

ARISTOTLE'S BIOLOGY OF LANGUAGE

RONALD A. ZIRIN

State University of New York at Buffalo

While the question of man's distinctiveness has been one of perennial interest since antiquity, the last few years have seen developments in linguistics, psychology and biology which have led to a renewed interest in the place of language in the discussion of man's position in relation to the other animals. Most striking perhaps is Chomsky's revivification of the Cartesian arguments on the distinction between men and animals.¹ The Cartesian claim was that the behavior of animals can in principle be explained in mechanistic terms. Human beings, on the other hand, have a creative capacity which is revealed in their linguistic behavior; namely, the ability to create and understand sentences which have never before been uttered. For Descartes this creative capacity was something which could not be understood on the basis of a mechanistic model, and indicated that the human being is not simply corporeal, but is also endowed with mind, which is different in substance from his body, and does not operate according to the mechanistic principles, which are applicable to the body.

The main thrust of Chomsky's position is that human language is essentially different from animal systems of communication, so that the two are basically incomparable. This is, of course, an extreme view, and the opposite extreme has also been stated. I refer not to the Skinnerian behaviorist view which Chomsky has argued so effectively against,² which sets up one principle from which all behavior, human or animal, can be derived, but rather to the work of C. F. Hockett, and some of the comparative ethologists, which suggests that there is a continuum of complexity among animal

¹ Noam Chomsky, *Cartesian Linguistics* (New York 1966), and *Language and Mind* (New York 1968).

² In his review of B. F. Skinner, *Verbal Behavior*, in *Language* 35 (1959) 26–58.

communication systems.³ Human language in this framework is indeed different from animal communication systems, but the difference is one of degree of complexity rather than one of kind. In a series of articles written in the 1960s Hockett suggested thirteen "design features" which are characteristic of human language, some of which are present in various degrees in the communication systems of various other species, but others of which are specific to human language.⁴ Examples of such "design features" are *semanticity* ("the fixed association between elements in messages and recurrent features of situations of the world around us"), *arbitrariness* (i.e., the arbitrariness of the connection between the linguistic sign and its meaning), *duality of patterning* (the use of a small number of meaningless elements, which in various combinations constitute a much larger number of meaningful elements), *displacement*—the possibility of referring to things distant in time or place. I choose these particular examples, since they are especially relevant to the discussion below of Aristotle's definitory features of human and animal language. It is clear, in any case, that the approach by means of design features leads to the conclusion that human language fits into a kind of continuum among biological communication systems in which it shares many features with other systems, though it is unique in its combination and elaboration of these features. This notion is well expressed by Thorpe,⁵ when he states that:

Perhaps the most reasonable assumption at present is that, however great the gulf which divides animal communication systems from human language, there is no single characteristic which can be used as an infallible criterion for distinguishing between animals and men in this respect. Human speech is unique only in the way in which it combines and extends attributes which, in themselves, are not peculiar to man, but are found also in more than one group of animals. We have evidence that animals can use conceptual symbols, but to a limited degree; and that here, as in so many other instances, the difference

³ An excellent summary of work done along these lines will be found in W. H. Thorpe, *Animal Nature and Human Nature* (New York 1974).

⁴ C. F. Hockett, "Logical Considerations in the Study of Animal Communication," in W. E. Lanyon and W. N. Tavolga, editors, *Animal Sounds and Communication* (Washington 1960) 392–430; C. F. Hockett, "The Origin of Speech," *Scientific American* 203 (1960) 89–96; C. F. Hockett and S. A. Altman, "A Note on Design Features," in T. A. Sebeok, ed., *Animal Communication* (Bloomington 1968) 61–72.

⁵ Thorpe 300–301.

between the mind of animals and men seems to be one of degree—often the degree of abstraction that can be achieved—rather than one of kind.

Hence, there are two poles of thought concerning the relationship between human and animal language. On the one side one finds the rationalist conception that the distinguishing features of human language are characteristic only of man, and indeed cannot even be understood on the principles which apply to animal behavior; on the other side, the conception that human language is not different from that of animals, but rather is characterized by design features which can individually be paralleled in animal systems, but the particular combination and elaboration of which is specific to human beings.

This brief outline of the range of modern views on the subject brings us to the consideration of Aristotle's work as they relate to questions of the biology of language. My purpose in this paper will be to draw together the relatively brief discussions scattered through Aristotle's corpus, which bear on the differences between human and animal communication. It is hoped that such an undertaking may add some historical depth to the current interest in these matters, since Aristotle was, among other things, the first systematic biologist.⁶ As the son of the court physician to Amyntas II of Macedonia, he was no doubt familiar with the medical tradition, and, as Plato's *Timaeus* shows, there was a good deal of speculation on biological matters with which he would have become familiar during his association with the Academy. During the time between his separation from the Academy (348–347 B.C.) and the inception of his tutorship of Alexander (343–342 B.C.), he seems to have undertaken the extensive field research in Zoology which led ultimately to his biological treatises. A number of scholars see this biological background as a major formative influence in the whole of Aristotle's work.⁷

As mentioned above, Aristotle's discussions of language are scattered throughout his works.⁸ All of the relevant discussions are quite brief, none of them running to more than a few pages. Each of these

⁶ For a general outline of Aristotle's biological works see W. O. Ross, *Aristotle* (London 1949^s), chapter four; and Ingemar Düring, *Aristoteles* (Heidelberg 1966) 506–53.

⁷ See, for example, Marjorie Grene, *Portrait of Aristotle* (Chicago 1963).

⁸ For general discussions of Aristotle's linguistics see H. Steinthal, *Geschichte der Sprachwissenschaft bei den Griechen und Römern* (Berlin 1890) 183–271; M. T. Larkin, *Language in the Philosophy of Aristotle* (The Hague 1971); and G. Morpurgo-Tagliabue, *Linguistica e Stilistica di Aristotele* (Rome 1967).

discussions is presented in a manner fitting the purpose of the treatise in which it is found. For example, chapter 20 of the *Poetics* (1456b–57a) presents the parts of speech (μέρη λέξεως) as part of the study of poetic diction, while similar material in the *De Interpretatione* is briefly presented in a more theoretical manner as an introduction to the form of logical propositions. In the *De Anima* voice (φωνή) is discussed in a way which shows its relation both to animal physiology and, as one would expect, to the soul. In the *De Partibus Animalium* voice is discussed from a purely physiological viewpoint in the sections which deal with the various parts of the vocal apparatus. Finally, the *Historia Animalium* (esp. 535a–36a) provides a description of the production of voice in various species of animals. One might also mention that there are brief comments on linguistic matters throughout the rest of the corpus (especially in the rhetorical works), which, however, do not usually bear on the overall theory of language. What I would like to show is that the various discussions of language, though diverse in context and purpose, fit together to form the outline of a coherent view of the nature of human language and its place in relation to the vocalizations of other species.

Let us begin with the linguistic units defined in the *De Interpretatione*. The treatise begins with a brief statement on the conventionality of linguistic units, and goes on to define the terms ὄνομα (“noun” or “name”), ῥήμα (“verb”) and λόγος (“sentence”).⁹ As pointed out above, the definitions are a preliminary to a discussion of the construction of logical propositions. Hence, we are told, for example, that nouns and verbs have no truth or falsity, unless they are joined together. The three definitions are as follows:

1. ὄνομα μὲν οὖν ἐστὶ φωνὴ σημαντικὴ κατὰ συνθήκην ἄνευ χρόνου, ἧς μηδὲν μέρος ἐστὶ σημαντικὸν κεχωρισμένον . . . τὸ δὲ κατὰ συνθήκην, ὅτι φύσει τῶν ὀνομάτων οὐδὲν ἐστίν, ἀλλ’ ὅταν γένηται σύμβολον· ἐπεὶ δηλοῦσί γέ τι καὶ οἱ ἀγράμματοι ψόφοι,

⁹ The translation of these terms presents a number of difficulties. J. J. Ackrill in his *Aristotle's Categories and De Interpretatione* (Oxford 1963), for example, translates ὄνομα as “name” since it can translate ὄνομα in all contexts and also since “it will serve to remind the reader of the rather primitive nature of Aristotle’s view of meaning.” In grammatical contexts, however, I think that “noun” is preferable and I have translated ὄνομα, ῥήμα, and λόγος by the grammatical terms “noun,” “verb” and “sentence,” although these words each have a number of other meanings which would be relevant in other contexts.

οἶον θηρίων, ὧν οὐδέν ἐστιν ὄνομα. (16a, 19 ff.)¹⁰

Now a noun is a vocal sound, which is meaningful by convention, has no reference to time, and no part of which is meaningful separate from the whole . . . I say "by convention" because nothing is a noun by nature, but only when it becomes a symbol; since even the unspellable noises, such as those of wild animals, communicate something, but none of them is a noun.

2. ῥῆμα δέ ἐστι τὸ προσσημαῖνον χρόνον, οὗ μέρος οὐδέν σημαίνει χωρίς. (16b, 5 ff.)

A verb is that which does refer to time, of which no part has any meaning separately.

3. λόγος δέ ἐστι φωνὴ σημαντική, ἧς τῶν μερῶν τι σημαντικόν ἐστι κεχωρισμένον. (16b, 26)

A sentence is a meaningful vocal sound, some parts of which are meaningful separate from the whole.

The definition of ῥῆμα is abbreviated. It is implied that the verb, like the noun, is "vocal sound meaningful by convention." Likewise, the definition of λόγος omits any reference to convention, but such a reference is supplied a few sentences later:

ἔστι δὲ λόγος ἅπας μὲν σημαντικός, οὐχ ὡς ὄργανον δὲ, ἀλλ' ὡς προεῖρεται, κατὰ συνθήκην. (16b, 29 f.)

Every sentence is meaningful, not as an instrument, but as stated above, by convention.

It is evident from these definitions that each of the three basic units of language are in the first place φωνὴ σημαντική, so that language for Aristotle is basically vocal utterance, which is meaningful, not because of any natural connection between words and objects, but only by convention.

¹⁰ The following editions were used for the text of Aristotle: *De Arte Poetica*, ed. R. Kassel, Oxford Classical Texts (Oxford 1965); *De Anima*, ed. W. O. Ross, Oxford Classical Texts (Oxford 1956); *Categoriae et Liber de Interpretatione*, ed. L. Minio-Paluello, Oxford Classical Texts (Oxford 1949); *Parts of Animals*, ed. and trans. A. L. Peck, Loeb Classical Library (Cambridge, Mass., 1968); *Historia Animalium*, vols. I and II, ed. and trans. A. L. Peck, Loeb Classical Library (Cambridge, Mass., 1970).

The primacy of vocalization in Aristotle's view of language is corroborated by his more extensive treatment of linguistic units in the *Poetics*. This discussion of the grammatical aspects of poetic diction (λέξις) begins by listing and defining the basic units of language:

τῆς δὲ λέξεως ἀπάσης τάδ' ἐστὶ τὰ μέρη, στοιχείου συλλαβὴ σύνδεσμος ἄρθρον ὄνομα ῥῆμα πῶσις λόγος. (1456b, 20–21)

Of diction as a whole these are the parts: the phoneme, the syllable, the connective, the joint, the noun, the verb, the inflection, and the sentence.

The definitions of noun, verb, and sentence which then follow are comparable to, though not identical with, those in the *De Interpretatione*:

ὄνομα δέ ἐστι φωνὴ συνθετὴ σημαντικὴ ἄνευ χρόνου ἧς μέρος οὐδὲν ἐστὶ καθ' αὐτὸ σημαντικόν.

A noun is a composite meaningful vocal sound without reference to time, no part of which is in itself meaningful.

ῥῆμα δὲ φωνὴ συνθετὴ σημαντικὴ μετὰ χρόνου ἧς οὐδὲν μέρος σημαίνει καθ' αὐτὸ ὥσπερ καὶ ἐπὶ τῶν ὀνομάτων . . .

A verb is a composite, meaningful vocal sound, no part of which has meaning in itself, just as in the case of nouns.

λόγος δὲ φωνὴ συνθετὴ σημαντικὴ ἧς ἕναι μέρος καθ' αὐτὰ σημαίνει τι.

A sentence is a composite, meaningful vocal sound, some parts of which mean something in themselves.

These definitions differ from the corresponding ones in the *De Interpretatione* in two important ways. First of all, there is no reference here to conventionality of meaning. The *De Interpretatione* is concerned in its very first chapter with providing a definite answer to the question posed by Plato's *Cratylus*; the work on poetic diction is not. The second important difference between the two sets of definitions is that nouns, verbs, and sentences are said in the *Poetics* to be *συνθετή*, i.e., composite, consisting of parts. The reason for the inclusion of compositeness as a distinguishing characteristic of these

three units is that definitions of two phonological units—the *στοιχείον* (phoneme), and the *συλλαβή* (syllable)—are also given. Of these the *στοιχείον* is by definition not composite; rather it is *ἀδιαίρετος* “indivisible.” The definition is as follows:

*στοιχείον μὲν οὖν ἐστὶν φωνὴ ἀδιαίρετος, οὐ πάσα δὲ, ἀλλ’ ἐξ ἧς πέφυκε συνθετὴ γίνεσθαι φωνή.*¹¹

Now a phoneme is indivisible vocal sound, not every such sound, but those from which composite vocal sounds are made.

The passage continues by pointing out a difference between the vocalizations of men and animals:

καὶ γὰρ τῶν θηρίων εἰσὶν ἀδιαίρετοι φωναὶ ὧν οὐδεμίαν λέγω στοιχείον.

For there are also indivisible vocal sounds of wild animals, none of which I would call a phoneme.

The syllable like the noun, verb and sentence, but unlike the phoneme, is composite. But like the phoneme and unlike the noun, verb, and sentence, it is not semantic:

*συλλαβὴ δὲ ἐστὶν φωνὴ ἄσημος συνθετὴ ἐξ ἀφώνου καὶ φωνῆν ἔχοντος· καὶ γὰρ τὸ ΓΡ ἄνευ τοῦ Α οὐκ ἐστὶ συλλαβή, ἀλλὰ μετὰ τοῦ Α, οἷον τὸ ΓΡΑ.*¹²

The syllable is a meaningless vocal sound composed of a consonant and a vowel. For GR without A is not a syllable, but with the A, as GRA, it is.

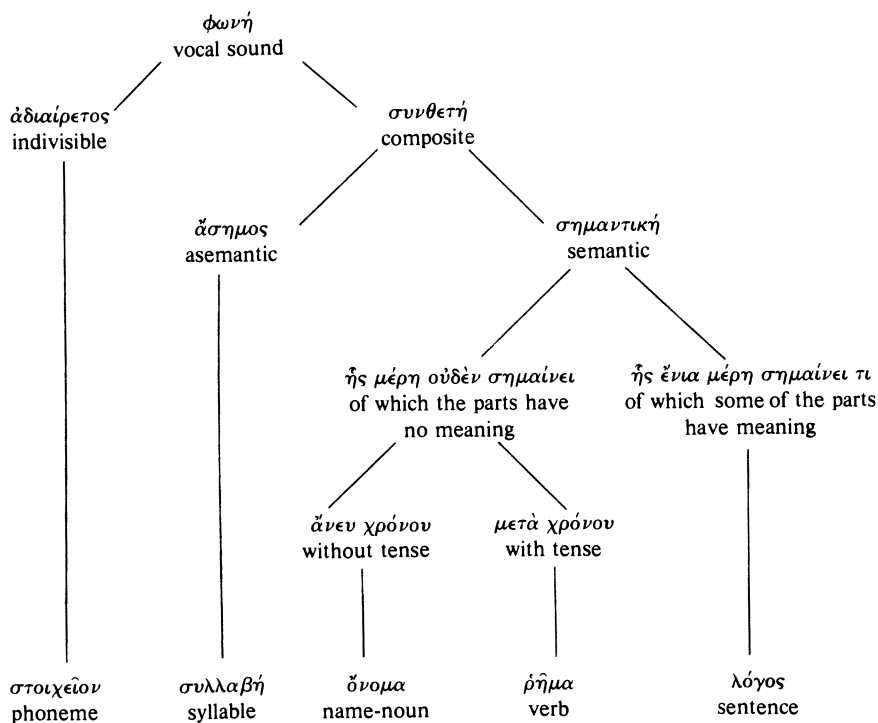
If we limit ourselves to the basic units of language discussed above and omit discussion of the connective (*σύνδεσμος*), and the “joint” (*ἄρθρον*), which are problematic as to their definition and reference,

¹¹ I follow Kassel's text which has *συνθετή*, though some MSS read *συνετή*. The former fits the context better, since it is opposed to *ἀδιαίρετος*, and it is precisely the feature of compositeness which Aristotle attributes to other linguistic units including the syllable, a unit which is not in itself intelligible. For a lengthy defense of the reading *συνετή* in this passage, see J. Vahlen, *Beiträge zu Aristoteles Poetik* (Leipzig 1914) 101–04; cf. Bywater, *Aristotle on the Art of Art of Poetry* (Oxford 1909) 262–63. In favor of *συνθετή*, see A. Gudeman, *Aristoteles περὶ ποιητικῆς* (Berlin 1934) 340; and Lucas, *Aristotle's Poetics* (Oxford 1968).

¹² I have adopted here the text as emended by Gudeman. The MS reading is *καὶ γὰρ τὸ ΓΡ ἄνευ τοῦ Α συλλαβὴ καὶ μετὰ τοῦ Α, οἷον τὸ ΓΡΑ*. It is inconceivable that Aristotle would consider ΓΡ a syllable immediately after stating that a syllable consists of a consonant and a vowel. For further discussion, see Gudeman 343–44.

and also of “inflection” (πτῶσις), which, though listed in the *Poetics* as a unit, is clearly not on a level with the others, we can arrive at a simple structure for the Aristotelian definitions of the linguistic units. Each unit belongs to the genus φωνή, and the main differentiae are “compositeness” and “semanticity.” “Noun” and “verb” are distinguished from “sentence” as not having meaningful parts, and from each other by the presence or absence of a time reference. We may outline these differentiations as follows:

DEFINITIONAL SCHEME OF LINGUISTIC UNITS



It will be noted that there is no cover term which includes both nouns and verbs, that is, there is no equivalent to "word" (or better "major grammatical category"). Further, one might be tempted to go beyond Aristotle and to note the relation between "sentence" and "word" is essentially the same as that between syllable and phoneme; that is to say that the "word" is the *στοιχείον* of the meaningful units (something like the modern "morpheme"), and that combinations of words make up sentences in much the same way as combinations of phonemes make up syllables. Aristotle seems to be groping toward a theory of the minimal elements of meaningful utterance at the beginning of the *De Interpretatione*, but the details are none too clear. In any case the notion of elementary units of meaning (*στοιχεία λόγου*) is not clearly developed until several centuries after Aristotle among the Stoics.¹³

It should be noted that Aristotle, the biologist, speaks through these definitions in that we are told in the *De Interpretatione* that the unspellable noises of wild animals are never nouns, and in the *Poetics* the indivisible vocal sounds of wild animals are not phonemes. These mentions of animals along with the features of compositeness and semanticity lead us to the discussion of language as presented in the biological treatises. "Language" is perhaps not the proper term to use, since, from Aristotle's point of view it is voice—*φωνή*—and its modifications which are to be explained. This brings us then to the discussion of the place of voice in Aristotle's biology and psychology.

Φωνή is discussed at some length in the *De Anima* (bk. 2, ch. 8), and also in the *Historia Animalium* (bk. 4, ch. 8). In addition, various aspects of speech production are mentioned in the sections of the *De Partibus Animalium* which deal with the physiology relevant to the production of voice. In the *De Anima* *φωνή* is defined in relation both to the soul (*ψυχή*) and to the physiology of animals. It is distinguished from noise (*ψόφος*) in that it is made by a living creature, i.e., one which is *ἔμψυχος*.

¹³ Cf. Apollonius Dyscolus' discussion (Keil, *Grammatici Graeci* II, 2, p. 2), in which he compares the "interweaving" (*ἐπιπλοκή*) of phonemes in a necessary arrangement to form syllables, with that of syllables to form words, and finally of thoughts (*νοήτοι*) to form sentences.

ἡ δὲ φωνὴ ψόφος τίς ἐστιν ἐμψύχων. τῶν γὰρ ἀψύχων οὐδὲν φωνεῖ ἀλλὰ καθ' ὁμοιότητα λέγεται φωνεῖν, οἷον αὐλὸς καὶ λύρα καὶ ἄλλα τῶν ἀψύχων ἀπότασιν ἔχει καὶ μέλος καὶ διάλεκτον. ἔοικε γὰρ καὶ ἡ φωνὴ ταῦτ' ἔχειν. (420b, 5–6)

Voice is a kind of sound of a living being, for no inanimate thing produces voice, but may be said by analogy to do so, since a flute and a lyre and other inanimate objects have pitch, melody, and articulation, for the voice also appears to have these things.

Voice is not restricted to men, but is characteristic of any animal which has the requisite physiological apparatus. For Aristotle this means any creature that breathes, and hence, has lungs and a windpipe against which exhaled air can strike to cause the sound of voice:

πολλὰ δὲ τῶν ζώων οὐκ ἔχουσι φωνήν, οἷον τὰ τε ἄναιμα καὶ τῶν ἐναίμων ἰχθύες, καὶ τοῦτ' εὐλόγως, εἴπερ ἀέρος κίνησις τίς ἐστιν ὁ ψόφος . . . φωνὴ δ' ἐστὶ ζώου ψόφος καὶ οὐ τῷ τυχόντι μορίῳ. ἀλλ' ἐπεὶ πᾶν ψοφεῖ τύπτοντός τινος καὶ τι καὶ ἐν τινι, τοῦτο δ' ἐστὶν ἀήρ, εὐλόγως ἂν φωνοίη ταῦτα μόνα ὅσα δέχεται τὸν ἀέρα. (420b, 9–16)

Many animals do not have voice, for example, the bloodless ones and, of those that have blood, fish; and this is reasonably so, since sound is a kind of movement of air . . . Voice is the sound of an animal but not sound produced by means of any part. But, since all sound comes about when something strikes something else in a certain medium, i.e., air, it is reasonable that only those creatures should produce voice which take in air.

After some comments on the dual function of the lungs and windpipe for both breathing and the production of voice, Aristotle concludes this discussion of voice with an important passage which distinguishes voice from other sounds made with the larynx. Voice proper is produced when the ψυχή is responsible for setting the air in motion against the windpipe:

διὸ ἀναγκαῖον εἶσω ἀναπνεομένον εἰσιέναι τὸν ἀέρα. ὥστε ἡ πληγὴ τοῦ ἀναπνεομένου ἀέρος ὑπὸ τῆς ἐν τούτοις τοῖς μορίοις ψυχῆς πρὸς τὴν καλουμένην ἀρτηρίαν φωνὴ ἐστιν. οὐ γὰρ πᾶς ζώου ψόφος φωνή, καθάπερ εἵπομεν (ἔστι γὰρ καὶ τῇ γλώττῃ ψοφεῖν καὶ ὡς οἱ βήττοντες),

ἀλλὰ δεῖ ἔμφυχόν τε εἶναι τὸ τύπτον καὶ μετὰ φαντασίας τινός·
σημαντικός γὰρ δὴ τις ψόφος ἐστὶν ἢ φωνή· καὶ οὐ τοῦ ἀναπνεομένου
ἄερος, ὥσπερ ἡ βήξ. (420b, 26–33)

Hence, it is necessary, as one breathes, for the air to enter. And so voice is the striking of the inhaled air under the agency of the *ψυχή* in these organs upon the windpipe, as it is called. For, as we have said, not every sound of an animal is voice (it is possible to make mere noise even with the tongue, or as when people cough), but it is necessary for the thing which strikes to be animate, and to be accompanied by some mental image (*φαντασία*). For indeed, voice is a certain meaningful sound and not merely the sound of inhaled air, like a cough.

One may grant that Aristotle's knowledge of anatomy is faulty in these descriptions, in that he had no idea of the structure of the larynx and the vocal cords. The important point, however, is the care with which he distinguishes voice itself from other noises on the basis of both the semantic and physiological criteria which were part of his original definitions. Voice cannot be present in animals which do not have the organic structure necessary for its production, and, in addition, no sound can be considered voice unless it is set in motion by the *ψυχή* and is accompanied by a mental image. To put this criterion in a slightly different way we might say that the efficient cause of voice is the *ψυχή*, since Aristotle is clearly trying to explain voice in this passage in terms of his notion of causes.

It is worth remembering at this point that the discussion of voice in the *De Anima* is not restricted to humans. All animals have a *ψυχή* (as do indeed plants, though in a more rudimentary form), and the semantic criterion must then apply to all animals (including human beings) which have the requisite vocal apparatus. Presumably, when a sheep bleats, or a cow lows, its *ψυχή* is causing the inhaled air to strike its windpipe, and the action is accompanied by a mental image.

A somewhat different approach is seen in the other extensive discussion of voice, the one which appears in the *Historia Animalium* (bk. 4, ch. 9). This chapter includes a discussion of sounds, vocal and otherwise, produced by the various species of animals. It begins with definitory remarks on sound, *ψόφος*, and voice, *φωνή*, similar to those in the *De Anima*, but also distinguishes "speech," i.e., *διάλεκτος*, from both sound and voice:

φωνή καὶ ψόφος ἑτερόν ἐστιν, καὶ τρίτον τούτων διάλεκτος. φωνεῖ μὲν
οὖν οὐδενὶ τῶν ἄλλων μορίων οὐδὲν πλὴν τῷ φάρυγγι διὸ ὅσα μὴ ἔχει
πνεύμονα οὐδὲ φθέγγεται· διάλεκτος δ' ἡ τῆς φωνῆς ἐστὶ τῇ γλώττῃ

διάρθρωσις. τὰ μὲν οὖν φωνήεντα ἢ φωνὴ καὶ ὁ λάρυγξ ἀφήσιν, τὰ δ' ἄφωνα ἢ γλῶττα καὶ τὰ χεῖλη· ἐξ ὧν ἡ διάλεκτός ἐστιν. ψοφεῖν δ' ἔστι καὶ ἄλλοις μορίοις. (535a, 27–535b, 3).

Voice and sound are two different things and speech differs from both of them. Voice is produced through no other part of an animal than its pharynx. Therefore, all those animals which do not have lungs, do not produce voice. Now speech, on the other hand, is articulation of the voice by the tongue. The voice and the larynx produce the vowels, while the tongue and the lips produce the consonants. It is from these that speech is formed, though it is possible to produce sound by means of other organs too.

Here we have some of the same criteria for distinguishing between voice and sound as in the *De Anima*. No mention, however, is made of the motive causation of the *ψυχή*, or of the presence of a mental image. Instead, the discussion includes speech, and the additional feature imposed upon voice which makes it into speech is a purely physiological one, since speech is the articulation of the voice by the tongue and the lips. The notion of *διάρθρωσις*, articulation, is to be taken quite literally here.¹⁴ *Διάρθρωσις* is based upon *ἄρθρον*, “joint.” Pure voice is indivisible, but speech is voice which has been provided with “joints” in the form of consonants through the action of the tongue and lips. The result of this “jointedness” is that speech is divisible into a series of discrete units.

Once again the physiology is not quite correct from a modern point of view, since Aristotle apparently had no knowledge that it is the configuration of the tongue and lips which distinguishes the various vowel sounds. The important point, however, in the present context is that the difference between voice and speech is not a semantic one. As we saw in the *De Anima*, vocal sound in animals is semantic, since it is impelled by the *ψυχή* and accompanied by *φαντασία*. Rather, the difference is based on the complexity introduced by articulation which makes possible the combination of discrete elements.

Embedded in a discussion of the functions of the tongue and teeth in the *De Partibus Animalium* there is an interesting passage which makes even clearer the way in which articulation is built upon a physiological base:

¹⁴ Cf. R. Zirin, “Inarticulate Noises,” in *Ancient Logic and its Modern Interpretations*, ed. J. Corcoran (The Hague 1974).

ὁ μὲν γὰρ λόγος ὁ διὰ τῆς φωνῆς ἐκ τῶν γραμμάτων σύγκειται, τῆς δὲ γλώττης μὴ τοιαύτης οὔσης μηδὲ τῶν χειλῶν ὑγρῶν οὐκ ἂν ἦν φθέγγεσθαι τὰ πλείστα τῶν γραμμάτων· τὰ μὲν γὰρ τῆς γλώττης προσβολαί, τὰ δὲ συμβολαί τῶν χειλῶν. ποίας δὲ ταῦτα καὶ πόσας καὶ τίνας ἔχει διαφοράς, δεῖ πυνθάνεσθαι παρὰ τῶν μετρικῶν. (660a, 2–8)

For vocal language is composed of letters (i.e., phonemes). But if the tongue were not such as it is, and the lips were not pliant, it would not be possible to produce most of the letters, for some of them are impacts of the tongue, and some are closings of the lips. What the distinguishing features of these phonemes are, and their kind and number, are matters to be learned from the experts on metrics.

The term *γράμμα*—letter—is here used in a phonetic sense; it obviously refers to the minimal unit of vocalization, and therefore is synonymous with *στοιχεῖον*.¹⁵ As we are told in the *Metaphysics* (1038a6), the relation between voice and the *στοιχεῖον* is that between material and form; that is, the *στοιχεῖα* are form imposed upon the voice by the vocal organs. The way this imposition takes place in general is through the action of the tongue and the lips. The particular distinguishing characteristics of each of the speech sounds, however, is left for the study of metrics. Phonetic classification, as we find it in Plato's *Cratylus*, had existed since the time of the Sophists, but is not a subject of detailed discussion in this context (cf. *Poetics* 1456b, 25–34).

The physiological bases of voice and speech as outlined in biological treatises fit in well with the definitions of linguistic units in the *Poetics*. One recalls that the first *differentia* in the definitions of the major linguistic units in the *Poetics* concerned whether or not the unit in question is composite, and that if this criterion was absent from the definitions in the *De Interpretatione*, it was only because of the omission of the non-composite unit, the *στοιχεῖον*, from the discussion. We can see that if the indivisible vocal sounds of wild animals are not phonemes, it is because they are not used to form composite units. The physiological mechanisms of articulation are not present in such animals, and as a result they are capable of voice but not of speech. One notes further that it is the “wild animals” whose sounds are indivisible. The Greek word used is *θηρίον*, which definitely excludes fish and birds, and usually refers to wild, rather than domestic animals. Perhaps Aristotle had in mind such vocal sounds as the roar of a lion or the trumpeting of an elephant.

¹⁵ On the phonetic use of *γράμμα* see Zirin, *op. cit.*

In any case the statement that *θηρία* have no phonemes does not necessarily apply to other kinds of animals, and to see the zoological range of Aristotle's ideas on voice and speech, we must return to Book 4, Chapter 9 of the *Historia Animalium*. In this section the discussion of the noises made by the members of various species roughly follows Aristotle's non-evolutionary *scala naturae*, and also makes use of the distinction between noise, voice, and speech, which we have outlined above.

First of all there are animals which lack voice because they have neither tongue nor lungs, though they may make noises with other organs. Insects are given as an example:

ὅσα γλῶτταν μὴ ἔχει ἢ μὴ ἀπολελυμένην οὐ διαλέγεται· ψοφεῖν δ' ἔστι καὶ ἄλλοις μορίοις, τὰ μὲν οὖν ἔντομα οὔτε φωνεῖ οὔτε διαλέγεται. (535b, 1–4)

Whatever creatures do not have a tongue or do not have one that moves freely, do not have speech. But it is possible to make noises with other parts of their bodies. Insects, for example, produce neither speech nor voice.

Likewise, Cephalopods, Crustacea, and fish are voiceless, since they have no lungs or windpipe, though Aristotle gives examples of various species of fish, whose members make noises other than voice.

The dolphin, on the other hand, illustrates a higher stage in the scale, since it produces voice, though it is not capable of speech:

ἀφίησι δὲ καὶ ὁ δελφίς τριγμὸν καὶ μύζει, ὅταν ἐξέλθῃ ἐν τῷ ἀέρι, οὐχ ὁμοίως δὲ τοῖς εἰρημένοις· ἔστι γὰρ τούτῳ φωνή· ἔχει γὰρ καὶ πνεύμονα καὶ ἀρτηρίαν, ἀλλὰ τὴν γλῶτταν οὐκ ἀπολελυμένην οὐδὲ χεῖλη ὥστε ἄρθρον τι τῆς φωνῆς ποιεῖν. (535b, 33–536a, 3)

The dolphin too utters a cry and moans, when it comes into the air, but not in the same way as the preceding [i.e., the cephalopods, crustacea, and fish]; for it has a voice, since it has lungs and a windpipe. But it has neither a tongue which moves freely nor lips, so as to make any articulation of the voice.

We come now to other animals which have voice, but not speech:

τῶν δ' ἐχόντων γλῶτταν καὶ πνεύμονα ὅσα μὲν ψοτόκα ἐστὶ καὶ τετράποδα ἀφίησι φωνήν, ἀσθενῇ δέ. (536a, 4–6)

Of the animals which have a tongue and lungs, the oviparous quadrupeds emit a voice, though a weak one.

In this class Aristotle discusses the frog and its peculiar tongue formation, and also mentions one aspect of the communicative function of the voice in various animals:

καὶ τὴν ὀλολυγόναν δὲ τὴν γιγνομένην ἐν τῷ ὕδατι οἱ βάτραχοι οἱ ἄρρενες ποιούσιν, ὅταν ἀνακαλῶνται τὰς θηλείας πρὸς τὴν ὀχείαν· εἰσὶ γὰρ τῶν ζώων ἴδιαι φωναὶ πρὸς τὴν ὁμιλίαν καὶ τὸν πλησιασμόν οἷον ὑπὲρ καὶ τράγοις καὶ προβάτοις. (536a, 11–16)

The croaking which comes about in the water is made by the male frogs, when they call to the females for the purpose of breeding. For each animal has its own particular vocalizations for the purpose of intercourse and association, as, for example, those of pigs, goats and sheep.

This passage is interesting in that it is the only mention in this chapter of the *Historia Animalium* of the communicative function of voice. It should be noted that this mention seems to be restricted to animals which truly have voice, as is clear from the wording (ἴδιαι φωναί). Furthermore, the examples chosen are mostly domestic animals, many of which have some small degree of articulation.

As to the viviparous quadrupeds, we are told the following:

τὰ δὲ ζωότοκα καὶ τετράποδα ζῶα ἄλλο ἄλλην ἀφήσι φωνήν, διάλεκτον δ' οὐδέν ἔχει, ἀλλ' ἴδιον τοῦτ' ἀνθρώπου ἐστίν· ὅσα μὲν γὰρ διάλεκτον ἔχει, καὶ φωνήν ἔχει, ὅσα δὲ φωνήν, οὐ πάντα διάλεκτον. (536a, 33–536b, 2)

The different viviparous quadrupeds produce different voices, but they do not have speech, since this is peculiar to man. For those creatures which have speech also have voice, but those which have voice do not all have speech.

This brings us to the discussion of birds, a point of particular interest, since some birds at least have the right kind of tongue, and do in their songs articulate the voice in the sense that has been defined above. Hence we are told:

τὸ δὲ ὀρνίθων γένος ἀφήσι φωνήν· καὶ μάλιστα ἔχει διάλεκτον ὅσοις ὑπάρχει ἡ γλώττα πλατεῖα, καὶ ἔχουσι τὴν γλώτταν αὐτῶν λεπτήν. (536a, 20–22)

The genus of birds emits a voice, and those which have a broad tongue especially have speech, as do those which have a supple tongue.

It is quite striking to find speech attributed to birds within a few lines of a statement that speech is peculiar to man. But this is not an isolated attribution, which might be questioned on that account. Indeed, in an earlier portion of the *Historia Animalium* it is also clearly stated that birds utter articulated voice:

καὶ γλώτταν ἅπαντες ταύτην δ' ἀνομοίαν· οἱ μὲν γὰρ μακρὰν οἱ δὲ πλατεῖαν. μάλιστα δὲ τῶν ζώων μετὰ τὸν ἄνθρωπον γράμματα φθέγγεται ἕνια τῶν ὀρνίθων γένη. (504a35–504b3)

All [birds] have a tongue, but not of the same sort. Some have a long tongue and some have a flat one. And more than the other animals, second only to man, some species of birds utter articulate phonemes [i.e., letters, γράμματα].

Likewise, in the *De Partibus Animalium*, in the section which deals with the functions of the tongue, we are told of the variety of tongue which makes articulation possible in some species of birds. Nor is the discussion in this passage restricted to physiology, since mention is also made of the communicative function of speech in birds:

διὸ καὶ τῶν ὀρνίθων οἱ μάλιστα φθεγγόμενοι γράμματα πλατυγλωττότεροι τῶν ἄλλων εἰσίν. τὰ δ' ἔνασμα καὶ ζωτόκα τῶν τετραπόδων βραχεῖαν τῆς φωνῆς ἔχει διάρθρωσιν· σκληράν τε γὰρ καὶ οὐκ ἀπολελυμένην ἔχουσι καὶ παχεῖαν τὴν γλώτταν. τῶν δ' ὀρνίθων ἔνιοι πολύφωνοι, καὶ πλατυτέραν οἱ γαμψώνυχοι ἔχουσιν. πολύφωνοι δ' οἱ μικρότεροι. καὶ χρώνται τῇ γλώττῃ καὶ πρὸς ἐρμηνείαν ἀλλήλοις πάντες μὲν, ἕτεροι δὲ τῶν ἐτέρων μάλλον, ὥστ' ἐπ' ἐνίων καὶ μάθησιν εἶναι δοκεῖν παρ' ἀλλήλων. (660a, 29–660b, 1)

Hence even among birds, the ones which especially utter articulate phonemes are broader tongued than the others. The blooded viviparous quadrupeds have but a slight articulation of the voice, for they have tongues which are stiff and thick and do not move freely. And of birds some make a variety of vocal sounds, the taloned ones having a rather broad tongue. Likewise, the smaller birds produce a variety of sounds. And all birds use their tongues to communicate with each other, but some more than others, so that for some of them it seems to be the case that information is conveyed from one to the other.

In terms of Aristotle's overall theory of language it is not surprising that bird-song qualifies as speech. Certainly, birds have lungs and

a windpipe, so that they have true voice. In addition, if some species of birds have tongues which are sufficiently supple to break up the stream of phonation into discrete units, i.e., sequences of consonants and vowels, then they qualify by definition as having speech.

Nor do I think Aristotle primarily had in mind such birds as parrots, which merely imitate human speech. In Book 4, Chapter 8 of the *Historia Animalium* the examples of the *διάλεκτος* of birds clearly show that the reference is to the various natural cries and songs of birds. These examples include the quail and the nightingale (536a, 24–32). We are even told that bird song shows local variation, much like the dialects of human speech, and that in nightingales the song is learned rather than innate, again a comparison to human speech (536b, 11–18). Furthermore, the parrot is mentioned in Book 9 of the *Hist. Anim.* (597b, 27–28), a book which many scholars consider not to have been written by Aristotle. It is mentioned as an oddity in that it is mimetic, and is said to be human-tongued, and to become licentious when it drinks wine. Setting aside the possible inauthenticity of Book 9, it is clear that the parrot is pointed out as an oddity, a strange exception, and therefore has little to do with the general theory of animal language.

We have noted that the discussion of voice in animals in *Historia Animalium* begins with a strict definition of *διάλεκτος*—*διάλεκτος δ' ἡ τῆς φωνῆς ἐστὶ τῇ γλώττῃ διάρθρωσις* (see above, pp. 335–36). It is, therefore, reasonable to expect that subsequent uses of this term in the discussion will adhere to the initial definition. On the whole, this expectation is fulfilled; the animals which do not have articulation do not have speech. Hence, insects *οὔτε φωνεῖ οὔτε διαλέγεται*, since they do not breathe, and the viviparous quadrupeds, though they produce different voices, *διάλεκτον δ' οὐδὲν ἔχει*, since their tongues are not flexible enough for articulation.

The term *διάλεκτος*, however, in common usage referred to conversation, discussion, debate, i.e., exchange of utterance, and can also refer to geographic variation in speech in precisely the sense of the English “dialect.” That Aristotle exhibits some discomfort in adhering to his strict definition of *διάλεκτος* is seen in his statement that *διάλεκτος* is peculiar to man (above, p. 339) just a few sentences after we were told that broad-tongued birds *μάλιστα ἔχει διάλεκτον*. Presumably, the former refers to conversation, or perhaps reasoned discourse, while the latter uses the technical meaning “articulated voice.” Further along in this section of the *Historia Animalium* in the concluding paragraph on local variation in “speech,” particularly of birds, (i.e., “dialect” in the modern sense) we are told that voice

does not differ as to locality but that:

ἡ δ' ἐν τοῖς ἄρθροις, ἣν ἂν τις ὥσπερ διάλεκτον εἴπειεν, καὶ τῶν ἄλλων ζῶων διαφέρει καὶ τῶν ἐν ταύτῳ γένει ζῶων κατὰ τοὺς τόπους . . . (*Hist. Anim.* 536b, 10–12)

Articulated voice, which one might speak of as “speech,” differs in the various animals, and also in animals of the same species according to locality.

Why the indefiniteness of the potential optative and of ὥσπερ? Presumably, to distinguish between διάλεκτος as ἡ ἐν ἄρθροις φωνή and διάλεκτος in its ordinary meaning of “conversation.”

This leaves us with the question of whether Aristotle believed birds or some species of birds converse. We have seen above that the ability of birds to utter articulated speech is second only to that of man. Is this ability matched with an ability to converse? To discuss this question we must look at Aristotle's statements concerning the functions of speech. In doing so we move from the physiological, psychological level to that of social intercourse between animals. We have seen above (p. 339) that the croaking of frogs serves as a mating call, and that all species (presumably all species which have voice, whether articulated or not) have special vocalizations (ἴδιαι φωναί) to establish social intercourse and proximity (πρὸς τὴν ὁμιλίαν καὶ τὸν πλησιασμόν). We might view the establishment of social contact as the most general function of vocalization; neither does it require articulation of the voice nor does it imply conversation, and therefore it is not διάλεκτος in any sense.

In the case of birds there is clearly a higher level function to vocalization. As we have seen above (p. 340), all birds use their tongues to communicate with each other (πρὸς ἐρμηνείαν ἀλλήλοις), and in the case of some birds learning appears to be conveyed *from one to the other* (ἐπ' ἐνίων καὶ μάθησιν εἶναι δοκεῖν παρ' ἀλλήλων). Clearly, then, birds do converse in the sense that their vocalizations are reciprocal and that they serve a function in addition to social contact, namely that of conveying learning (μάθησις). We are told further (*Hist. Anim.* 536b, 14–20) that bird song is not innate but is learned:

καὶ τῶν μικρῶν ὀρνιθίων ἔνια οὐ τὴν αὐτὴν φωνὴν ἀφιαῖσιν ἐν τῷ ἄδειν τοῖς γεννήσασιν, ἂν ἀπότροφα γένωνται καὶ ἄλλων ἀκούσωσιν ὀρνίθων ἀδόντων. ἥδη δ' ὥπται καὶ ἀηδῶν νεοττὸν προσδιδάσκουσα,

ὥς οὐχ ὁμοίας φύσει τῆς διαλέκτου οὔσης καὶ τῆς φωνῆς, ἀλλ' ἐνδεχόμενον πλάττεσθαι. καὶ οἱ ἄνθρωποι φωνὴν μὲν τὴν αὐτὴν ἀφιάσιν, διάλεκτον δ' οὐ τὴν αὐτήν.

Some of the small birds do not utter the same voice as their parents when they sing, if they are reared away from home and hear other birds singing. A nightingale has already been observed teaching its chick, suggesting that speech [i.e., bird song] is not the same by nature as is voice, but is receptive to training. Men too have the same voice, but different varieties of speech.

Birds then, just as men, exhibit dialectal variations, since their "speech" is not innate, but is rather due to learning. Hence, birds have several features of communication in common with men. Indeed, the three meanings of *διάλεκτος* referred to above are applicable to birds: (1) they have articulated voice, (2) they converse in the sense of reciprocal vocalization involving communication, and (3) they show local variation, dialect.

We may now ask where man fits into this scheme. What are the structural and functional elements in human language which differentiate his linguistic ability from the rather impressive performance of birds? On the level of social function we are told the following in the *Politics*, as an explanation of why man is a more political animal than any of the others:

λόγον δὲ μόνον ἄνθρωπος ἔχει τῶν ζώων. ἡ μὲν οὖν φωνὴ τοῦ λυπηροῦ καὶ ἡδέος ἐστὶ σημεῖον, διὸ καὶ τοῖς ἄλλοις ὑπάρχει ζῶσις (μέχρι γὰρ τούτου ἡ φύσις αὐτῶν ἐλήλυθεν, τοῦ ἔχειν αἴσθησιν λυπηροῦ καὶ ἡδέος καὶ ταῦτα σημαίνειν ἀλλήλοις), ὁ δὲ λόγος ἐπὶ τῷ δηλοῦν ἐστὶ τὸ συμφέρον καὶ τὸ βλαβερόν, ὥστε καὶ τὸ δίκαιον καὶ τὸ ἄδικον· τοῦτο γὰρ πρὸς τὰλλα ζῶα τοῖς ἄνθρωποις ἴδιον, τὸ μόνον ἀγαθοῦ καὶ κακοῦ καὶ δίκαιον καὶ ἀδίκον καὶ τῶν ἄλλων αἴσθησιν ἔχειν. (*Pol.* 1253a, 8–18)

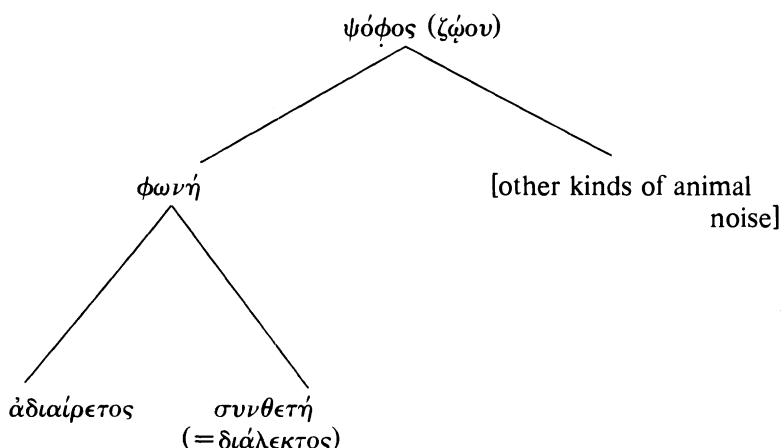
Man alone of the animals has language (λόγον). Now the voice is an indicator of pain and of pleasure, wherefore the other animals also have it (for their nature has progressed up to the point of having the perception of pain and pleasure and of indicating these things to each other), but the function of language is to indicate the advantageous and the harmful, and so also the just and unjust; for it is peculiar to man in comparison with the other animals that he alone has the perception of good and bad, just and unjust, and other such things.

It is interesting that here too we find a biological reference, though this time on a functional level. Voice (and hence the animals which

possess it) is capable of expressing the sensations of pleasure and pain and therefore (presumably) can serve as social signals for approach or avoidance.

I have translated the term λόγος as “language” to distinguish it carefully from διάλεκτος “speech,” “conversation.” In this passage it is λόγος which is attributed to man alone and its purpose is said to be the communication of the advantageous and the harmful, the good and the bad, the just and unjust. It is this politico-ethical function of language which makes the *polis* possible as the unit organization proper to man. The contrast in this passage is between the φωνή of animals and the λόγος of man, and the kind of expression of which each is capable. The term διάλεκτος is not used, and of course the question of the intermediate linguistic position of birds would be irrelevant. We may assume, however, that διάλεκτος would have been appropriate in this context in the meaning “vocal language” (ὁ λόγος ὁ διὰ τῆς φωνῆς). What birds are capable of is not λόγος with which to communicate τὸ σύμπερον καὶ τὸ βλαβερόν, ὥστε καὶ τὸ δίκαιον καὶ τὸ ἄδικον, but rather the mere communication of information.

If we return to our discussion of the units of language and their physiological substratum we can throw further light on the question of man’s linguistic distinctiveness, though in doing so, as we shall see, we leave the realm of what may properly be called a biology of language. Up to this point we have established that some animals produce ψόφος, some produce φωνή and that birds produce διάλεκτος (articulated voice), and that each of these is defined in terms of physiological structures. If we return to the definition of the units of human language outlined in the *Interpretations* and the *Poetics* (see chart, p. 332), we note that the first subdivision of voice distinguishes φωνή ἀδιαίρετος from φωνή συνθετή. This distinction separates the phoneme from the other units which are subsequently defined by additional features. If, however, we apply the same distinction to the animal kingdom, we simply have the distinction between φωνή and διάλεκτος, that is, between undifferentiated and articulated voice. Hence, the classification of sub-human vocalization may be summed up as follows:



We may then state further that man is differentiated linguistically from the other animals by those features which must be imposed upon voice to allow the definition of the *ὄνομα*, the *ῥῆμα* and the *λόγος*, i.e., by the definitory elaborations of *φωνή συνθετή*. If we omit the definition of the syllable from our discussion, these features include (1) a combinatory feature—that meaningful parts may be combined to form a sentence, and (2) a feature of time reference. It is just these features, that birds lack, so that their utterances, though articulated, reciprocal, and capable of communicating information, must be meaningful only as a whole and not as a combination of meaningful parts. Both of these features go beyond what can be defined on a biological basis in that neither of them has a particular physiological substratum. Since the function of the nervous system was not recognized in antiquity, the higher cerebral functions could be thought of as non-physiological. It is in these features then that we find man's linguistic distinctiveness, a distinctiveness which goes beyond physiological considerations and which, despite Aristotle's view of a continuum among species, separates man absolutely from the lower animals.

It is interesting to note that the definitions of linguistic units in the *De Interpretatione* are introduced as a preliminary to the discussion of logical propositions and that in particular we are told that there can be no such propositions without nouns, verbs and sentences. We may indeed conclude that the differentiation of voice in man beyond that which is present in other animals is a prerequisite to his ability to reason. This ability does not have a physiological substratum and

indeed Aristotle considers intellect (*νοῦς*) to be immortal, divine, peculiar to man among the animals, and even to enter the body from without during gestation. The activity of reason is explicitly said to be independent of physical activity (*De Generatione Animalium* 736b, 27 ff.) We need not enter into the difficult question of Aristotle's views on *νοῦς* and its relation to other aspects of soul, but simply note that the linguistic units which differentiate man are the ones which are independent of the body just as *νοῦς* which differentiates man from the lower animals is also independent of physical substratum. Given man's ability to reason and the more complex linguistic structure which this entails, he can use language for the higher order of political and ethical functions referred to in the *Politics*. It is clear at least that man is distinguished from the lower animals in his linguistic ability in that he has the material (nouns, verbs, and sentences) with which to construct propositions, and that the basis of this material is not biological, as is the mere articulated voice, but rather rests on his possession of intellect which is conceived of as independent of body. Hence, in Aristotle man's linguistic capacity is, on the one hand, part of a biological continuum, but, on the other, is radically differentiated from such a continuum by his possession of *νοῦς*.

The classification of speech and speech-like activities which emerges from Aristotles works may finally be summarized as follows:

VOCAL ACTIVITY	DISTINGUISHING FEATURE	PREREQUISITE	FUNCTIONS	EXAMPLE
None	None	None	-----	Most fish, crustacea cephalopods
noise (<i>ψόφος</i>)	sound	movement of various parts of body	-----	insects
voice (<i>φωνή</i>)	semanticity	lungs and windpipe	social intercourse and proximity, expression of pleasure and pain	dolphins, frogs most viviparous quadrupeds
speech (<i>διάλεκτος</i>)	articulation	freely moving tongue	reciprocal utterances, transmission of learning	birds
language (<i>λόγος</i>)	utterances consisting of meaningful parts	intellect (<i>νοῦς</i>)	to express the advantageous and the harmful, the just and the unjust	human beings

If we try to evaluate Aristotle's system from a modern point of view, we are struck by the way in which his brief and scattered discussions do form the outlines of an organized biological theory of language. We are also struck, I think, by the similarity of some of his *differentiae* to Hockett's design features. Aristotle recognizes the feature of *semanticity*, though he defines it according to his own system of psychology. *Arbitrariness* is clearly similar to what Aristotle refers to as the conventionality of meaning. *Duality of Patterning* forms the cornerstone of his notion of composite and non-composite units. *Displacement* finds a partial precursor in the use of time reference to distinguish nouns and verbs. In respect to language, as in many other respects, Aristotle sees a continuous scale among living beings, at the top of which is man.

On the other hand, although he recognizes this continuum, he nevertheless finds a unique place for man, as the only member of the biological kingdom who is in possession of *νοῦς*, and this too is reflected in the theory of language. And here I think lies some of the appeal of Aristotle's approach. Although we know an enormous amount more about human language and about animal communication (particularly as to the neural substratum of both), we seem still to be searching for a viewpoint which allows both for a biological perspective (though now in an evolutionary framework), and for an appreciation of the uniqueness of man's linguistic capacity. We can at least look back wistfully at a period in history when such an integration was possible.