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Glottochronology and Its Appraisal

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Summary: Glottochronology, a linguistic method, is used to determine the date of the separation of genetically related languages. Initially it was used in archeology and then applied to linguistics. This paper gives a general outline of the method and shows how it works. The opponents and proponents of the method and its shortcomings are also dealt with.

Key words: C 14, glottochronology, word lists, genetic relationship, retention rate.

Глоттокронология жана аны баалоо

Мазмуну: Тил илиминдеги глоттокронологиялык методу тектеш (жакын тууган) тилдердин бири-биринен бөлүнүп чыгуу тарыхында хронологиялык таблицада колдонулат. Бул метод башында археологияда колдонулган, андан кийин тил илимине да өткөн. Бул макалада жогорудагы методун (ыкманын) колдонулушу, канчалык денгээлде өсүп өнүгүшү тууралуу сөз болот. Бул метотдун колдонулушуна каршы чыккандар жана аны колдогондордун пикирлерин угуу аркылуу бул методдун жетишпеген жактарын карадык.

Негизги сөздөр: С 14, глоттокронология, сөз тизмеги, тектеш тилдер, өзгөрүү пайызы.

Glottokronoloji ve Değerlendirilmesi

Özet: Bir dilbilim metodu olan glottokronoloji, akraba olan dillerin birbirlerinden ayrılış tarihlerini hesaplamada kullanılır. Bu metot başlangıçta arkeolojide kullanılan bir metottu, daha sonra dilbilimine uyarlanmıştır. Bu yazıda metodun genel bir değerlendirmesi, nasıl uygulandığı ele alınmıştır. Metodun uygulanmasına karşı çıkanlar ve metodun uygulanabileceğini söyleyenler ile metodun eksik yönleri ele alınmıştır.

Anahtar Kelimeler: C 14, glottokronoloji, kelime listeleri, genetik akrabalık, değişme oranı.

1. What is Glottochronology?

Glottochronology is a method used to deduce the family relationship of languages and the date of separation of branches of a given language family on the basis of comparative statistical studies of vocabularies of languages in question.

The history of glottochronology as a method to be used in linguistics goes back to the discovery of radiocarbon dating in archaelogy. It was discovered that radioactive isotope of carbon C 14, which exists in certain kinds of organic matter, wood, bone and the like, disappears in a steady rate by preserving %81 in a millenium. It was Morris Swadesh who suggested that this steady disappearing rate of carbon can be applied to linguistic analysis in about 1950.

This method is based on the assumption that the basic or common words of a language are maintained at a definite rate, Swadesh calls these words as the basic core vocabulary. The fact that languages change over the time, and replace new words for the abondoned ones has long

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been known. Also the idea that the greater the degree of linguistic differentiation the greater the period of time for differantiation must be assumed is not new.

2. How it works

Applying this method begins with the compilation of basic vocabularies of the studied languages. At hand there are three different word lists containing 215, 200 and 100 items. These items or concepts have been thought as the everyday vocabulary of every language. Concepts are first expressed in English and it is expected that the language(s) to be studied have them in their vocabulary. Three lists are different marginally from one another and the total number of words goes up to 230 and 240.

After compilation of word list the next step to go through is the control cases in which comparisons are made at different dates of individual languages of which written texts covering enough a long period are available. After studying control cases Swadesh discovered that basic vocabulary changes at a constant rate which is 81%. In his paper Robert B. Lees gives the following constant rates for different languages; English .766, Spanish .7909, French .776, German .854, Coptic .760, Athenian .836, Cypriote .829, Chinese .795, Swedish .854, Italian .839, Portuguese .806, Rumanian .764, and Catalan .793. From these data, Lees proposes an average 81% constant rate for all languages at all times. This means that "... 81% of the basic-root-morphemes of a language will survive as cognates after 1000 years". (Lees, Robert B., 1953: 113-127) Under this surviving rate then, we can make calculations to estimate the separation dates of related languages from the common ancestor.

In the next stage, comparing the basic vocabularies of languages we can ascertain how many of them are common to the languages we are studying and deduce the dates at which they had separated and become independent languages. Lees gives the following study on determining the separation dates of Turkish, Azerbaijan Turkish and Uzbek which he calls time depths. Lets read from his paper "... the word list contains 209 morphemes and 166 cognates (79.4%), giving a time-depth of 0.526 millenia. This would date the split of Osmanli and Azerbaijani abaut 1424 A.D. The Turks took Constantinople in 1453, but had been in Anatolia since about the year 1000. There must have been some considerable intercommunication between the Caucasian Turks over a period of many years, and this may account for our late estimate. A second word list was prepared for Turkish and for Ferghana Uzbek. On the basis of 177 usable words, of which 117 (66.2%) were identifiable cognates, the calculated time-depth was 0.954 millenia. This would indicate that the Osman tribes may have separated from their Uzbek relatives about the year 1000, which compares favorably with their date of entry into Anatolia". (Lees, Robert B., 1953: 122-123). The formula to determine the time-depth devised by Lees is the following, *t* being time depth, *c* cognates and *r* assumed percentage of cognates after a millenium of separation:

$$t = \frac{\log c}{2\log r}$$

3. What is the shortcomings?

Glottochronology has been a target to severe criticism. Many scholars showed that this method has many shortcomings and cannot be used as a trustworthy devise in linguistics. Unless the whole vocabulary of the proto language is known, it is impossible to determine the percentage of surviving words in individual languages. When at a certain time of history the ancestor language becomes obsolete, two or more different new born languages begin to emerge. After this independence appearing they will have their own fate, and surviving percentage of basic

vocabulary of ancestor languages will depend on many external and internal factors such as new environment, convergence etc. If a branch of nuclear languages stays in the mother land, it will probably turn out more conservative than the one moving away. In this case the retention of vocabularies of two related languages will give different separation dates and leads us a wrong conclusion.

Sometimes it can be hard to decide on the connotations of a word, to give an example from Clauson "... for example 'stand' may connote 'not to fall', 'not to move' or 'to rise to one's feet'" (Clauson, G.1969:7). It must be kept in mind that the exact connotations of a word a thousand years ago could be different from the recent connotations.

Some languages may be more conservative than others, it is also true for single words of a language, to be exact some words may prove to be more conservative than other words. To account for these facts and to delimit the discrepancies some attempts have been made to improve the theory of glottochronology with a more complicated mathematical formulae.

To test the validity of glottochronology many attempts have been made, in one of them Bergsland and Vogt studied on the comparison of Norse and Georgian. They found that Modern Icelandic and Riksmal show a difference of retention rates of about 15% when compared to Old Norse. The retention rates for Georgian also vary and under this rates the time-depth varies between 1000 to 5000 years, a big disagreement. This study of Bergsland and Vogt, as they state, "...clearly disproves the basic assumption of glottochronology 'that fundamental vocabulary changes at a constant rate'" (Bergsland and Vogt, 1962: 115-153).

Glottochronology assumes that the rate of change in the basic vocabulary of all languages is constant. This assumption cannot be proved by the nature of language: language is created by human minds, therefore there is no way that this change rate will remain same in neither different periods of a language nor between different languages. Not believing that more complicated mathematical methods will help to revise the glottochronology Bergsland and Vogt suggest the following: "Therefore in our opinion the most urgent task for lexicostatistics is not the refinement of the mathematical methods applied, nor the elaboration of still more ingenious rules for compilation of test lists, nor the search for special explanations of "aberrant" cases, but rather the submission of all cases, especially those upon which glottochronology was originally based, to a thorough critical examination" (Bergsland and Vogt, 1962: 115-153).

4. Conclusion

To sum up, glottochronology has two main defects as shown in the following:

1. There is no one and only changing rate among languages.
2. Different periods of a language can display different change rates. In addition to these, as a shortcoming of glottochronology, different word lists can give different results.

On his comment to the paper of Bergsland and Vogt, Alvar Ellegard underlines the weak points of glottochronology as following: 1) Due to the different semantic patterning of languages it is difficult to use the various lists in a consistent manner. 2) Different lists give different results. 3) The rate of vocabulary change differs from one language to another (in Bergsland and Vogt, 1962: 115-153).

Besides these doubts about the method, Ellegard still believes that it can be successfully modified and makes the following suggestions: 1) The basic vocabulary lists must be modified. Covering different semantic areas different several lists should be used at the beginning. 2) The definition of "retained expression" must be modified to beat the difficulty displayed by the semantic range. To do so, words defining items or concepts more sharply can be used. Ignorance of meaning of words and looking just occurence or non-occurence of them can be a solution too. 3) The glottochronological index can be abondoned especially if used ignoring the meanings of

words. Even the name, glottochronology, may be given up and what is left is a method to estimate the degree of similarity of languages (in Bergsland and Vogt, 1962: 115-153).

Again to sum up, as a method glottochronology seems to lost most of its attractiveness to linguists mainly due to the reasons I tried to list above. However when necessary linguists have to go ahead and use the glottochronology as best in order to make some kind of sense out of the data before them (Armstrong, Robert G. 1962:283).

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