The Tree of Language
Giorgio Agamben

Translated by Connal Parsley[1]

The path traced by the essays collected here leads us to the widest possible vantage over the problems of contemporary linguistics.[2] Linguistics, today, has begun to occupy a privileged place amongst the disciplines; seeming to promise a methodological model for every kind of inquiry, from ethnology to literary criticism. Setting out along this path, therefore, the reader must inevitably consider the question: what *is* linguistics? To borrow the opening words of the *Course in General Linguistics* that, for better or for worse, has long enjoyed an unusual level of prestige: what is 'the science that has been developed around the facts of language'?[3]

That linguistics really is the *science* of language is taken as self-evident; something that need not detain our thinking. According to current opinion, this just means that as a science, linguistics takes 'language studied in and for itself' as its 'true and unique object';[4] where the phrase 'in and for itself' reflects the objective character of modern scientific method as it has been constructed from the sixteenth century to today. But is such a scientific contemplation of the 'facts of language' really possible? We know that in 1927, when he needed to explain the impossibility of knowing with precision both the position and the momentum of a quantum particle, the German physicist Werner Heisenberg had to introduce what he called the *Uncertainty Principle*. According to this notion, every time a scientist observes or measures a given physical system, an interaction is produced between observer and system that results in the distortion of the phenomenon being observed. If we consider the mechanism that has made the birth of linguistics as a science possible, we may be tempted to ask whether a similar phenomenon also lies at the foundation of the study of language, and whether, as a result, the idea of language as a whole considered 'in and for itself' isn't merely one more myth amongst the many that accompanied the birth of nineteenth century science.

Saussure — who thought himself the first to transport linguistics from the utopian realm into the realm of science (just as Marx did with socialism) — informs

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[2] For a full list of the contents of the journal in which this article originally appeared, please consult the Italian version of the text that immediately precedes the translation. — Ed.

[3] Ferdinand de Saussure, *Course in General Linguistics* (Columbia University Press, 2011), 1.

[4] Ibid., 232.

us that if he has, for the first time, 'succeeded in assigning linguistics a place among the sciences' it is because he has 'related it to semiology'.[5] Linguistics could be cast as a science, that is, only by defining its object as a system of signs — a coherent whole made up of entities, each characterised by the indivisible union of two elements, the *signifier* and the *signified* (*signans* and *signatum*). In other words, the birth of linguistics as a science coincides with the definitive entry of language into a semiological sphere, without remainder. The 'distortion' that is produced by the interaction between the scholar and the object-phenomenon in question is, in this case, the reduction of language to a system of signs. In truth, this distortion is imperceptible. This is so because, according to a definition that has barred our access to a more essential reflection on linguistic problems for almost two thousand years (but which has only now, in our time, acquired a normative significance), language is *phônê sêmantikê*, a sonic emission that signifies. Contrary to a mistaken belief that endured for some time, this definition of language was in no way Saussure's discovery. Already implicit in Aristotle's *On Interpretation*, it was comprehensively elaborated by the Stoic philosophers, who regarded the *sêmeion* as an entity comprised of the inseparable connection between a sensible *sêmainon* and an intelligible *sêmainomenon*. Saussure merely made this relation normative, and thus silencing any other characterisation of language that might have been equally prevalent in Greek thought, arrived at a consideration of the laws of language from both a *synchronic* perspective (the state of a language at a determinate moment) and a *diachronic* one (from the point of view of its evolution in time). In this way, he preserved the illusion of analysing language scientifically 'in and for itself', forgetting that *'la langue envisagée en elle même et pour elle même'* is something very much like a phantasm. Any inquiry into language must take root not in the pure fact of language, but in an object that is already itself the product of philosophical reflection: in this case, language considered or indeed pre-judged to be a system of signs.

Since Saussure, this characterisation of language-as-sign has become the foundation of all linguistic inquiry, and is accepted as incontestable dogma even by those who take an avowedly critical stance towards his work. As Jakobson wrote, 'modern structuralist thought has clearly established [that] language is a system of signs, and linguistics is part of the science of signs, or SEMIOTIC (Saussure's *sémiologie*). The ancient definition of the sign — *'aliquid stat pro aliquot'* — has been resurrected and proposed as still valid and productive'.[6]

If we now reply, to the question we posed at the outset, that linguistics is the science that studies language considered as a system of signs — an answer that no longer seems quite so obvious — then a question immediately arises concerning the

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[5] Ibid., 16.
[6] Roman Jakobson, *Selected Writings Volume II, Word and Language* (Mouton de Gruyter, 1971), 103.

concrete aims assumed by any such science. Here, too, the answer is apparently straightforward: linguistics, it is said, seeks the laws of language, both synchronic and diachronic, in the sense we have described. But what does it mean to search for the laws of a given phenomenon, or of a system? We are so used to representing reality as a system governed by laws (that is, representing it 'rationally') that we no longer even ask what this expression might mean, to 'seek the laws of language'.

The word 'rationally', in fact, helps us to find an answer. Scientific investigation (but also our modern way of thinking generally and indeed the very possibility of the existence of something like 'laws') is based on a principle that was not clearly articulated until the eighteenth century, with the expression *principium rationis*. Leibniz, who was extremely proud of his discovery, formulated it thus: *nihil est sine ratione*. Nothing is without reason: this means that nothing in the universe exists whose reason cannot be given, or as the expression of the time had it, nothing exists for which we cannot *reddere rationem*. To reason means, in fact, to search for and to provide reasons — to name the real by giving to it its reason. Linguistics, as a science, therefore seeks the reason of language, summoning language *ad rationem reddendam*. In Greek, *ratio*, or reason, is *logos*. But *logos* is also the name that the Greeks gave to language itself. As such, Aristotle's most celebrated definition of man as *zôon logon ekhon* means both that man is 'the animal who has reason' and 'the animal who has language'.

Among the first thinkers to pose language's problems in a radically new way was Johann Georg Hamann, whom Hegel and Goethe both held in very high regard. As he wrote in a letter to Johann Gottfried Herder: 'Even if I were as eloquent as Demosthenes, I should not have to do more than thrice repeat a single phrase: Reason is language, *logos*. This is the bone I gnaw at, and shall gnaw myself to death over. Yet these depths are still obscure to me; I still await an apocalyptic angel with a key to this abyss'.[7] If this is true — if *logos* is language, if reason and language are the same thing — then how would it be possible to discover the reason of language? If nothing is without reason, then reason maintains itself beyond the reach of its own principle in any case: that which founds is necessarily without foundation. Understood as reason, language thus ends up revealing an abyss that it forces us to circle for eternity. Like Angelus Silesius' rose, language is 'without why, it / blooms because it blooms, / It pays no attention to itself, / asks not whether it is seen'.

In this way, to enquire after the nature of linguistic science leads us to call into question the very possibility of linguistics itself, insofar as it is a science that seeks the reason of language and hopes to oblige language to justify itself rationally. Yet if it is true that questioning is the piety of thought — if our question leads us, that is, to ask 'what is language?' in a more originary sense — then we will also have been led to a place where we can hear the specific resonance of the essays gathered here.

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[7] Ronald Gregor Smith, *J. G. Hamann (1730-1788) A Study in Christian Existentialism: With Selections from His Writings* (Harper and Brothers, 1960), 246.

We can then pose the question once more, in its fullest sense: what is linguistics? What is the science that has been developed around the facts of language?

To what does linguistics owe its privileged place among the sciences? To answer this question we must return to the biblical myth of the origin of language. In the story of Genesis, language's origin is presented thus: 'Now the Lord God had formed out of the ground all the wild animals and all the birds in the sky. He brought them to the man to see what he would name them; and whatever the man called each living creature, that was its name'.[8] We know nothing more of this original language of humanity, Adamic language. But we can deduce, from the words of Genesis, that it was a kind of nomenclature whose aim was to guarantee man's dominion 'over the fish in the sea and birds in the sky and over ever living creature that moves on the ground' that God promised him at the moment of creation.

When Adam was banished from the garden of Eden and his descendants began to people the earth, humanity retained this original language. The power of Adamic naming must have been truly remarkable if, according to Genesis, God had to confound it in order to prevent humans from erecting the tower at Babel that reached 'to the heavens': 'The Lord said, "If as one people speaking the same language they have begun to do this, then nothing they plan to do will be impossible for them. Come, let us go down and confuse their language so they will not understand each other"'.[9]

Towards the second half of the eighteenth century, driven by nostalgia for the mythical power of Adamic language, philosophers and linguists posed themselves the problem of the nature of human language before the confusion of languages at Babel. Even whilst they were arranging the very foundations of modern science, these thinkers understood that the problem of knowledge was inextricably linked to that of language, and they thought that if man could rediscover the language of Babel then no further obstacle could be placed in the way of science's march toward the acquisition of truth.

The Jesuit mathematician Athanasius Kircher — and also, independently, John Wilkins and George Dalgarno — realised that although it is impossible to return to Adamic language via an analytic examination of known natural languages, it is nonetheless possible to construct an artificial language that possesses the same characteristics. Such a language would be universal, in the sense that it could be understood and spoken by all humankind. It would also, for that reason, be *rational*, in the sense that once its primary or irreducible characters or signs are discovered (its 'philosophical grammar'), then the entire logical-linguistic universe would emerge from these signs through a system of implicit rules of transformation

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[8] Genesis 2,19 (New International Version).
[9] Genesis 2, 4-6.

— more or less like that of natural numbers, thanks to which we know without even thinking that 2 + 1 = 3. In a letter to Marin Mersenne of 20th November 1629, asking himself whether such a 'philosophical' language is possible, Descartes realised that the possibility of its creation depended on *'la vraye philosophie'*, because it presupposed the possibility of establishing an alphabet made up of all the basic ideas of the human mind, from which all the possibilities of reasoning could be derived.

Pursuing this path via a method he termed 'analytic-synthetic', Kircher came to construct a true and proper tree of Reason. Proceeding from its base up a vertical trunk and along its horizontal branches, this tree condensed within itself the entire universe of logic, supplying the elemental structure of every possible knowledge. At that point, it remained only to assign each of these primary elements an appropriate sign, so that the tree of Reason would be transformed into a tree of Language and man would come into possession of a perfect equivalent of the language of Babel. Encountering the research conducted by Kircher, Wilkins and Dalgarno, it dawned on Leibniz that a certain problem must be resolved in order to make this transition from the tree of Reason to the tree of Language — and thus to construct the universal language that would throw open the portals to knowledge that were closed at Babel. What was to be discovered was the rational nexus that binds the sign to the thing it represents (that binds the signifier to the signified, we would say today). In his words: 'there ought to be a reason why certain words are assigned certain things' (*causas subesse oportet, cur certae voces certis rebus sint assignate*).[10] This is why Leibniz strove his entire life to develop a science (the *'characteristica universalis'* or *'spécieuse générale'*), which — more than two centuries before Saussure's general science of signs — would have revealed to man the 'reason' that binds sign and thing: '[s]ince it is this *Characteristic* which gives words to languages, letters to words, numbers to Arithmetic, notes to Music. It teaches us how to fix our reasoning, and to require it to leave, as it were, visible traces on the paper of a notebook for inspection at leisure. Finally, it enables us to reason with economy, by substituting characters in the place of things'.[11]

In 1702, at seventy years of age, Leibniz transcribed and annotated Dalgarno's *Lexicon Grammatico-philosophicum*, the title of which, for evident reasons, is worth transcribing here in full: 'Grammatical-Philosophical Lexicon, or Methodically organised Table of all simple and general Things and Notions, both natural and artificial, including their Causes and Common relations; whose meanings are assigned names, not arbitrarily but with art and intelligence, preserving the analogical relation between Thing and Sign. From these Things and Notions are then formed, by general and clear rules and according to logical-

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[10] Marcelo Dascal, *Leibniz. Language, Signs, and Thought: A Collection of Essays* (John Benjamins Publishing Company, 1987), 189.

[11] Gottfried Wilhelm Leibniz, *Leibniz: Selections* (Charles Scribner's Sons, 1951), 4.

grammatical analogy, all other, more complex names, either by deduction or by combination in one or more entries'.[12]

The reason we have given careful attention to Kircher and Leibniz's research, and to the full title of Dalgarno's treatise, is the fact that they announce — either explicitly or implicitly — the fundamental themes of present-day linguistics. Even the lay reader will be aware that with the publication of Noam Chomsky's 1957 *Syntactic Structures*, contemporary linguistics enters a true and proper upheaval, suddenly throwing into question every article of faith held by linguists. What was the point of departure for the enquiry made by this new school of linguistics? Chomsky himself declares his debt to the rationalist current of thought of the seventeenth and eighteenth centuries. Although he seems to neglect Kircher and Dalgarno, as well as Leibniz's writing on rational language, he often cites Descartes and other works by Leibniz, and refers explicitly to the Port-Royal philosophers' universal grammar. According to Chomsky, every speaking subject acts as if, inherent in their *res cogitans*, there were a kind of generative code capable of establishing connections between semantemes and phonemes in an indefinite number of possible combinations. Everything happens as if, in other words, every language had a *generative grammar* that could account for any possible phrase, by reference to a base of minimal structures and a defined system of rules for their transformation — encompassing a phrase's semantic content as well as its phonological structure.

A generative grammar, understood in this way, can be compared with the well-known children's toy, Junior Engineer. This consists of (A) a nucleus of primitive elements; base materials that are the building blocks for the manufacture of new objects, (B) instructions setting out the steps that should be followed in order to construct new objects from the base materials, and (C) structural designs for making particular objects. Seen in this way, a startling analogy emerges between generative grammar and the philosophical tree of language elaborated by Kircher and Dalgarno's *Lexicon Grammatico-philosophicum* — which were also generative linguistic systems.

The analogy becomes even more pronounced if we bear in mind that Chomsky, and the other theorists of this new linguistic school, did not attempt to

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[12] *Tabulae Rerum, et Notionum omnium Simpliciorum, et Generaliorum, tam Artefactarum quam Naturalium, Rationes, et Respectus communiores, Methodo Praedicamentali ordinatas, complectentes: Quibus significandis, Nomina, non Casu, sed Arte, et Confilio, servata inter Res et Signa convenientia Analogica, instituuntur. Ex quibus, Rerum et Notionum aliarum omnium magis Complexarum et specialorum Nomina, vel Derivatione, vel Compositione, in una vel pluribus vocibus, per Regulas quasdam Generales et certas, secundum Analogiam Logico-Grammaticam, formantur; Ita ut Nomina sic formata, Rerum Descriptiones ipsarum Naturae consentaneas, contineant.* — Trans.*

deduce the generative grammars of existing natural languages through a process of analysis. Instead, they arrived at the construction of purely abstract generative grammars by a procedure they termed 'analysis by synthesis' — whose very name recalls Kircher's analytic-synthetic method. Such grammars are like 'logical machines' that provide the structural description of theoretical and virtual languages, just like the philosophical language of the seventeenth century rationalists.

Turning to the other aspect of Leibniz and Dalgarno's research — the necessary relation that must exist between sign and thing (or signifier and signified) — this finds its precise correlate in the other great current of contemporary structural linguistics: Jakobson's critique of Saussure's theory of the arbitrariness of the sign. Without entering into the detail of this critique here (which would barely be comprehensible to any reader not versed in linguistic theory), we may nonetheless recall that in Plato's *Cratylus*, Socrates and Hermogenes discussed the question of whether, in language, a form should be considered to be related to its content 'by nature' *(physei)* or 'by convention' *(thesei).* In the dialogue, Socrates favours the first answer, and Hermogenes the second.

In modern linguistics, it is Hermogenes' thesis that has prevailed. And Saussure, albeit with some hesitation, eventually established a true and proper theory of the *arbitraire du signe.* Roman Jakobson, on the contrary — taking up themes already signalled by Otto Jesperson, as well as C. S. Peirce, an American — vindicates Socrates' answer, making it the foundation of a series of brilliant analyses in which the emphasis is shifted, in the examination of linguistic phenomena, from language's lexical aspect to its structural quality.

A careful examination thus reveals that the second fundamental theme of contemporary linguistics — alongside the theory of generative grammar — is precisely the construction of the *characteristica universalis* sought by Leibniz: the science that would allow the establishment of a rational connection between sign and thing.

In 1677, at 31 years of age, Leibniz penned a 'Dialogue' on the method that would permit the calculation — a complete calculation, for everything that exists — of the relation between the word, the sign and the thing. In this essay, as Heidegger noted,[13] Leibniz laid the logical foundations for what we know today as artificial neural networks and cybernetic machines. In the margin of the text may be a found a note, made by Leibniz himself, which reads: *Cum deus calculat, fit mundus*: 'As God calculates, the world arises'. Divine 'calculation' is the secret reason written into the universe; and into human language, that man may realise his every project and assume dominion over the earth.

If linguistics currently occupies a privileged place among disciplines it is because in seeking the reason of language, it makes possible the construction of a universal method comparable to that of Leibniz's *rational language,* which finds its

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[13] Martin Heidegger, *The Principle of Reason* (Indiana University Press, 1996), 101.

definitive elaboration in cybernetics and information theory. In contemporary linguistics, in other words, the phrase 'language is reason' is understood to mean 'language is calculation': a logical machine that transforms information from one form into another by means of mathematical rules. And linguistics studies the operation of this calculation that supplies the rational structure for every possible knowledge.

If this is true, then linguistics is not merely the science that takes as its object the facts of language. It is rather an appeal to language, asking that it conform to the all-pervasive demand of calculative reason and arrange itself in accordance with a universal calculus. From this point of view, the growing convergence between linguistic research, information theory and cybernetics assumes an extremely particular significance. The tree of language is in fact a branch of that 'mathematical science of the soul' (or mathematical psychology) which already proclaims itself the most important discipline of the immediate future, and to which universal linguistic calculus, information theory and cybernetics are but the precursor.

We have seen that the quest for the reason of language has led linguistic research to renounce many of the postulates established by Saussure, developing instead a quasi-mathematical method. This method, to the extent that it recalls Kircher and Leibniz, no longer seems to have much in common with that of traditional linguistics. The growing importance assumed by abstract generative grammar theory, and the introduction of linguistic models, have induced many American universities to offer special courses in mathematics in order to provide the training necessary for linguistic study. Algebraic linguistics, given a marked boost by Chomsky's theories, is decisively on the rise.

From the very beginning of the history of linguistics to the present day, however, one linguistic postulate remains unexamined: the definition of language as a system of signs, understood as indissoluble unities of signifier and signified. Despite radical critiques by philosophers — who have recently even spoken of 'the historical closure' of the 'age of the sign'[14] — the dogma of the sign remains intact. In this sense, it can be said that contemporary linguistics remains faithful to Saussure's semiological project to the very end. Language, for this project, remains *phônê sêmantiké;* a sonic emission that signifies something. The structure of this system of signs is understood as rational, in the sense that it is thought possible to articulate its reason in a formal model analogous to a formal mathematical theory. Hand in hand with this mathematisation of the study of language, we witness an ever more marked convergence between linguistics (which, as we have said, has become a branch of a broader mathematical theory of the soul) and cybernetics, together with information theory. (For this reason, it will not surprise the reader to find a chapter by Silvio Ceccato, a scholar of cybernetics, in the present volume

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[14] Jacques Derrida, *Of Grammatology* (Johns Hopkins University Press, 1998), 13.

dedicated to linguistics). The study of language as a 'logical machine', in fact — reproducing the traditional problem of the relation between language and thought in a new domain — usefully contributes to the resolution of the fundamental problem in cybernetics: the 'modulation of human thought in the universal calculating machine'.[15]

In this sense, linguistics seems to be on a path to realising the dreams of the rationalist philosophers, through the construction of a rational tree of language. Just like the *Arbor philosophica universae cognitionis typus* that Kircher drew at the end of his *Arte magna del sapere*, the trunk of this tree would rise out of the abyss of nothingness, stretch up to the heavens, and furnish us with the structural rationality of the entire logical universe.

Alongside this possibility, however, another one presents itself. Disclosed at the dawn of Greek thought, it has remained in reserve, so to speak, within the history of the western meditation on language. If we consider language in accordance with the path opened up by this alternative possibility, language is *logos* — but *logos* does not simply mean 'reason, calculation'. Instead, according to its etymology, *logos* designates the act of gathering, preserving and bringing something before the gaze so that it appears as what it is. Language, in this sense, is that which enables every thing to be gathered in itself and held before us, in the light of presence. This is why the Greeks said: *to autò estin einai te kai logos,* 'being and language are the same', and it is why they so readily understood the linguistic sign in light of its originary belonging to being.

A fragment from Heraclitus expresses magnificently this ontological dimension of the sign: 'The Lord of whom Delphi is the oracle, neither unveils nor hides, but signifies *(sêmainei)*'. This is to say, in the indissoluble unity of the linguistic sign, the Greeks glimpsed the mystery of being that appears in the sensible sign and thereby conceals itself, and in concealing itself, comes to appear. This dual nature of being is also expressed in the negative inflection they gave to truth: *alêtheia,* un-concealment, unveiling, and the mutual relation between appearance and being-concealed.

The essence of language is not fully expressed, then, in its being a means of communication and expression — a signifying sound. Language's semiological nature is merely a clue to the originary belonging of language to being. The semiological perspective that linguistics opens on language is, for this reason, accurate only to the extent that it opens onto a wider ontological dimension, since it is in language that humankind — that animal endowed with language — draws closer to the problem of its being in the world and recovers, time and again, its fundamental place in relation to Being.

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[15] Sebastian Konstantinovič Šaumjan, 'Cybernetics and Language' (1965) 13 (51) *Diogenes* 129, 144.

The tree of language is the unity of the tree of life and the tree of knowledge, possessed by Adam in Eden but then denied to humanity by the confusion of languages at Babel. In this sense, humankind is always on the way to language. And linguistics — this 'science that has been developed around the facts of language' — serves its aims only if, while orienting humankind on the way toward language, it obliges us to pay attention to language's word *and* its reason (we could say, language's reason-word).

D. Today we are confronted by a variety of linguistics: linguistics as applied to machines in general, functional linguistics, various structuralisms, glossematics used by generative grammars, etc. From what point of view do you yourself approach the object 'language'?

R. From the point of view of its possible relation with mathematics. I think that by a perimathematical analysis one can bring to light certain characteristics of a style, and so of the literary enterprise in general. I am working in this direction, but I haven't yet arrived at something like a 'result' and so I have not yet published anything. I am dedicating myself in particular to certain problems having to do with linguistic ambiguity, which I believe quantitative analysis is able to reveal more than any other method.

From an interview with Raymond Queneau for *Paesi Libri*, 1968.