Darwin's Biosemiotics: The Linguistic Rubicon in the *Descent of Man*

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Abstract In this essay I shall attempt to show how Darwin's work on, and contribution to, linguistics has often charted a proto-biosemiotic trajectory of thought. While modern linguistic studies have tended to explore Darwin's contribution to linguistics adopting a Saussurean view I argue that such views undermine Darwin's notion of continuity between animals and humans and I propose to look at Darwin's theory of language, which stems from the Romantic thought, by adopting a biosemiotic perspective which clarifies Darwin's own ideas on the origin of language and animal evolution as well as their inter-relations.

Keywords Biosemiotics • Origin of language • F. de Saussure • Ch.S. Peirce • Sign • Evolutionary theory • Ch. Darwin • German Romanticism • Philology

Introduction

Literary criticism[1] has seen an increased interest in Charles Darwin's work in relation to his views on language and its origins, and his contribution to the development of linguistics. However, his theory of language has more often than not been interpreted through a twentieth century Saussurean tradition based on the arbitrariness of signs. Although such interpretations shed light on what has been defined as Darwin's theory of signs,[2] they seem to fall into what Hans Aarslef[3] identifies as an error, namely that of confusing the formal criteria of a discipline in its maturity, with the motives and influences that brought it into being. In a similar way, it could be argued that Darwin's theory of language has often been interpreted from the standpoint of how his work was conceptualised in its maturity, rather than understood in the light of the influences that lead to its emergence. By building on the account of the rise and proliferation of comparative philology in nineteenth century England

[1] Alter 1999; Herbert 2001; Winter 2009.

[2] Winter 2009.

[3] Aarsleff 1983, p. 7.

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and by outlining the legacy of the German Romantic thought as a model for Darwin's own understanding of language theory, the aim of this essay is to show how Darwin's semiotic project, which emerges in the *Descent of Man, and Selection in Relation to Sex* (1871), could be argued to be closer to a proto-biosemiotic perspective of language than a Saussurean. In order to do so I shall endeavour to show how Darwin's postulation of the link between animal cognition and human cognition could be understood from a biosemiotic perspective as the result of sign interpretation or semiosis.

Doctrines Concerning the Theory and Origin of Language: A Background to Darwin's Evolutionary and Language Theory[4]

The study of language has traditionally been seen as the central question about the nature of man and as such linked to questions concerning intelligence, reason, thought, and progress of knowledge. In its eighteenth century formulation, as Aarsleff notes,[5] the origin of language and speech was the key to the history of thought and mankind. John Locke, for instance, had noted that any inquiry into the human race would necessarily involve an inquiry into the origin of language. This point was taken up and quoted, as Gillian Beer[6] observes, by Lord Monboddo in *Of the Origins and Progress of Language*[7] where he devoted two chapters to epistemological questions and the nature of man before reverting to the origin of language as the central issue to the understanding of human mind and its progress.

A central preoccupation in the eighteenth century was to show the separateness of man's natural endowments from his artificial accomplishments and language was not only a prime example of man's art, but also the foundation of the progress of knowledge and thought. It is within this context that Horne Tooke's (1736–1812) publication of his first volume of *Diversions of Purley* appeared in 1786, almost simultaneously with Sir William Jones's famous discourse "On Hindus" in England. These publications marked the beginning of the decline of one tradition in the study of language, namely the philosophical, based on a general reasoning **a priori** and etymology,[8] and the emergence of another, the comparative and historical, based on the study of grammar and kinship of languages. The fact that both works were published in the same year reflects of the controversies which were to capture the imagination of two generations in England and which were to form the basis for

[4] Part of this argument has been developed in Neubauer 2013.

[5] Aarsleff 1976.

[6] Beer 1996.

[7] Monboddo 1779.

[8] Beer notes that etymology was the oldest form in which linguistic change was recorded, however it didn't allow to establish an authoritative sequence of change, since it was possible to produce more than one convincing etymology for one word (Beer 1996, p. 109).

discussions among linguists on the necessity to institute a study of language upon a more scientific footing.

As Aarsleff points out, the reputation of Tooke's *Diversion of Purley* is "one of the most remarkable phenomena in the intellectual and scholarly life of England during the first third of the 19th century"[9] as it kept England immune to the new philology which had to be imported from the Continent by German linguists and which was adopted and popularised in England by Max Müller. At the root of such a success lay Tooke's proposed integration of philosophy and philology. He set out to demonstrate the dependence of thought on language and to create a system of language which, applied to metaphysical domains, could transcend them. He based his views largely on theories proposed by the empiricist John Locke (1632–1704) and the French philosopher, epistemologist and psychologist Étienne Bonnot de Condillac (1715–1780).

Locke's *Essay Concerning Human Understanding* is a philosophical landmark devoted not only to the understanding of the nature and limits of human knowledge in terms of concepts and ideas, but also to the discussion of the role language plays in human cognition. The *Essay* is divided in four books, where after a critique of innate ideas and an extensive discussion of the origin and classification of ideas in *Books I* and *II* respectively, Locke turns to his discussion on language. *Book III* starts with a chapter entitled "Of words or language in general" followed by "On the signification of words". In the latter he emphasises the arbitrary nature of words as well as their importance in communication as he writes:

> Words are sensible signs, necessary for communication of ideas. […] in their immediate signification, words are the sensible signs of his ideas who uses them, how imperfectly soever or carelessly those ideas are collected from the things which they are supposed to represent. […] *Words* come to be made use of by Men, as *the Signs of* their *Ideas* […] not by any natural connexion, that there is between particular articulate sounds and certain *Ideas*, […] but by a voluntary Imposition, whereby such a Word is made arbitrarily the Mark of such an *Idea.*[10]

As the above passage clearly explains, Locke sees the relation between words and ideas as a human artefact and a product of voluntary activity. He further states that it is only "the arbitrary imposition of Men" that connects words and ideas because he believes there is no "natural connexion between sound and Idea".[11] By stating that there is no natural connection between sound and idea, Locke dismissed the then predominant view of natural language largely associated with the Biblical description of Adam's language.

It is important to point out here that with his discussion on language and his classification of science into three domains whereby the third was occupied by what he termed "σημειωτική [*sēmeintikē*], or *the Doctrine of Signs*; the most usual whereof being words, it is aptly enough termed λογική [*logikē*], Logick" Locke introduced the formal study of signs into philosophy. The task of this doctrine was "to consider

[9] Aarsleff 1983, p. 73.

[10] Locke 1690 [1975], Book III, p. 405.

[11] *Ibid.*, p. 477.

the nature of signs, the mind makes use of for the understanding of things, or conveying its knowledge to others".[12] The type of signs which should be studied by his doctrine are not only words, but also ideas which are signs of external objects, or as he writes: "[S]ince the things the mind contemplates are none of them, besides itself, present to the understanding, it is necessary that something else, as a sign or representation of the thing it considers, should be present to it: and these are ideas".[13] By postulating the link between words that signify ideas and ideas that represent objects, Locke showed the intrinsic relation between representation and knowledge.[14]

Similarly to Locke, Condillac based his explanation of the operation of mind and the origin of human knowledge on a theory of signs. This theory was founded on two principles namely on the Lockean doctrine of the origin of ideas in sensation and on the rational principles of the universal grammar whereby language was supposed to have a single origin. Condillac presented his theory in *Essai sur l'origine des conaissances humaines*,[15] which was translated into English with the title *An Essay on the Origin of Human Knowledge, Being a Supplement to Mr. Locke's Essay on the Human Understanding*. Due to the parallelisms between Condillac and Locke's work, critics initially believed that Condillac's *Essai* was just an extension of Locke's *Essay*. Although Condillac admired Locke greatly, he didn't agree with Locke's reduction of ideas to a dual origin in sensation and reflection. Instead Condillac wished to demonstrate that reflection could be derived from sensation and to do so he postulated a new principle, namely that of the connection of ideas which depended on the use of signs.

Condillac's *Essai* is divided into two parts; the first discusses the operations of mind and postulates the importance of an active and deliberate use of signs which he divided into three categories – the accidental, natural and instituted or as he put it: "I distinguish three sorts of signs: 1. accidental signs, or the objects which particular circumstances have connected with some of our ideas, so as to render the one proper to revive the other. 2. Natural signs or the cries which nature has established to express the passions of joy, of fear or of grief. 3. Instituted signs or those we have chosen ourselves, and bear only an arbitrary relation to our ideas".[16] As Aarsleff explains,[17] all knowledge, according to Condillac, is stocked on these three internalised sign categories and its progress depends on the sign capability to open the way to reflection which is an expression of reason. Human beings are capable of higher degrees of reflection in proportion to their reason. Progress in knowledge and language is possible only from this. However, to be able to use the third type of signs, the instituted or conventional ones, human beings need to have control over the first two sign-types. In order to explain this, Condillac reverted to the study of the origin of language, which represented the second part of his essay. He argued that

[12] *Ibid.*, Book IV, p. 720.

[13] *Ibid.*

[14] Cf. Losonsky 2007 for an in-depth discussion of Locke's essay.

[15] Condillac 1746 [2001].

[16] *Ibid.*, p. 51.

[17] Aarsleff 1982.

language developed from animal cries or what he called natural signs which human beings used to communicate in situations of danger and fear. It was the repetition of the same gestures and cries over a long period of time that enabled man to recall specific signs at will rather than use them instinctively. This way, Condillac believed that mind and the use of signs would interact to the mutual advantage of both.

Although Condillac's view of linguistic signs is limited to the notion that they are a special category outside the mind and that they are arbitrary (a term he uses consistently in his *Essay*) what is important is that, he reverted to nature and natural signs in order to understand the origins and nature of language by paving the way for a possible correspondence between the natural world and the cultural one. Yet, Condillac's assertion that animals do not have reason (although he conceded that they have rudimentary forms of thought) meant that man and animal were separated by the higher capacity of human beings to use arbitrary signs in language and speech. In the nineteenth century this view was challenged by Darwin's evolutionary theory and his suggestion in the *Descent of Man* about a similar genealogy for human beings and language and the shared intellectual capacities of human and animals. However, it is fair to say that Darwin's interest in the workings of language stemmed from his preliminary readings of Monboddo and of Tooke whom Darwin held up as "one of the founders of the noble science of philolology".[18] The importance of Monboddo's and Tooke's influence on Darwin should not be underestimated as Darwin's initial concern to show that language had a natural origin and that it developed over time in a genealogical progression found expression in the following note he wrote in his notebook *M*[19] after returning from the Beagle Voyage: "Origins of Man now proved. Metaphysics must flourish. He who understands baboon would do more towards metaphysics than Locke",[20] and a few pages later, referring to Locke's *tabula rasa* of human knowledge he writes: "[T]he monkey understand the affinities of man better than the boasted philosopher himself".[21] The reference to baboons which we find in his notebook relate to Monboddo's view that there is a clear relation between human beings and orangutans not less so because they exhibit "exactly […] the same human form; walking erect […] they use sticks

[18] Darwin 1871 [1981, p. 87].

[19] Darwin's notebooks represent an important testimony to the development of his thought and theories. According to Jonathan Hodge (2009) they have helped in transforming the understanding of Darwin's entire life and work since 1960s. They reveal the vast range of Darwin's readings which contributed to his elaboration of the origin of species, his theory of the origin of moral sense in man from ancestral animal instinct, as well as language theory. The notebooks were written between 1831 and 1839. He started recording his observations during his voyage on the *Beagle* in the Field Notebooks which were followed by the Red Notebook. Darwin labelled each notebook with a letter. For instance, notebook *A* was written in July 1837 and was devoted to geology whereas notebook *B* was headed *Zoonomia* and was devoted to the laws of life. By July 1838 he had filled notebook *C* devoted to transmutation which was followed by notebook D on the same subject. In 1838 he started filling notebooks *M* and *N* on metaphysics and moral expression. For a detailed commentary and Darwin's notebooks cf. Barrett et al. 1987.

[20] Darwin, Notebook *M*, p. 84e, quoted in Wyhe 2002.

[21] Darwin, quoted in Degler 1991, p. 7.

for weapons; […] and have the organs of pronunciation as perfect as we have".[22] Although Monboddo affirms that *Homo sapiens* and orangutans share the same organs of pronunciation, and that *Homo sapiens* began articulating in the imitation to natural cries of animals, he is adamant that only human beings "had received the disposition"[23] for developing speech.

Monboddo's theory of the origin of language is similar to Condillac's view; the difference between the two lies in the fact that for Condillac the development of language started at a later stage than that proposed by Monboddo. Monboddo's work received mixed reviews in England, however his reputation was better in Germany where his work was translated by Johann Gottfried von Herder (1744–1803). In the preface of the translation Herder explained that the German audience would not object to Monboddo's attack on Locke and Isaac Newton because of the developing view of nature and language which stemmed from the German philosophy of Naturphilosophie. I shall address this shift of perspective in the next section before turning to discussing Darwin's indebtedness to such views in the formulation of his own theory.

The German Legacy: Romanticism and the Rise of Philology in England

As Condillac, in France, and Monboddo in England were elaborating their view on language and its origins, the German philosopher Johann Georg Hamann (1730–1788) also addressed the origins of language and criticised responses offered by both the Enlightenment and its critics. The issue rested, as Andrew Bowie[24] points out, on the fact that language was either conceived as the result of consciousness coming to make animal cries into meaningful signs, as proposed by Condillac, or, alternatively, it was in the nature of humankind to establish social conventions that gave agreed meanings to signs. Instead Hamann saw language as a creative force. To sustain his view of the creative force of language, Hamann presented a series of texts from antiquity to the present in order to demonstrate a kind of continuity of thought and to establish new contexts and meanings for his carefully selected material. By so doing, he introduced a historical dimension to language. In contrast to the rationalist tradition of the Enlightenment, he believed that primary contact with the world is in terms of feeling or sensation and not ideas. For Hamann, as Bowie explains, "human beings have a fundamental conviction of the reality of things which are prior to any abstract philosophical attempt to establish the nature of that reality".[25] Such belief is supported not by reason but by the immediate or non-

[22] Monboddo 1774, pp. 187–189.

[23] *Ibid.*, p. 481.

[24] Bowie 2003.

[25] *Ibid.*, p. 46.

inferential thinking. In other words, the world is revealed as something that is always already intelligible since the intelligibility of language and things are inseparable, because they are created by God's word. While it is God's word that brings utterances concretely into existence, it is human language which reveals how his word can be translated into new forms.

Hamann's views on language are important for two main reasons: firstly because the connection he posited between the creativity of language and art prefigured developments in early Romantic thought and, specifically, its re-animation of nature that replaced a mechanistic model of the natural world with an organic one. Secondly, the introduction of a historical dimension of language helped the institutionalisation of philology and anthropology by allowing language to change and grow or evolve over time. Philology held that the meaning of words is not fixed and immutable, but rather alters in history as a result of adaptation. Understanding the meaning and evolution of words became a way of interpreting past societies and cultures. Thus, both historians and anthropologists reverted to the study of words. As we shall see shortly, it was the interest in language and classical, later comparative, philology that initiated an interest and furnished Darwin with a key metaphor and an example or illustration of an evolutionary process.

Similarly to Hamann, Herder attributed a historical dimension to language. By asserting that language works in the manner of nature he equated the development of language with stages of the development of man. For instance, in the childhood stage language is determined by the affective reaction to the environment, and it is based on feeling and instinct. In the next stage, when human beings move to a more developed stage of thought, language becomes more able to deal with abstract concepts, until it reaches its youth or the poetic stage when a direct link is visible between man and nature. In the final, mature phase, language reaches what he termed the era of prose and philosophy where language "loses the pure poetry of nature".[26] Herder's equation of the development of language to the various phases of human evolution prefigures concepts in Darwin's evolutionary theory of species.[27]

John Wyon Burrow[28] notes that the development of comparative philology in England was closely linked to the central doctrines of German Romanticism, specifically in its understanding of language as something, not made, but natural and thus growing and evolving. The historical-comparative study of language in England sprung from the work of the aforementioned Sir William Jones who in 1789, delivered his famous lecture "On the Hindus" to the Asiatic Society of Calcutta which

[26] Herder 1767 [1985, p. 441].

[27] It is important to highlight, that Herder was familiar with Condillac's work, specifically with the part that deals with the origin of language and that his ideas may have influenced the writing of Herder's essay *Über den Ursprung der Sparche* (1772) or *On the Origin of Language* (Aarsleff 1982).

[28] Burrow 1967, p. 189.

was a part of his wider contribution "The Sanskrit Language",[29] in which he suggested that that classical languages, such as Greek and Latin, had a common root with Sanskrit, and that they may be further related to Gothic and Celtic as well as Persian. Jones put it as follows:

> The Sanskrit language, whatever be its antiquity, is of a wonderful structure; more perfect than the Greek, more copious than the Latin, and more exquisitely refined than either, yet bearing to both of them a stronger affinity, both in the roots of verbs and in the forms of grammar, than could possibly have been produced by accident; so strong indeed, that no philologer could examine them all three, without believing them to have sprung from some common source, which, perhaps no longer exists; there is a similar reason, though not quite so forcible, for supposing that both the Gothic and the Celtic, though blended with a very different idiom, had the same origin with the Sanskrit; and the old Persian might be added to the same family, if this were the place for discussing any question concerning the antiquities of Persia.[30]

Jones's statement about the kinship and affiliations between Indo-European languages was based on a comparative study of grammar which, he argues, was far more accurate than etymology. In their account of the importance of language studies in England, Burrow and Aarsleff agree that Jones' insight caused a revolution in the study of language because "the classification and derivation of languages could be systematised and that linguistic change could be studied on a comparative basis".[31] The consequences were various, but by far the most important one was that comparative philology became a model for different kinds of inquiry into the remote past and an ethnological tool or means of classifying racial families and even finding a single origin of the human race. It was this endeavour, i.e. the attempt to trace phenomena in an unbroken line to a remote past, which appealed to nineteenth century scholars working along these lines in biology and geology. Charles Lyell and Charles Darwin, for instance, found in comparative philology a consonant analogue.

While Jones' foremost Oriental scholarships – in particular his declaration of affiliation between languages was a fundamental contribution to the development of philology and Darwin's language theory lay in the work of Wilhelm von Humboldt (1767–1835), Jacob Grimm (1785–1863) and August Schleicher (1821–1868) who were all in various ways and to various degrees indebted to German Romanticism and who based the historical-comparative study of language on grammar alone.[32]

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[29] Cf. Aarsleff 1983.

[30] Jones 1799, p. 26.

[31] Hoenigswald 1963, p. 7. Hoenigswald notes, however, that term *comparative* as used in the eighteenth century does not refer to comparison at large, but to a process whereby original features can be separated from recent ones and where the aim of classification is subordinated to the aim of reconstruction (cf., e.g., his argument in Hoenigswald 1963).

[32] Linda Dowling argues that Englishmen have contributed relatively little to the development of this new science, so much so, that when M. Müller arrived in England in 1846, he believed to have set foot in a country rich of philological resources, yet relatively poor in philological achievements (cf. for instance Dowling 1982).

In his *On the Comparative Study of Language and its Relation to the Different Periods of Language Development* (1820), for instance, Humboldt argued that language is creative. Its function was not limited simply to representing or communicating existing ideas and concepts but it was a "formative organ of thought",[33] and as such was capable of creating and not just reflecting the existing world. It is precisely because of its creative aspect that the structure and organization of a language could not be gathered from actual verbal forms of its construction or its grammar. Rather, they had to be obtained from an analysis of the procedures language employs in speech, hence through sounds.[34] In his earlier empirical essay, *Thinking and Speaking: Sixteen Theses on Language* of 1795, he drew a clear distinction between the "physical sound of nature"[35] (similar to Condillac's animal cries) on the one hand and the "articulated sounds"[36] that constitute language on the other. In his studies he argued that the latter alone could form discernible units and were thus capable of embodying features to allow these sounds to enter into specific relationships with each other and any other sound. In other words, for Humboldt, the individual sound of a given language can be formed only "in relation to the others"[37] that make up the entire "sound system" of that language.[38]

He endeavoured to compile a phonetic system of different languages cataloguing them either according to their phonetic affinities or their oppositions. Humboldt's emphasis on language's creativity and its productive ability represents not only his critique of the rationalist (Descartes) and empiricist (Locke and Condillac) views on language whereby it was assumed that signs constituted a special class of objects outside an independently existing mind, to which convenient labels agreed upon by society had been attached.[39] As Robert J. Richards[40] observes, Alexander von Humboldt not only conveyed a conception of living nature, which Darwin later incorporated into his evolutionary theory, but Humboldt also suggested that language helped to create human intellect, an idea that became predominant in Darwin's language theory.

On the other hand, others such as J. Grimm in his *Deutsche Grammatik* (or *German grammar*) (1819) set out to illustrate the resemblance and kinship between languages based on the *Lautverschiebung* 'sound shift' or Grimm's law where, over a period of time, sets of consonants displace each other in a predictable and regular fashion.[41] Grimm presented the development of a single mother tongue, in this case Sanskrit, through a series of natural transformations through sound inheritance. Grimm's work was so revolutionary, that the translator of the English version of his

[33] Humboldt 1820 [1986, p. 100].

[34] Mueller-Vollmer 2011.

[35] *Ibid.*

[36] *Ibid.*

[37] *Ibid.*

[38] Mueller-Vollmer 1989.

[39] Mueller-Vollmer 2011.

[40] Richards 2002, p. 26.

[41] Gamkrelidze and Ivanov 1990, p. 111.

work remarked that it had "created a new epoch in the science of comparative philology"[42] and he compared it to Newton's *Principia in mathematics* and Bacon's *Novum Organum.* It is important to note here that Hensleigh Wedgwood, Darwin's cousins, published a technical exposition of Grimm's work and expressed enthusiasm for his achievement: so such work was familiar to Darwin who was in contact with his cousin when he was writing the *Descent of Man*. As Beer notes, Grimm's achievement lied in the fact that he did not draw on an even spread of evidence, but on the discovery of a law which could trace with precision the various shifts in language, or as Wedgewood himself wrote: "The illustrious scholar Grimm, has here given us, under the modest title of German Grammar, a thorough history not only of his own language, but of that of every descendant of the Gothic stock throughout Europe, tracing at the same time every inflection in every dialect through every intermediate stage up to the earliest period of which any literary monuments remain".[43] In the *Descent of Man* Darwin referred to Wedgwood and Schleicher as sources for ideas about the evolutionary descent of language. Richards argues that it was Schleicher's "thorough-going naturalism that Darwin depended on for his theory of the constructive effect of language on mind".[44] Schleicher held that contemporary languages had gone through a process in which simpler languages or *Ursprachen* had given rise to descendant languages. Schleicher maintained that this fact was perfectly in line with Darwin's theory and that the linguistic model was a repeated analogue for the biological one. In his *Darwinsche Theorie und die Sprachwissenschaft* (1863) he identified four areas which he thought would advance Darwin's theory based on a linguistic model. Among the most interesting of these seems to be Schleicher's point that languages are natural organisms, yet they have an advantage over natural organisms as far more transitional forms of language have survived as compared to animal's fossilised remains. In his discussion on Schleicher's argument on the correspondence between pattern of language descent and human descent, Richards explains that Schleicher found a justification for such a claim in his belief in monism. In fact Schleicher states that:

> Thought in the contemporary period runs unmistakably in the direction of monism. The dualism, which one conceives as the opposition of mind and nature, content and form, being and appearance, or however one wishes to indicate it this dualism is for the natural scientific perspective of our day a completely unacceptable position. For the natural scientific perspective there is no matter without mind [*Geist*] (that is, without that necessary power determining matter), nor any mind without matter. Rather there is neither mind nor matter in the usual sense. There is only one thing that is both simultaneously.[45]

As Richards goes on to explain, the doctrine of monism provided Schleicher with a metaphysical ground for his theory that the organism of language simply represented the material side of mind. What this implied, was that the evolution of language carried the evolution of mind and vice versa. This idea itself had its roots

[42] Aarsleff 1983, p. 160.

[43] Beer 1996, p. 103.

[44] Richards 2002, p. 31.

[45] Schleicher, quoted in Richards 2009b, p. 126.

in German Romanticism which, as noted above, dispensed with the mechanistic understanding of nature and propounded the concept of organism as the fundamental principle "in terms of which human mentality and all natural phenomena were ultimately to be understood".[46] Schleicher's view became an important aspect of Darwin's theory which I consider next.

Darwin's *Descent of Man* and the Linguistic Rubicon

In the period leading to his elaboration of the theory of species transmutation, Darwin became increasingly interested in the workings of language. As early as 1839, Darwin had been fascinated by Lord Henry Brougham's *Dissertations of Subjects of Science Connected with Natural Theology* which insisted that both animals and humans shared the capacity for abstraction because they could understand signs. Beer[47] notes, that what Darwin did not understand about this work is that Brougham thought, and, I suggest, much as Condillac before him, that signs are to be understood as arbitrary, in a view later developed by the Swiss linguist Ferdinand de Saussure (1857–1913) in the *Course in General Linguistics* (1916). Beer explains that Brougham argued that the relation between signifier and signified (to use Saussure's terminology) is as arbitrary in animal communication as it is in human language. Brougham states:

> Have not animals some kind of language? At all events they understood ours. A horse knows the encouraging or chiding voice or whip, and moves and stops accordingly. […] But they seem to have some knowledge of conversational signs. If I am to teach a dog or a pig to do certain things on a given signal, the process I take to be this. I connect his obedience with reward, his disobedience with punishment. But this only gives him the motive to obey, the fear of disobeying. It in no way can give him the means of connecting the act with the sign. Now connecting the two together (action and sign), whatever be the manner in which the sign is made, is Abstraction; but it is more, it is the very kind of abstraction in which all language has its origin – the connecting the sign with the thing signified; for the sign is purely arbitrary in this case as much as in human language.[48]

Although Darwin could have used Brougham's suggestion of the common origins between man and animal and animal intelligence, it was the move from the idea of abstraction to that of language which Darwin found difficult to grasp as he found no evidence for it in Brougham's work. In a passage in the *Descent of Man*, Darwin questions the claim that *animals* do not have the power of abstraction or that of forming general concepts and he states that: "[W]hen a dog sees another dog at a distance, it is often clear that he perceives that it is a dog in the abstract; for when he gets nearer his whole manner suddenly changes if the other dog be a friend".[49]

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[46] *Ibid*., p. 30.

[47] Beer 1996.

[48] Brougham 1839, vol. 2, pp. 195–196.

[49] Darwin 1871 [1981, p. 64].

Yet Beer suggests that Darwin's concern was the result of his preoccupation at the time with ideas of continuity and connections and that the idea of semiotic arbitrariness as the prototype of abstraction would have undermined Darwin's primary concerns.[50] Beer makes a valid point here, since as it is known from Darwin's very early theorising in his notebooks *M* and *N* and from the *Descent of Man*, he believed in the non-arbitrary understanding of the relation between words and things at the origin of language. Darwin came to believe that there was a necessary connection between "things and voices" or rather he believed in the musical basis of language which implied either a mimetic or an abstract relation between a thing and a voice. In the *Descent of Man*, in fact, Darwin states that:

> With respect to the origin of articulate language, after having read on the one side the highly interesting works of Mr. Hensleigh Wedgwood, the Rev. F. Farrar, and Prof. Schleicher, and the celebrated lectures of Prof. Max Müller on the other side, I cannot doubt that language owes its origin to the imitation and modification of various natural sounds, the voices of other animals, and man's own instinctive cries, aided by signs and gestures. It is, therefore, probable that the imitation of musical cries by articulate sounds may have given rise towards expressive of various complex emotions. The strong tendency in our nearest allies, the monkeys, and in the barbarous races of mankind, to imitate whatever they heard deserves notice, as bearing on the subject of imitation. Since monkeys certainly understand much that is said to them by man, and when wild, utter signal-cries of danger to their fellows; * (3) and since fowls give distinct warnings for danger on the ground, or in the sky from hawks (both, as well as a third cry, intelligible to dogs), * (4) may not some unusually wise apelike animal have imitated the growl of a beast of prey, and thus told his fellow-monkeys the nature of the expected danger? This would have been a first step in the formation of a language. As the voice was used more and more, the vocal organs would have been strengthened and perfected through the principle of the inherited effects of use; and this would have reacted on the power of speech.[51]

In other words, Darwin thought that it was through natural selection that the primitive vocal efforts of animals and human beings had evolved into a vast array of songs, sounds and cries and ultimately into speech. In his notebook *N*, some 30 years before the publication of the *Descent of Man*, as Richards points out,[52] Darwin already supposed that our aboriginal ancestors began imitating the sounds of nature and that language developed from these simple beginnings. What is particularly interesting, however, is Darwin's focus on imitation since it shows parallelisms with a biosemiotic perspective in animal communication or zoosemiotics which is based on the Peircean sign model. According to zoosemiotics, imitation could be based either on an iconic (i.e. based on similarity or resemblance) or an indexical (i.e. based on spatio-temporal contiguity) interpretation of signs. For instance, iconic imitation could have developed for purposes of predator deception or self-protection. An example of iconic imitation is alarm calls whose loudness is proportional to the degree of threat felt by the animal, as Darwin also suggested.[53] In line with Thomas

[50] Beer 1996.

[51] Darwin 1871 [1981, p. 68].

[52] Richards 2009a, p. 109.

[53] Nöth 1995, p. 163.

Sebeok's view of biosemiotics,[54] Darwin also sees that communication among animals is based on nonverbal signs and that human beings share this capacity with animals. Iconic and indexical signs are most often seen as being nonverbal.[55]

However, the difference between Sebeok and Darwin here is that Sebeok makes a distinction between language and speech whereas Darwin doesn't. In Sebeok's view,[56] language evolved as an adaptation much *earlier* than speech in humans and it did so not for communicative purposes, but for what Sebeok will call modelling. In other words, for Sebeok, language is a communicative device, so the specific function of language is neither to give information nor to transmit it. Sebeok,[57] instead, describes language as a modelling device, and although every species is endowed with a model that produces its own world, language is the specific model belonging to the human species. Speech, like language, made its appearance as an adaptation later than language and for the sake of communication. In its form "speech" (and later script language), it enabled humans to attain an enhanced nonverbal capacity, which they already possessed in less developed form. Darwin and Sebeok are in agreement on this point, as Darwin in the *Descent* similarly acknowledges that "articulate speech" (by which he means vocalization augmented by controlled movement of the lips and tongue[58]) is "peculiar to man",[59] but differently from Sebeok he denies that this mere power of articulation suffices to distinguish human language from animal vocalisations, "for as everyone knows, parrots can talk".[60] Translated into a biosemiotic perspective we could suggest that they both agree on continuity between animals and human beings and that this continuity has later been elaborated by Sebeok as being based on the iconicity and indexicality of signs.

The correspondence between animal language and human language and its origins postulated by Darwin in the *Descent of Man* encountered severe criticism by M. Müller who in *The Science of Language* (1861) presented the implications of Darwin's theory of natural selection as an overt attack on humankind. He argued that the use of language implied the ability to form concepts and, since animals cannot do that, there must be an impassable barrier between the two. Müller's point of view emerged from his conviction that language and thought coincide and, as Dowling argues, since Müller believed there is an exact coincidence between the two, "all language becomes meaningful, with reason transpiercing its apparent opacities and formal elements from within".[61] Given the inherent meaningfulness of words, Müller also believed that language could never arise conventionally as a system of external signs and as Saussure would later assert of arbitrary signs,

[54] Sebeok 2001.

[55] Cf., e.g., Martinelli 2010; Sebeok 1990 and 1972.

[56] Sebeok 1994.

[57] *Ibid.*

[58] Darwin 1871 [1981, p. 59].

[59] *Ibid.*, p. 55.

[60] *Ibid.*

[61] Winter 2009, p. 128.

because he held that humans would have needed words to hold the convention. Instead he portrayed it as internal and expressive in origin. Also, given the fact that Müller argued for a perfect identity between thought and language, he retorted that language stood in opposition to the evolutionary view proposed by Darwin. In fact he declared that: "One of the great barriers between the brute and man is *Language*. Man speaks and no brute had ever uttered a word. Language is our Rubicon and no brute will dare to cross it. […] It admits of no cavilling, and no process of natural selection will ever distil significant words out of the notes of birds and the cries of beasts".[62] Although there are differences between Darwin and Müller's views, the fact that they both believe in the non-arbitrariness of language is an important element which they concur. As John Deely points out, Saussure's definition of a sign rests on the notion that a sign is linguistic in essence and dyadic in character, and is arbitrary in the sense that it rests upon a stipulation.[63] In other words, Saussure postulates the relationship between form and meaning, arbitrarily restricting signs to the human sphere thus "severing their connection with the motivating history of the sign users as embodied in their language".[64] The severing of this connection also serves to separate human beings from animals, contrary to Darwin's view.

In the Peircean model of signs, the investigation of signs is not based upon an arbitrary dyadic model. Instead, it is based on a relational, triadic model. Where Saussure began positing a stipulated definition of a linguistic, thus cultural, sign, Peirce began with a descriptive definition of any sign, not only of linguistic signs.[65] Peirce emphasised the importance of investigating and interpreting signs rather than positing arbitrary meanings to them, and upon this he based his interdisciplinary science of the study of signs, which biosemiotics is based upon as a fundamental principle. The way he defines signs is according to the type of relations they have, where iconic and indexical signs (non-arbitrary signs) are shared between the human species and animals.

Many twentieth century linguists have followed Saussaure and thus neglected the importance of iconic and indexical signs. Often, they have concentrated their attention on cultural and conventional signs. It is therefore significant, for example, to observe that Sarah Winter,[66] in her article on Darwin's semiotic project on the expression of the emotions in man and animals, states that his project can be satisfactorily understood or investigated through a Saussurean lens. Winter states that, "Darwin's theory of expression falls into place within Saussure's disciplinary chronology"[67] yet immediately goes on to assert, "[w]hat I will characterise as Darwin's biosemiotic thinking in Expression also has important implications for clarifying our understanding of the status of race in Darwinian theory".[68] Winter

[62] Müller 1861 [1862, p. 354].

[63] Deely 2010.

[64] *Ibid.*, p. 20.

[65] *Ibid.*, p. 21.

[66] Winter 2009.

[67] *Ibid*, p. 131.

[68] *Ibid.*

thus argues that Darwin engaged in proto-biosemiotic thinking, yet within a Saussurean perspective on signs. In an endnote to the article, Winter quotes from Jesper Hoffmeyer and Thomas Sebeok to account for her perspective on biosemiotics, stating that they "favour a Peircean perspective"[69] of sign. It is not clear how they could have favoured or adopted a non-Peircean perspective, as the Saussurean view contradicts the non-arbitrary nature of the phenomena Darwin was investigating, namely (to use today's terms) the iconic and indexical signs of animal expression. In addition since iconic and indexical signs are not part of *langue*, Saussure was simply not concerned with the non-arbitrary signs of Darwin, Peirce and Hoffmeyer.

To conclude, in this paper, I have attempted to show how Darwin's work on, and contribution to, linguistics has often charted a proto-biosemiotic trajectory of thought which cannot be adequately underpinned, I have argued, by a Saussurean tradition. However, modern linguistic theorists often favour a Saussurean perspective, apparently overlooking and undermining Darwin's notion of continuity between animal and human. It is striking that this is a legacy of Romantic thought which influenced him and the evolution of his own ideas on the origin of language and animal evolution, and their inter-relations.

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[69] *Ibid*., p. 156.

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