

From August Schleicher to Sergei Starostin

On the development of the tree-diagram models of the Indo-European languages

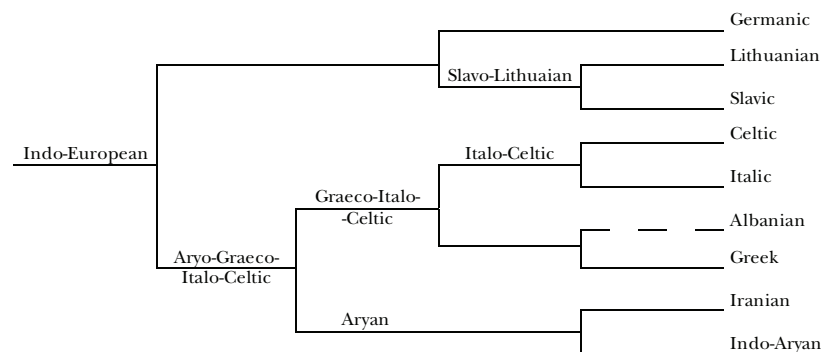
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Abstract

The following provides an attempt to illustrate the most representative tree-models for the classification of the Indo-European languages and their daughter branches and, where available, their temporal position as suggested by glottochronology.

0. Indo-European

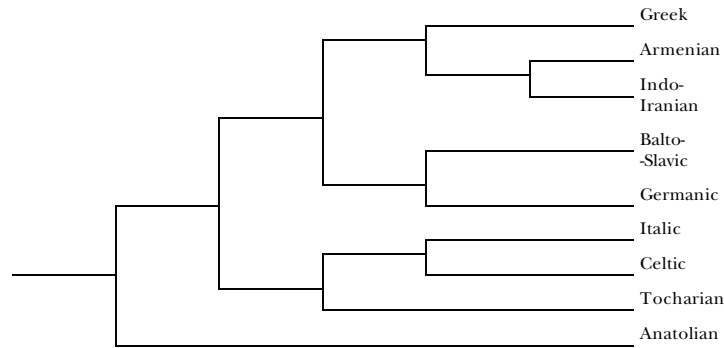
0.1. In the 19th century the tree-diagram of A. Schleicher (1860) was very popular:



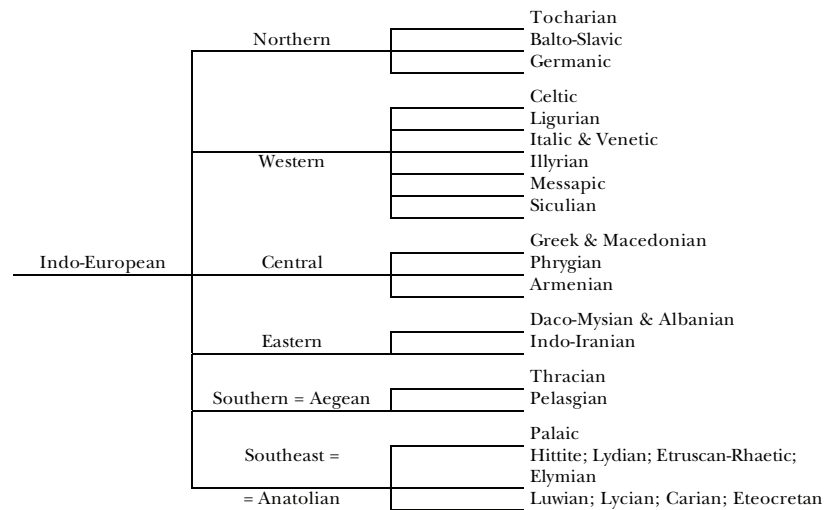
After the discovery of the Indo-European affiliation of the Tocharian A and B languages and the languages of ancient Asia Minor, it was necessary to take them into account. Recent models accept the Anatolian vs. non-Anatolian ('Indo-European' in the narrower sense) dichotomy, which was first formulated by E. Sturtevant (1942). Naturally, it is difficult to include the relic languages into the model of any

classification, if they are known only from several inscriptions, glosses or even only from proper names. That is why there are significant differences in classification of these scantily recorded languages. For this reason some scholars omit them altogether.

0.2. Gamkrelidze and Ivanov (1984, 415) developed the traditional ideas.

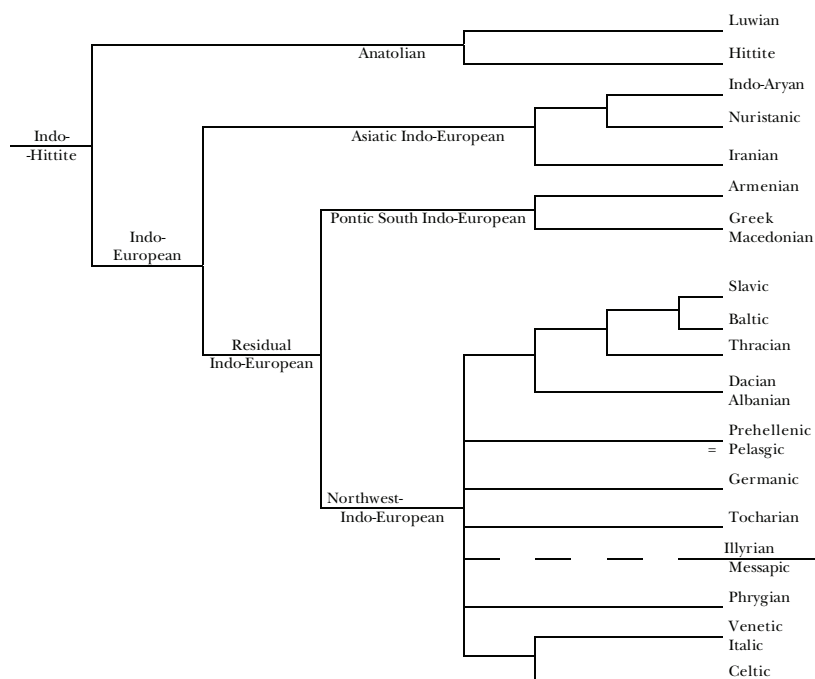


0.3. Vladimir Georgiev (1981, 363) included in his Indo-European classification some of the relic languages, plus the languages with a doubtful IE affiliation.

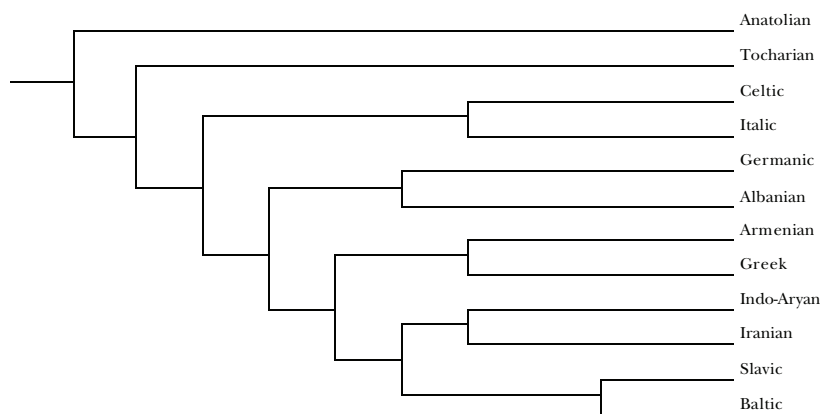


0.4. Eric Hamp proposed his original model of the Indo-European disintegration, including the relic idioms, based on specific isoglosses in phonology, morphology and lexicon

(1990).

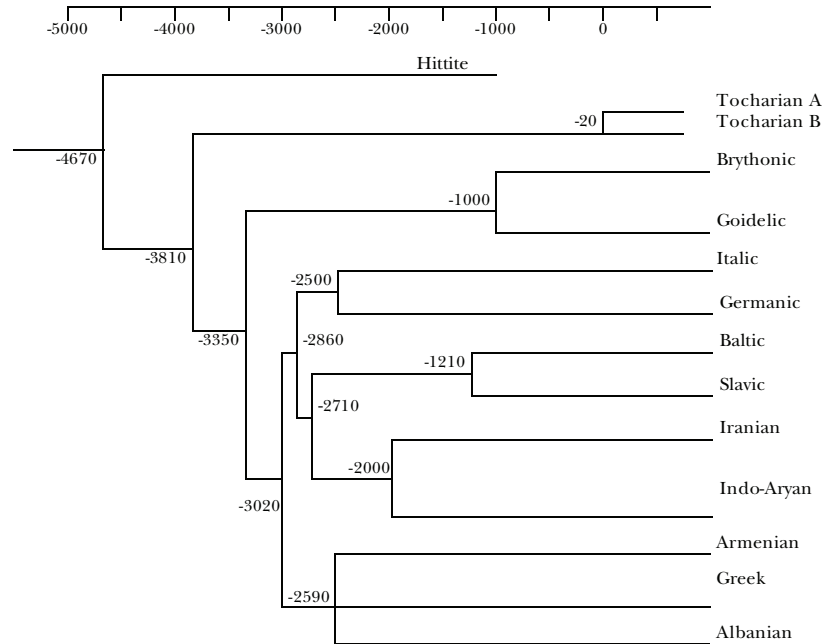


0.5. As an illustration of a realistic application of cladistics is the model suggested by D. Ringe, T. Warnow and A. Taylor (2002, 87).



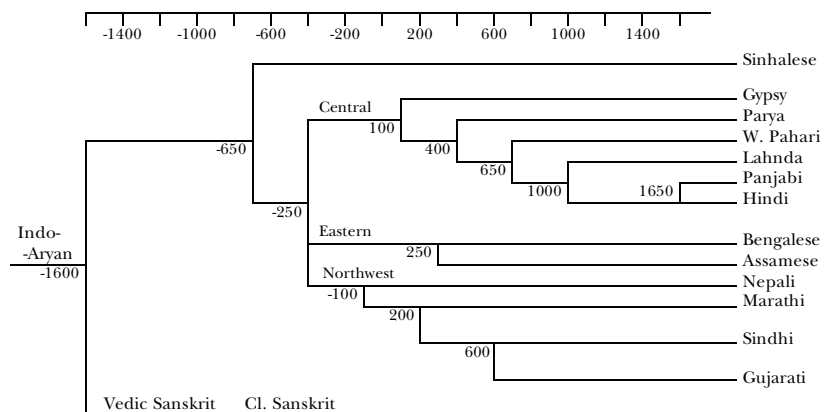
0.6. The absolute chronology of Indo-European is available only thanks to glottochronology. The most recent result of Sergei Starostin (*Workshop on the chronology in linguistics*, Santa

Fe 2004) applies his own model of the ‘recalibrated’ glottochronology, where all borrowings were excluded before any calculation and the coefficient of changes was empirically recounted to 5% per millennium instead of 14% as postulated by Swadesh.



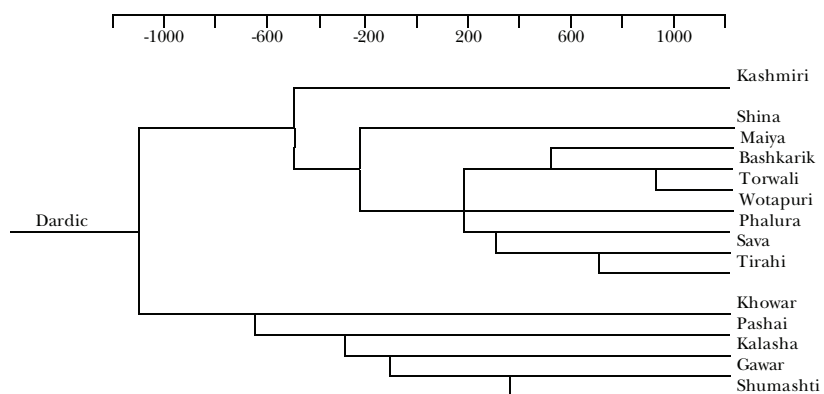
1. Indo-Aryan

The only attempt to apply glottochronology for several modern Indo-Aryan languages in comparison with Sanskrit was accomplished by S. Starostin and his team (database 2004).



2. Dardic

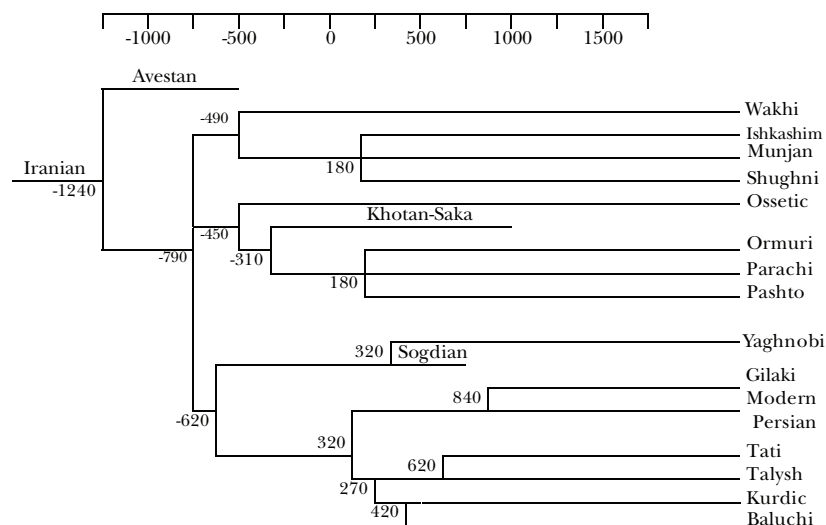
The only tree-diagram for Dardic was constructed by S. Starostin's team (database 2004).



Note: Concerning the internal classification and depth of divergence of the Nuristani languages, there are no available results.

3. Iranian

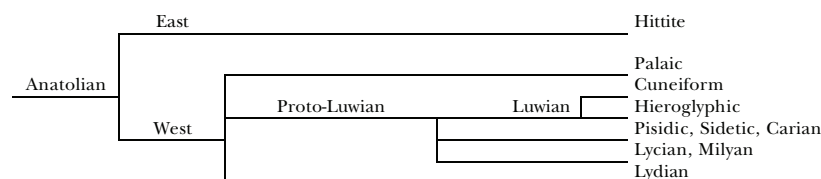
The only attempt to construct a tree-diagram for the Iranian languages was also accomplished by S. Starostin and his team (Santa Fe 2004).



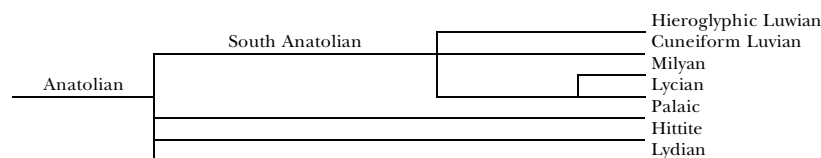
4. Anatolian

With exception of Hittite no Anatolian language permits the application of glottochronology because of our limited knowledge of their lexical corpora. That is why the existing classifications are based on combinations of phonological, morphological and lexical isoglosses. In recent times three alternative models of the internal classification of the Anatolian languages have been proposed.

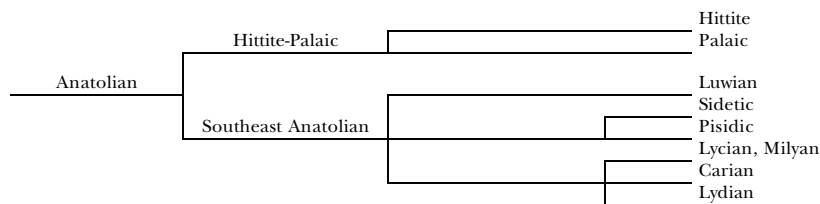
4.1. N. Oettinger 1978, 92 (supplemented on the basis of personal communication in 2001).



4.2. R. Werner (1991, 17).

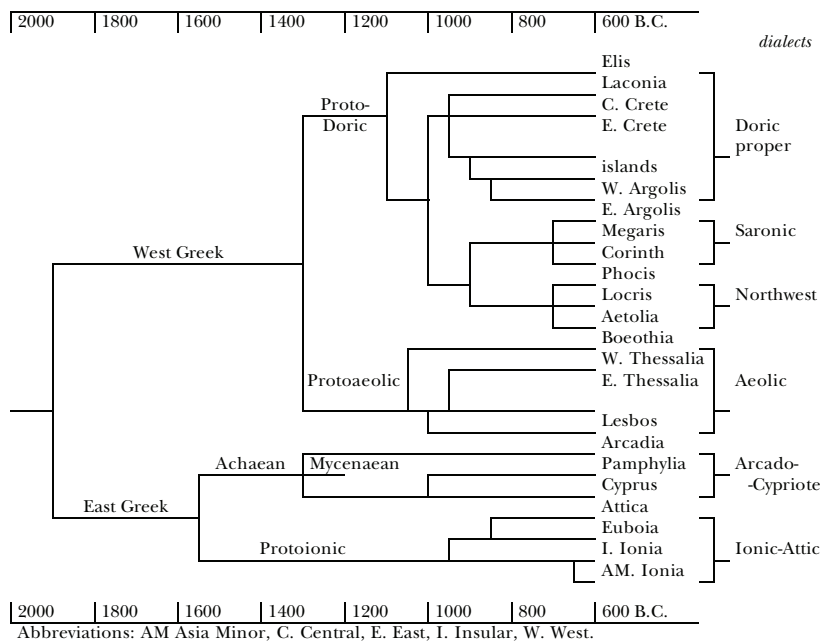


4.3. C. aan de Wiel <http://iiasnt.leidenuniv.nl/pie/ielangs/anatolian.html>



5. Greek

The most detailed scheme classifying the Greek dialects was proposed by A. Bartoněk on the basis of phonology and morphology (1987, 104; 2003, 494).



Abbreviations: AM Asia Minor, C. Central, E. East, I. Insular, W. West.

Note: Greek can be classified as one of the Hellenic languages, together with Phrygian / Brygian, ancient

Macedonian, and perhaps also Messapic, if the hypothesis of M. Huld (1995, 147-55) is accepted. Unfortunately, the lexical corpora do not allow any quantification.

6. Paleo-Balkan

Extremely poor data and their ambiguous interpretation lead to various hypotheses. The present author finds the following most probable. In Prehellenic = Pelasgian the *Lautverschiebung* operated; the language was of the *centum*-type (Hamp) rather than of *satem*-type (Georgiev). If Thracian and Bithynian were *satem*-languages with *Lautverschiebung*, their closer relation with Armenian is expectable (so Kortlandt 1988). Albanian is a descendant of Illyrian, both *satem*-languages. The change $*g^w > b$ (Pisani 1957) in Dacian indicates more probably the *centum*-type, regarding the complementarity of the $*k : *k^w$ and $*k : *k'$ distinction.

7. Italic

7.0. The ancient Italic languages are only fragmentarily recorded, naturally with the exception of Latin. For this reason, their classification cannot employ lexicostatistic methods and so only the qualitative analysis of phonology can provide some results. The present model does not reflect any grade of a mutual relationship.

Wallace (1984, 123-51) discusses five scenarios of classification of the **Oско-Umbrian** languages:

(A)

R. von Planta: *Grammatik der oskisch-umbrischen Dialekte*, I. Strassburg: Teubner 1892.

F. Sommer: *Handbuch der lateinischen Laut- und Formenlehre*. Heidelberg: Winter 1948.

H. Krahe: *Indogermanische Sprachwissenschaft*, I. Berlin: de Gruyter 1966.

(B)

L.R. Palmer: *The Latin Language*. London: Faber & Faber 1954.

(C)

C.D. Buck: *A Grammar of Oscan and Umbrian*. Boston: Ginn 1928.

R.G. Kent: *The sounds of Latin*. Baltimore: Waverly Press 1945.

(D)

J.W. Poultney: Volscians and Umbrians. *American Journal of*

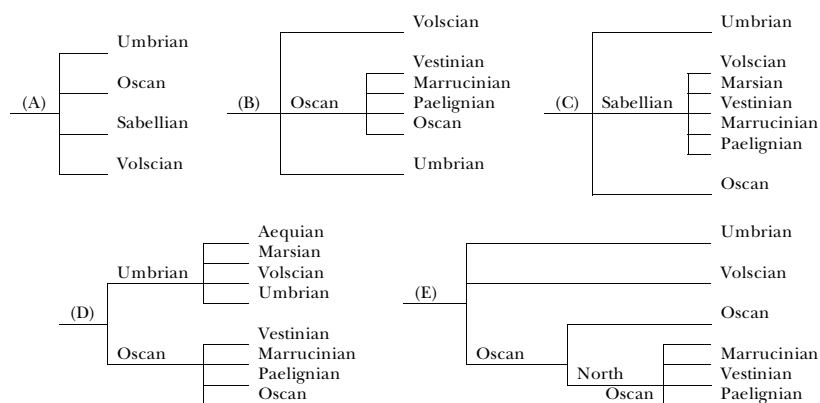
Philology 72, 1951, 113-127.

J. Poultney: *The bronze tables of Iguvium*. Philadelphia: American Philological Association (Philological monographs 18) 1959.

M. Durante: I dialetti medio-italici, in: *Popoli e civiltà dell' Italia*, ed. M. Cristofani et al. Roma 1978, 793-820.

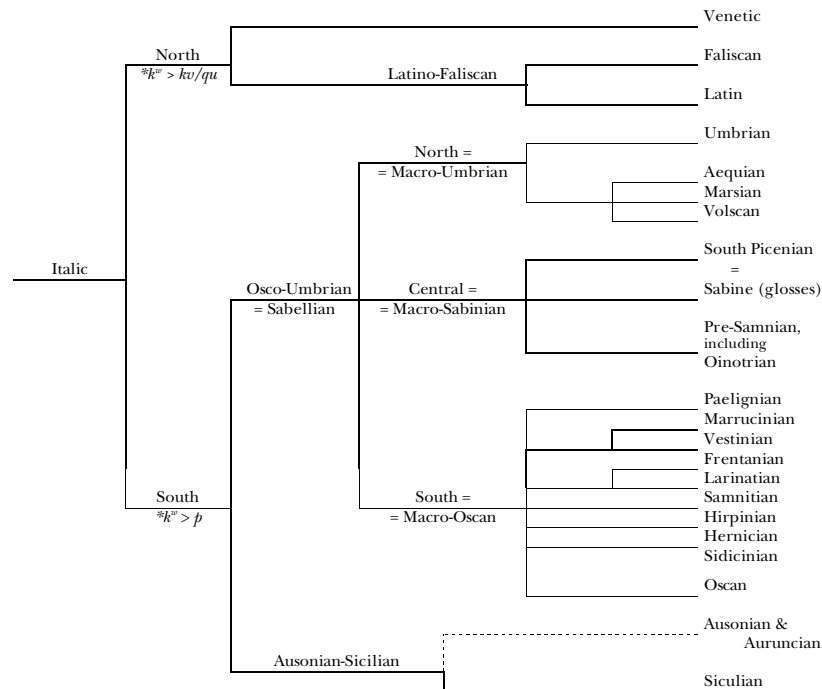
(E)

R.S. Conway: *The Italic dialects*, 1-2. Cambridge: University Press 1897.



Synthesis of contemporary views on the classification of the Italic languages:

The following model represents an attempt to find a synthesis based on conclusions of various scholars, who are in agreement as to the close position of Venetic to the Latino-Faliscan branch, with the idea of H. Rix (2002, 3-9) about the internal structure of the Osco-Umbrian branch. The constitution of a special Ausonian-Sicilian branch is based on the evidence of ancient authors, documenting that in the past the Sicilians-Ausonians were pushed away from Italy to Sicily (Thucydides; Dionysius Halicarnassensis referring to Hellanicus; see Schmoll 1958, 96). The change $*k^w > p$ assumed for Sicilian connects the hypothetical Ausonian-Sicilian branch with the Osco-Umbrian languages.

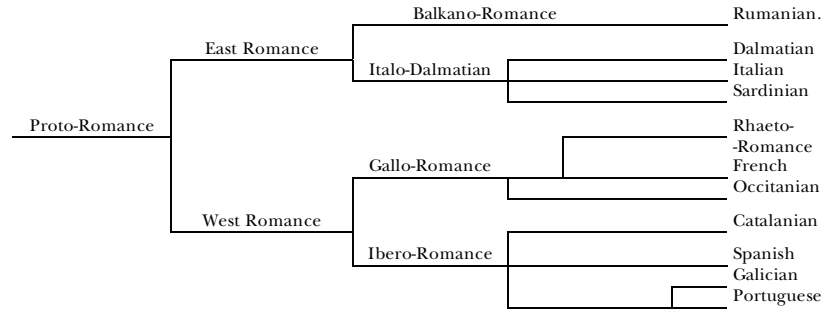


Note: Rix (2002) differentiated the following local varieties of Oscan: from Capua, Pompeie, Cetera Campania, Central Oscan, Lucania & Bruttium, Messina.

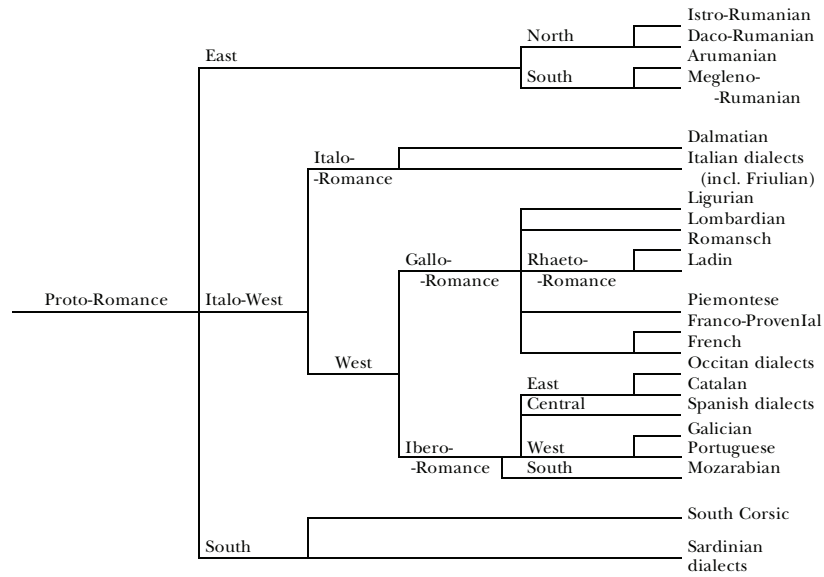
7A. Romance

The lexical material of the Romance languages served for determining the basic constants in glottochronology. Let us compare several models of their disintegration.

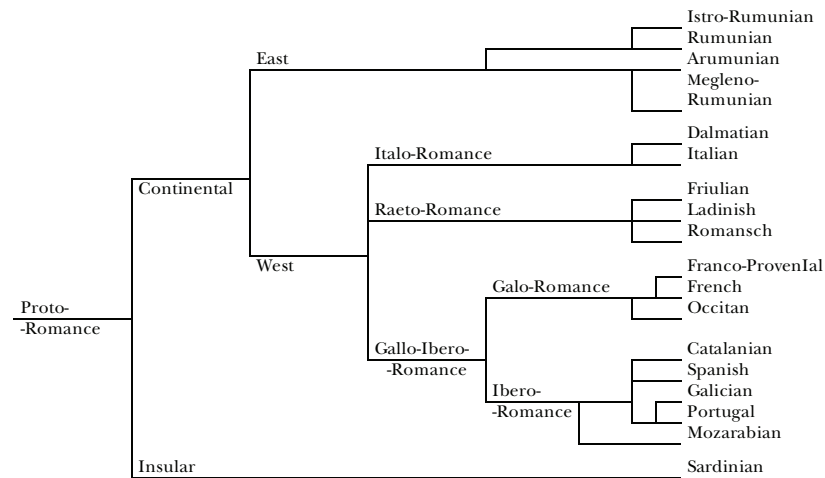
7A.1. Suzanne Fleischman. The Romance Languages, in: William Bright (ed.), *International Encyclopedia of Linguistics*, vol. 3. Oxford: University Press 1992, 339.



7A.2. Joseph E. & Barbara F. Grimes 1996, 57-58.

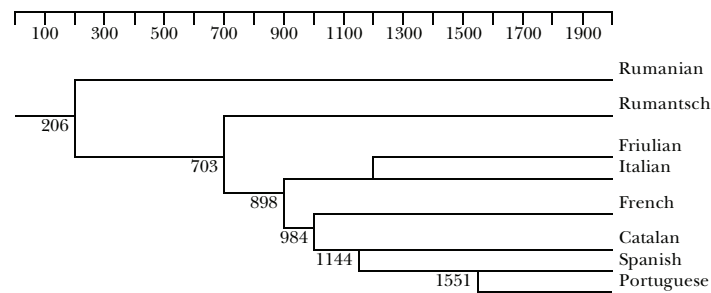


7A.3. Merritt Ruhlen 1987, 326.

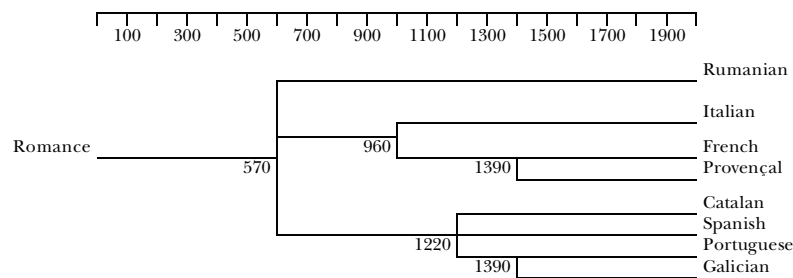


7A.4. It is natural that glottochronology was also applied to the Romance languages. Here we present two recent attempts.

Embleton (1986, 142):



7A.5. Starostin (Santa Fe 2004):



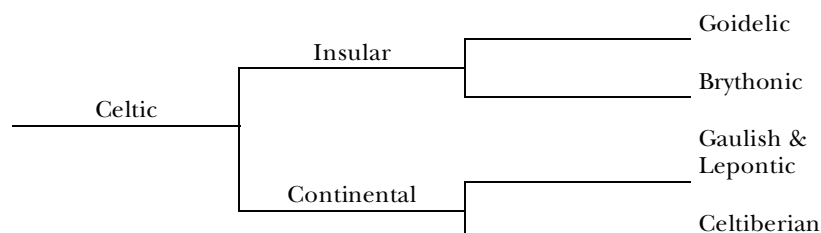
8. In the area between Italic and Celtic there were at least two

relic languages which could form a closer unit in the genealogical sense: Ligurian and Lusitanian, the former reconstructed on the basis of proper names attested by classical authors in northern Italy, the latter known from several inscriptions written in the Latin alphabet, discovered in south Portugal and Spain.

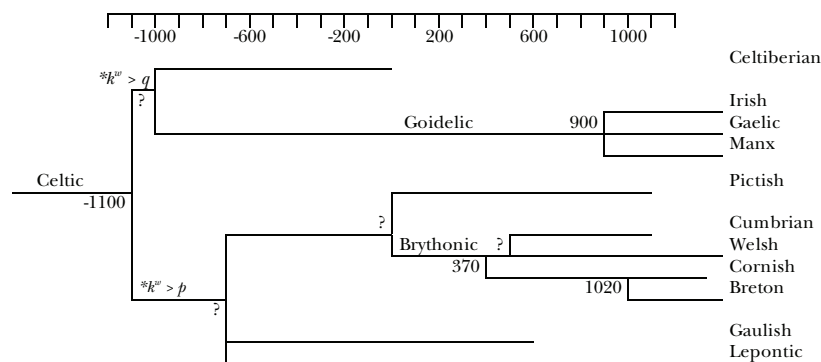
9. Celtic

There are two alternative models of disintegration of the Celtic languages.

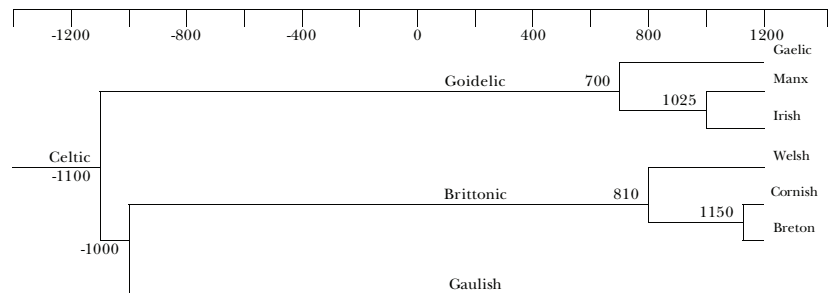
9.1. The first model has to reflect the opposition between the insular and continental languages. It is defended, e.g., by W. Cowgill (1975) or P. Schrijver (1995, 463).



9.2. The alternative and more traditional model is based on the *q/p*-isogloss in the reflexes of the Indo-European labiovelar $*k^w$. The figures for living languages (plus Cornish) and the age of the divergence of Goidelic vs. Brittonic were calculated by S. Starostin and his team (Santa Fe 2004). The positions of other nodes indicated by question marks represent only rough assessments.



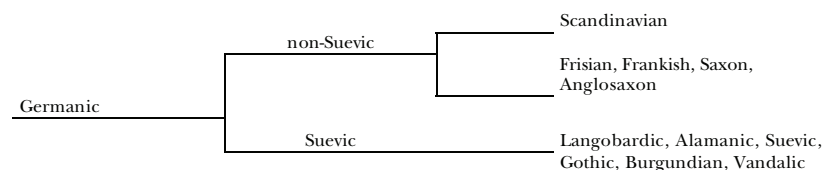
9.3. Applying Starostin’s approach with one modification, namely the systematic inclusion of synonyms for all sufficiently described languages, i.e., all Goidelic, Brythonic, plus Gaulish, the internal structure of the Celtic tree diagram is in principle the same; the differences occur only in details. Let us mention that the time depth of the divergence of Gaulish vs. Brythonic (1000 BC) is practically the same as Goidelic vs. Gaulish-Brythonic (Novotná and Blažek 2006, 91).



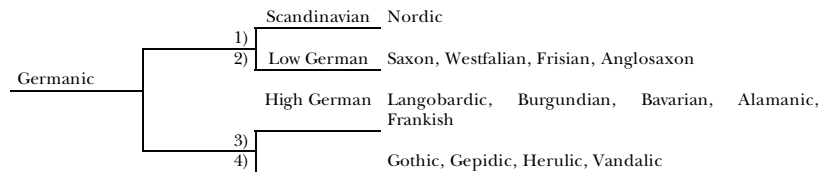
10. Germanic

The best summary of the various ideas concerning the classification of the Germanic languages is the study of W. Mańczak (1992; cf. also Blažek & Pirochta 2004).

10.1. J.Ch. Adelung (1806) divided the Germanic languages into two branches.

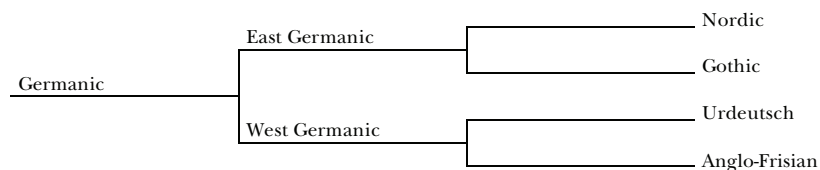


10.2. Similarly J. Grimm (1819) operated with the binary classification. For some of the tribal dialects he supposed a transitional character, viz. Frisian and Anglian (1-2), Frankish (2-3), Quadic & Marcomanic (3-4). Alternatively he assumed the opposition of East Germanic vs. others.

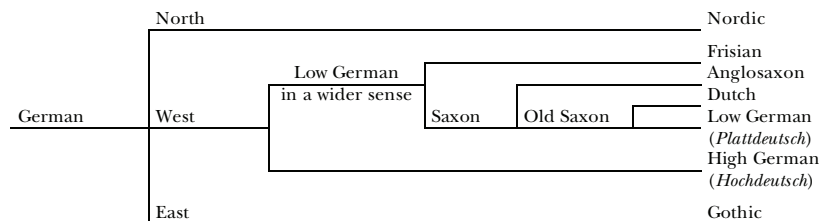


10.3. Applying his original method based on the lexicostatistic analysis of parallel texts, Mańczak (1992) formulated a similar conclusion. He ordered the languages respective to their relationship with Gothic: the closest has to be Old High German, further Old Saxon, finally the Scandinavian languages.

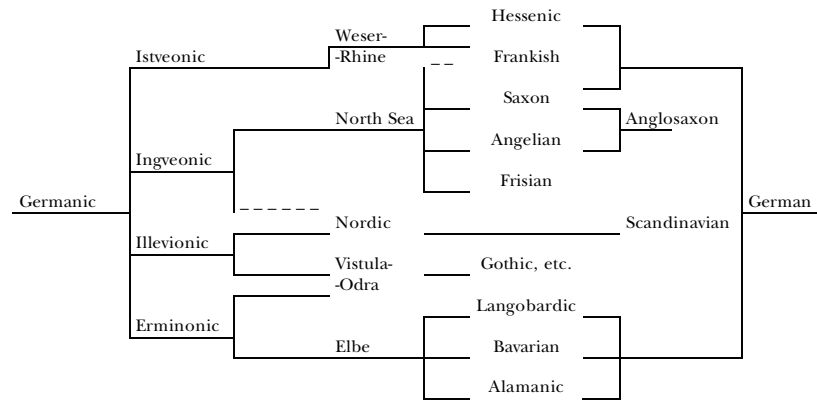
10.4. Another model of the binary classification was presented by K. Müllenhoff (1898).



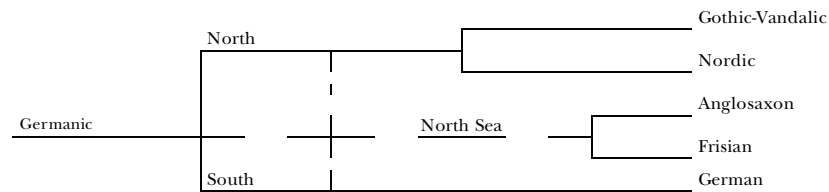
10.5. The most frequent model divides the Germanic languages into three branches: East, North and West. The author of the following classification is J. Schmidt (1860).



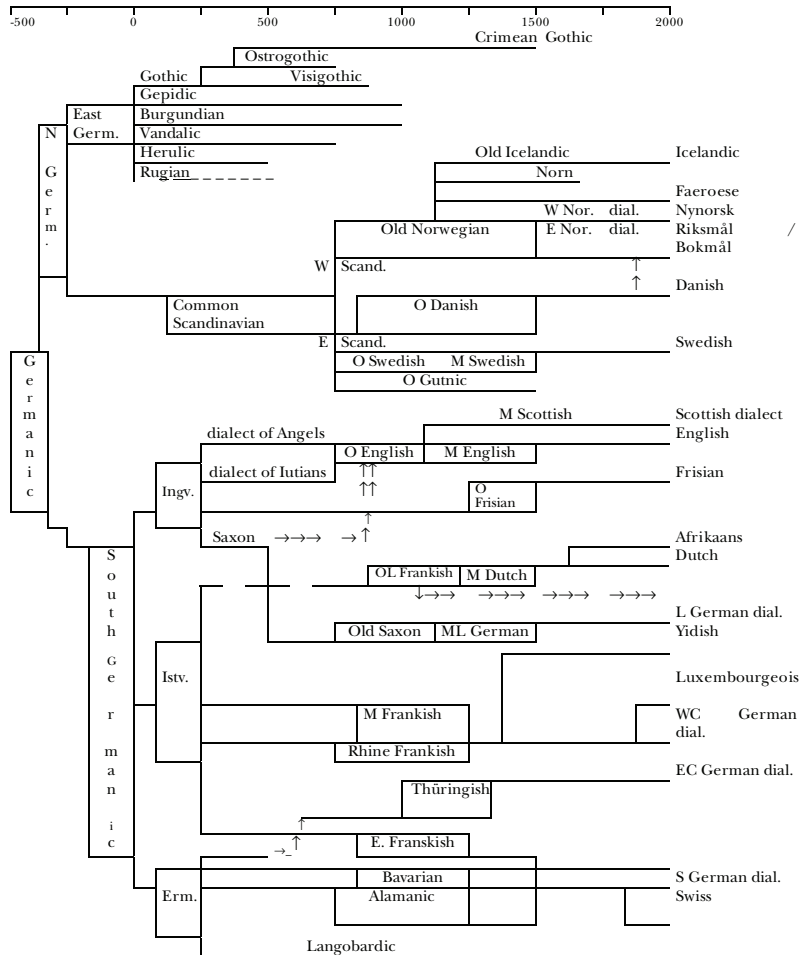
10.6. F. Maurer (1943) attempted to depict the development from the tribal Germanic dialects to the languages of the late Middle Ages and the present, including convergent processes.



10.7. E. Schwarz (1951) assumed that *c.* 200 BC the Germanic language continuum was already divided into a North zone, generating the later Scandinavian languages and Gothic, and a South zone, where the later German dialects were formed. About four centuries later the third, transitional zone, cristalized, which saw the development of the languages of the Angles and Frisians.

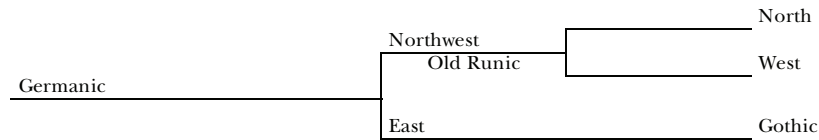


10.8. The most detailed scheme for the development of the Germanic languages was proposed by T.V. Toporova (2000), inspired by Maurer and Schwartz.

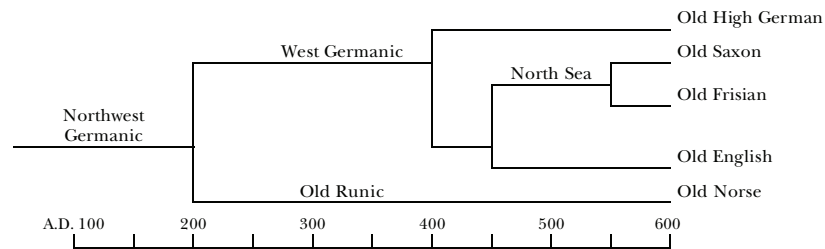


Abbreviations: C Central, dial. dialect, E East, Erm. Erminonic, Germ. Germanic, Ingv. Ingveonic, Istv. Istveonic, L Low, M Middle, Nor. Norwegian, O Old, S South, Scand. Scandinavian, W West.

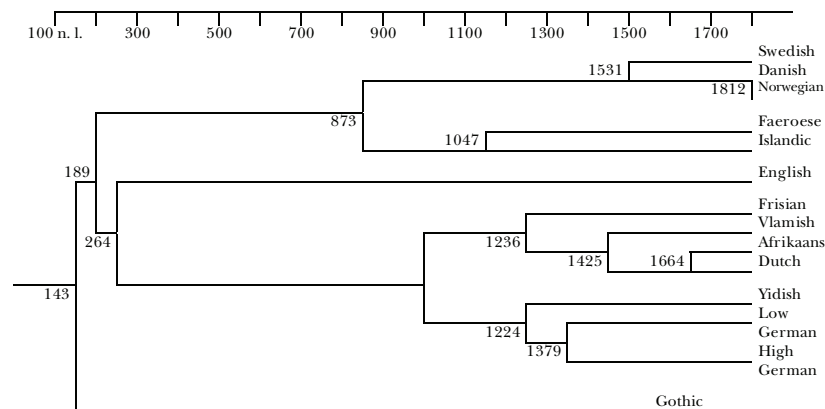
10.9. E. Antonsen (1975) assumed the opposition of the east and northwest branches.



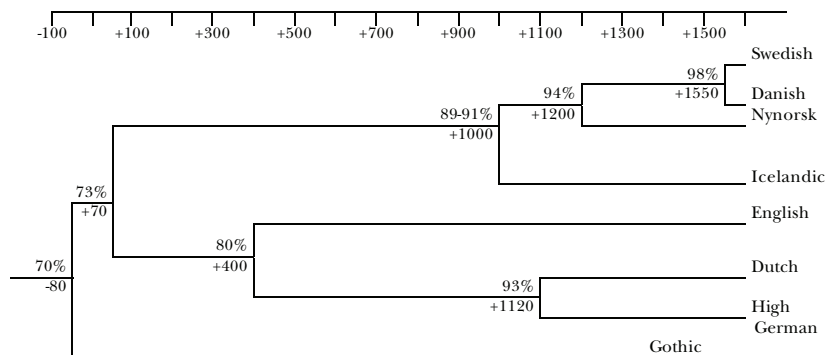
10.10. H. F. Nielsen (2000) returned to the traditional idea, identifying in Old Runic a direct ancestor only of the Scandinavian languages.



10.11. For her classification of the Germanic languages Sheila Embleton (1986, 117) employed her modification of glottochronology.

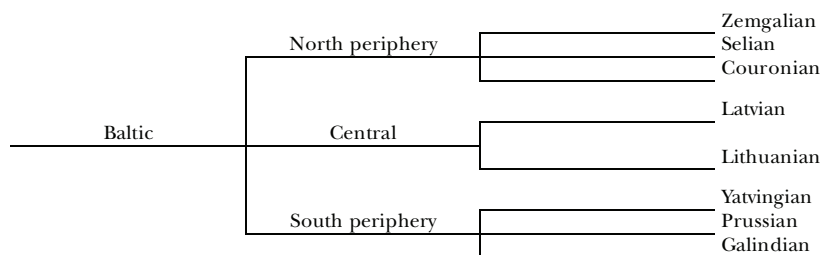


10.12. The most recent attempt to classify the Germanic languages was published by Starostin and Burlak (2001, 82-105). They applied Starostin's recalibrated glottochronology for seven literary living languages and Gothic.

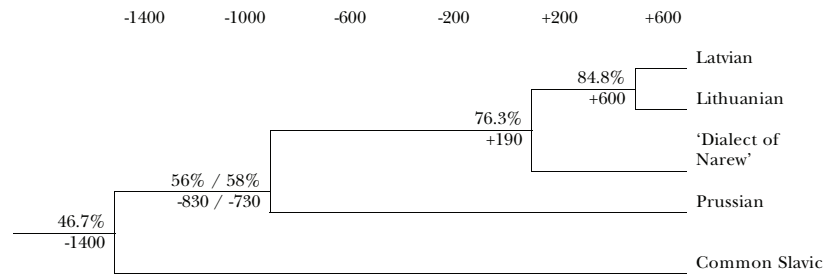


11. Baltic

The Baltic languages are traditionally divided into Western, represented by Old Prussian, extinct from c. 1700, and Eastern, represented by the living languages, Lithuanian and Latvian. But the Baltic dialectology was much more complex a millennium ago. The following model was proposed by V. Mažiulis (1981).



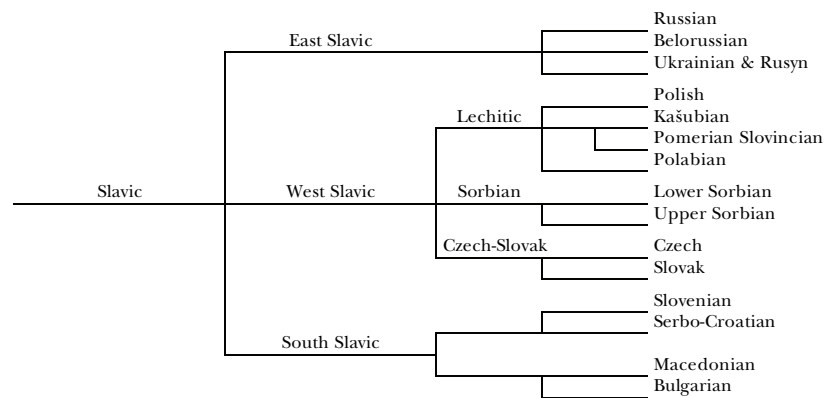
The first serious application of classical glottochronology was made by Lanszweert (1984, xxxii-xxxvii), who found 58.6% for Prussian vs. Lithuanian and 55.2% for Prussian vs. Latvian. The results of Girdeņis and Mažiulis (1994, 9) are lower: 68% Lithuanian vs. Latvian, 49% Lithuanian vs. Prussian, 44% Latvian vs. Prussian. Starostin (Santa Fe 2004 and p.c., June 2005) dated the separation of Lithuanian and Latvian to 80 BC. Lithuanian and the 'Dialect of Narew' to 30 BC, Latvian and the 'Dialect of Narew' to 230 BC. The position of Prussian in his calculations is rather strange, it has to be closer to Slavic than to Baltic. Novotná and Blažek (forthcoming), also calculating the synonyms, have reached the following results.



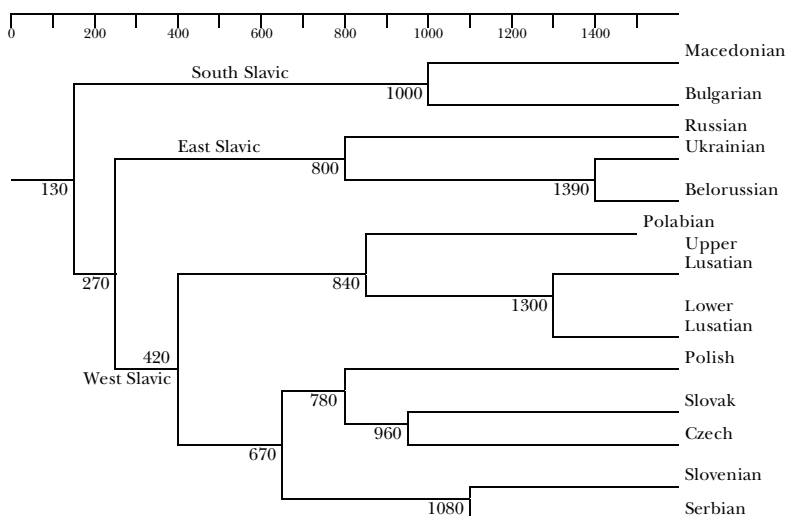
The double-result 58/56% for Prussian vs. other Baltic languages reflects the calculation without / with the ‘Dialect of Narew’. The score 43% between Prussian and the ‘Dialect of Narew’ (*Poga ske gwary z Narewu*; see Zinkevičius 1984) in comparison with 62% and 55.2% for Prussian vs. Lithuanian and Prussian vs. Latvian respectively, excludes the identification of the ‘Dialect of Narew’ with the historical Yatwingians, known from the Middle Ages, if their language had to be connected with another Baltic idioms of the southern periphery, including Prussian. Regarding this large difference, it seems better to accept the explanation of Schmid (1986) who identified in the ‘Dialect of Narew’ the strong influence of Northeast Yiddish, spoken in the large cities of Lithuania and Latvia, hence the hybrid East Baltic-German idiom.

12. Slavic

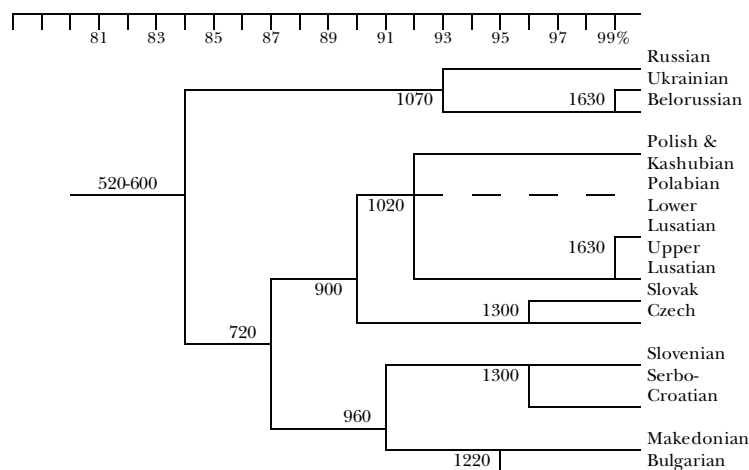
12.1. According to the traditional model the Slavic languages are divided into three groups (e.g., J. and B. Grimes 1996, 58).



12.2. The classification of the Slavic languages by Starostin (Santa Fe 2004), employing his recalibrated glottochronology, is revolutionary in both topology and chronology.



12.3. Using the principles of Starostin's recalibration of glottochronology, Novotná and Blažek (2005) proposed another model of the internal grouping of the Slavic languages.



Comments

The present choice of diagrams is only illustrative, not exhaustive. The largest controversy occurs in the case of the relic languages, where our knowledge, especially of their lexicons, is very limited. The arguments for their genetic classification is based only on the accidentally preserved lexical, phonological and morphological isoglosses which are evaluated qualitatively. The models of two great authorities in this field are have been compared: [0.3.] V.I. Georiev (1981) and [0.4.] E.P. Hamp (1990). It is apparent they are radically different. The quantitative approach is also represented here by two examples: [0.5] Ringe, Warnow, and Taylor (2002), demonstrating the cladistic approach, and [0.6.] Starostin (2004), using his modification of the recalibrated glottochronology. Ringe, Warnow and Taylor were chosen for their ability to apply highly sophisticated mathematical methods to carefully analyzed linguistic data. In their model there is only one problematic conclusion, namely the position of Albanian together with Germanic. In the alternative cladistic models published practically at the same time (Gray and Atkinson 2003; Rexová, Frynta and Zrzavý 2003) only the mathematical approaches are emphasized. The results of both teams—the absolute dating of the beginning of the divergence of the Indo-European languages to the ninth millennium BP implies at least five millennia of the independent development before the first literary fixation of such languages as Hittite, Palaic, Luwian, Vedic, Avestan and Mycenaean Greek in the fourth millennium BP. Regarding the striking similarities between these languages in this phase of their development, especially in grammar, it is ...difficult to imagine their fast later development, confronting the situation in the beginning of their literary era with corresponding contemporary descendants. Starostin eliminated the most important imperfections of the classical glottochronology, introducing both different basic formula (time of divergence for two contemporary languages: $t = \sqrt{(\ln c) / \sqrt{(-2\lambda \sqrt{c})}}$, where $c = N(t) / N_0$, i.e., the share of the common inherited cognates vs. the number of all common semantic pairs from the basic test list, if the borrowings are eliminated; $\lambda = \ln c / t^2$; cf. the ‘classical formula’ by Swadesh: $t = \ln c / -2\lambda$) and the constant of disintegration (0.05 per millennium, instead of 0.14 by Swadesh for the 100-word-list). His conclusions are always based on a very careful etymological

analysis, including the elimination of all borrowings. Finally, his dating of the beginning of disintegration of the Indo-European languages to the seventh millennium BP, i.e. two millennia later than the dating of the two teams mentioned above, seems much more realistic.

The situation with the internal classification of the daughter branches is even more controversial. Let us compare, for example, three quite different classifications for the Anatolian branch, five for the Romance languages and twelve (!) for the Germanic languages, although the models of [10.9] Antonsen, [10.11] Embleton and [10.12] Starostin in principle reflect the same topology. Let us mention that Antonsen worked especially with the phonological and morphological isoglosses, while both Embleton and Starostin developed her/his own modification of glottochronology. In the case of the Slavic languages the situation is even more controversial, cf. the text (in Czech) "On the classification of the Slavic languages: the development of the evolutionary models" <<http://www.phil.muni.cz/linguistica/art/novbla/nob-001.pdf>>. Applying his method to the Slavic languages, Starostin [12.2] reached results which were too old and too controversial compared with the results of classification based on phonological and morphological criteria. But when the present author and his co-author Petra Novotná [12.3] made only a minor correction in the method of Starostin, namely the systematic inclusion of synonyms, while N_0 was redefined as the number of the semantic units attested in both tested languages without any borrowing, the results became more realistic, including the agreement with the data of archaeology and history. During our last personal dialogue in Leiden, June 2005, Sergei asked me for the secret of our approach. He admitted that our results were "more charming" in comparison with his own and the solution based on the inclusion of synonyms was fruitful.

Summing up, comparing the various methods of the genetic classification and their results, the following conclusions can be suggested:

- 1) The conclusions expressing the relative or absolute grade of the genetic relationship between two or more languages cannot be formulated without a quantitative approach.
- 2) Any calculation of the linguistic phenomena serving to demonstrate genetic links or their degree should be based on

the careful application of the comparative-historical method.

3) The results based only on phonology or morphology or only on lexicon cannot be taken as definitive, although in specific cases it has been the only way to formulate any conclusion about genetic affiliation, e.g., in the case of the relic languages known only from stereotypic laconic texts, glosses, borrowings or proper names.

4) The most convincing results correlate with the situation when the quantitative approach, based usually on the etymological analysis of compared basic lexicons, and the qualitative approach, based on comparison in the field of historical phonology and morphology, are both in a good agreement (e.g., the Germanic languages). If the results also agree with the extra-linguistic data, e.g., from history or archaeology, the probability of such a model grows.

As far as I can judge, these conclusions were systematically applied by Sergei Starostin.

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