Encyclopédie méthodique. The first complete physiological approach of phonetics can be found in A. von Haller’s (1708–1777) Elementa physiologiae corporis humani (1757–1766, 3 vols.). In the late 1760s, interest was aroused in “speaking machines” or speech synthesizers, producing sounds similar to the human voice. After several experimental versions, W. von Kempelen (1734–1804) proposed (in Mechanismus der menschlichen Sprache nebst Beschreibung einer sprechenden Maschine, 1791) an automaton completely devoid of anthropomorphic features. A decade before, Chr. F. Hellwig (1754–1835) had proposed the first systematic articulatory description in a triangular model of the German vowels, in Dissertatio inauguralis physiologic-medica de formatione loquelae (1861). It was this type of articulatory description that was adopted in 19th-century historical linguistics.

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Western Traditions: Comparative-Historical Linguistics

The history and comparison of languages is the hallmark of 19th-century linguistics. The historical approach pervaded the century, and came to be viewed as the only "scientific" approach to language. Genealogical comparison aimed at establishing language families and at reconstructing unattested proto-languages. Its results were spectacular—above all, the definition of the [Indo-E]uropean family. Yet throughout the century, there was also strong interest in the description of the world's languages, and in the problem of their typological classification. In the later period, we find advanced work in phonetics, dialectology, psycholinguistics, and other sub-disciplines. (For reference see Pedersen 1931, Robbins 1967, Koerner 1975, Morpurgo Davies 1975, 1998, Christmann 1977, Gipper and Schmitter 1979, Aarsleff 1983, and Auroux et al. 2001.)

Assessment of the century's achievement is influenced by two external phenomena. First, contemporary linguists
were far more interested than their predecessors in writing their own history; they argued that they had created a “new” and “scientific” linguistics, which owed little or nothing to previous centuries (cf. Benfey 1869, Delbrück 1880)—and the 20th century inherited this view. Second, in the 19th century linguistics became institutionalized (Amsterdamska 1987, Morpurgo Davies 1998, Storost 2001): the first linguistic chair was founded by the new University of Berlin in 1821; by the end of the century, all German universities had at least one chair in the subject. Other Western countries followed suit; the new arrangements highlighted the supposed discontinuity with previous centuries, while creating a link with the present.

1. Predecessors. Recent historiography has done much to bridge the gap between 19th-century linguistics and what preceeded it (Droixhe 1978, 2000). Starting with the late Renaissance, we find relevant though disorganized work at varying levels of scholarship. First came numerous collections of linguistic data: glossaries, translations of the Bible or the Lord’s Prayer, etc. Second, there were attempts at linking the known languages in language families, though no clear methodology was established. The belief that all languages were derived from Hebrew gradually disappeared; “Scythian,” “Celtic,” etc. are mentioned as “original” languages. Third, we witness the discovery and publication of the earliest European texts: the efforts were desultory, but there were illustrious examples, such as the pioneering work on Anglo-Saxon and Gothic done in the 17th century. Finally, the general attitude toward the facts of language changed. The French Enlightenment asserted the primacy of language as a precondition of thought; the study of the origin and development of language then became a history of the human mind. This view was exemplified in France by the Idéologues and their predecessors, and in England by James Burnett Lord Monboddo; in Germany, the “genealogical priority” of language is asserted by Johann Georg Hamann and Johann Gottfried von Herder. This was not yet historical linguistics, but it inspired an interest in etymology as a key to origins; the philosophical concern for origins can then be reinterpreted in a historical key. Perhaps the single most influential voice was that of the philosopher Gottfried Wilhelm von Leibniz (1646–1716), who pleaded for complete collections of linguistic data to use as the basis for comparison; this would add to the knowledge not only of things, but also of the mind and its faculties, and of the origin of peoples.

2. Early discoveries. The end of the 18th and beginning of the 19th century saw an explosion of linguistic data. Three linguistic collections—edited by Peter Simon Pallas (at the prompting of Catherine II), by Lorenzo Hervás y Panduro, and by Johann Christoph Adelung and Johann Severin Vater—appeared in this period (Haarmann 2000); contemporaries noted that the number of known languages had risen from seventy-two to two thousand. The striking differences among languages called not only for a philosophical explanation, but also for new principles of classification.

The excitement surrounding all things Oriental at the time was increased by the “discovery” of Sanskrit. Sporadic observations about the language, and even grammars in manuscript, appeared earlier; but the first editions, translations, and reference works were produced by British civil servants, judges, or soldiers (see Rocher 2001). The connection of Sanskrit with Greek, Latin, and the European languages was immediately apparent; it was reconsidered and made famous by Sir William Jones in the third of his presidential discourses (1786) to the Asiatic Society of Calcutta. With Sanskrit, the West acquired a new tradition of grammatical analysis, and also learned an “exotic” language (made more attractive by the beauty of its literature), which in lexicon and structure was similar to the classical languages, though this could not be the result of borrowing. The excitement was best expressed by Friedrich Schlegel’s Über die Sprache und Weisheit der Indier (1808), an influential book which oscillated between the mystic and the scholarly; it aimed, inter alia, at demonstrating the descent of the classical languages from Sanskrit.

The new linguistics, including the work of Schlegel, has traditionally been associated with the German Romantic circles. The concern of Romanticism for the early phases of language and culture—its identification of language and national spirit, its constant comparison of language and organism, and its historicism—are all relevant. Yet not all the founding fathers of linguistics were exponents of Romanticism, and the role of the Enlightenment has been underrated. Powerful pleading for a data-oriented linguistics based on comparative study is found in the work of scholars such as C.F. de Volney and Jean-Pierre Abel-Rémusat, who were closer to the French Idéologie than to the German Romanticism.

3. The comparative method. The new data could be looked at from the angle of philosophical grammar, which aimed at universals; or through the lens of Romanticism, which magnified the national character of each language. In either case, a reappraisal was needed. Wilhelm von Humboldt contributed more than anyone else to an awareness of this need; he was seriously involved both in
theoretical problems (e.g., what is language?), and in the concrete analysis and classification of linguistic data. His followers, including August Pott and Heymann Steinthal, kept alive the interest in theory and typology when it became threatened by increasingly technical discussions. Steinthal also emphasized (following Humboldt) the psychological dimension of language study, in contrast to what he saw as the logicism of his predecessors (Knobloch 2001). Yet Humboldt also described in detail the operation of the comparative method; he stressed that, while the sharing of grammatical forms "which have a close analogy in their sound" was a proof of kinship between languages, structural similarity was not.

The way in which linguistic kinship was demonstrated was new. Initially, emphasis moved from lexical to morphological comparison. In the 18th century, the latter method had been used to demonstrate the relationship of Hungarian with Lappish, Finnish, and other languages (Fazekas 2001). That work remained isolated; but a Dane, Rasmus Rask (1787–1832), and two Germans, Franz Bopp and Jacob Grimm, had profound influence in the first part of the century. Starting with different backgrounds and aims, they built up a body of concrete results which were adopted by subsequent generations. Rask edited early Germanic texts and produced outstanding grammars of Icelandic and Anglo-Saxon. In a book written in 1814 (published in 1818), he demonstrated the kinship of Germanic with Greek, Latin, and Slavic through an accurate analysis of lexical and grammatical correspondences which also listed the regular permutations of "letters" between languages. Bopp, who came to linguistics from Sanskrit studies, argued for the study of language for its own sake, and not merely as ancillary to literature or history; he published in 1816 (English version, 1820) a detailed morphological analysis of the Sanskrit verb in comparison with Latin, Greek, Persian, and Germanic, which he derived from a common lost ancestor (Rousseau 2001a). His aim, well in tune with a rationalistic approach, was to show that all verbs originally included a form of the verb 'to be'. The method was new and survived: words were segmented on formal and functional criteria, and similar segments were compared across related languages, in order to distinguish inherited from innovated forms. Bopp produced the first comparative IE grammar (1833–1852), which in successive versions exploited data from Sanskrit, Iranian, Greek, Latin, Germanic, Slavic, Lithuanian, Celtic, and Armenian.

Grimm, who began with a concern for the earliest phases of national culture and concentrated on the development of Germanic, analyzed both the various dialects and the various phases of each dialect in that language group. On the model of Rask, he also introduced an unsophisticated but detailed phonological analysis of each language phase, and stressed the regularity of phonological correspondences between related languages and between successive stages of the same language. The famous Grimm's Law (so named by Rudolf von Rau mer and by some English scholars, though a first full statement is found in Rask) defined a series of phonological correspondences between Germanic and other ancient IE languages; as Grimm said, it had "important consequences for the history of the language and the validity of etymology," and also "provided sufficient evidence for the kinship of the languages involved." Grimm's work served as a model for the analysis of linguistic groups other than Germanic, but also challenged the results of both universal grammar and prescriptive grammar.

4. Language classification was inspired by the model of the natural sciences. Initially at least, the distinction between genealogical affinity and typological similarity was blurred. Both were based on morphological comparison—until it was made clear that, for genealogical purposes, it was necessary to compare the phonological form of functionally similar elements; for typological analysis, what mattered was the general structure. In 1808, Friedrich Schlegel argued that the basic distinction was that of "inflected" (or "organic") languages vs. "non-inflected" languages. Yet in his work, inflection was a quasi-mystical concept which applied only to IE languages. The most successful later classification divided languages into inflected (e.g. Sanskrit), agglutinative (e.g. Turkish), and isolating (e.g. Chinese); but even at this stage, all related languages were taken to belong to the same typological class. No agreement was ever reached about typological classification; but throughout the century, general reflection about language was connected with typological discussion, partly because of Humboldt's influence. For Steinthal (1823–1899), classification theory was a modern substitute for the old general grammar; it was in the context of a typological discussion that August Schleicher attempted a reconsideration of the validity of our descriptive categories. (See in general Morpurgo Davies 1975, 1998, Rousseau 2001b, and Ringmacher 2001.)

5. Reconstruction and etymology. By the end of the 1840s, the main lines of inquiry were clear. Extensive philological work led to new editions of early and later texts, and to grammatical descriptions. Grimm's work for Germanic was imitated in Romance, Slavic, and other
groups. Pott established the basic word correspondences between IE languages, and laid the foundation for later reconstruction of the IE lexicon. Outside IE, the comparative method was applied to other language groups: American Indian, Bantu, Altaic, Dravidian, etc. The method evolved, but methodological and theoretical discussions became rarer. Even for Pott, the most theoretically minded of all technicians, Grimm's account of sound changes in Germanic had more importance than many a philosophical grammar full of abstractions.

The historical approach prevailed even among non-linguists. A short essay (1821) by the Danish mineralogist J. H. Bredsdorff (1790–1841), about the causes and ways of language change, remained isolated; but it was the first attempt to establish general principles. Classicists were often hostile to the new discipline; but in 1812 Franz Passow laid down the requirements for a dictionary on historical principles, and implemented them in a Greek lexicon (1819–1823) that served as a model for the *Oxford English Dictionary* (1884–1928; cf. Aarsleff 1983). Independently, Jacob Grimm and his brother Wilhelm in 1852 undertook a similar enterprise, the *Deutsches Wörterbuch*.

6. Schleicher and organicism. In the second half of the century, the comparative method acquired stricter guidelines with August Schleicher, whose *Compendium* (1861–1862) replaced Bopp's *Comparative grammar* of IE. Attention concentrated on phonological change; Schleicher attempted a reconstruction of the unattested forms of the parent language, and established rules of derivation which led from them to the attested data. The relationship of cognate languages was given graphic expression in the form of a tree, with binary branchings which represented the successive divisions of the parent language into subgroups, languages, and dialects. Schleicher's technical work summarized with impressive clarity some of the achievements of his predecessors, and added to them, not least because his philological and historical accounts of the IE languages were much more advanced (Bynon 2001). His general views, however, were far more extreme. For him, languages were real organisms, which had a life of their own; they developed according to natural laws through a prehistorical period of growth, followed by decay and differentiation. "Glottik" or linguistics was a part of natural history, and followed the method of the natural sciences. The Romantic connections between language and culture, or language and history, were rejected.

7. The Neogrammarians. With Schleicher, organicism reached a point of no return. Scholarly reaction was strong: Michel Bréal in France, G. I. Ascoli in Italy, J. N. Madvig in Denmark, and William D. Whitney in the United States, as well as Steinthal and Anton Scherer in Germany, all argued that linguistics had to be brought back into history. In the 1870s in Germany, anti-organicism became associated with a group of young scholars who congregated round the Leipzig Slavist August Leskien; they were given in jest the name "Junggrammatiker" ("Neogrammarians" is the usual mistranslation). In the 1878 preface to the *Morphologische Untersuchungen*, which counts as the manifesto of the movement, Karl Brugmann and Hermann Osthoff maintained that language could not be studied separately from the speaker. They called for a more explicit and stricter methodology, based on a uniformitarian approach: the same principles operated in all phases of language. The study of modern languages and dialects was as important as that of the most ancient phases; "glottogonic" speculation had to be abandoned. Yet language change was still the center of interest, and the Neogrammarians thought that two main factors were responsible for it:

(a) *Phonetic change* was gradual and unconscious, and operated without exceptions (the regularity principle). It was stated in phonetic laws of the type [ɪ] > [d]: in a given language or dialect, in a given period, and in a given phonetic environment (e.g. between vowels), [ɪ] was always replaced by [d]. Whenever this did not happen, an explanation had to be found; etymologies and reconstructions based on vague similarities and not on phonetic laws were worthless.

(b) The second factor was *analogy*—words or grammatical elements were altered on the model of other forms with which they were associated in the mind of the speaker. The development of individual morphemes could not be studied in isolation from the whole linguistic structure. Indeed, in his influential *Principien der Sprachgeschichte* (1880), Hermann Paul argued that analogy is responsible not only for innovations (e.g. *cows* replacing *kine*), but also for the normal creativity of language: speakers do not repeat forms and sentences which they have heard, but re-create them analogically.

The Neogrammarians were attacked; but in the midst of the controversies, we observe an explosion of nearly definitive work in historical and comparative phonology and morphology; friends and foes alike built on each other's results. The contemporary achievements of experimental phonetics (e.g. Henry Sweet and Eduard Sievers) were also influential (Kemp 2001, Galeazzi 2001). No doubt the new approach, geared as it was to under-
standing change, was highly technical, and in some ways aphilosophical; it marked a form of retrenchment from the broader aims of Romanticism. Yet it also asked for a more explicit methodology, and for a clearer statement about the activities and goals of linguists (see Einhauser 1989, Morpurgo Davies 1998, and Jankowsky 2001).

Within the context of this search for a greater methodological awareness, we may consider the various developments which, in the last quarter of the 19th century, mark the beginning of a shift toward new interests: semantics (e.g., Bréal), sociolinguistics (Hugo Schuchardt), theoretical and descriptive linguistics (Whitney, Jan Baudouin de Courtenay, Ferdinand de Saussure) (see Kohrt and Kurcharczik 2001). Even so, the prevailing ethos of 19th-century linguistics remained historical; it is no small tribute to this bias that the concrete historical work produced by the Neogrammarians and their contemporaries is still consulted, and that the techniques they developed remain in constant use among comparative and historical linguists.

[See also Analogy; Bopp, Franz; Comparative Method; Grimm, Jacob; Humboldt, Wilhelm von; Indo-European Languages; Language Change; Neogrammarians; Pott, August Friedrich; Rask, Rasmus; Sapir, Edward; Schleicher, August; Reconstruction; and Grammaticalization.]

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In the more specific sense, the label refers to a trend in American linguistics represented by Leonard Bloomfield and linguists inspired by his work. They tried to adopt the methods of Behaviorist psychology and a Neopositivist philosophy of science, which are now widely thought to be too restrictive even in the physical sciences, let alone in linguistics and the humanities. In the 1950s, Noam Chomsky reacted vigorously against this trend, and has contributed to the current unpopularity of structural linguistics.

But Chomsky has attributed some of those reductionist, restrictive assumptions (which do not always apply to the subtle and supple analyses of Bloomfield) to structural linguistics understood in a more comprehensive sense. The result has been paradoxical, because in this more general sense, the label refers to the theories of Saussure (who may be considered the father of structuralism) and to the Prague School. It also refers to the research of Edward Sapir and his pupils—as well as to other structuralist trends which seem to share with generative grammar an interest in the dynamic nature of language, its creative character, and its universal features. It is possible to argue that generative linguistics itself has produced some of the more interesting developments of the structuralist movement, in the comprehensive sense, rather than a destructive critique.

3. Saussure. Ferdinand de Saussure’s *Cours de linguistique générale* (1916) was produced by Charles Bally and Albert Sechehaye on the basis of lecture notes after Saussure’s death in 1913. It became arguably the most influential work of linguistics of the 20th century, and can be considered the foundation stone of structuralism. The book is written with a lucidity both striking and deceptive, as it is often difficult to establish exactly what certain theses mean, and how they are interrelated. The following discussion is limited to presenting the main points which made the *Cours* so influential. What modern linguistics absorbed from the book was mainly a set of dichotomies—contrasting notions which help to illuminate the facts of language. (For a critical edition, see Saussure 1967–1974.)

The most striking, in a cultural context, is Saussure’s opposition of a synchronic to a diachronic point of view. The major achievement of 19th-century linguistics was the elaboration of the historical study of language: scientific linguistics was by definition historical. It took a great deal of intellectual courage and originality for Saussure to recognize that there was also a synchronic study of language—and that in fact, from the viewpoint