance essentially and as such;\textsuperscript{177} and necessity in the occurrences of nature is of two kinds: it may work in accordance with a thing's natural tendency or by constraint and in opposition to it.\textsuperscript{178} In rhetoric, universals and common principles are less effective than the simple statement of what is known and near at hand;\textsuperscript{179} and therefore the rhetorician uses probabilities, which are the judgment of what happens for the most part, and signs, which indicate interconnections, necessary or fallible, among things. In poetry, finally, a "universal" is defined as the sort of thing that a certain type of man will probably or necessarily say or do.\textsuperscript{180} The incidents of a plot must not be impossible, and they must, in addition to their possibility, be credible. Possibility and credibility are interrelated, since the possible is credible; and, whereas we do not yet believe in the possibility of a thing which has not happened, that which has happened is obviously possible.\textsuperscript{181} Possibility and credibility may, however, be in opposition, and in such a case a probable impossibility is preferable to an unconvincing possibility; but the argument or story should have no irrational parts or improbable incidents.\textsuperscript{182} Impossibilities may be justified by consideration of the nature of poetry or of the ideal or of opinion.\textsuperscript{183} Improbabilities may be defended by showing that they are in accordance with opinion or that at times they are not improbable, for there is a probability of things happening against probability.\textsuperscript{184} If the poet has succeeded in achieving necessity, his poem is probable, but he may achieve probability short of necessity.

Like the rhetorician, the poet must make what he says credible, and he is dependent, therefore, on probability in the sense of what would follow from opinions or information held. The rhetorician supplements his probabilities with signs, which mark interconnections and coincidences without specifying reasons, whereas the poet must seek the necessities and reasons for the interconnections; and, indeed, the use of signs is the least artistic kind of discovery, and the poet has recourse to it only through lack of invention.\textsuperscript{185} The scientist, unlike the rhetorician, is unconcerned to make his theory credible on other grounds than on the evidence of its truth, and therefore the presentation in scientific discourse of a probability without necessity or at least signs expresses only the scientist's conviction in hypotheses entertained without factual support. The physical scientist may discover a hypothetical necessity in a process of change if he can show the dependence of an occurrence on causal antecedents; the necessity sought by the poet is determined by the beginning and the end of a sequence of events and depends on finding stages, necessary or probable, from one to the other. He can establish the necessity and probability in incidents,\textsuperscript{186} in character,\textsuperscript{187} in thought,\textsuperscript{188} or in diction.\textsuperscript{189} Where the scientist strives to abstract from inferences based on his own character (for mathematical discourses depict no character)\textsuperscript{190} and to bring his thought into conformity with the facts, the drama-

\textsuperscript{177} Post. Anal. 1. 4. 73a26-23.
\textsuperscript{178} Ibid. 11. 94a37–95b3.
\textsuperscript{179} Rhet. II. 22. 1395b27–1396a3.
\textsuperscript{180} Poet. 9. 1451a8–11.
\textsuperscript{181} Ibid. 1451a16–19. \textsuperscript{182} Ibid. 24. 1460b26–32.
\textsuperscript{183} Ibid. 25. 1460a22–1461a4, b9–14.
\textsuperscript{184} Ibid. 1460a32–1461a9, b14–15; cf. also ibid. 18. 1456b23–25.
\textsuperscript{185} Ibid. 16. 1454b19–30, 1455a19–20.
\textsuperscript{186} Ibid. 7. 1451a9–15; 8. 1451a22–29; 9. 1451a36–1452a1; 10. 1452a12–21.
\textsuperscript{187} Ibid. 15. 1454a33–36.
\textsuperscript{188} Ibid. 19. 1456b2–4.
\textsuperscript{189} Ibid. 17. 1455a8–12.
\textsuperscript{190} Rhet. III. 16. 1417a18–20.
tist makes use of characters and thought to supplement the necessity and probability of the facts and incidents.

One should always seek in characters just as in the organization of incidents the necessary or the probable, so that it is either necessary or probable for a person of such a description to say or do things of this description, and either necessary or probable for this thing to happen after that. The necessity or probability may be achieved, moreover, either by what happens or by what the character thinks or knows; and therefore necessity and probability are achieved better in complex plots than in simple plots in which the change in the hero's fortunes takes place without reversal or discovery; for reversal is a change in the state of things to its opposite in the probable or necessary sequence of events and discovery is a change from ignorance to knowledge (and consequently to either love or hate in the persons marked for good or evil fortune), which is achieved best by means of a probable incident.

The problem of thought is the same in rhetoric and poetic, and therefore the subject is referred in the Poetics to the treatment of thought which occupies the first two books of the Rhetoric. In their respective uses of language, both poetic and rhetoric are related to, but distinct from, the art of elocution, but rhetoric has a special problem of arrangement in the construction of a speech; and, although the styles of rhetoric and poetic make use of similar resources of language, the virtues and problems of rhetorical style are the converse of those of poetry. The organization of a drama is inseparable from the structure of its plot; but, since persuasion is a kind of proof, the arrangement of a speech has analogies with logic rather than with poetic, and the two essential parts of a speech are the statement of the case and the argument, which are similar to the statement of a problem and the proof. The introduction, however, is comparable to the prologue in poetry and the prelude in music. The perfection of style or diction in both rhetoric and poetic is achieved by choice of language at once clear and appropriate, without either meanness or undue elevation. The difference between poetry and prose is therefore to be found not merely in the distinction between the meters of verse and the rhythms of prose but in the fact that clarity is achieved easily in prose by the use of ordinary words, whereas meanness is avoided easily in poetry by the use of unfamiliar terms—such as strange words, metaphors, lengthened forms—which depart from the ordinary modes of speech. The center of interest in both poetic and rhetoric is therefore the metaphor, but for opposite reasons. Prose writers must pay specially careful attention to metaphor, because their other resources are scantier than those of poets, whereas for poets it is the most effective of the numerous poetic forms designed to give diction a nonprosaic character. Mastery of metaphors cannot be learned from others, and it is also a sign of natural genius, since a good metaphor implies an intuitive perception of the similarity in dissimilar things. It is comparable, therefore, to quick wit or

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191 Poet. 15. 1454a33–36.
192 Ibid. 11. 1452a22–29.
194 Poet. 19. 1450a33–8; cf. Rhet. ii. 20. 1403a34–b2.
195 Poet. 19. 1456b8–19; Rhet. iii. 1. 1403b21–1404a19.
196 Rhet. iii. 13. 1414a30–36.
198 Ibid. iii. 2. 1404a1–17; Poet. 22. 1458a18–21.
199 Rhet. iii. 8. 1408b21–32.
200 Ibid. 2. 1404b1–26; Poet. 22. 1458a21–5.
201 Rhet. iii. 2. 1405b6–10.
202 Poet. 22. 1459a4–8; cf. also Top. vii. 14. 163a9–16; Nic. Eth. iii. 7. 1114a31–b12; Rhet. i. 6. 1362a23–25; Poet. 17. 1455b32–34.
sagacity (ευστοχία) in the perception of middle terms in demonstrations and similarities in things\textsuperscript{203} and to excellence in deliberation (ευθυλία) concerning alternative courses of action.\textsuperscript{204}

The whole treatment of style in the two treatises reflects the tendency of prose to clarity and to the standards of ordinary speech and the tendency of poetry to distinction and the use of uncommon modes of expression. Special attention is given in the *Rhetoric* to current and ordinary words, nouns, and verbs; and strange words, inappropriate epithets, and poetic metaphors are censured as faults.\textsuperscript{205} In the *Poetics*, on the other hand, style or diction is analyzed into eight parts, which include the characteristics, parts, and adornments of the word itself—the letter, the syllable, the conjunction, the article, the noun, the verb, the case, and the speech—as well as the ordinary meanings of nouns and verbs; and nouns are differentiated to include not only the ordinary word for the thing but strange words, metaphors, ornamental words, coined words, and words lengthened, curtailed, or altered in forms. The styles appropriate to the various kinds of rhetoric may be distinguished in terms of the qualities which make them suitable either to be read or to be heard, and the epideictic style is particularly suited to written prose, for it is meant to be read.\textsuperscript{206}

The styles of poetry, on the other hand, may be distinguished by the use of compounds in dithyrambs, strange words in heroic poetry, and metaphors in iambic poetry; and in the latter, which models itself on the spoken language, only those kinds of words are proper which are allow-

\textsuperscript{203} Post. Anal. i. 34. 89\textsuperscript{a}10–20; cf. also Nic. Eth. vi. 9. 1142\textsuperscript{a}22–26; Rhet. i. 6. 1362\textsuperscript{b}23–25; iii. 11. 1412\textsuperscript{a}9–14.

\textsuperscript{204} Nic. Eth. vi. 7. 1141\textsuperscript{b}12–14; 9. 1142\textsuperscript{a}31–33.

\textsuperscript{205} Rhet. iii. 2. 1404\textsuperscript{b}5–10, 1405\textsuperscript{a}26–1405\textsuperscript{b}2; 3. 1405\textsuperscript{a}34–1406\textsuperscript{b}19.

\textsuperscript{206} Ibid. iii. 12. 1413\textsuperscript{a}3–1414\textsuperscript{b}18.

\textsuperscript{207} Post. 22. 1459\textsuperscript{a}8–16.
however, on the separation of the sciences and precise distinction of methods and arts. These basic distinctions have continued to operate in the history of Aristotle's influence; but criteria and methods have been scrambled, and revolutions have been worked in each of the arts by giving it functions and devices borrowed, usually without awareness of the derivation, from the other arts. When Aristotle's dictum that each science has its proper method has been forgotten and attention has been focused on the syllogism to the exclusion of the principles of the particular sciences, the "Aristotelian logic" has become "formal logic" or has become a science in which theory could be separated from practice, and its deficiencies were then to be remedied by investigating categories of things, discovering laws of thought, or establishing rules of symbolic operation. Or, following the lead of Cicero, who found a logic of discovery in Aristotle's rhetoric and dialectic, medieval philosophers were able to identify logic and dialectic; and the humanists and philosophers of the Renaissance, from Ramus to Bacon, found in the method of the common-places and the particular-places a remedy for the irrelevancies of formal logic in reconstituting the method of philosophy, literature, and the sciences. Historians could then discover the beginnings of anything peculiar to the Aristotelian logic in earlier writers; and pragmatists, denying the distinction between theoretic and practical, and between science and art, could seek the bases of all operations, not in the nature of the external world or in the structure of the mind, but in the processes of production. Rhetoric itself, even while it was being used as a source for new analyses in logic and poetic, was transformed, in turn, into a practical science conjoined with politics, a method for analyzing literature and Scripture, a technique for presenting legal arguments and for writing letters, and, finally, losing all connection with arguments, an analysis of figures of speech and style. Poetic, following the lead of Horace, was expressed in the remnants of Aristotelian language, interpreted rhetorically by reference to intentions of artists and effects on audiences; or, following the hint of Plato, it was used to trace moral and therapeutic consequences; or, using Platonic arguments to reverse Plato, it consisted in the discovery that poetry rather than philosophy is the architectonic discipline and the fullest expression of truth; or it undertook to explain poetry by its social and psychological sources or to examine it as an instrument for social and economic revolution and counterrevolution. The influence of Aristotle can be found less surely in repetitions of his doctrines and conclusions than in the use to which his distinctions have been put to improve or undermine the arts as he conceived them. Yet such tangential influence is itself evidence of the vitality of the distinctions on which Aristotle's differentiation of methods and arts is based; and the disentanglement and restatement of that differentiation is useful, not only in throwing historical light on the complex evolution of the discussion of scientific, practical, and artistic problems since his time, but also in suggesting philosophic solutions to problems concerning which we have fuller information than he possessed but have forgotten the insights which are still interred in the discovery and arrangement of our information and which might be fruitful in restating and resolving the problems it presents.

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