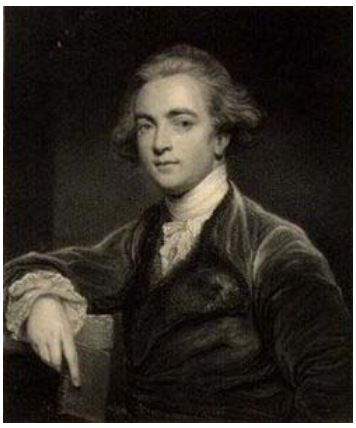
From the Study of Ancient Texts to the Study of Talking People: 222 Years of Linguistics

Clips[†] mostly from Wikipedia, the free encyclopedia

Setting the Stage

… The original inspiration for linguistics in India was the need to preserve orally transmitted Sanskrit texts from the Vedic period (ca. 1200 BC to 1000 BC). Panini's "Eight Books" (btw 600 BC and 300 BC) already indicate a rich linguistic tradition. (R H Robins)

Sir William Jones



Sir **William Jones** (September 28, 1746 – April 27, 1794) was an English philologist and student of ancient India, particularly known for his proposition of the existence of a relationship among Indo-European languages.

Of all his discoveries, Jones is best known today for making and propagating the observation that Sanskrit bore a certain resemblance to classical Greek and Latin. In *The Sanscrit Language* (1786) he suggested that all three languages had a common root, and that indeed they may all be further related, in turn, to Gothic and the Celtic languages, as well as to Persian.

His third discourse (delivered in 1786 and published in 1788) with the famed "philologer" passage is often cited as the beginning of comparative linguistics and Indo-European studies. This is Jones' most quoted passage, establishing his tremendous find in the history of linguistics:

> The *Sanscrit* 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 the forms of grammar, than could possibly have been produced by accident; so strong indeed, that no philologer could examine them all three,

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[†] **The selection is based on lectures by Professor Zsigmond Telegdi (1909-1994) at ELTE, Budapest. – Anna Szabolcsi.**

> without believing them to have sprung from some common source, which, perhaps, no longer exists.

Although as early as the mid-17th century Dutchman Marcus Zuerius van Boxhorn (1612–1653) and others had been aware that Ancient Persian belonged to the same language group as the European languages, and, publishing in 1787, American colonist Jonathan Edwards Jr. demonstrated, with supporting data (which Jones lacked), that Algonquian and Iroquoian language families (families not merely languages) were related, it was Jones' discovery that caught the imagination of later scholars and became the semi-mythical origin of modern historical comparative linguistics.

Karl Wilhelm Friedrich Schlegel

Karl Wilhelm Friedrich (later: **von**) **Schlegel** (March 10, 1772 - January 12, 1829) was a German poet, critic and scholar.

In 1802 he went to Paris, where he edited the review *Europa* (1803), lectured on philosophy and carried on Oriental studies, some results of which he embodied in an epoch-making book, *Über die Sprache und Weisheit der Indier* (On the Language and Wisdom of India) (1808).

A permanent place in the history of German literature belongs to Friedrich Schlegel and his brother August Wilhelm as the critical leaders of the Romantic school.

Wilhelm von Humboldt

Wilhelm von Humboldt

Friedrich Wilhelm Christian Karl Ferdinand Freiherr **von Humboldt** (June 22, 1767 – April 8, 1835), government functionary, diplomat, philosopher, founder of Humboldt Universität in Berlin, friend of Goethe and especially of Schiller, is especially remembered as a German linguist who introduced a knowledge of the Basque language to European intellectuals.

His younger brother Alexander von Humboldt was an equally famous naturalist and scientist.

Philosopher and diplomat

Wilhelm von Humboldt was a philosopher of note and published *On the Limits of State Action* in 1810, the boldest defence of the liberties of the Enlightenment. It anticipated John Stuart Mill's essay *On Liberty* by which von Humboldt's ideas became known in the English-speaking world.

He describes the development of liberalism and the role of liberty in individual development and in pursuit of excellence. He also describes the necessary conditions without which the state must not be allowed to limit the action of individuals. Friedrich Hayek considers Humboldt the greatest German philosopher of liberty.

Linguist

Wilhelm von Humboldt was an adept linguist who translated Pindar and Aeschylus and studied the Basque language.

Von Humboldt's work as a philologist in the Basque language has had the most extended life of all his other work. The result of his visit to the Basque country was *Researches into the Early Inhabitants of Spain by the help of the Basque language* (1821). In this work von Humboldt endeavored to show, by an examination of geographical placenames, that a race or races speaking dialects allied to modern Basque once extended throughout Spain, southern France and the Balearic Islands; he identified these people with the *Iberians* of classical writers, and he further surmised that they had been allied with the Berbers of northern Africa. Von Humboldt's pioneering work has been superseded in its details by modern linguistics and archaeology, but is sometimes still uncritically followed even today.

Von Humboldt died while still preparing on his greatest work, on the ancient Kawi language of Java, but its introduction was published in 1836 as *The Heterogeneity of Language and its Influence on the Intellectual Development of Mankind*. This essay on the philosophy of speech:

> "... first clearly laid down that the character and structure of a language expresses the inner life and knowledge of its speakers, and that languages must differ from one another in the same way and to the same degree as those who use them. Sounds do not become words until a meaning has been put into them, and this meaning embodies the thought of a community. What Humboldt terms the inner form of a language is just that mode of denoting the relations between the parts of a sentence which reflects the manner in which a particular body of men regards the world about them. It is the task of the morphology of speech to distinguish the various ways in which languages differ from each other as regards their inner form, and to classify and arrange them accordingly." *1911 Encyclopædia Britannica*

He is credited with being the first European linguist to identify human language as a rule-governed system, rather than just a collection of words and phrases paired with meanings. This idea is one of the foundations of Noam Chomsky's theory of language. Chomsky frequently quotes Humboldt's description of language as a system which *"makes infinite use of finite means"*, meaning that an infinite number of sentences can be created using a finite number of grammatical rules. In recent times, Humboldt has also been credited as an originator of the linguistic relativity hypothesis (more commonly known as the Sapir-Whorf hypothesis), approximately a century before either Edward Sapir or Benjamin Whorf.

Georges Cuvier

Baron Georges Léopold Chrétien Frédéric Dagobert Cuvier (August 23, 1769–May 13, 1832) was a French naturalist and zoologist. He was the elder brother of Frédéric Cuvier (1773–1838), also a naturalist. He was a major figure in scientific circles in Paris during the early 19th century, and was instrumental in establishing the fields of comparative anatomy and paleontology by comparing living animals with fossils. His most famous work is the *Regne animal distribué d'après son organisation* (1817; translated into English as *The Animal Kingdom*). He died in Paris of cholera.

The family followed the Lutheran tradition of work and religion. Early on, Georges Cuvier was given the works of Linnaeus and Buffon. Therefore it is not surprising that he showed a bent towards the investigation of natural phenomena. He was also noted for his studious habits and marvelous memory.

After spending four years at the University of Stuttgart, where he received a pragmatic German education, he accepted the position of tutor in the cultivated family of the Comte d'Héricy in Normandy, who were in the habit of spending the summer near Fécamp. It thus came about that he made the acquaintance of the agriculturist A. H. Tessier, who was then living at Fécamp, and who wrote strongly in favour of his protégé to his friends in Paris — with the result that Cuvier, after corresponding with the well-known naturalist Étienne Geoffroy Saint-Hilaire, was appointed in 1795, at the age of 26, as assistant to the professor of comparative anatomy at the *Muséum National d'Histoire Naturelle*.

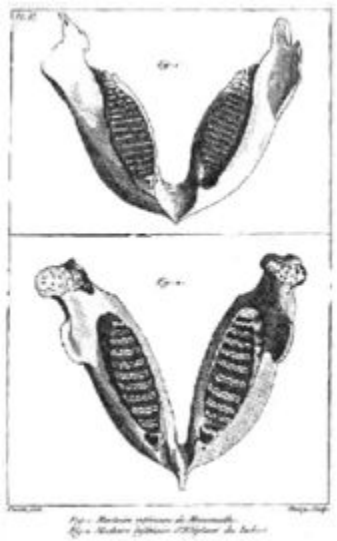


illustration of an Indian elephant jaw and a mammoth jaw from Cuvier's 1796 paper on living and fossil elephants

The Institut de France was founded in the same year and he was elected a member. In 1796 he began to lecture at the *École Centrale du Pantheon*, and at the opening of the National Institute in April, he read his first palaeontological paper, which was subsequently published in 1800 under the title *Mémoires sur les espèces d'éléphants vivants et fossiles*. In this paper he analyzed skeletal remains of Indian and African elephants as well as mammoth fossils, and a fossil skeleton known at that time as the 'Ohio animal'. Cuvier's analysis established, for the first time, the fact that African and Indian elephants were different species and that mammoths were not the

same species as either African or Indian elephants and therefore must be extinct. He further stated that the 'Ohio animal' represented another extinct species that was even more different from living elephants than mammoths were. Years later, in 1806, he would return to the 'Ohio animal' in another paper and give it the name mastodon.

Scientific ideas and their impact

Extinction

At the time Cuvier presented his 1796 paper on living and fossil elephants, it was still widely believed that no species of animal had ever become extinct, because God's creation had been perfect. Authorities such as Buffon had claimed that fossils found in Europe of animals such as the wooly rhinoceros and mammoth were remains of animals still living in the tropics (ie rhinoceros and elephants), which had shifted out of Europe and Asia as the earth became cooler. Cuvier's early work demonstrated conclusively that this was not the case. [1]

Principle of correlation of parts

In an 1798 paper on the fossil remains of an animal found in some plaster quarries near Paris Cuvier wrote:

> *Today comparative anatomy has reached such a point of perfection that, after inspecting a single bone, one can often determine the class, and sometimes even the genus of the animal to which it belonged, above all if that bone belonged to the head or the limbs. ... This is because the number, direction, and shape of the bones that compose each part of an animal's body are always in in a necessary relation to all the other parts, in such a way that - up to a point - one can infer the whole from any one of them and vice versa.*

This idea is sometimes referred to as 'Cuvier's principle of correlation of parts', and while Cuvier's description may somewhat exaggerate its power, the basic concept is central to comparative anatomy and paleontology.

Opposition to Evolution

Cuvier was highly critical of evolutionary theories proposed by his contemporaries Lamarck and Geoffroy Saint-Hilaire. He was skeptical of the mechanisms of change that they proposed and his commitment to the principle of correlation of parts caused him to doubt that any mechanism could ever significantly modify any part of an animal in isolation from all the other parts, without rendering the animal unable to survive. He also pointed out that Napoleon's expedition to Egypt had retrieved animals mummified thousands of years previously that seemed no different from their modern counterparts. [3]

The harshness of his criticism and the strength of his reputation continued to discourage naturalists from speculating about the transmutation of species, right up until Darwin published *The Origin of Species* more than two decades after Cuvier's death. [4]

The Old Grammarians

Franz Bopp

Franz Bopp (September 14, 1791 - October 23, 1867) was a German linguist known for extensive comparative work on Indo-European languages.

Friedrich Schlegel's book, *Über die Sprache und Weisheit der Indier* (*On the Speech and Wisdom of the Indians*, Heidelberg, 1808), which had just begun to exert a powerful influence on the minds of German philosophers and historians, could not fail to stimulate also Bopp's interest in the sacred language of the Hindus.

In 1812, he went to Paris at the expense of the Bavarian government, with a view to devoting himself vigorously to the study of Sanskrit. There he enjoyed the society of such eminent men as AL Chézy, S de Sacy, LM Langlès, and, above all, of Alexander Hamilton (1762 - 1824), who had acquired, when in India, an acquaintance with Sanskrit, and had brought out, conjointly with Langlès, a descriptive catalogue of the Sanskrit manuscripts of the Imperial library.

The first fruit of his four years' study in Paris appeared at Frankfurt am Main in 1816, under the title *Über das Conjugationssystem der Sanskritsprache in Vergleichung mit jenem der griechischen, lateinischen, persischen und germanischen Sprachen* (*On the Conjugation System of Sanskrit in comparison with that of Greek, Latin, Persian and Germanic*) (Windischmann contributed a preface). In this first book Bopp entered at once on the path on which he would focus the philological researches of his whole subsequent life. He did not need to prove the common parentage of Sanskrit with Persian, Greek, Latin and German, for previous scholars had long established that; but he aimed to trace the common origin of those languages' grammatical forms, of their inflections from composition -- a task which no predecessor had attempted. By a historical analysis of those forms, as applied to the verb, he furnished the first trustworthy materials for a history of the languages compared.

His chief activity centred on the elaboration of his *Comparative Grammar*, which appeared in six parts at considerable intervals (Berlin, 1833, 1835, 1842, 1847, 1849, 1852), under the title *Vergleichende Grammatik des Sanskrit, Zend, Griechischen, Lateinischen, Litauischen, Gotischen und Deutschen* (*Comparative Grammar of Sanskrit, Zend, Greek, Latin, Lithuanian, Gothic and German*.

In his *Comparative Grammar* Bopp set himself a threefold task:

1. to give a description of the original grammatical structure of the languages as deduced from their intercomparison
2. to trace their phonetic laws, and
3. to investigate the origin of their grammatical forms.

The first and second points remained subservient to the third.

“His quest for the original Indo-European language led Bopp to discover the principles of comparative grammar much like Columbus discovered America in his search for a new route to India” (A. Meillet)

Jacob Grimm

Jacob Ludwig Carl Grimm (Hanau, January 4, 1785 — Berlin, September 20, 1863), German philologist, jurist and mythologist, was born at Hanau, in Hesse-Kassel. He is best known as a recorder of fairy tales, one of the Brothers Grimm.

The purely scientific side of Grimm's character developed slowly. He seems to have felt the want of definite principles of etymology without being able to discover them, and indeed even in the first edition of his grammar (1819) he seemed to be often groping in the dark. As early as 1815 we find AW Schlegel reviewing the *Altdeutsche Wälder* (a periodical published by the two brothers) very severely, condemning the lawless etymological combinations it contained, and insisting on the necessity of strict philological method and a fundamental investigation of the laws of language, especially in the correspondence of sounds. This criticism is said to have had a considerable influence on the direction of Grimm's studies.

Grimm's famous *Deutsche Grammatik* (Germanic Grammar) was the outcome of his purely philological work. The labors of past generations from the humanists onwards resulted in an enormous collection of materials in the shape of text-editions, dictionaries, and grammars, although most of it was uncritical and untrustworthy. Something had even been done in the way of the comparison and determination of general laws, and the concept of a comparative Germanic grammar had been clearly grasped by the illustrious Englishman George Hickes by the beginning of the 18th century in his Thesaurus. Ten Kate in Holland had afterwards made valuable contributions to the history and comparison of the Germanic languages. Even Grimm himself did not at first intend to include all the languages in his *Grammar*, but he soon found that Old High German postulated Gothic, and that the later stages of German could not be understood without the help of other West Germanic varieties including English, and that the rich literature of Scandinavia could not be ignored either. The first edition of the first part of the *Grammar* (which appeared in 1819), and is now extremely rare, treated of the inflections of all these languages, and included a general introduction, in which he vindicated the importance of an historical study of the German language against the *a priori*, quasi-philosophical methods then in vogue.

In 1822 this volume appeared in a second edition (really a new work, for, as Grimm himself says in the preface, it cost him little reflection to mow down the first crop to the ground). The wide

distance between the two stages of Grimm's development in these two editions is significantly shown by the fact that while the first edition gives only the inflections, in the second volume phonology takes up no fewer than 600 pages, more than half of the whole volume. Grimm had, at last, awakened to the full conviction that all sound philology must be based on rigorous adhesion to the laws of sound change, and he never afterwards swerved from this principle, which gave to all his investigations, even in their boldest flights, that iron-bound consistency, and that force of conviction which distinguishes science from dilettanteism. Prior to Grimm's time, philology was nothing but a more or less laborious and conscientious dilettanteism, with occasional flashes of scientific inspiration.

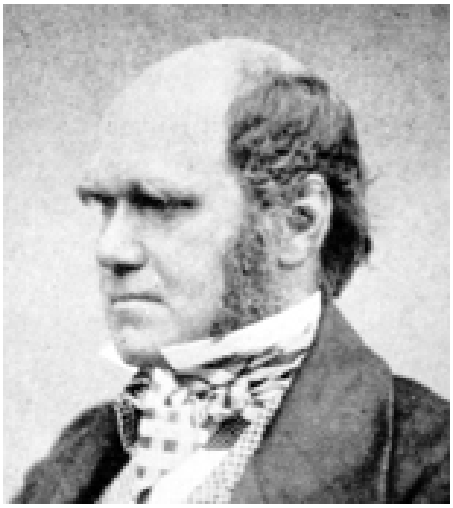
His advances must be attributed mainly to the influence of his contemporary Rasmus Christian Rask. Rask was born two years later than Grimm, but his remarkable precocity gave him something of an even start. In Grimm's first editions, his Icelandic paradigms are based entirely on Rask's grammar, and in his second edition, he relied almost entirely on Rask for Old English. His debt to Rask can only be estimated at its true value by comparing his treatment of Old English in the two editions; the difference is very great. For example, in the first edition he declines disg, dceges, plural dcegas, without having observed the law of vowel-change pointed out by Rask. There can be little doubt that the appearance of Rask's Old English grammar was a main inducement for him to recast his work from the beginning. To Rask also belongs the merit of having first distinctly formulated the laws of sound-correspondence in the different languages, especially in the vowels (those more fleeting elements of speech which had hitherto been ignored by etymologists).

The *Grammar* was continued in three volumes, treating principally derivation, composition and syntax, the last of which was left unfinished. Grimm then began a third edition, of which only one part, comprising the vowels, appeared in 1840, his time being afterwards taken up mainly by the dictionary. The *Grammar* stands alone in the annals of science for its comprehensiveness, method and fullness of detail. Every law, every letter, every syllable of inflection in the different languages was illustrated by an almost exhaustive mass of material, and it has served as a model for all succeeding investigators. Diez's grammar of the Romance languages is founded entirely on its methods, which have also exerted a profound influence on the wider study of the Indo-European languages in general.

Grimm's “Law” [a misnomer; he meant a tendency with exceptions, AS]

Grimm's Law, also known as 'Rask's-Grimm's Rule' is the first law in linguistics concerning a non-trivial sound change. It was a turning point in the development of linguistics, allowing the introduction of a rigorous methodology to historic linguistic research. It concerns the correspondence of consonants in the older Indo-European, and Low Saxon and High German languages was, first fully stated by Grimm in the second edition of the first part of his grammar. The correspondence of single consonants had been more or less clearly recognized by several of his predecessors including Friedrich von Schlegel, Rasmus Christian Rask and Johan Ihre, the last having established a considerable number of *literarum permutationes*, such as **b** for **f**, with the examples ba~ra =ferre, befwer =fiber. Rask, in his essay on the origin of the Icelandic language, gave the same comparisons, with a few additions and corrections, and even the very same examples in most cases.

Charles Darwin



Charles Robert Darwin (12 February 1809 – 19 April 1882) was an eminent English naturalist[1] who achieved lasting fame by convincing the scientific community that species develop over time from a common origin. His theories explaining this phenomenon through natural and sexual selection are central to the modern understanding of evolution as the unifying theory of the life sciences, essential in biology and important in other disciplines such as anthropology, psychology and philosophy.[1]

Darwin developed his interest in natural history while studying first medicine, then theology, at university.[2] His five-year voyage on the *Beagle* established him as a geologist whose observations and theorising supported Charles Lyell's uniformitarian ideas, and the subsequent publication of his journal of the voyage made him famous as a popular author. Puzzled by the geographical distribution of wildlife and fossils he collected on the voyage, he investigated the transmutation of species and conceived his theory of natural selection in 1838. He had seen others attacked for such heretical ideas and confided only in his closest friends while carrying out extensive research to meet anticipated objections.[3] However, in 1858, Alfred Russel Wallace sent him an essay describing a similar theory, forcing early joint publication of both of their theories.[4]

His 1859 book, *On the Origin of Species*, established evolution by common descent as the dominant scientific explanation of diversification in nature. Human origins and features without obvious utility such as beautiful bird plumage were examined in *The Descent of Man, and Selection in Relation to Sex*, followed by *The Expression of the Emotions in Man and Animals*. His research on plants was published in a series of books, and in his final book, he examined earthworms and their effect on soil.[5]

August Schleicher

August Schleicher (February 19, 1821 – December 6, 1868) was a German linguist. His great work was *A Compendium of the Comparative Grammar of the Indo-European Languages*, in which he attempted to reconstruct the Proto-Indo-European language.

August Schleicher was born in Meiningen (Duchy Saxe-Meiningen, southwest of Weimar in the Thuringian Forest). He began his career studying theology and Indo-European, especially Slavic languages. Influenced by Hegel, he formed the theory that a language is an organism, with periods of development, maturity, and decline. In 1850 Schleicher completed a monograph systematically describing the languages of Europe, *Die Sprachen Europas in systematischer Übersicht (The languages of Europe in systematic perspective)*. He explicitly represented languages as perfectly natural organisms that could most conveniently be described using terms drawn from biology e.g., genus, species, and variety. Schleicher claimed that he himself had been convinced of the natural descent and competition of languages before he had read Darwin's

Origin of Species. He invented a system of language classification that resembled a botanical taxonomy, tracing groups of related languages and arranging them in a genealogical tree. His model, the *Stammbaumtheorie (family-tree theory)*, was a major development in the study of Indo-European languages. To show how Indo-European might have looked he created a short tale, Schleicher's fable, to exemplify both words and known culture. He first introduced a graphic representation of a *Stammbaum* in articles published in 1853. By the time of the publication of his *Deutsche Sprache (German language)* (1860) he had begun to use **trees to illustrate language descent**. Schleicher is commonly recognized as the first linguist to portray language development using the figure of a *tree*. For the most part, however, Darwin's ideas simply overlaid the fundamental features of Schleicher's prior evolutionary project, which derived from the work of those individuals immersed in German romanticism and idealism especially Humboldt and Hegel. August Schleicher died from tuberculosis at the age of 47 in Jena (Duchy Saxe-Weimar-Eisenach, Thuringia).

The Neogrammarians

The **Neogrammarians** (also **Young Grammarians**, German *Junggrammatiker*) were a German school of linguists, originally at the University of Leipzig, in the late 19th century who proposed the **Neogrammarian hypothesis** of the regularity of sound change. According to this hypothesis, a diachronic sound change affects simultaneously all words in which its environment is met, without exception. Verner's law (1875) is a famous example of the Neogrammarian hypothesis, as it resolved an apparent exception to Grimm's law. The Neogrammarian hypothesis was the first hypothesis of sound change to attempt to follow the principle of falsifiability according to scientific method. Today this hypothesis is considered more of a guiding principle than an exceptionless fact, as numerous examples of lexical diffusion (where a sound change affects only a few words at first and then gradually spreads to other words) have been attested.

Other contributions of the Neogrammarians to general linguistics were:

- The object of linguistic investigation is not the language system, but rather the idiolect, that is, language as it is localized in the individual, and therefore is directly observable.
- Autonomy of the sound level: being the most observable aspect of language, the sound level is seen as the most important level of description, and absolute autonomy of the sound level from syntax and semantics is assumed.
- Historicism: the chief goal of linguistic investigation is the description of the historical change of a language.
- Analogy: if the premise of the inviolability of sound laws fails, analogy can be applied as an explanation if plausible. Thus, exceptions are understood to be a (regular) adaptation to a related form.

Leading Neogrammarian linguists included:

- Wilhelm Braune Karl Brugmann Berthold Delbrück August Leskien Hermann Osthoff Hermann Paul
- Eduard Sievers Karl Verner August Leskien Otto Behaghel

Despite their strong influence in their time, the methods and goals of the Neogrammarians have been criticized from various points of view, but mainly for: reducing the object of investigation to

the idiolect; restricting themselves to the description of surface phenomena (sound level); overvaluation of historical languages and neglect of contemporary ones.

Patrick Honeybone English Language, School of Philosophy, Psychology and Language Sciences University of Edinburgh on Brugmann:

Brugmann, Karl (*b.* 1849, *d*. 1919; German), lecturer at Leipzig University (1877-1884), professor at Freiburg (1884-1887), then professor of Indo-European linguistics at Leipzig (1887-1919). A vastly influential historical linguist, both in his youth as a leading member of the 'neogrammarians', who revolutionised the study of diachrony, and later as the author of the key compendium for Indo-European historical and comparative linguistics.

Brugmann belonged to the third generation of serious nineteenth-century linguists. The first comprised pioneers such as *Rask, *Bopp and *Grimm. The second, including such figures as August Schleicher, established linguistics as an academic discipline, both in universities and as a developing paradigm of knowledge, with scholars aware of and consciously building on colleagues' work.

Brugmann thus found linguistics a relatively mature discipline (he reckoned it 60 years old in 1878). Its primary goal was the reconstruction of Proto-Indo-European, and Brugmann's first influential articles were both contributions to this goal. Published in 1876, while still a school teacher, they were distinctly controversial, also a defining characteristic of some of Brugmann's later writings. These first major contributions substantially but simply reshaped Indo-European phonology by reinterpreting its inventory of vowels and recognising that it had underlying syllabic nasals. The latter illustrates his openness to developments in general phonetics and phonology, unlike many historical linguists who had gone before.

Brugmann is best known as a leader among the 'neogrammarians'. This handful of scholars and their contemporary co-thinkers were academically young, and set out to revitalise linguistics and save it from what they saw as non-scientific, romantic faults. The translation 'neogrammarian' does not well convey the humorously-meant 'young upstart' flavour of the original *Junggrammatiker*, and the confidence with which they set about revising old results was as infuriating for some contemporaries as it was inspiring for others.

Brugmann co-founded the quasi-journal *Morphologische Untersuchungen*, to publicise neogrammarian ideas, and its first volume's preface (1878) is now known as the 'neogrammarian manifesto'. Written by Brugmann (also signed by Hermann Osthoff), this sets out the theoretical assumptions of the neogrammarian movement. These were not stunningly new in 1878 – as the 'manifesto' explains, they had been assumed in some previous work – but their formulation by Brugmann in a concise and coherent manner had a considerable impact due to their explicitness and clear contradiction of the assumptions of predecessors and contemporaries.
Using modern terminology, these principles can be summed up thus: (i)

phonological change proceeds through the innovation of regular, subconscious ‘sound laws’ which do not allow exceptions – for any change, all occurrences of a segment in the environment concerned will be changed (this is referred to as the ‘regularity’ or ‘exceptionlessness’ hypothesis; it aided the shift in linguistics from plain comparative reconstruction to attempts to link reconstructed to attested forms through the formulation of historical phonological processes), (ii) the other key mechanism which can lead to changes in a morpheme’s form is an analogy with a member of parallel morphological paradigm (sometimes referred to as ‘form association’), (iii) the languages which linguists reconstruct had exactly the same kind of linguistic properties as languages have today (often referred to as ‘uniformitarianism’), (iv) language exists in the human mind and is not an autonomous organism which might ‘be young’, ‘grow old’, ‘improve’ or ‘decay’.

Points (i) and (ii) are the key methodological principles, and all four are now fundamental assumptions in much linguistics, apart perhaps from (i), which may have been complicated by the recognition of ‘lexically diffusing’ changes, which seem to spread gradually through the lexicon, so that not all words are affected at the same time, even though they feature the same phonological environment; nonetheless, many linguists in 2003 still claim some version of the regularity hypothesis as a crucial guiding methodological assumption. The principles fitted well with the general assumption of universal laws and uniformity in nature in nineteenth-century science. Brugmann applied these principles in many contributions to the history of Indo-European languages, especially Latin and Greek. For the latter, he produced a detailed grammar (1885), recognised as one of the clearest and most comprehensive for any individual language. Although historically focussed, it also described the synchronic phonology, morphology and syntax of Ancient Greek (indeed, synchronic description was taken for granted by the neogrammarians, although not seen as a goal in its own right).

· I think a direct line can be drawn from the kind of work that Brugmann and the Neogrammarians did through Structuralist synchronic work to early Generative linguistics, and hence to the basic foundation of much of how linguistics is conceived of, and done, today. Phonology, long the pilot science of linguistics, was the crucial theoretical field in which many of these basic principles were worked out, establishing the assumptions that language can be investigated as an autonomous entity, and that linguistics should be rigorous and explicit and should look for ‘law-like’ linguistic generalisations (rules, constraints, principles etc...). As Robins (1967) says, “we are all neogrammarians now”.

Johannes Schmidt

Johannes Schmidt (July 29, 1843 – July 4, 1901) was a German linguist. He developed the *Wellentheorie (wave theory)* of language development.

Johannes Schmidt was born in Prenzlau (Kingdom of Prussia). He was a pupil of August Schleicher and studied philology (historical linguistics), specializing in Indo-European, especially Slavic, languages. He earned a doctorate in 1865 and worked from 1866 as a teacher at a *gymnasium* in Berlin.

In 1868 Schmidt received a call from the University of Bonn to the position of professor of German and Slavic languages. In Bonn he published the work *Die Verwandtschaftsverhältnisse der indogermanischen Sprachen (The relationships of the Indo-European languages)*, which contained his *Wellentheorie (wave theory)*. According to this theory, new features of a language spread from a certain point in continuously weakening concentric circles, similar to the waves created when a stone is thrown into a body of water. This should lead to convergence amongst dissimilar languages. The theory was directed against the doctrine of *sound laws* introduced by the Neogrammarians in 1870.

Structuralism

History

Structuralism appeared in academia for the first time in the 19th century and then reappeared in the second half of the 20th century, when it grew to become one of the most popular approaches in academic fields concerned with analyzing language, culture, and society. The work of Ferdinand de Saussure concerning linguistics is generally considered to be a starting point of 20th century structuralism. The term "structuralism" itself appeared in the works of French anthropologist Claude Lévi-Strauss, and gave rise, in France, to the "structuralist movement," which spurred the work of such thinkers as Michel Foucault, Louis Althusser, the psychoanalyst Jacques Lacan, as well as the structural Marxism of Nicos Poulantzas. Almost all members of this so-called movement denied that they were part of it. Structuralism is closely related to semiotics. Post-structuralism attempted to distinguish itself from the use of the structural method. Deconstruction was an attempt to break with structuralistic thought. Some intellectuals like Julia Kristeva, for example, took structuralism (and Russian formalism) for a starting point to later become prominent post-structuralists. Structuralism has had varying degrees of influence in the social sciences: a great deal in the field of sociology, hardly any in economics.

Structuralism in psychology (19th century)

At the turn of the 19th century the founding father of experimental psychology Wilhelm Wundt tried to confirm experimentally his hypothesis that conscious mental life can be broken down into fundamental elements, which then form more complex mental structures. In this part of the 19th century, researchers were making great advances in chemistry and physics by analysing complex compounds (molecules) in terms of their elements (atoms). These successes encouraged psychologists to look for the mental elements of which more complex experiences were composed. If the chemist made headway by analysing water into oxygen and hydrogen, perhaps the psychologist could make headway by considering a perception, e.g., the taste of lemonade, to be a "molecule" of conscious experience which can be analysed into elements of conscious experience: e.g., sweet, sour, cold, warm, bitter, and whatever else could be identified by introspection. A major believer was the psychologist Edward B. Titchener who was trained by Wundt and worked at Cornell University. Since the goal was to specify mental structures, Titchener used the word "structuralism" to describe this branch of psychology (Atkinson, R.L.

1990, Introduction to Psychology. (10th Ed) New York, Harcourt Brace Jovanovich, p767). Wundt's structuralism was quickly abandoned because its objects, conscious experiences, are not easily subjected to controlled experimentation in the same way that behavior is.

Structuralism in linguistics

Ferdinand de Saussure was the originator of the 20th century reappearance of structuralism, and evidence of this can be found in *Course in General Linguistics*, written by Saussure's colleagues after his death and based on student notes, where he focused not on the use of language (*parole*, or speech), but rather on the underlying system of language (*langue*) and called his theory *semiology*. This approach focused on examining how the elements of language related to each other in the present, that is, 'synchronically' rather than 'diachronically'. Finally, he argued that linguistic signs were composed of two parts, a **signifier** (the *sound pattern* of a word, either in mental projection - as when we silently recite lines from a poem to ourselves - or in actual, physical realization as part of a speech act) and a **signified** (the concept or *meaning* of the word). This was quite different from previous approaches which focused on the relationship between words on the one hand and things in the world that they designate, on the other.

Saussure's *Course* influenced many linguists between World War I and WWII. In America, for instance, Leonard Bloomfield developed his own version of structural linguistics, as did Louis Hjelmslev in Denmark and Alf Sommerfelt in Norway. In France Antoine Meillet and Émile Benveniste would continue Saussure's program. Most importantly, however, members of the Prague School of linguistics such as Roman Jakobson and Nikolai Trubetzkoy conducted research that would be greatly influential.

The clearest and most important example of Prague School structuralism lies in phonemics. Rather than simply compile a list of which sounds occur in a language, the Prague School sought to examine how they were related. They determined that the inventory of sounds in a language could be analyzed in terms of a series of contrasts. Thus in English the sounds /p/ and /b/ represent distinct phonemes because there are cases (minimal pairs) where the contrast between the two is the only difference between two distinct words (e.g. 'pat' and 'bat'). Analyzing sounds in terms of contrastive features also opens up comparative scope - it makes clear, for instance, that the difficulty Japanese speakers have differentiating /r/ and /l/ in English is because these sounds are not contrastive in Japanese. While this approach is now standard in linguistics, it was revolutionary at the time. Phonology would become the paradigmatic basis for structuralism in a number of different forms.

Structuralism in anthropology and sociology

See the main articles at structural anthropology and structural functionalism

According to structural theory in anthropology and social anthropology, meaning is produced and reproduced within a culture through various practices, phenomena and activities which serve as systems of signification. A structuralist studies activities as diverse as food preparation and serving rituals, religious rites, games, literary and non-literary texts, and other forms of entertainment to discover the deep structures by which meaning is produced and reproduced within a culture. For example, an early and prominent practitioner of structuralism, anthropologist and ethnographer Claude Lévi-Strauss in the 1950s, analyzed cultural phenomena including mythology, kinship (the Alliance theory and the incest taboo), and food preparation (see also structural anthropology). In addition to these studies, he produced more linguistically-focused writings where he applied Saussure's distinction between *langue* and *parole* in his search

for the fundamental mental structures of the human mind, arguing that the structures that form the "deep grammar" of society originate in the mind and operate in us unconsciously. Levi-Strauss was inspired by information theory and mathematics.

Another concept was borrowed from the Prague school of linguistics, where Roman Jakobson and others analysed sounds based on the presence or absence of certain features (such as voiceless vs. voiced). Levi-Strauss included this in his conceptualization of the universal structures of the mind, which he held to operate based on pairs of binary oppositions such as hot-cold, male-female, culture-nature, cooked-raw, or marriageable vs. tabooed women. A third influence came from Marcel Mauss, who had written on gift exchange systems. Based on Mauss, for instance, Lévi-Strauss argued that kinship systems are based on the exchange of women between groups (a position known as 'alliance theory') as opposed to the 'descent' based theory described by Edward Evans-Pritchard and Meyer Fortes.

While replacing Marcel Mauss at his *Ecole Pratique des Hautes Etudes* chair, Lévi-Strauss' writing became widely popular in the 1960s and 1970s and gave rise to the term "structuralism" itself. In Britain authors such as Rodney Needham and Edmund Leach were highly influenced by structuralism. Authors such as Maurice Godelier and Emmanuel Terray combined Marxism with structural anthropology in France. In the United States, authors such as Marshall Sahlins and James Boon built on structuralism to provide their own analysis of human society. Structural anthropology fell out of favour in the early 1980s for a number of reasons. D'Andrade (1995) suggests that structuralism in anthropology was eventually abandoned because it made unverifiable assumptions about the universal structures of the human mind. Authors such as Eric Wolf argued that political economy and colonialism should be more at the forefront of anthropology. More generally, criticisms of structuralism by Pierre Bourdieu led to a concern with how cultural and social structures were changed by human agency and practice, a trend which Sherry Ortner has referred to as 'practice theory'.

Some anthropological theorists, however, while finding considerable fault with Lévi-Strauss's version of structuralism, did not turn away from a fundamental structural basis for human culture. The Biogenetic Structuralism group for instance argued that some kind of structural foundation for culture must exist because all humans inherit the same system of brain structures. They proposed a kind of Neuroanthropology which would lay the foundations for a more complete scientific accout of cultural similarity and variation by requiring an integration of cultural anthropology and neuroscience -- a program also embraced by such theorists as Victor Turner.

Ferdinand de Saussure

Ferdinand de Saussure (pronounced ['f□rdinã də'sosy□]) (November 26, 1857 – February 22, 1913) was a Geneva-born Swiss linguist whose ideas laid the foundation for many of the significant developments in linguistics in the 20th century. He is widely considered the 'father' of 20th-century linguistics.

Born in Geneva in 1857, Saussure showed early signs of considerable talent and intellectual ability. After a year of studying Latin, Greek, Sanskrit, and a variety of courses at the University of Geneva, he commenced graduate work at the University of Leipzig in 1876. Two years later at 21 years Saussure studied for a year at Berlin where he wrote his only full-length work titled *Mémoire sur le système primitif des voyelles dans les langues indo-européenes*. He returned to Leipzig and was awarded his doctorate in 1880. Soon afterwards he relocated to Paris, where he would lecture on ancient and modern languages, and lived for 11 years before returning to Geneva in 1891. Saussure lectured on Sanskrit and Indo-European at the University of Geneva for the remainder of his life. It was not until 1906 that Saussure began teaching the Course of General Linguistics that would consume the greater part of his attention until his death in 1913.

Contributions to linguistics

Course in General Linguistics

Saussure's most influential work, *Course in General Linguistics* (*Cours de linguistique générale*), was published posthumously in 1916 by former students Charles Bally and Albert Sechehaye on the basis of notes taken from Saussure's lectures at the University of Geneva. The *Course* became one of the seminal linguistics works of the 20th century, not primarily for the content (many of the ideas had been anticipated in the works of other 19th century linguists), but rather for the innovative approach that Saussure applied in discussing linguistic phenomena.

Its central notion is that language may be analyzed as a formal system of differential elements, apart from the messy dialectics of realtime production and comprehension. Examples of these elements includes the notion of the linguistic sign, the signifier, the signified, and the referent.

Laryngeal theory

While a student Saussure published an important work in Indo-European philology that proposed the existence of a class of sounds in Proto-Indo-European called laryngeals, outlining what is now known as the laryngeal theory. It has been argued that the problem he encountered, of trying to explain how he was able to make systematic and predictive hypotheses from known linguistic data to unknown linguistic data, stimulated his development of structuralism.

Legacy

The impact of Saussure's ideas on the development of linguistic theory in the former half of the 20th century cannot be overstated. Two currents of thought emerged independently of each other, one in Europe, the other in America. The results of each incorporated the basic notions of Saussurian thought in forming the central tenets of structural linguistics. In Europe, the most important work was being done by the Prague School. Most notably, Nikolay Trubetzkoy and Roman Jakobson headed the efforts of the Prague School in setting the course of phonological theory in the decades following 1940. Jakobson's universalizing structural-functional theory of phonology, based on a markedness hierarchy of distinctive features, was the first successful solution of a plane of linguistic analysis according to the Saussurean hypotheses. Elsewhere, Louis Hjelmslev and the Copenhagen School proposed new interpretations of linguistics from

structuralist theoretical frameworks. In America, Saussure's ideas informed the distributionalism of Leonard Bloomfield and the post-Bloomfieldian Structuralism of those scholars guided by and furthering the practices established in Bloomfield's investigations and analyses of language. In contemporary developments, structuralism has been most explicitly developed by Michael Silverstein, who has combined it with the theories of markedness and distinctive features.

Outside linguistics, the principles and methods employed by structuralism were soon adopted by scholars and literary critics, such as Roland Barthes, Jacques Lacan, and Claude Lévi-Strauss, and implemented in their respective areas of study. However, their expansive interpretations of Saussure's theories, and their application of those theories to non-linguistic fields of study, led to theoretical difficulties and proclamations of the end of structuralism in those disciplines.

Quotes

- *"A sign is the basic unit of language (a given language at a given time). Every language is a complete system of signs. Parole (the speech of an individual) is an external manifestation of language."*
- *"A linguistic system is a series of differences of sound combined with a series of differences of ideas."*

Semiology: Langage, Langue, and Parole

Saussure focuses on what he calls *langage*, that is "a system of signs that express ideas," and suggests that it may be divided into two components: *langue*, referring to the abstract system of language that is interalized by a given speech community, and *parole*, the individual acts of speech and the "putting into practice of language". Saussure argued against the popular organicist view of language as a natural organism, which, without being determinable by the will of man, grows and evolves in accordance with fixed laws. Instead, he defined language as a social product, the social side of speech being beyond the control of the speaker. According to Saussure, language is not a function of the speaker, but is passively assimilated. Speaking, as defined by Saussure, is a premeditated act.

While speech (parole) is heterogeneous, that is to say composed of unrelated or differing parts or elements, language (langue) is homogeneous, composed of the union of meanings and 'sound images' in which both parts are psychological. Therefore, as langue is systematic, it is this that Saussure focuses on since it allows an investigative methodology that is rooted, supposedly, in pure science. Beginning with the Greek word ‘semîon’ meaning 'sign’, Saussure names this science semiology: ‘a science that studies the life of signs within society’.

The Sign

The focus of Saussure’s investigation is the linguistic unit or sign.

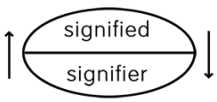


Fig. 1 - The Sign

The sign (*signe*) is described as a "double entity", made up of the signifier, or sound image, (*signifiant*), and the signified, or concept (*signifié*). The sound image is a psychological, **not** a material concept, belonging to the system. Both components of the linguistic sign are inseparable.

The easiest way to appreciate this is to think of them as being like either side of a piece of paper - one side simply cannot exist without the other.

But the relationship between signifier and signified is not quite that simple. Saussure is adamant that language cannot be considered a collection of names for a collection of objects (as where Adam is said to have named the animals). According to Saussure, language is not a nomenclature. Indeed, the basic insight of Saussure's thought is that denotation, the reference to objects in some universe of discourse, is mediated by system-internal relations of difference.

Arbitrariness

The basic principle of the arbitrariness of the sign (*l'arbitraire du signe*) in the extract is: there is no natural reason why a particular sign should be attached to a particular concept.

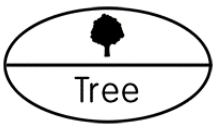


Fig. 2 - Arbitrariness

In Figure 2 above, the signified "tree" is impossible to represent because the signified is entirely conceptual. There is no definitive (ideal, archetypical) "tree". Even the picture of a tree Saussure uses to represent the signified is itself just another signifier. This aside, it is Saussure's argument that it is only the consistency in the system of signs that allows communication of the concept each sign signifies.

The object itself - a real tree, in the real world - is the referent. For Saussure, the arbitrary involves not the link between the sign and its referent but that between the signifier and the signified in the interior of the sign.

In *Jabberwocky*, Lewis Carroll exploits the arbitrary nature of the sign in its use of nonsense words. The poem also demonstrates very clearly the concept of the sign as a two sided psychological entity, since it is impossible to read the nonsense words without assigning a possible meaning to them. We naturally assume that there is a signified to accompany the signifier.

The concepts of signifier and signified could be compared with the *Freudian* concepts of latent and manifest meaning. Freud was also inclined to make the assumption that signifiers and signifieds are inseparably bound. Humans tend to assume that all expressions of language mean something.

In further support of the arbitrary nature of the sign, Saussure goes on to argue that if words stood for pre-existing concepts they would have exact equivalents in meaning from one language to the next and this is not so. Different languages divide up the world differently. To explain this, Saussure uses the word *bœuf* as an example. He cites the fact that while, in English, we have different words for the animal and the meat product: *Ox* and *beef*, in French, *bœuf* is used to refer to both concepts. A perception of difference between the two concepts is absent from the French vocabulary. In Saussure's view, particular words are born out of a particular society’s needs, rather than out of a need to label a pre-existing set of concepts.

But the picture is actually more complicated, through the integral notion of 'relative motivation'. Relative motivation refers to the compositionality of the linguistic system, along the lines of an immediate constituent analysis. This is to say that, at the level of langue, hierarchially nested signifiers have relatively determined signified. An obvious example is in the English number system: That is, though *twenty* and *two* might be arbitrary representations of a numerical concept, *twenty-two*, *twenty-three* etc. are constrained by those more abitrary meanings. The tense of verbs provides another obvious example: The meaning of "kicked" is relatively motivated by the meanings of "kick-" and "-ed". But, most simply, this captures the insight that the value of a syntagm-- a system-level sentence-- is a function of the value of the signs occurring in it. It is for this reason that Leonard Bloomfield called the lexicon the set of fundamental irregularities of the language. (Note how much of the 'meaningfulness' of 'The Jabberwocky' is due to these sorts of compositional relationships!)

A further issue is onomatopoeia. Saussure recognised that his opponents could argue that with onomatopoeia there is a direct link between word and meaning, signifier and signified. However, Saussure argues that, on closer etymological investigation, onomatopoeic words can, in fact, be coincidental, evolving from non-onomatopoeic origins. The example he uses is the French and English onomatopoeic words for a dog's bark, that is *Bow Wow* and *Ouaf Ouaf*.

Finally, Saussure considers interjections and dismisses this obstacle with much the same argument i.e. the sign / signifier link is less natural than it initially appears. He invites readers to note the contrast in pain interjection in French (*aie*) and English (*ouch*).

Difference

Saussure states: "[a sign's] most precise characteristic is to be what the others are not". In other words, signs are defined by what they are not. An example may be found in Blackadder: After burning the only copy of Johnson's Dictionary, Blackadder and Baldrick attempt to rewrite it themselves. Baldrick comes up with: "Dog: Not a cat."

Difference in language is unique; Saussure writes: "In language there are only differences. Even more important: a difference generally implies positive terms between which the difference is set up; but in language there are only differences without positive terms...The idea or phonic substance that a sign contains is of less importance than the other signs that surround it."

But, shortly thereafter, he adds: "But the statement that everything in language is negative is true only if the signified and the signifier are considered separately; when we consider the sign in its totality, we have something that is positive in its own class."

It is frequently argued that Saussure's emphasis on difference is somehow incompatible with communication, the use of language or parole, which is obviously more than a nosedive into an abyss of difference. But Saussure acknowledges the positive value of the sign; in this case, too, a chess metaphor comes up. If, during a game, a piece is lost - for example, the set is short a bishop - any object could replace it (a salt shaker, a thimble, a candy corn), but as long as the substitute is set into the board it functions as a bishop and it is that function that confers value upon it.

The Synchronic and Diachronic Axes

Language that is studied synchronically is "studied as a complete system at a given point in time" (The AB axis). Language studied diachronically is "studied in its historical development" (The CD axis). Saussure argues that we should be concerned with the AB axis (in addition to the CD

axis, which was the focus of attention in Saussure's time), because, he says, language is "a system of pure values which are determined by nothing except the momentary arrangements of its terms".

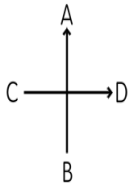


Fig. 4 - The Synchronic and Diachronic Axes

To illustrate this, Saussure uses a chess metaphor. In chess, a person joining a game's audience mid-way through requires no more information than the present layout of pieces on the board. They would not benefit from knowing how the pieces came to be arranged in this way.

American structuralism

Franz Boas

Franz Boas (July 9, 1858 – December 21, 1942[1]) was one of the pioneers of modern anthropology and is often called the "Father of American Anthropology". Born in Minden, Germany, Boas worked for most of his life in North America. Like many such pioneers, he trained in other disciplines; he received his doctorate in physics, and did post-doctoral work in geography.

Edward Sapir

Edward Sapir (pronounced /sə□pi□/), (January 26, 1884 – February 4, 1939) was an American anthropologist-linguist, a leader in American structural linguistics, and one of the creators of what is now called the Sapir-Whorf hypothesis. He is arguably the most influential figure in American linguistics, influencing even Noam Chomsky.

In 1904 he graduated from Columbia with a B.A. in Germanics, but his linguistic interests proved to be much broader. In the next two years he took up studies of the Wishram and Takelma languages in the field. While a graduate student at Columbia he met his mentor, anthropologist Franz Boas, who was probably the person who provided the most initial impetus for Sapir's study of American languages. He arranged Sapir's employment in 1907-08 researching the nearly extinct Yana language of northern California, to which he returned briefly in 1915 to work with Ishi, the monolingual last surviving speaker of Yahi (southern Yana).

In the years 1910-1925 he built and directed the Anthropological Division in the Geological Survey of Canada, in Ottawa. When he was first hired, he and Marius Barbeau were the only two, and the first two, full-time anthropologists in Canada. Among the many accomplishments of this very productive period are a substantial series of publications on Nootka and other languages, and his seminal book *Language* (1921), still important today and eminently readable. As he was leaving for a teaching position at the University of Chicago, one of very few research universities then in the United States, he enabled Leonard Bloomfield to obtain support from Ottawa to do fieldwork on Cree, essential to his project of historical reconstruction in Algonkian. Bloomfield moved to Chicago in 1927 to teach Germanic languages. It appears (Darnell 268-272) that they were congenial but not close. From 1931 to his death Sapir was at Yale University, where he became the head of the Department of Anthropology.

He was one of the first who explored the relations between language studies and anthropology. His students include Fang-kuei Li, Benjamin Whorf, Mary Haas, and Harry Hoijer, but it was one not formally his student who he came to regard as his intellectual heir, a young Semiticist named Zellig Harris (who for a time dated his daughter).

Some suggestions of Sapir about the influence of language on the ways in which people think were adopted and developed by Whorf, initially while he was substitute teaching in the classroom during Sapir's illness. It was felt that stimulating and challenging ideas would attract students to this fledgling field. During the 1940s and later this became known as the Sapir-Whorf Hypothesis. Some support may be found in late work of Harris.

His special focus among American languages was in the Athabaskan languages, a family he was especially fascinated by: "Dene is probably the son-of-a-bitchiest language in America to actually *know*...most fascinating of all languages ever invented" (Krauss 1986:157). Among the languages and cultures studied by Sapir are Wishram Chinook, Navajo, Nootka, Paiute, Takelma, and Yana. Although noted for his work on American linguistics, he was also prolific in linguistics in general, as depicted by his book *Language*, which provides everything from a grammar-typological classification of languages (with examples ranging from Chinese to Nootka) to speculation on the phenomenon on language drift and the arbitrariness of associations between language, race, and culture.

Leonard Bloomfield

Leonard Bloomfield (April 1, 1887 – April 18, 1949) was an American linguist, whose influence dominated the development of structural linguistics in America between the 1930s and the 1950s. He is especially known for his book *Language* (1933), describing the state of the art of linguistics at its time.

Bloomfield was the main founder of the Linguistic Society of America.

Bloomfield's thought was mainly characterized by its behavioristic principles for the study of meaning, its insistence on formal procedures for the analysis of language data, as well as a general concern to provide linguistics with rigorous scientific methodology. Its pre-eminence decreased in the late 1950s and 1960s, after the emergence of Generative Grammar.

Bloomfield also began the genetic examination of the Algonquian language family with his reconstruction of Proto-Algonquian; his seminal paper on the family remains a cornerstone of Algonquian historical linguistics today.

Charles Francis Hockett (January 17, 1916 - November 3, 2000) was an important American linguistic theorist who developed many influential ideas of American structuralism, and a student of Leonard Bloomfield.

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Charles Hockett, Linguist With an Anthropological View, Dies at 84
http://www.nytimes.com/2000/11/13/national/13HOCK.html

November 13, 2000

By MARGALIT FOX

Charles F. Hockett, one of the last great champions of structural
linguistics, an approach to the study of language upstaged by the
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"Chomsky Revolution" of the 1950's, died Nov. 3 at the Cayuga Medical Center in Ithaca, N.Y. He was 84 and lived in Ithaca.

Before his retirement in 1982, Dr. Hockett was the Goldwin Smith Professor of Anthropology and Linguistics at Cornell University. His many books included "A Course in Modern Linguistics" (1955), which remained the standard introductory work for nearly two decades, and the anthropology text "Man's Place in Nature" (1973).

Dr. Hockett, whose goatee and deliberate manner of speaking contributed to his professorial mien, was one of the most prominent linguists of the post-World War II era, recognized for his meticulous analyses of languages from Chinese to Fijian to Potawatomi, a lifework he once described as "anthropology wrapped around linguistics." He was later known for his stinging criticism of Chomskyan linguistics, which he called "a theory spawned by a generation of vipers."

Until the late 1950's, structural linguistics held sway as the field's reigning methodology. Closely allied with behavioral psychology, it viewed language as a social phenomenon and the linguist's task as the compilation of minutely detailed grammatical inventories of individual languages.

But in 1957 the young linguist Noam Chomsky redirected the course of the field from behavior to biology, arguing that human language ability is the product of an innate, universal cognitive faculty. The task of the linguist, then, should be to characterize this inborn faculty by means of abstract, quasi-mathematical rules. Dr. Chomsky's work, originally known as transformational-generative grammar, continues to be the dominant force in linguistics.

Dr. Hockett, however, remained a lifelong adherent of structuralism, lamenting what he viewed as the Chomskyans' ripping of language from its social context. "In the form of an aphorism that paraphrases Stalin and Einstein," he wrote in 1979, "linguistics without anthropology is sterile; anthropology without linguistics is blind."

Charles entered Ohio State in 1932 at the age of 16, receiving his B.A. and M.A. in ancient history jointly in 1936. He received his doctorate in 1939 from Yale, where he was a student of the renowned linguist and anthropologist Edward Sapir.

As a United States Army officer during World War II, Dr. Hockett prepared foreign-language instructional materials for military personnel ("In 1944 I could say `Where is the toilet?' in 28 languages," he recalled), and on returning to civilian life he worked briefly on the American College Dictionary ("Many of the nontechnical definitions in the B's are mine, and I am especially proud of the entry on `bubble' "). He joined the Cornell faculty in 1946.

He was a member of the American Academy of Arts and Sciences and the National Academy of Science, and a past president of the Linguistic Society of America.

In 1968, Dr. Hockett published "The State of the Art," a book-length denunciation of the transformational grammarians. "Their studies are as worthless as horoscopes," he told The New Yorker in 1971. "They have rejected the scientific approach to the

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study of the human mind and human behavior, and retreated into
mysticism."
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Zellig Harris

Zellig Sabbetai Harris (October 23, 1909 - May 22, 1992) was an American linguist, mathematical syntactician, and methodologist of science. Originally a Semiticist, he is best known for his work in structural linguistics and discourse analysis and for the discovery of transformational structure in language, all achieved in the first 10 years of his career and published within the first 25. His contributions in the subsequent 35 years, including sublanguage grammar, operator grammar, and a theory of linguistic information, are perhaps even more remarkable.

It is widely believed that Harris carried Bloomfieldian ideas of linguistic description to their extreme development: the investigation of discovery procedures for phonemes and morphemes, based on the distributional properties of these units.

His *Methods in Structural Linguistics* (1951) is the definitive formulation of descriptive structural work as he had developed it up to about 1946. This book made him famous, but was (and still is) frequently misinterpreted as a synthesis of a "neo-Bloomfieldian school" of structuralism. His so-called discovery procedures are methods for verifying that results, however reached, are validly derived from the data, freeing linguistic analysis from Positivist-inspired restrictions, such as the fear that to be scientific one must progress stepwise from phonetics, to phonemics, to morphology, and so on, without "mixing levels." Beginning with the recognition that speaker judgments of phonemic contrast are the fundamental data of linguistics (not derived from distributional analysis of phonetic notations), his signal contributions in this regard during this period include discontinuous morphemes, componential analysis of morphology and long components in phonology, a substitution-grammar of phrase expansions that is related to immediate-constituent analysis, and above all a detailed specification of validation criteria for linguistic analysis. The criteria lend themselves to differing forms of presentation which have sometimes been taken as competing, but for Harris they are complementary, analogously to intersecting parameters in optimality theory. Consequently, Harris's way of working toward an optimal presentation for this purpose or that was often taken to be "hocus-pocus" with no expectation that there was any truth to the matter. The book includes the first formulation of generative grammar.

Among his most illuminating works in this period are restatements of analyses that bring out the invariant properties of the phenomena. Even in his early publications may be seen his central methodological concern to avoid obscuring the essential characteristics of language under covert presuppositions inherent in conventions of notation or presentation. He later clarified that this is because such notions are dependent upon prior knowledge of and use of language. Natural language, which demonstrably contains its own metalanguage, cannot be based in a metalanguage external to it, and any dependence on *a priori* metalinguistic notions obscures an understanding of the true character of language.

Deriving from this insight, his aim was to constitute linguistics as a product of mathematical analysis of the data of language, an endeavor which he explicitly contrasted with attempts to treat language structure as a projection of language-like systems of mathematics or logic.

As early as 1939 he began teaching his students about linguistic transformations and the regularizing of texts in discourse analysis. This aspect of his extensive work in diverse languages such as Kota, Hidatsa, and Cherokee, and of course Modern Hebrew, as well as English, did not begin to see publication until his "Culture and Style" and "Discourse Analysis" papers in 1952. Then in a series of papers beginning with "Co-occurrence and Transformations in Linguistic Structure" (1957) he put formal syntax on an entirely new, generative basis.

Harris recognized, as Sapir and Bloomfield also had stated, that semantics is included in grammar, not separate from it, form and information being two faces of the same coin. (Any specification of semantics other than that given in language can only be stated in a metalanguage external to language.) But grammar as so far developed could not yet treat of individual word combinations, but only of word classes. A sequence or *n*tuple of word classes (plus invariant morphemes, termed *constants*) specifies a subset of sentences that are formally alike. He investigated mappings from one such subset to another in the set of sentences. In linear algebra, a transformation is a mapping that preserves linear combinations, and that is the term that Harris introduced into linguistics.

Since Harris was Noam Chomsky's teacher, beginning as an undergraduate in 1946, some linguists have questioned whether Chomsky's transformational grammar is as revolutionary as it has been usually considered. The two scholars developed their concepts of transformation on different premisses. Chomsky early adapted Post production systems as a formalism for generating language-like symbol systems, and used this for presentation of immediate-constituent analysis. From this he developed phrase structure grammar and then extended it for presentation of Harris's transformations, restated as operations mapping one phrase-structure tree to another. This led later to his redefinition of transformations as operations mapping an abstract deep structure into a surface structure. Because these operations are specified over abstract preterminal nodes (noun phrase, verb phrase, and so on) they cannot make direct reference to words and morphemes, which appear only at the terminal or leaf nodes of a phrase-structure tree by a process of "lexical insertion". As a consequence, co-occurrence restrictions between words must be managed by a separate semantic component injecting a new vocabulary of semantic features into abstract phrase-structure rules. Also because of this, intuitions of paraphrase remained the only available criterion for Chomsky's transformations.

Harris's linguistic work culminated in the companion books *A Grammar of English on Mathematical Principles* (1982) and *A Theory of Language and Information* (1991). Mathematical information theory concerns only quantity of information; here for the first time is a theory of information content. In the latter work, also, Harris ventured to propose at last what might be the "truth of the matter" in the nature of language, what is required to learn it, its origin, and its possible future development. His discoveries vindicate Sapir's recognition, long disregarded, that language is pre-eminently a social artifact.

Harris's enduring stature derives from the remarkable unity of purpose which characterizes his oeuvre. His rigor and originality, as well as the richness of his scientific culture, allowed him to take linguistics to ever new stages of generality, often ahead of his time. He was always interested in the social usefulness of his work, and applications of it abound, ranging from medical informatics, to translation systems, to speech recognition, to the automatic generation of text from data as heard, for example, on automated weather radio broadcasts. Many workers continue to extend lines of research that he opened.

Other students of Harris, besides Noam Chomsky, include among many, many others, Joseph Applegate, Ernest Bender, William Evan, Lila Gleitman, Michael Gottfried, Maurice Gross, James Higginbotham, Stephen Johnson, Aravind Joshi, Michael Kac, Edward Keenan, Richard Kittredge, Leigh Lisker, Fred Lukoff, Paul Mattick, James

Munz, Bruce Nevin, Jean-Pierre Paillet, John ("Haj") Ross, Naomi Sager, Morris Salkoff, Thomas Ryckman, and William Watt.

Behaviorism

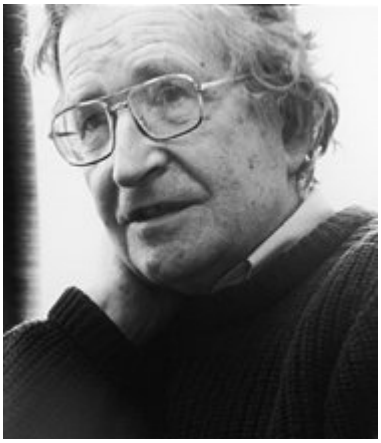
Behaviorism is an approach to psychology based on the proposition that behavior can be studied and explained scientifically without recourse to internal mental states. A similar approach to political science may be found in Behavioralism.

The behaviorist school of thought ran concurrent with the psychoanalysis movement in psychology in the 20th century. Its main influences were Ivan Pavlov, who investigated classical conditioning, John B. Watson who rejected introspective methods and sought to restrict psychology to experimental methods, and B.F. Skinner who conducted research on operant conditioning.

Contemporaries

Generative Grammar

Noam Chomsky



Noam Chomsky

Avram Noam Chomsky, Ph.D (born December 7, 1928) is the Institute Professor Emeritus of linguistics at the Massachusetts Institute of Technology. Chomsky is credited with the creation of the theory of generative grammar, considered to be one of the most significant contributions to the field of theoretical linguistics made in the 20th century. He also helped spark the cognitive revolution in psychology through his review of B.F. Skinner's *Verbal Behavior*, in which he challenged the behaviorist approach to the study of mind and language dominant in the 1950s. His naturalistic approach to the study of language has also affected the philosophy of language and mind (see Harman, Fodor). He is also credited with the establishment of the Chomsky–Schützenberger hierarchy, a classification of formal languages in terms of their generative power.

Chomsky received his Ph.D. in linguistics from the University of Pennsylvania in 1955. He conducted much of his doctoral research during four years at Harvard University as a Harvard Junior Fellow. In his doctoral thesis, he began to develop some of his linguistic ideas, elaborating on them in his 1957 book *Syntactic Structures*, perhaps his best-known work in linguistics.

Chomsky joined the staff of the Massachusetts Institute of Technology in 1955 and in 1961 was appointed full professor in the Department of Modern Languages and Linguistics (now the Department of Linguistics and Philosophy). From 1966 to 1976 he held the Ferrari P. Ward

Professorship of Modern Languages and Linguistics. In 1976 he was appointed Institute Professor. Chomsky has been teaching at MIT continuously for the last 50 years.

Contributions to linguistics

Syntactic Structures was a distillation of his book *Logical Structure of Linguistic Theory* (1955, 75) in which he introduces transformational grammars. The theory takes utterances (sequences of words) to have a syntax which can be (largely) characterized by a formal grammar; in particular, a Context-free grammar extended with transformational rules. Children are hypothesized to have an innate knowledge of the basic grammatical structure common to all human languages (i.e. they assume that any language which they encounter is of a certain restricted kind). This innate knowledge is often referred to as universal grammar. It is argued that modeling knowledge of language using a formal grammar accounts for the "productivity" of language: with a limited set of grammar rules and a finite set of terms, humans are able to produce an infinite number of sentences, including sentences no one has previously said.

The Principles and Parameters approach (P&P) — developed in his Pisa 1979 Lectures, later published as *Lectures on Government and Binding* (LGB) — make strong claims regarding universal grammar: that the grammatical principles underlying languages are innate and fixed, and the differences among the world's languages can be characterized in terms of parameter settings in the brain (such as the pro-drop parameter, which indicates whether an explicit subject is always required, as in English, or can be optionally dropped, as in Spanish), which are often likened to switches. (Hence the term principles and parameters, often given to this approach.) In this view, a child learning a language need only acquire the necessary lexical items (words, grammatical morphemes, and idioms), and determine the appropriate parameter settings, which can be done based on a few key examples.

Proponents of this view argue that the pace at which children learn languages is inexplicably rapid, unless children have an innate ability to learn languages. The similar steps followed by children all across the world when learning languages, and the fact that children make certain characteristic errors as they learn their first language, whereas other seemingly logical kinds of errors never occur (and, according to Chomsky, should be attested if a purely general, rather than language-specific, learning mechanism were being employed), are also pointed to as motivation for innateness.

More recently, in his Minimalist Program (1995), while retaining the core concept of "principles and parameters", Chomsky attempts a major overhaul of the linguistic machinery involved in the LGB model, stripping from it all but the barest necessary elements, while advocating a general approach to the architecture of the human language faculty that emphasizes principles of economy and optimal design, reverting to a derivational approach to generation, in contrast with the largely representational approach of classic P&P.

Chomsky's ideas have had a strong influence on researchers investigating the acquisition of language in children, though some researchers who work in this area today do not support Chomsky's theories, often advocating emergentist or connectionist theories reducing language to an instance of general processing mechanisms in the brain.

Generative grammar

The Chomskyan approach towards syntax, often termed generative grammar, though quite popular, has been challenged by many, especially those working outside the United States of

America. Chomskyan syntactic analyses are often highly abstract, and are based heavily on careful investigation of the border between grammatical and ungrammatical constructs in a language. (Compare this to the so-called pathological cases that play a similarly important role in mathematics.) Such grammatical judgments can only be made accurately by a native speaker, however, and thus for pragmatic reasons such linguists often focus on their own native languages or languages in which they are fluent, usually Spanish, English, French, German, Dutch, Italian, Japanese or one of the Chinese languages. However, as Chomsky has said:

> The first application of the approach was to Modern Hebrew, a fairly detailed effort in 1949–50. The second was to the native American language Hidatsa (the first full-scale generative grammar), mid-50s. The third was to Turkish, our first Ph.D. dissertation, early 60s. After that research on a wide variety of languages took off. MIT in fact became the international center of work on Australian Aboriginal languages within a generative framework [...] thanks to the work of Ken Hale, who also initiated some of the most far-reaching work on Native American languages, also within our program; in fact the first program that brought native speakers to the university to become trained professional linguists, so that they could do work on their own languages, in far greater depth than had ever been done before. That has continued. Since that time, particularly since the 1980s, it constitutes the vast bulk of work on the widest typological variety of languages.

Sometimes generative grammar analyses break down when applied to languages which have not previously been studied, and many changes in generative grammar have occurred due to an increase in the number of languages analyzed. It is claimed that linguistic universals in semantics have become stronger rather than weaker over time. The existence of linguistic universals in syntax, which is the core of Chomsky's claim, is still highly disputed. Still, Richard Kayne suggested in the 1990s that all languages have an underlying Subject-Verb-Object word order.[12] One of the prime motivations behind an alternative approach, the functional-typological approach or linguistic typology (often associated with Joseph Greenberg), is to base hypotheses of linguistic universals on the study of as wide a variety of the world's languages as possible, to classify the variation seen, and to form theories based on the results of this classification. The Chomskyan approach is too in-depth and reliant on native speaker knowledge to follow this method, though it has over time been applied to a broad range of languages.

Contributions to psychology

Chomsky's work in linguistics has had major implications for modern psychology. For Chomsky linguistics is a branch of cognitive psychology; genuine insights in linguistics imply concomitant understandings of aspects of mental processing and human nature. His theory of a universal grammar was seen by many as a direct challenge to the established behaviorist theories of the time and had major consequences for understanding how language is learned by children and what, exactly, the ability to use language is. Many of the more basic principles of this theory (though not necessarily the stronger claims made by the principles and parameters approach described above) are now generally accepted in some circles.

In 1959, Chomsky published an influential critique of B.F. Skinner's *Verbal Behavior*, a book in which Skinner offered a speculative explanation of language in behavioral terms. "Verbal behavior" he defined as learned behavior which has its characteristic consequences being delivered through the learned behavior of others; this makes for a view of communicative behaviors much larger than that usually addressed by linguists. Skinner's approach focused on the

circumstances in which language was used; for example, asking for water was functionally a different response than labeling something as water, responding to someone asking for water, etc. These functionally different kinds of responses, which required in turn separate explanations, sharply contrasted both with traditional notions of language and Chomsky's psycholinguistic approach. Chomsky thought that a functionalist explanation restricting itself to questions of communicative performance ignored important questions. (Chomsky-Language and Mind, 1968). He focused on questions concerning the operation and development of innate structures for syntax capable of creatively organizing, cohering, adapting and combining words and phrases into intelligible utterances.

In the review Chomsky emphasized that the scientific application of behavioral principles from animal research is severely lacking in explanatory adequacy and is furthermore particularly superficial as an account of human verbal behavior because a theory restricting itself to external conditions, to "what is learned", cannot adequately account for generative grammar. Chomsky raised the examples of rapid language acquisition of children, including their quickly developing ability to form grammatical sentences, and the universally creative language use of competent native speakers to highlight the ways in which Skinner's view exemplified under-determination of theory by evidence. He argued that to understand human verbal behavior such as the creative aspects of language use and language development, one must first postulate a genetic linguistic endowment. The assumption that important aspects of language are the product of universal innate ability runs counter to Skinner's radical behaviorism.

Chomsky's 1959 review has drawn fire from a number of critics, the most famous criticism being that of Kenneth MacCorquodale's 1970 paper *On Chomsky's Review of Skinner's Verbal Behavior* (*Journal of the Experimental Analysis of Behavior*, volume 13, pages 83-99). This and similar critiques have raised certain points not generally acknowledged outside of behavioral psychology, such as the claim that Chomsky did not possess an adequate understanding of either behavioral psychology in general, or the differences between Skinner's behaviorism and other varieties; consequently, it is argued that he made several serious errors. On account of these perceived problems, the critics maintain that the review failed to demonstrate what it has often been cited as doing. As such, it is averred that those most influenced by Chomsky's paper probably either already substantially agreed with Chomsky or never actually read it. Chomsky has maintained that the review was directed at the way Skinner's variant of behavioral psychology "was being used in Quinean empiricism and`naturalization of philosophy" (quoted in Barsky- Noam Chomsky: A Life of Dissent[3].

It has been claimed that Chomsky's critique of Skinner's methodology and basic assumptions paved the way for the "cognitive revolution", the shift in American psychology between the 1950s through the 1970s from being primarily behavioral to being primarily cognitive. In his 1966 *Cartesian Linguistics* and subsequent works, Chomsky laid out an explanation of human language faculties that has become the model for investigation in some areas of psychology. Much of the present conception of how the mind works draws directly from ideas that found their first persuasive author of modern times in Chomsky.

There are three key ideas. First is that the mind is "cognitive", or that the mind actually contains mental states, beliefs, doubts, and so on. Second, he argued that most of the important properties of language and mind are innate. The acquisition and development of a language is a result of the unfolding of innate propensities triggered by the experiential input of the external environment. Subsequent psychologists have extended this general "nativist" thesis beyond language. Lastly, Chomsky made the concept of "modularity" a critical feature of the mind's cognitive architecture. The mind is composed of an array of interacting, specialized subsystems with limited flows of

inter-communication. This model contrasts sharply with the old idea that any piece of information in the mind could be accessed by any other cognitive process (optical illusions, for example, cannot be "turned off" even when they are known to be illusions).

Sociolinguistics

William Labov

William Labov (born December 4, 1927) is a professor in the linguistics department of the University of Pennsylvania. He is widely regarded as the founder of the discipline of variationist sociolinguistics and pursues research in sociolinguistics and dialectology.

Born in Rutherford, New Jersey, he studied at Harvard (1948) and worked as an industrial chemist (1949-61) before turning to linguistics. For his MA thesis (1963) he completed a study of change in the dialect of Martha's Vineyard, which was presented before the Linguistic Society of America to great acclaim. Labov took his PhD (1964) at Columbia University studying under Uriel Weinreich. He taught at Columbia (1964-70) before becoming a professor of linguistics at the University of Pennsylvania (1971), and then became director of the university's Linguistics Laboratory (1977). The methods he used to collect data for his study of the varieties of English spoken in New York City, published as *The Social Stratification of English in New York City* (1966), have been influential in social dialectology. In the late 1960s and early 1970s, his studies of the linguistic features of African American Vernacular English (AAVE) were also influential: he argued that AAVE should not be stigmatized as substandard but respected as a variety of English with its own grammatical rules, although speakers of AAVE may often want to learn standard American English for interactions in society at large. He is also noted for his seminal studies of the way ordinary people structure narrative stories of their own lives.

More recently he has studied changes in the phonology of English as spoken in the United States today. Labov has described chain shifts of vowels (one sound replacing a second, replacing a third, in a complete chain). He finds two such divergent shifts taking place today: a Southern Shift (in Appalachia and southern coastal regions) and a Northern Cities Shift affecting a region from Madison, Wisconsin east to Syracuse, New York.

Labov's works include *Language in the Inner City: Studies in Black English Vernacular* (1972), *Sociolinguistic Patterns* (1972), *Principles of Linguistic Change* (vol.I Internal Factors, 1994; vol.II Social Factors, 2001), and, together with Sharon Ash and Charles Boberg, *The Atlas of North American English* (2006).

… and there are those who were born after 1930…