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The transformations of linguistic science (1957)

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Abstract

As it developed, linguistics clarified its object of research; its perspective came to be modified as it extended its scope to all of the world's languages. Linguistics moved from a naturalistic to a historical perspective, then to a sociological perspective. An earlier conception of language as organism shifted to a conception of language as structure.

[1. Historical linguistics and the Neogrammarians]

Among the human sciences, linguistics is one of the earliest fields of study: it has been developing for almost 150 years. Moreover, it is a discipline whose modern orientations are of general epistemological interest.

Like any science, it has progressed by applying its methods to an ever broadening domain of observable facts; by developing its conceptual foundation; by demanding greater rigour; and by constantly re-examining the validity of its postulates. It has also built on progress that was being made in neighbouring fields. During the first years of the 19th century, the study of European languages did not yield a satisfactory account of the origin of vocabulary and grammatical forms. The discovery of Sanskrit, and the comparison of Sanskrit with classical languages, gave a decisive impetus to the development of a type of explanation that would dominate throughout the 19th century: historical explanation. According to F. Bopp's (1833) program for the missions of linguistics, linguistics aims "to provide a description of the organism of the languages listed in the book's title; to

compare facts of the same nature, to study the physical and mechanical laws that govern these languages, and to look for the origin of the forms that express grammatical relationships" [cited from Bréal 1867]. This program would still be considered valid by modern linguists, except that Bopp based his ideas on a set of postulates [some of which would not be accepted in the current state of the discipline]. Bopp postulated that comparison concerned comparable elements in different languages, and that an explanation for grammatical forms in daughter languages was to be found in the mother language [proto-language]. In Bopp's days, there was an implicit assumption that the mother language must be simple and regular. This led Bopp to believe that there were only three original vowels (proto-vowels), *i, *u, and *a [in proto-Indo-European], and that the short vowels ĕ and ŏ in Greek must be derived from a short ă in Sanskrit:

> "Among simple vowels, the Ancient Indian alphabet lacks vowels corresponding to Greek *ε* and *o*. In case these sounds developed at a stage when Sanskrit was still a living language, they must have developed from the short *a* after the time when the alphabet was fixed, because this alphabet represents the finest differences in sound, and would certainly have reflected the difference between *ă*, *ĕ* and *ŏ* if it had existed." [Bopp 1833:3, cited from Bréal 1867:31]

At the time, it was not conceivable that *ĕ and *ŏ could have existed and later merged into *a before Sanskrit writing became fixed. Work from this period aimed to explain the origin of the rich morphology of Indo-European languages; it was implicitly assumed that a language with invariable elements is more basic than a language with inflectional morphology (whose root vowels vary according to declension and conjugation). It was believed that the natural development of languages consisted of evolution from a stage in which all elements are clearly distinct from one another, to a stage in which they merge into a single word.

Between 1871 and 1880, a whole series of discoveries called the earlier postulates into question. One such example was the fact that short *ĕ and *ŏ had left traces in Sanskrit: in this language, earlier *kĕ and *kŏ yielded *ca* and *ka*, respectively. These findings led to the development of a school of linguistics known as the Neogrammarian school (Junggrammatik), which questioned any sort of explanatory and evolutionary postulates, and only recognized *facts* and *laws*, in a perspective that may be called

positivist. What the Neogrammarians referred to as "laws" were essentially phonetic laws, which Brugmann characterized as follows:

> Every sound change, inasmuch as it occurs mechanically, takes place according to laws that admit no exception. (...) all words in which the sound subjected to the change appears in the same relationship are affected by the change, without exception. [Osthoff & Brugmann 1878:13]

For example, any Latin *c* [k] followed by an *a* yields *ch* [ʃ] in French. Any exception to this rule is to be explained as resulting from analogy or borrowing. For instance, Latin *vincam* [subjunctive, 'that I conquer'] yields French *que je vainque* [vɛ̃k] and not *vainche* [vɛ̃ʃ], by analogy with the indicative [cf. the infinitive *vaincre* [vɛ̃kʁ] 'to conquer'], which has a velar stop: [k]. Processes of borrowing can be illustrated by the example of French *canine* 'canine' and *cavalier* 'horseman', which are learned words introduced by scholars who deliberately devised these words on the basis of Latin roots.

Instead of searching for a rational origin for grammatical forms, the Neogrammarians are content to explain through which phonetic laws or analogical processes these forms may be derived from earlier forms. The principle of consistency of phonetic laws led to increased methodological rigour, leading researchers to clarify which cases constitute exceptions to phonetic laws and require an explanation in terms of analogy.

[2. Saussure and the development of general linguistics]

The Neogrammarians' method had a major shortcoming, however: it projected automatically into the past any anomaly that was found in the data. Ferdinand de Saussure was the only linguist at the time who reintroduced the notion of language as an organism. In his celebrated *Memoir on the Primitive System of Vowels in Indo-European Languages* (1879), he attempted to treat the reconstructed Indo-European language, not as a repository for aberrant forms, but as a full-fledged language possessing a structure of its own. This led him to reconstruct consonants for which no attestation was known at the time, and whose existence was proved forty years later when Hittite was deciphered.

Only in the 20th century, particularly after the posthumous publication of Saussure's *Course in General Linguistics* (1916), did linguistics, which until then had been practically synonymous with comparative grammar,

become a much broader field, General Linguistics. Saussure showed that linguistics should first and foremost adopt a synchronic point of view: studying language in use, as a system of signs used by a given human group. Diachronic or historical studies only come next, and are subordinate to synchronic studies. Since Saussure, a significant step forward has consisted of studying the history of languages in terms of the evolution of their structure: taking into account the overall state of the language's structure when studying individual sound changes (Martinet 1955). But to take stock of the progress realized in linguistics during this period, we need to consider the relationship of linguistics with related sciences: phonetics and ethnology, which played the role of auxiliaries[1] in the development of linguistics.

[3. The role of phonetics/phonology]

In the initial phase of comparative work on classical languages, the material under study consisted of letters; the first chapters of Bopp's book on Indo-European linguistics are accordingly entitled "Sanskrit alphabet", "Slavic alphabet", and so on. It was only in the second half of the 19th century that an increasing familiarity with foreign languages in their spoken form, along with the need to transcribe languages that did not have a writing system, led linguists to distinguish clearly between sounds and letters. This distinction led to the creation of phonetic alphabets, providing a direct representation of sounds, independent from spelling habits associated with a specific language. With this system, a single, unchanging letter is consistently used to represent a single sound, for instance using [ʃ] for a sound which is variously written as *ch* in French, *sh* in English, *sch* in German, *ski* in Swedish, *sci* in Italian, *sz* in Polish, and so on. From that point on, there was far clearer awareness than before of the physical, material aspect of languages. Physicists set out to study the nature of these sounds. The sounds of language, considered in themselves and defined by their physical and physiological properties, seemed to offer a field of study akin to that of

1. [The term 'auxiliary', *auxiliaire*, is by no means derogatory: it is applied to disciplines that are distinct from linguistics proper, but which make a contribution to its development. In Haudricourt's view, this includes experimental phonetics, which is concerned with acoustics and physiology, and thus belongs to the natural sciences.]

the Natural Sciences. The rigour of the phonetic laws discovered by the Neogrammarians seemed to confirm the biological nature of human language. One of the best-known phoneticians of the end of the 19th century, Pierre-Jean Rousselot ["l'abbé Rousselot"], believed that changes in pronunciation were caused by a disease in the nerve endings of muscles in the tongue and the phonatory apparatus. Rev. Van Ginneken tried to demonstrate that "brachycephalic races" [human groups supposedly characterized by shorter skulls] mostly used sounds articulated at the back of the mouth.

As against these extreme proponents of a biological view of language, the majority of linguists recognized the fundamentally social nature of language. Among phoneticians too, some authors (such as Henry Sweet, Paul Passy, and Daniel Jones) recognized that the existence of a certain set of sounds in a language was a social phenomenon. The term 'phoneme' was borrowed from the Slavicist Baudoin de Courtenay by the Russian phonetician Ščerba, to refer to a sound in a language that has a social and differentiating value, that is, a sound which distinguishes different words within a given social group. Thus, in French as spoken in Marseilles, [e] and [ɛ] constitute one single phoneme, since [e] only appears in open syllables, and [ɛ] in closed syllables. On the other hand, in French as spoken in Paris, [e] and [ɛ] constitute distinct phonemes: Parisians distinguish [ʁe] *ré* (the musical note D) and [ʁɛ] *raie* ('ray, skate': a species of fish).

From the point of view of the Natural Sciences, there is an infinite range of sounds that humans are capable of producing. From the point of view of linguistics, on the other hand, there is only a limited and fixed number of sounds that are used to differentiate words in a given language: these are the language's phonemes. When early linguists spoke about "letters", they actually meant *phonemes*; it is the existence of a limited number of phonemes in each language that makes it possible to write it down with an alphabet that contains a fixed number of letters.

The discontinuous nature of oppositions between phonemes explains the regularity of phonetic laws. Phonemes have a differentiating [i.e. contrastive] function, which forces them to set themselves up in opposition to one another. This leads the linguist to pay attention to the entire set that they constitute: the language's phoneme system. The major contribution of phonology to modern linguistics consisted of bringing out the importance of the notion of system, or rather, in making the notion of system fully explicit.

[4. The role of ethnology and sociology]

From the very beginnings of linguistics, W. von Humboldt suggested that there exists a tight relationship between language, mentality and psychology. Since then, a number of scholars have been tempted to adduce linguistic data to conduct studies in comparative psychology. While phonetic changes were attributed to biology, analogical changes were attributed to psychology. At the end of the 19th century, the clear distinction that was being established between psychology and sociology freed linguistics from Wundt's overly ambitious explanations, which rested on general proposals about the "psychology of peoples". Psychology can nonetheless provide some assistance to linguistics in its broadest definition: as a science of language.

Explanations based on analogy can be made more precise by using mathematics, with calculations of frequency of use. This strand of research, which was initiated by Zipf, is now being pursued in modern cybernetics and information theory. This type of explanation shows, for example, that irregular verbs are immune to the power of analogy due to their frequency of use, and that frequent use tends to lead to a decrease in a word's length. This field is evolving rapidly.

In the second half of the 19th century, the study of social phenomena from the perspectives of sociology and ethnology began in earnest. The social nature of languages is strongly asserted by Saussure and Meillet, who build on Durkheim's approach to sociology.

A widely different approach was applied by Rev. Wilhelm Schmidt: he attempted to pair grammatical elements and clusters of ethnographic facts. Schmidt was thus following the formalist methods of German ethnography, which focused on the examination of clusters of cultural facts found within the same geographical area (the "Kulturkreis" approach). Another attempt consisted in applying Morgan and Engels's evolutionary ethnography to language: Nikolai Marr, a Caucasologist, classified grammatical types along different stages in social evolution. Looking back on these various attempts, they all appear to be completely arbitrary: there does not seem to exist a causal link between social structure and grammatical structure.

On the other hand, a fruitful collaboration has developed between linguistics and ethnology in the course of dialectal-lexical surveys. The elaboration of linguistic atlases – by Gilliéron in France, then by Swiss scholars in Italy – provided an impetus for this collaboration. In this type of work, linguistics was always a step ahead of ethnography, because

comparative technology – the study of objects and tools – had only attracted very little attention until then. For linguistics, an important outcome of dialectal-lexical surveys was that the notion of structure came to be applied to the study of the lexicon, as the role played by homonymy became clear: the existence of a pressure to resist sound changes that threaten lexical distinctions. There would be no point in studying the history and the geographic distribution of a word without considering the other words in the language that are similar to it in either sound or meaning. The study of lexical systems was carried out by W. van Wartburg and his students as they put together historical and etymological dictionaries.

Collaboration between linguistics and ethnography can arguably be credited with fostering the development of studies of indigenous languages in North America, which in turn played a decisive role in shaping the general orientation of linguistics in America, ushering in structural theories in general linguistics. The study of American languages was undertaken by American scholars (many of whom were born in Europe) among whom the most famous are Boas, Sapir and Bloomfield. The positivist method of collecting supposedly objective raw data was contradicted by contact with these languages. It became fully clear that objectivity of the observer was an illusion. The phonetic alphabets devised in Europe, which were meant to represent physical sounds, only represented the phonemes of European languages. The most amusing case of creativity in devising new tools to approach indigenous languages of the Americas is that of the phonetic alphabet devised for the Southern Fuegians by Rev. Bridges.[2] Bridges's alphabet not only offered means to represent the sounds of the Indian language: it could also transcribe the sounds found in the author's dialect of English, including unitary symbols for the diphthongs in 'house', 'mice', and 'boy'.

The description of Indian languages of North America showed how different the grammatical categories and lexical concepts in these languages were from those of European languages. It revealed the extent to which the influence of models developed for European languages could introduce errors into the description and interpretation of the linguistic facts. This is why Bloomfield, who was the group's main theoretician, was led to define a "non-mentalist" attitude in linguistics, namely to base description on

2. [Rev. Thomas Bridges (1842-1898) in fact used the English phonotypic alphabet devised by Alexander John Ellis (1814-1890) and Isaac Pitman (1813-1897) in his grammar and dictionary of Yámana (Yaghan).]

form, without concerning oneself with meaning, as our understanding of meaning is inevitably influenced by our linguistic categories. Indeed, a grammatical category in a European language is often defined by its meaning. For instance, in German, 'verb' is referred to as *Zeitwort*, literally 'time-word'; the verb is thus seen as a word which has tense (<Fr. *temps* 'time'). In French verbal morphology, 'indicative mode' *(indicatif)* is the one which 'indicates'. Other labels for grammatical categories refer to properties of form, such as *adverb*, referring to a word occurring 'next to the verb' (from Latin *ad-verbum*), and *subjunctive*, referring to a mode only used in subordinate clauses. There exists a tight, reciprocal relationship between form and meaning, so that it is understandable that they should sometimes become blended in linguistic terminology; but one must bear in mind that the reason why we make a strong difference between nouns and verbs as word classes is because verbs and nouns are very different in form in the languages with which we are most familiar: the languages of Europe. In many exotic languages, this difference is much weaker, so much so that the word 'father', referring to a notion which to us appears squarely nominal, can carry inflection for tense, *e.g.* to refer to 'my *late* father'; for person, to refer to 'my father, your father'; and for voice, to convey 'I am a father' vs. 'This is my father'.

[5. Bloomfield, Harris, and Pike]

In his first book,[3] Bloomfield based his work on Wundt's psychological linguistics. He then turned to the behaviourist concepts that held sway in the American scholarship of the time.[4] Behaviourism was precisely a psychology of behaviour, studying behaviour in response to an environment, without concern for its significance for the subject. This point of view was taken to excess in the Chicago school of linguistics, currently headed by Zellig Harris. In contrast, Kenneth Pike and his disciples – most of whom are Protestant missionaries – developed and taught a good descriptive method; they are working the world over to describe the last exotic languages that have so far remained undocumented.

3. [Bloomfield, Leonard. 1914. *Introduction to the Study of Language*. New York: Holt.]
4. [Bloomfield's second, behaviourist book was published in 1933: *Language*. New York: Holt.]

[6. Hjelmslev and the Copenhagen school]

Among modern currents in linguistics, Hjelmslev and the Copenhagen school also need to be mentioned. Hjelmslev's attempt continues a strand of thought that can be traced back to Saussure: that language must be studied for itself and in itself, without reference to anything external to it. In order to achieve this, Hjelmslev came up with a set of new disciplines which are exclusively concerned with combinatorial possibilities for phonemes (cenematics) and morphemes (plerematics).

[7. Concluding remarks: central and non-central issues in the scientific study of language]

A lingering problem is that of language classification, and the relationship between language genealogy (i.e., natural classification) and typology (artificial classification). We believe that a classification based on genealogy cannot encompass all of the world's languages, despite attempts by a few overenthusiastic researchers. [5] Calculations of statistical probability will be necessary to delineate the limits within which genealogical classification is possible: to determine the respective probability of chance and inheritance when similarities are found between languages. In order to perform calculations, one would need to be able to quantify the degree of interdependency of elements in a language's structure. Swadesh attempted to translate genealogical relationships into absolute chronology, using lexical similarities across languages. But this method, called glottochronology, is based on the controversial assumption that the rate of renewal of basic vocabulary is constant in time. Furthermore, the application of glottochronological tools is often extended to cases where family relationships are not established.

All linguists now acknowledge the social nature of language and accept that its essential functions are communication and expression. The possibility of studying language in a truly scientific way is more and more

5. [In a header added to the reprint of this article in *Problèmes de phonologie diachronique,* Haudricourt indicates that the name of the linguist Trombetti was cited in brackets (after the word 'enthusiasts') in the original manuscript; it was removed by the editorial board of the journal *Scientia*. See the Introduction to the article.]

widely recognized. Linguistics can uncover laws: language-specific laws – "phonetic laws" in the classical sense: regular sound changes that have taken place at one point in history – and also general laws, referring to language structures independent of time and place.[6] Attempts at explaining the evolution of languages, and the diversity of attested languages, are becoming more and more precise; they make reference either to external phenomena (such as bilingualism, and the action of social groups on one another) or to internal phenomena. The latter result from changes in the nature of communications between individuals within society; they consist of changes in the frequency of use of given elements and of the various combinations in which these elements appear. Auxiliary sciences[7] to linguistics have multiplied: in addition to acoustics, and to the physiological study of the organs of the speaker and listener, new fields are developing, such as cybernetics and machine translation.

The program from the Oslo linguistics conference of August 1957 is a good indication of the current topics of interest in modern linguistics: of the fifteen conference topics, only one concerns genealogical relationships between languages.

Comment

Haudricourt provides the following foreword to this article in the French edition of his collected papers on historical phonology:

> This article was written under the spur of indignation, after reading in *Scientia* a paper by Oddone Assirelli (1956). The author heaps praise on the most debatable linguists: W. Schmidt, Van Ginneken, and most of all his former teacher, Trombetti. The editorial board of *Scientia* deleted the name of Trombetti, which was cited in brackets at the end of the sentence, 'We believe that a classification based on genealogy cannot encompass all of the world's languages, despite attempts by a few overenthusiastic researchers.' (Haudricourt 1972:21)

6. [Haudricourt is alluding here to the panchronic programme in linguistics, which aims to formulate generalizations about language change that are independent of any particular language or language group. See Haudricourt 1940 "Towards empirical laws in general linguistics" (this volume).]
7. [As noted above, the term 'auxiliary', *auxiliaire*, is by no means derogatory: it is applied to disciplines that Haudricourt considers distinct from linguistics proper, but which make a contribution to its development.]

Condominas (1997:13) reports that Haudricourt liked to cite colonel Henri Frey's *Annamese as the mother of languages: on the common origin of the Celtic, Semitic, Sudanese and Indochinese races* (1892) as a typical example of wild speculations about the origin of languages and ethnic groups. The propensity to reveries of this type endures to this day: cherry-picking similarities between languages (or cultures) and proposing a common ancestry on the basis of what is in fact no more than chance resemblances. From time to time, a historical linguist stands up to warn against the errors of the authors who press all of the world's languages into a single family tree on the basis of "Pre-Copernican" methods (Salmons 1996).

But Haudricourt's article is not restricted to this issue, which only constitutes a very minor part of the discussion. In keeping with the stated orientation of *Scientia*, a non-technical, multilingual, multidisciplinary journal emphasizing links between the sciences, Haudricourt insists on the relation of linguistics to other disciplines and currents of thought.

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