

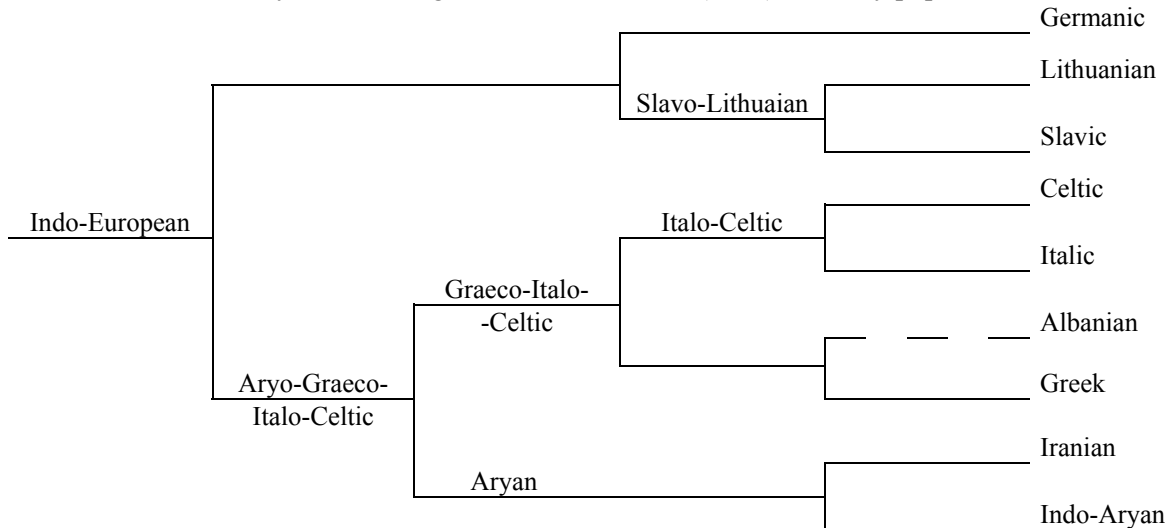
FROM AUGUST SCHLEICHER TO SERGEI STAROSTIN
On the development of the tree-diagram models of the Indo-European languages

Václav Blažek

The purpose of the present study is to confront most representative models of the internal classification of Indo-European languages and their daughter branches.

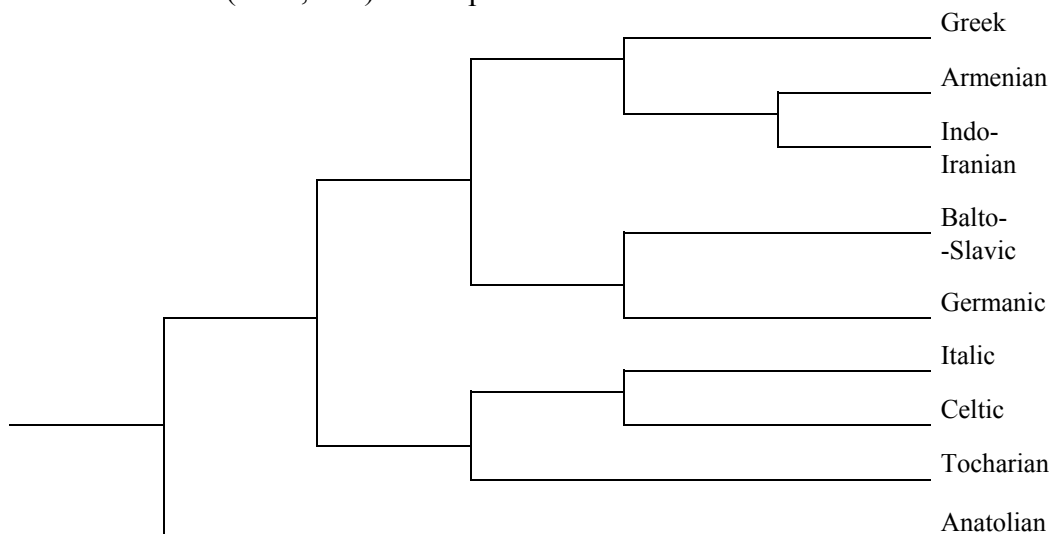
0. Indo-European

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

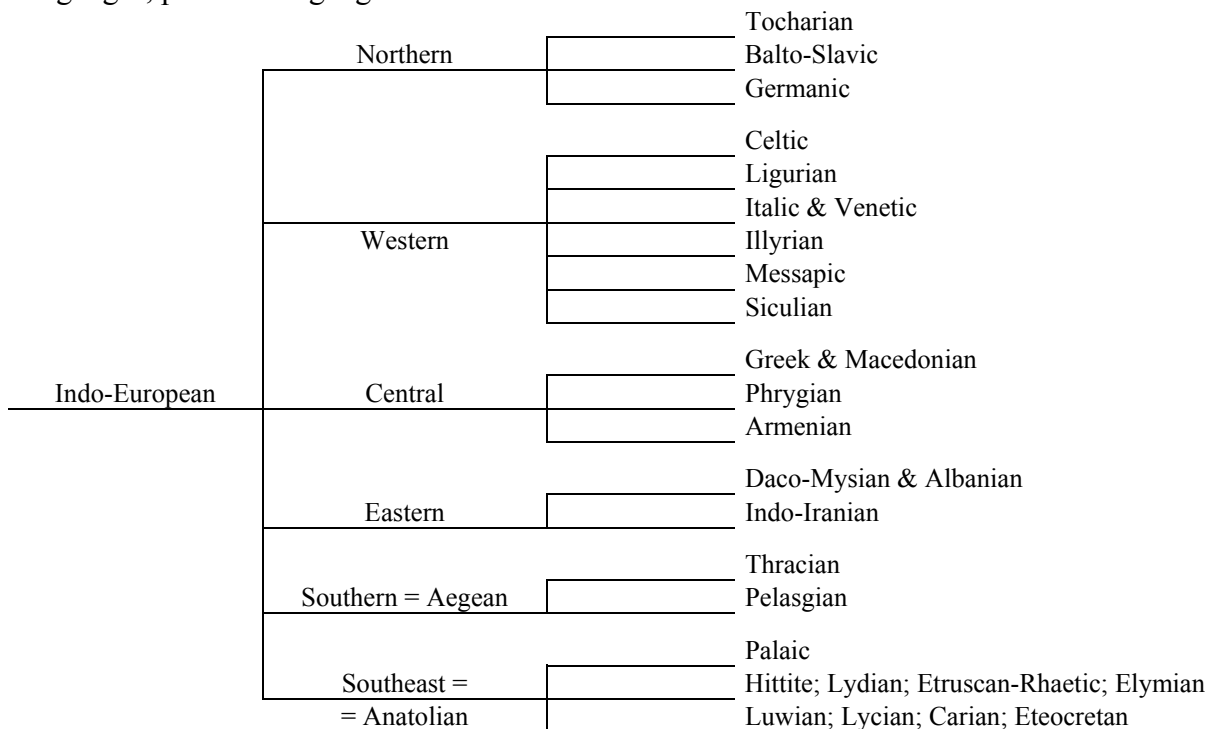


After the discovery of the Indo-European affiliation of the Tocharian A & B languages and the languages of ancient Asia Minor, it is necessary to take them in account. The models of the recent time accept the Anatolian vs. non-Anatolian ('Indo-European' in the narrower sense) dichotomy, which was first 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 so big differences in classification between these scantily recorded languages. For this reason some scholars omit them at all.

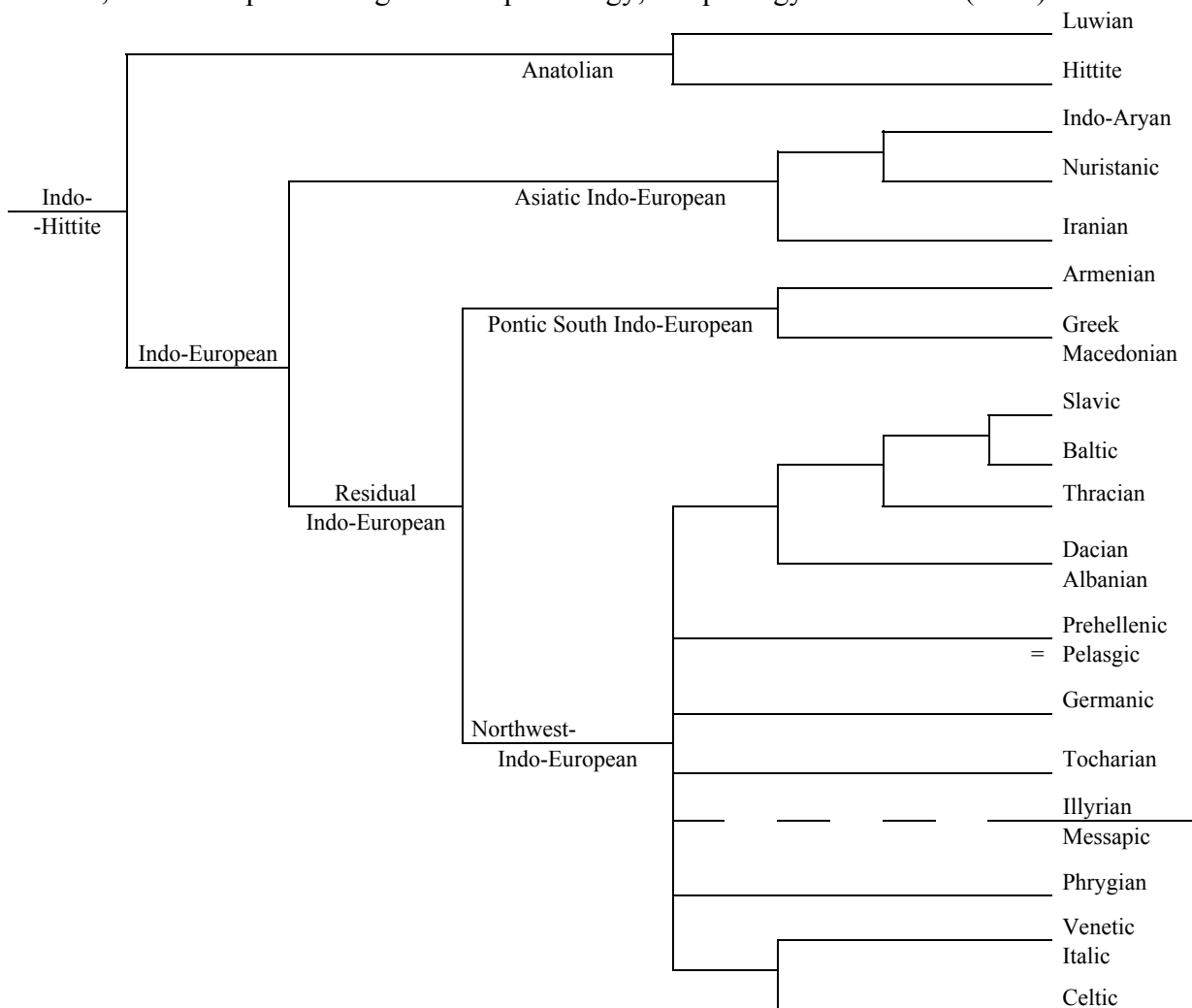
0.2. Gamkrelidze & Ivanov (1984, 415) developed the traditional ideas:



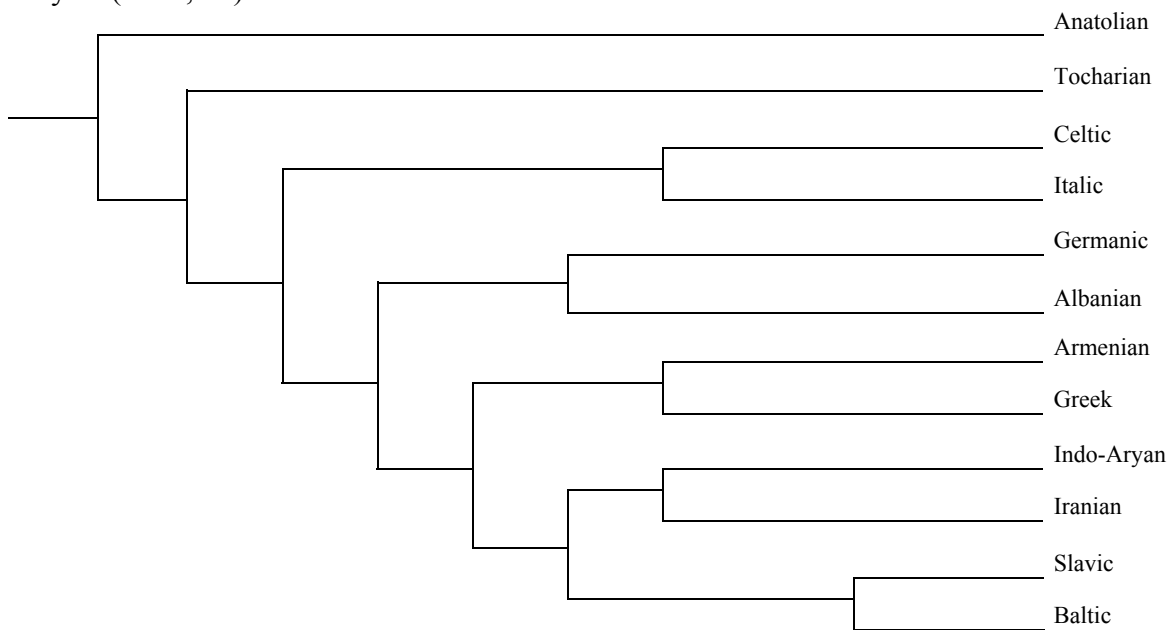
0.3. Vladimir Georgiev (1981, 363) included in his Indo-European classification some of the relic languages, plus the languages with a doubtful IE affiliation at all:



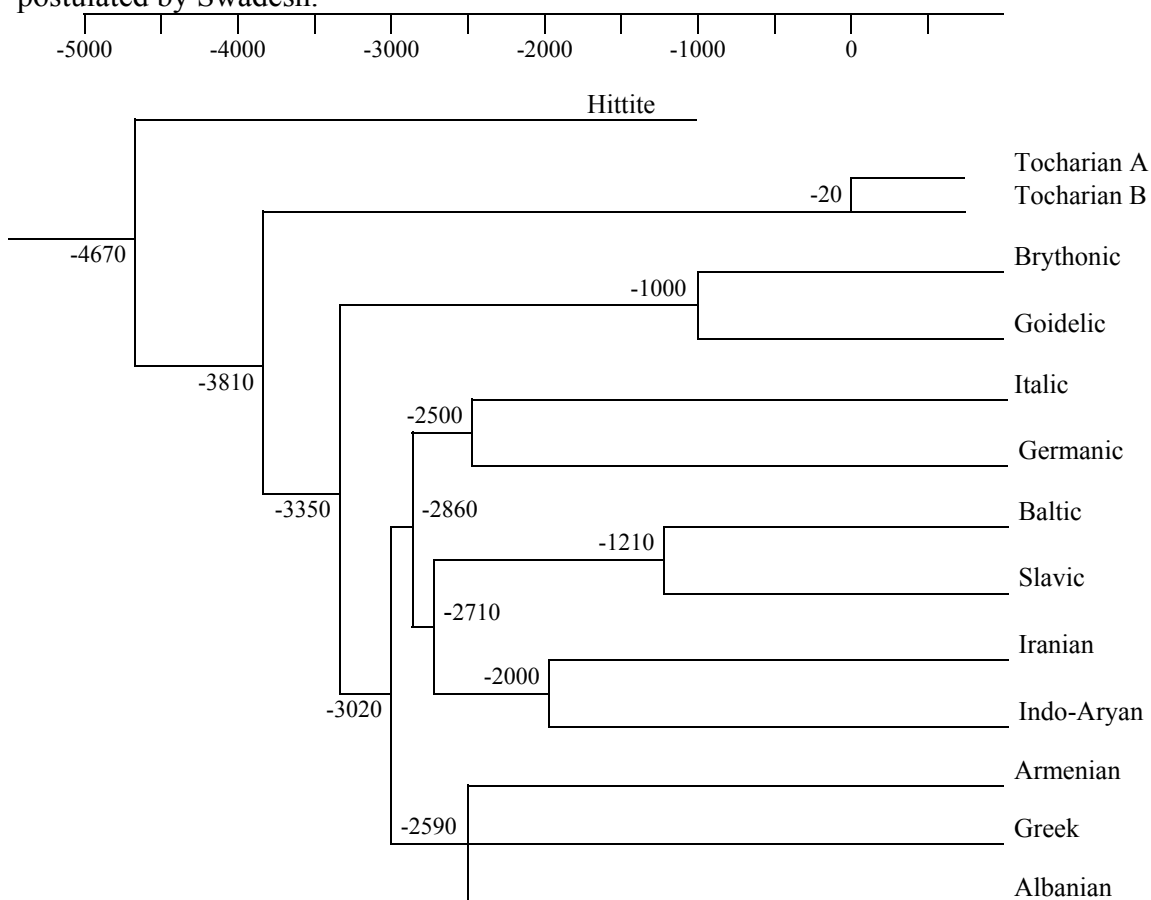
0.4. Eric Hamp proposed his original model of the Indo-European disintegration, including the relic idioms, based on specific isoglosses in phonology, morphology and lexicon (1990):



0.5. As the illustration of a realistic application of cladistics can serve D. Ringe, T. Warnow & A. Taylor (2002, 87):

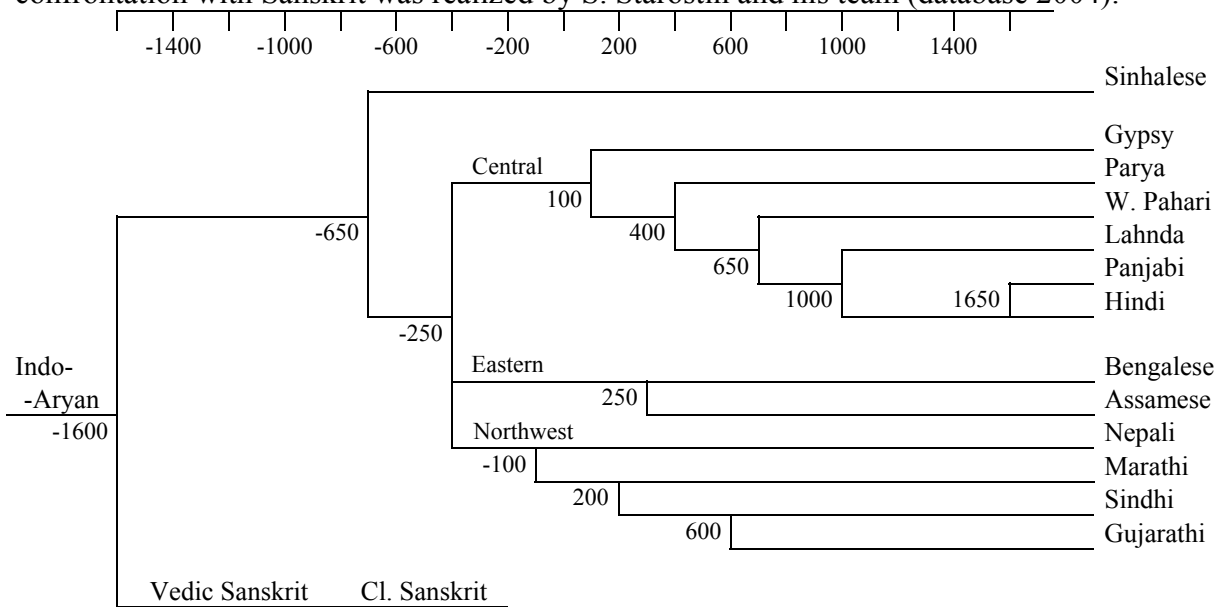


0.6. The absolute chronology is available only thanks to glottochronology. The most recent result of Sergei Starostin (*Workshop on the chronology in linguistics*, Santa Fe 2004) applies his own model of the ‘recalibrated’ glottochronology, where all borrowings are excluded before any calculation and the coefficient of changes is empirically recounted to 5% per millennium instead of 14% postulated by Swadesh.



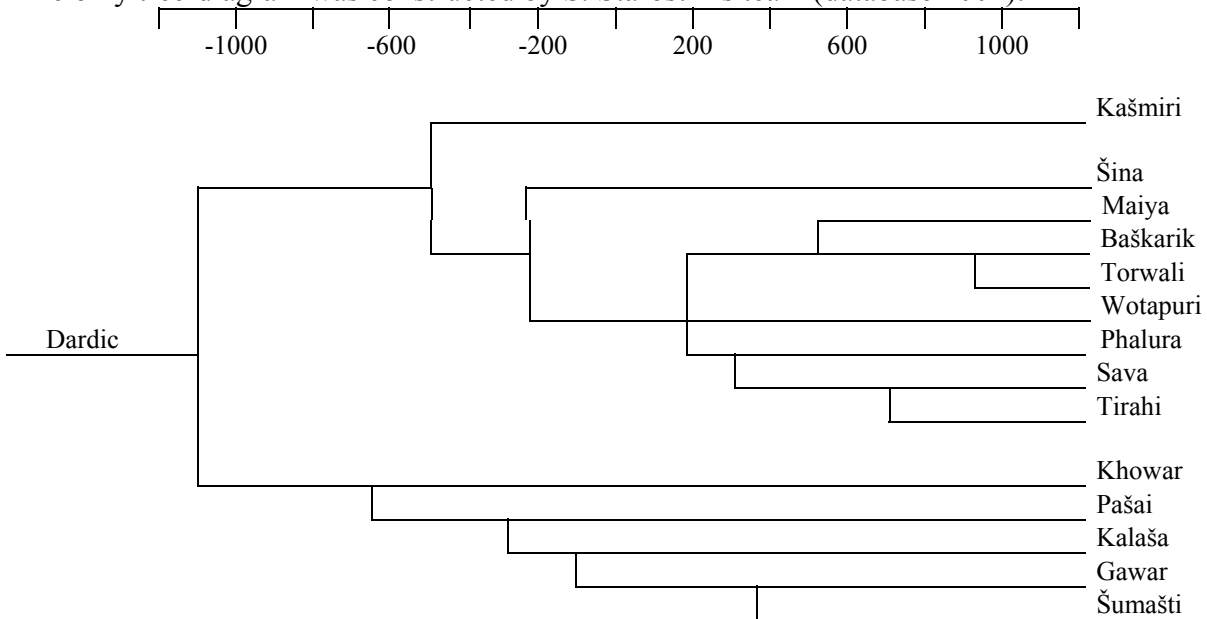
1. Indo-Aryan

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



2. Dardic

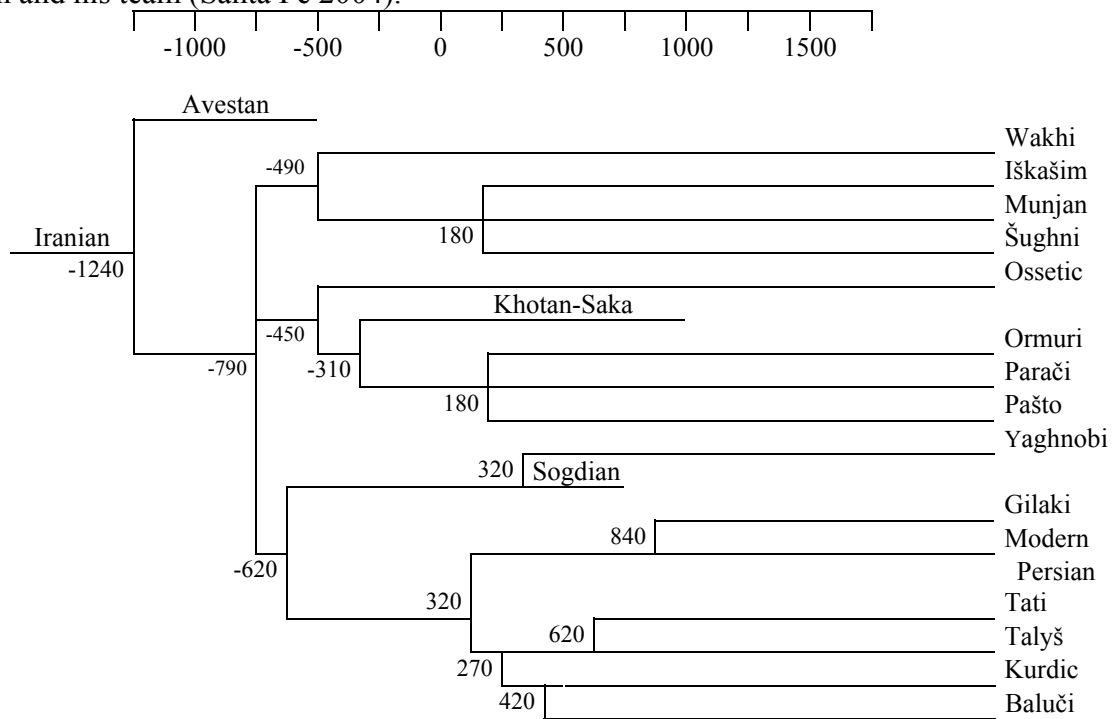
The only tree-diagram was constructed by S. Starostin's team (database 2004):



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

3. Iranian

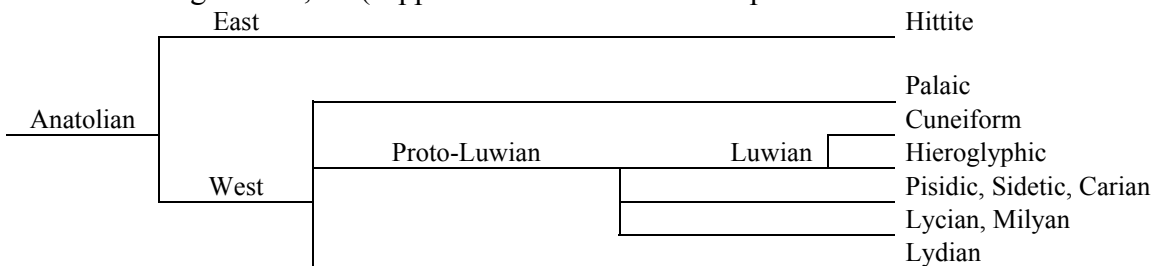
The only attempt to construct the tree-diagram for the Iranian languages was realized by S. Starostin and his team (Santa Fe 2004).



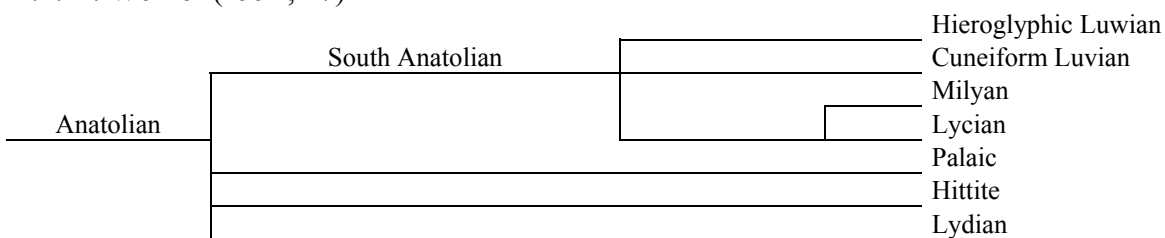
4. Anatolian

With exception of Hittite no Anatolian language allows to apply glottochronology for our limited knowledge of their lexical corpora. That is why the existing classifications are based on combinations of phonological, morphological and lexical isoglosses. In the recent time these three alternative models of the internal classification of the Anatolian languages were proposed.

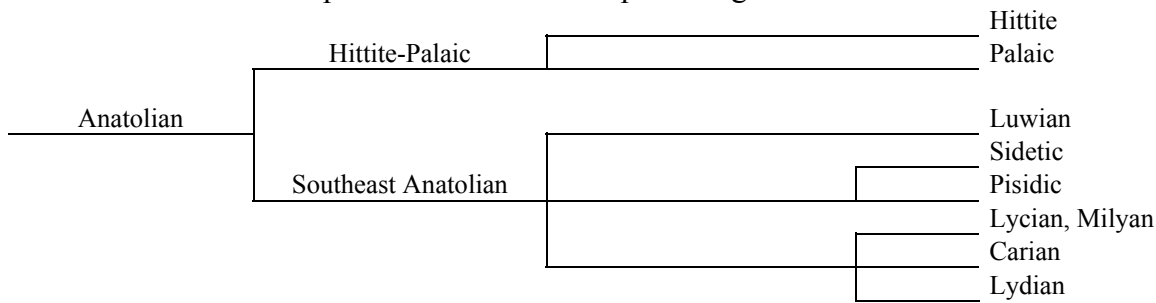
4.1. N. Oettinger 1978, 92 (supplemented on the basis of personal communication in 2001):



4.2. R. Werner (1991, 17)

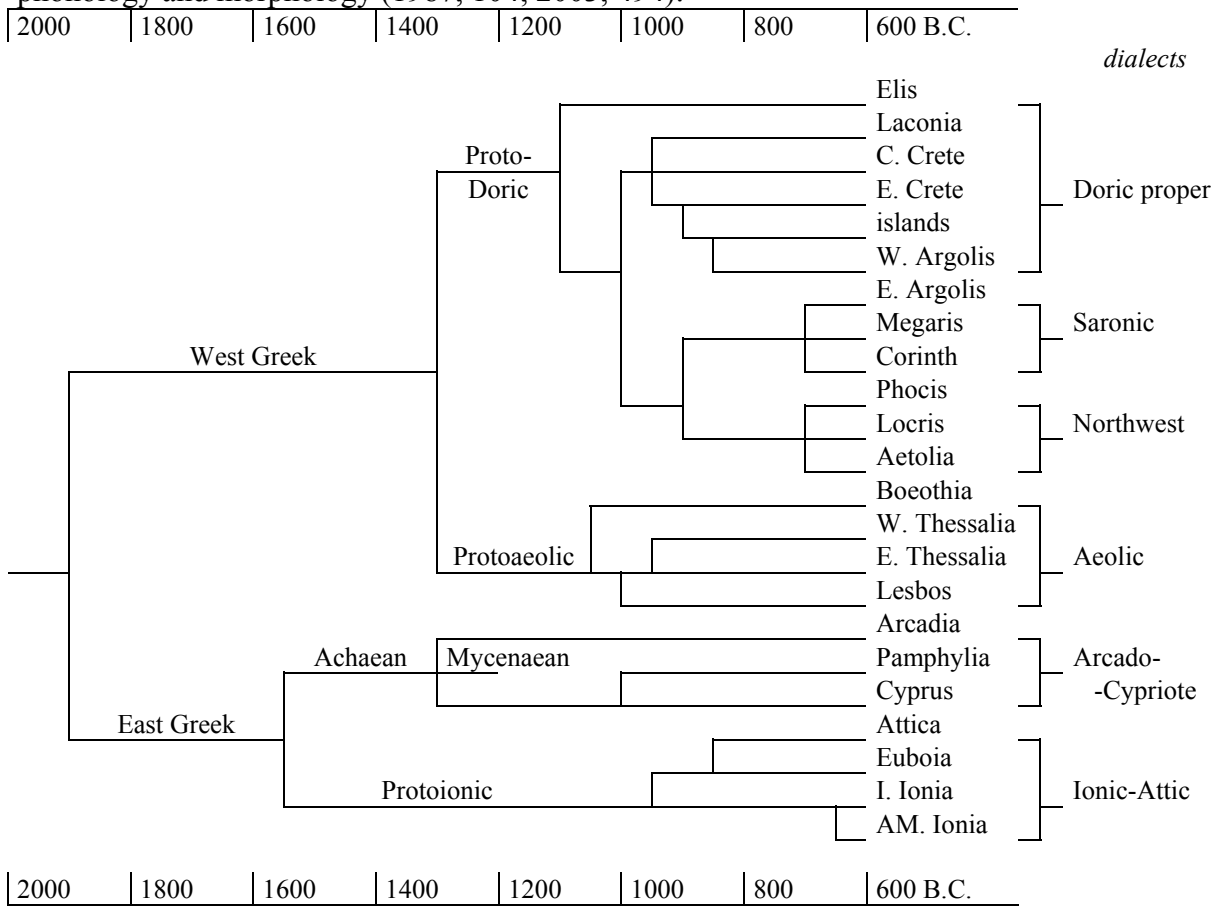


4.3. C. aan de Wiel <<http://iiasnt.leidenuniv.nl/pie/ielangs/anatolian.html>>



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.

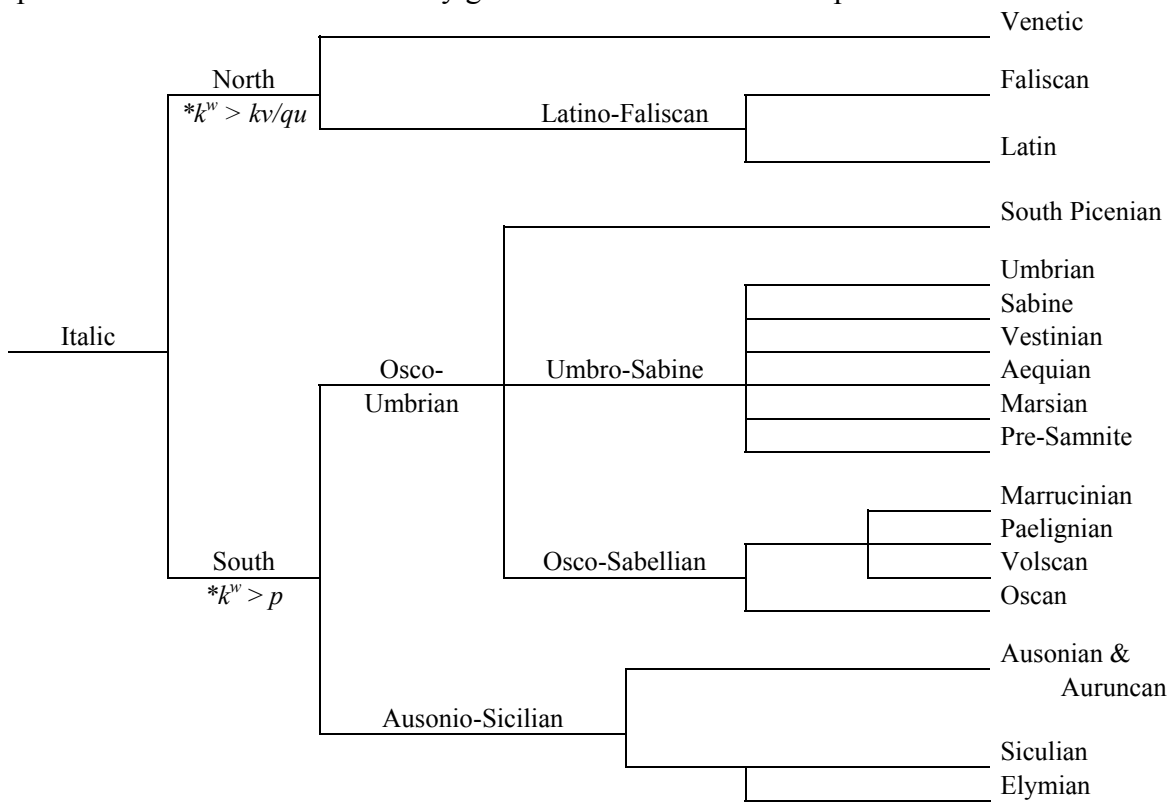
Note: Greek can be classified as one of the **Hellenic** languages, together with Phrygian / Brygian, ancient Macedonian, and perhaps also Messapic, if the hypothesis of M. Huld (1995, 147-55) is accepted. Unfortunately, the lexical corpora do not allow any quantification.

6. Paleo-Balkanian

Extremely poor data and their ambiguous interpretations lead to various hypotheses. The present author finds as probable following: In Prehellenic = Pelasgian the *Lautverschiebung* operated; the language was of the *centum*-type (Hamp) rather than of *satem*-type (Georgiev). If Thracian & Bithynian were *satem*-languages with *Lautverschiebung*, their closer relation with Armenian is expectable (so Kortlandt 1988). Albanian is a descendant of Illyrian, both the *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

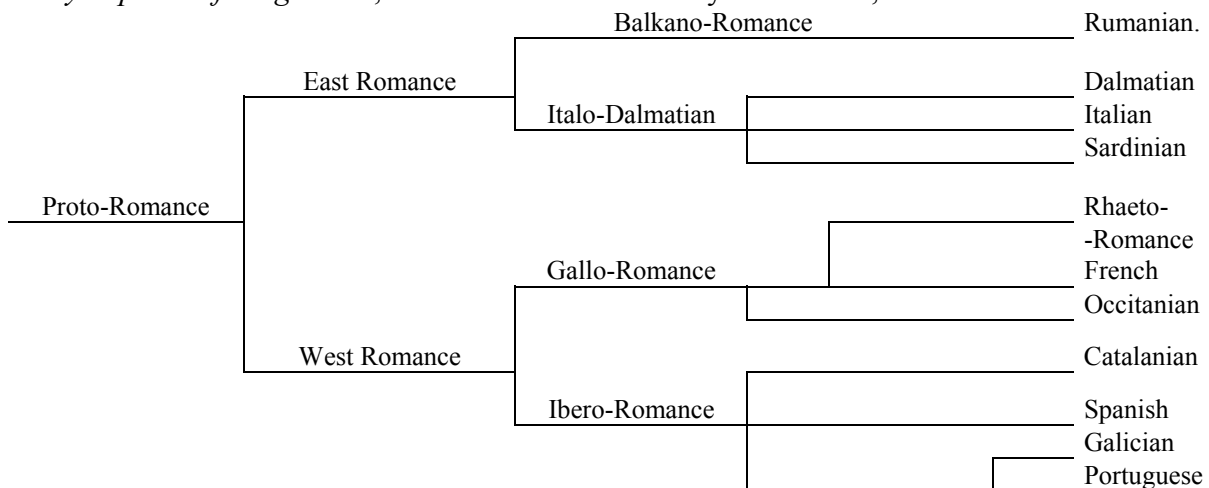
7.0. For ancient Italic languages the application of glottochronology is not possible, because their lexicons are very limited, naturally with exception of Latin. For this reason the following hypothetical classification is based only on unique common features in phonology, morphology and sporadically in lexicon (Coleman 1986). Older classifications see Wallace (1984, 149-51). The present model does not reflect any grade of a mutual relationship.



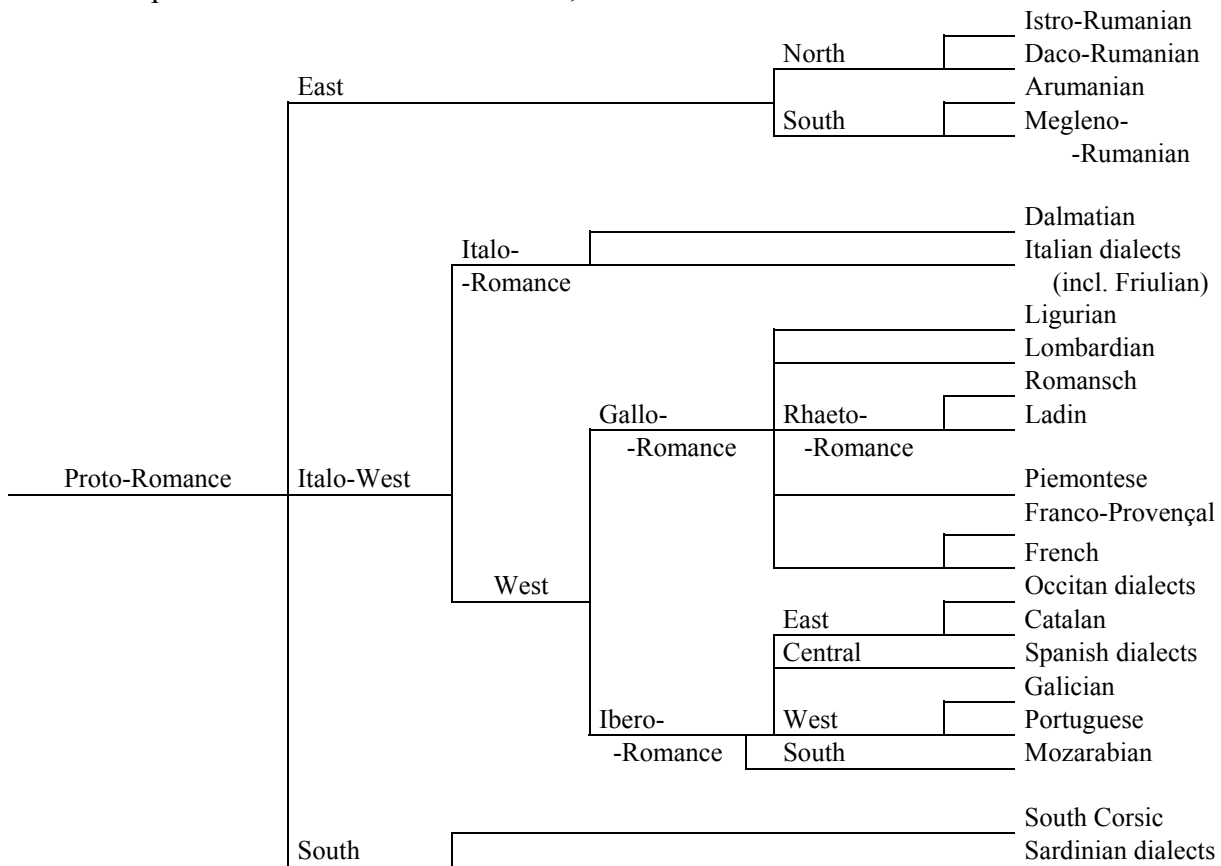
7A. Romance

On the other hand, the lexical material of the Romance languages served for determination of the basic constants in glottochronology. Let us confront several models of their disintegration:

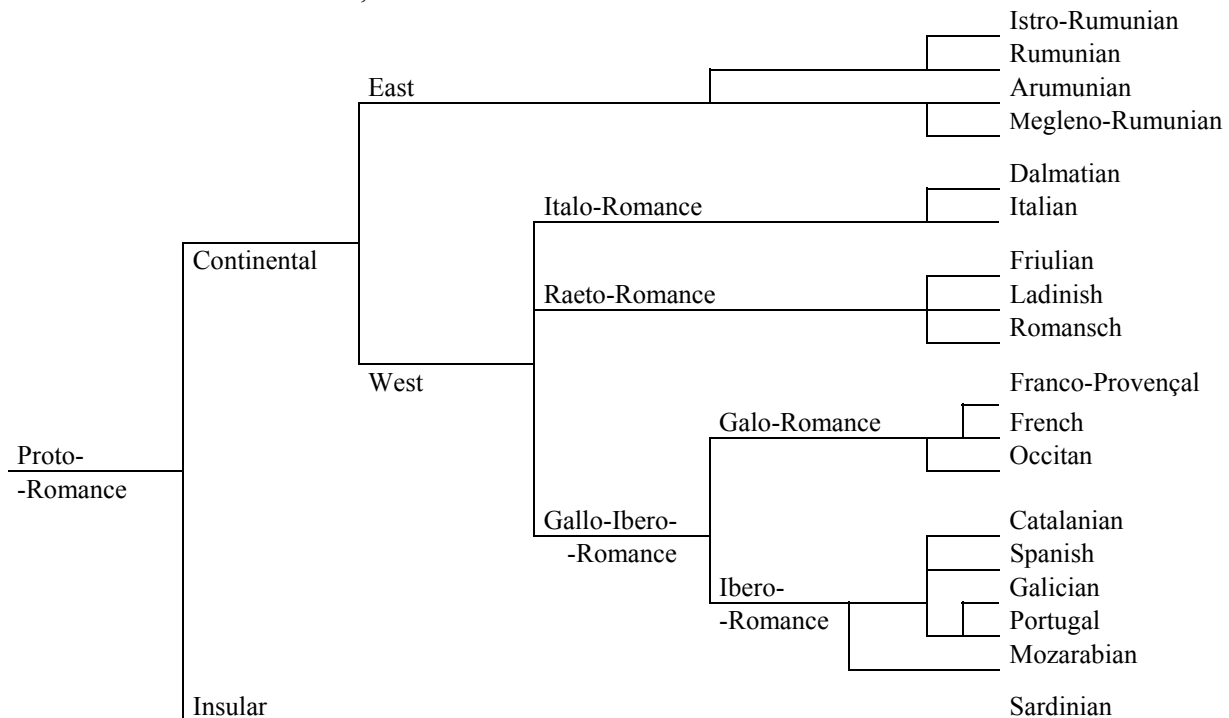
7A.1. Suzanne Fleischman. The Romance Languages, in: William Bright (ed.), *International Encyclopedia of Linguistics*, vol. 3. Oxford: University Press 1992, 339



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

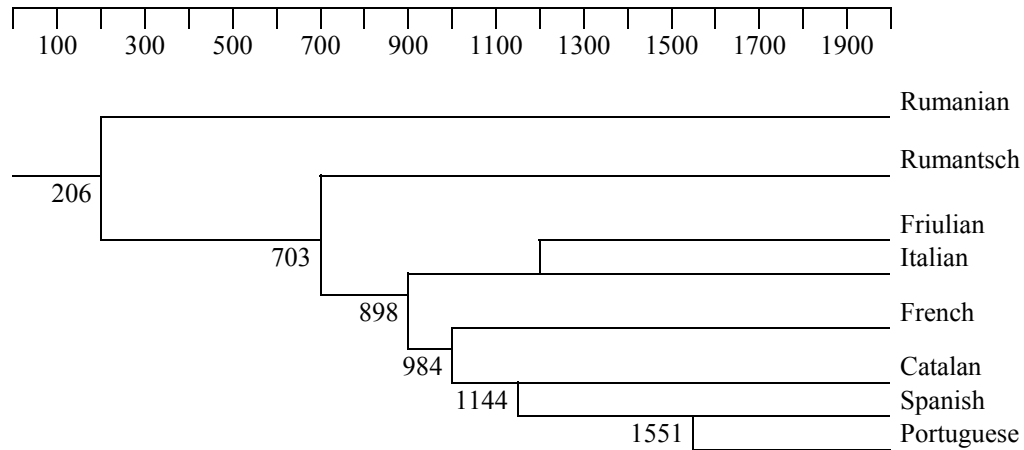


7A.3. Merritt Ruhlen 1987, 326:

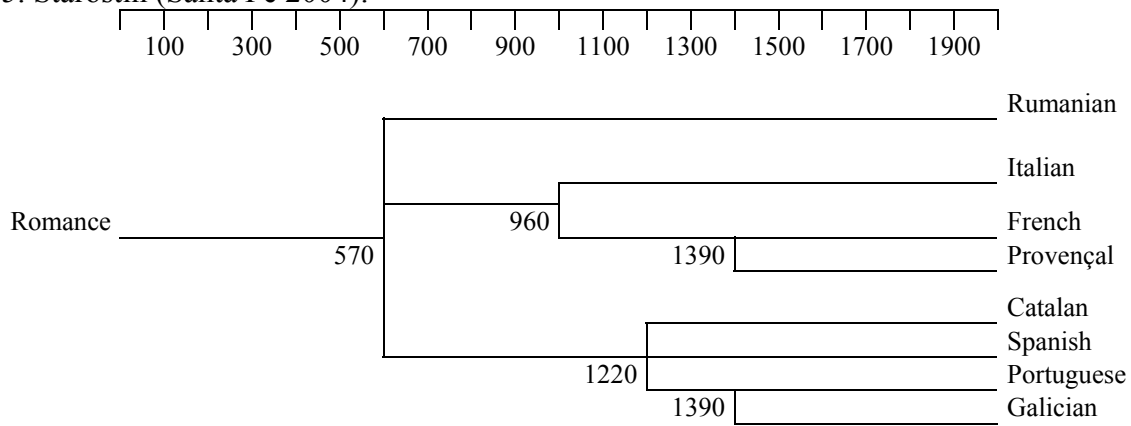


7A.4. It is natural that glottochronology was also applied for Romance languages. Let us confront two attempts from the recent time:

Embleton (1986, 142):



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

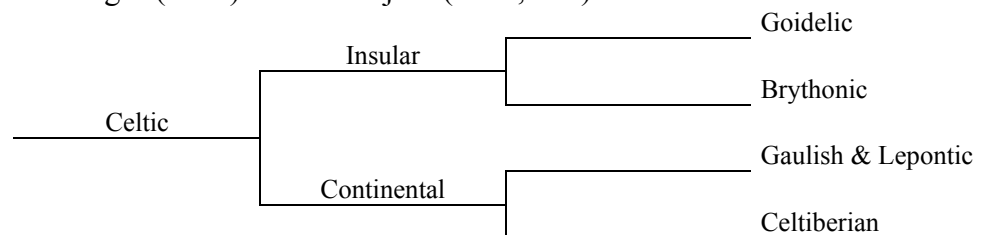


8. In the area between Italic and Celtic there were at least two relic languages which could form a closer unit in the genealogical sense: **Ligurian** and **Lusitanian**, former reconstructed on the basis of proper names attested by classical authors in northern Italy, latter known from several inscriptions written in the Latin alphabet, discovered in south Portugal and Spain.

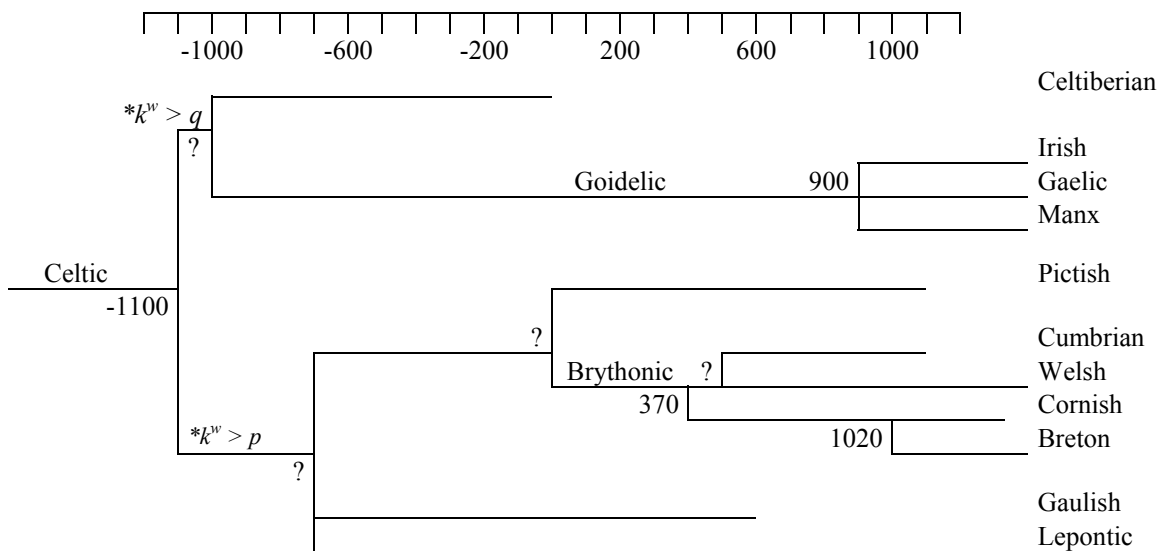
9. Celtic

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).



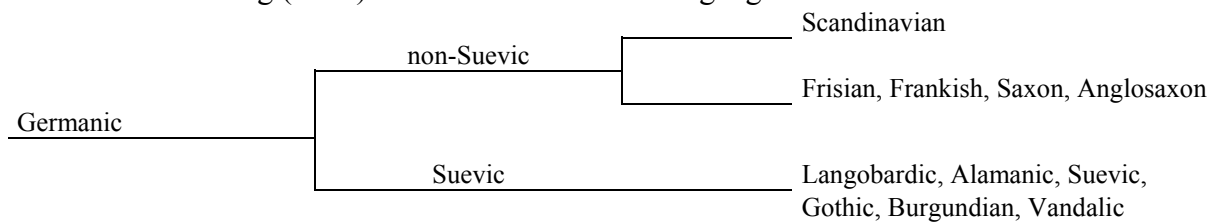
9.2. The alternative and more traditional model is based on the *q/p*-isogloss in the reflexes of the Indo-European labiovelar **k^w*. The figures for living languages (plus Cornish) and the age of the divergence of Goidelic vs. Brythonic were calculated by S. Starostin and his team (Santa Fe 2004).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



10. Germanic

The best summarization of 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:

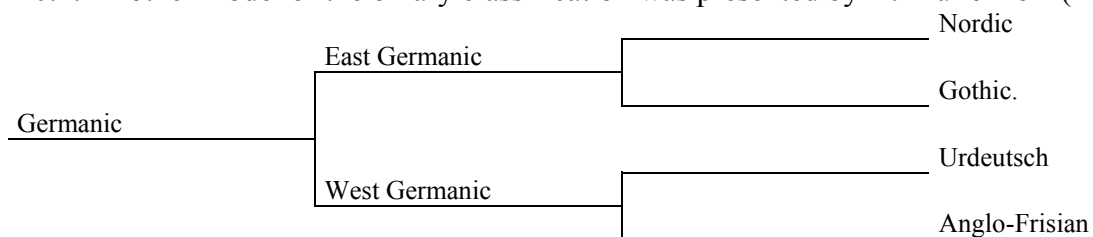


10.2. Similarly J. Grimm (1819) operated with the binary classification. For some of the tribal dialects he supposed the transit character, viz. Frisian & Anglian (1-2), Frankish (2-3), Quadic & Marcomanic (3-4). Alternatively he assumed the opposition of East Germanic vs. others.

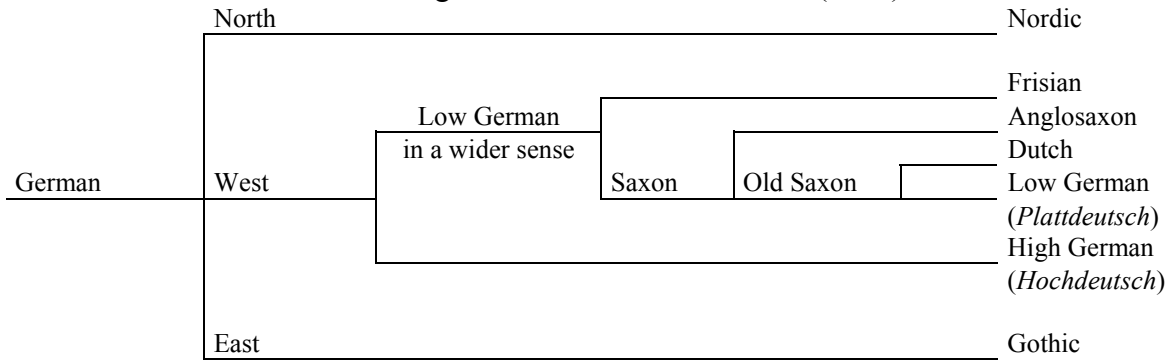


10.3. Applying his original method based on the lexicostatistic analysis of parallel texts, Mańczak (1992) formulated a similar conclusion. He ordered the languages decliningly according their relationship with Gothic: the closest has to be Old High German, further Old Saxon, finally Scandinavian languages.

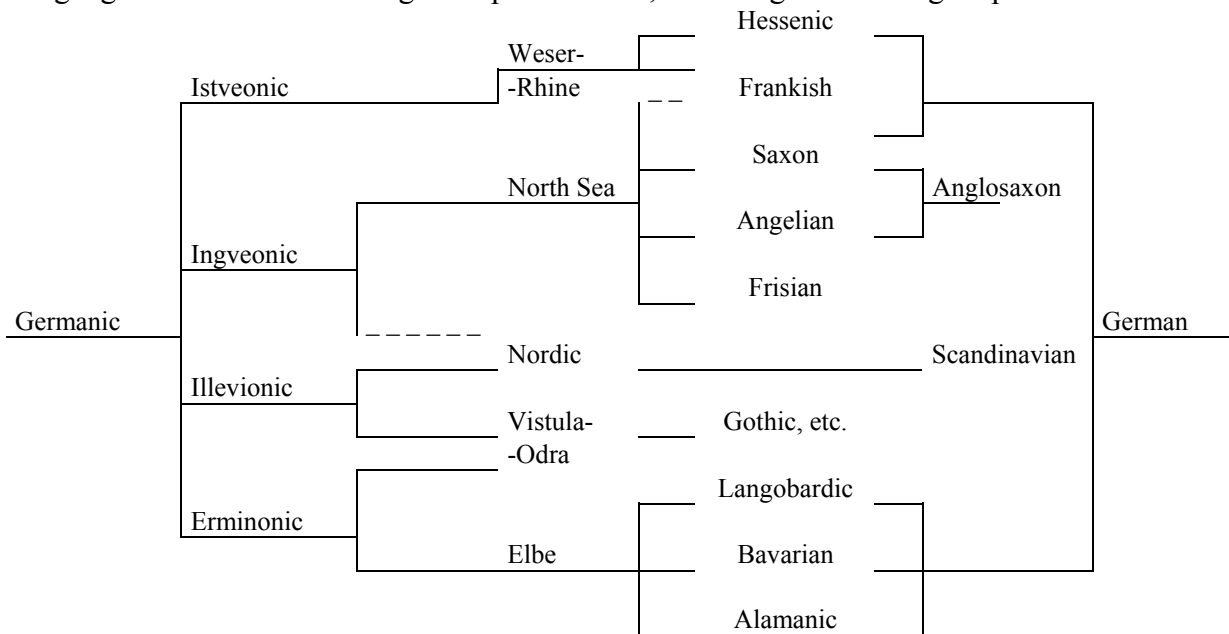
10.4. Another model of the binary classification was presented by K. Müllenhoff (1898):



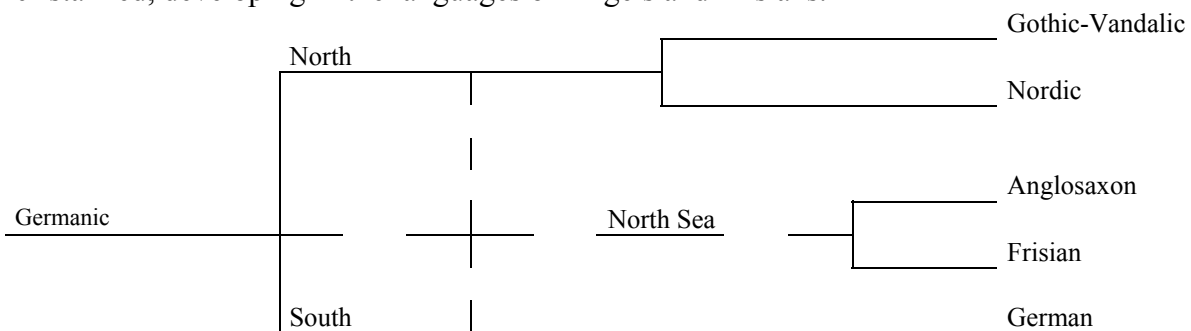
10.5. The most frequent model divides the Germanic languages into three branches: East, North and West. The author of the following classification is J. Schmidt (1860):



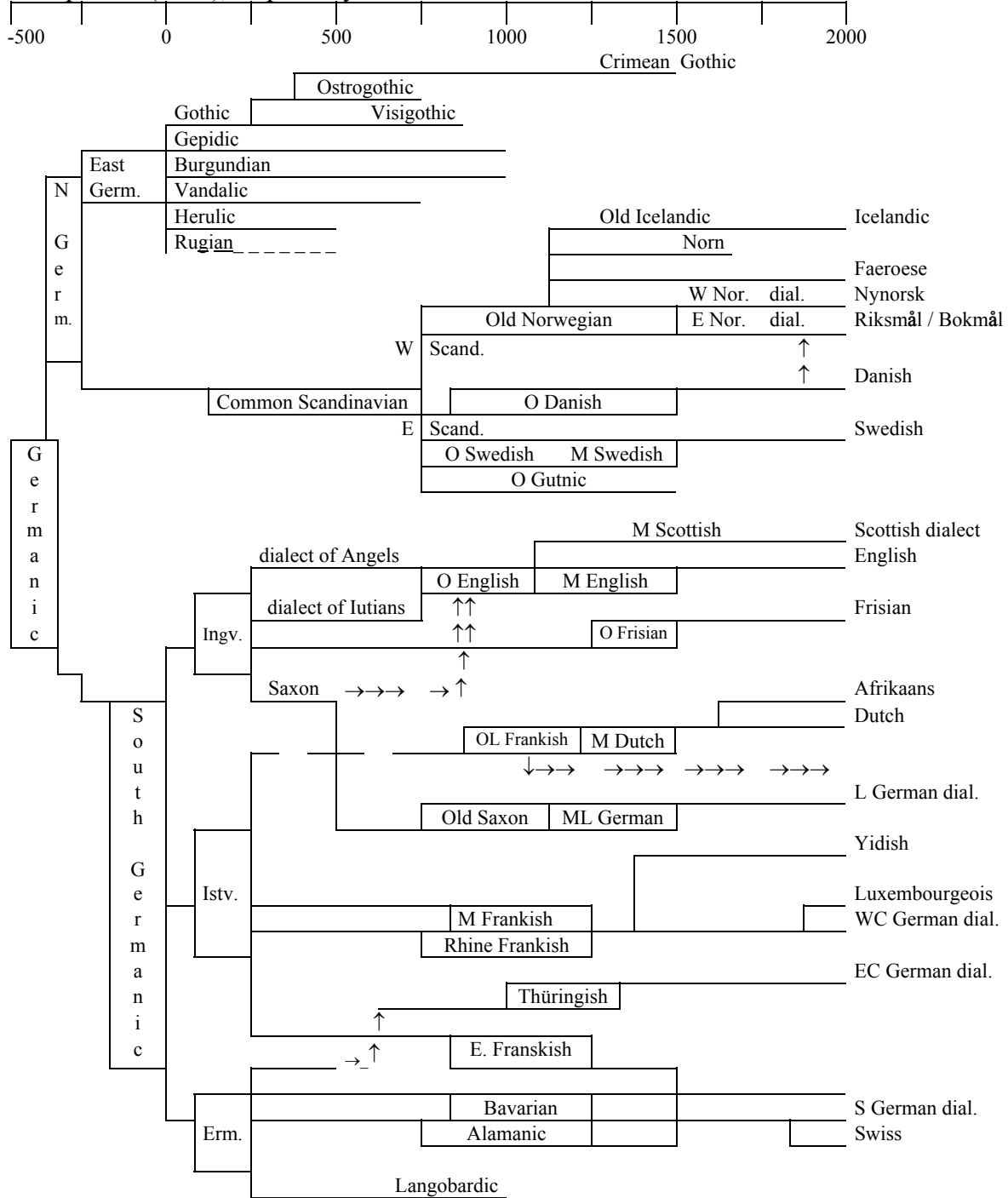
10.6. F. Maurer (1943) tried to depict the development from the tribal Germanic dialects to the languages of the late middle age and present time, including the convergent processes:



10.7. E. Schwarz (1951) assumed that c. 200 B.C. the Germanic language continuum was already divided into the North zone, generating the later Scandinavian languages and Gothic, and the South zone, where the later German dialects were formed. About 4 cent. later the third, transit zone, cristalized, developing in the languages of Angels and Frisians.

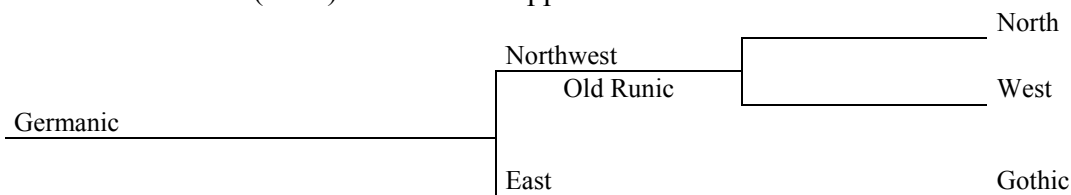


10.8. The most detailed scheme of the development of the Germanic languages was proposed by T.V. Toporova (2000), inspired by Maurer and Schwartz:

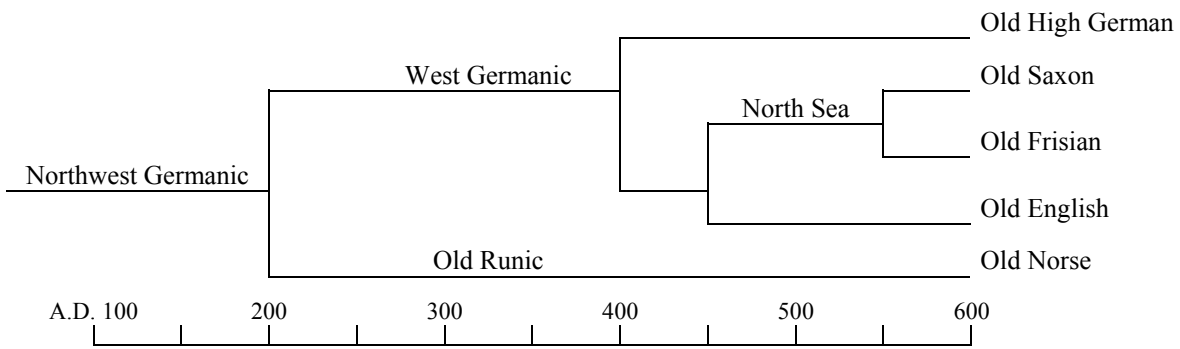


Abbreviations: C Central, dial. dialect, E East, Erm. Erminonic, Germ. Germanic, Ingv. Ingeveonic, Istv. Istveonic, L Low, M Middle, Nor. Norwegian, O Old, S South, Scand. Scandinavian, W West.

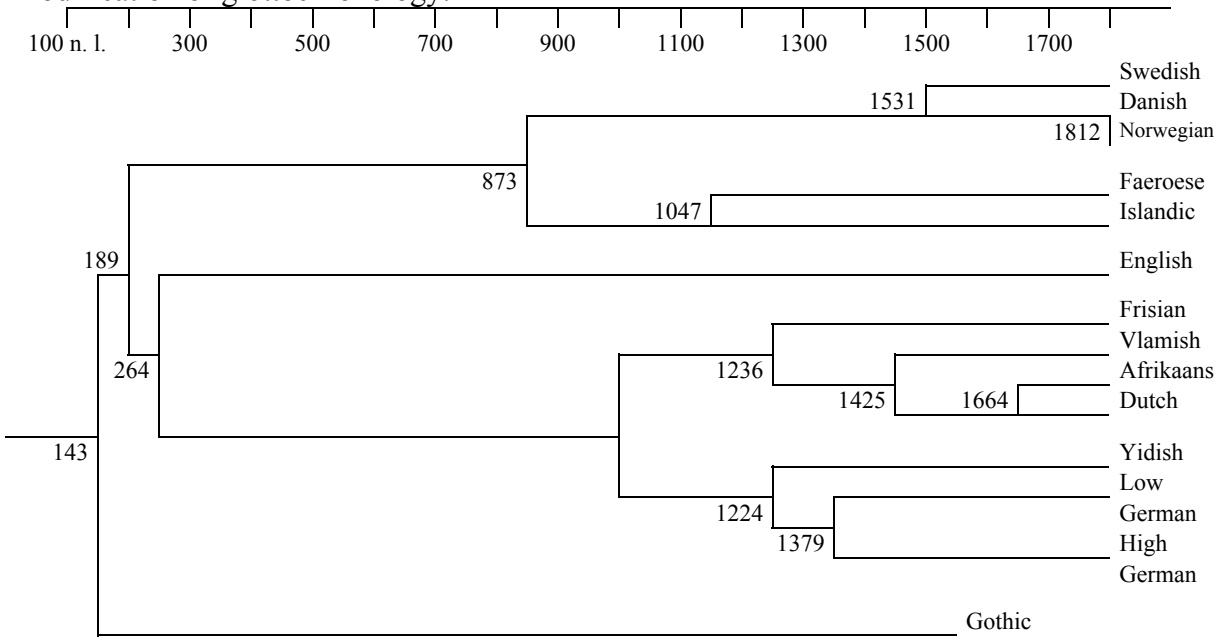
10.9. E. Antonsen (1975) assumed the opposition of the east and northwest branches:



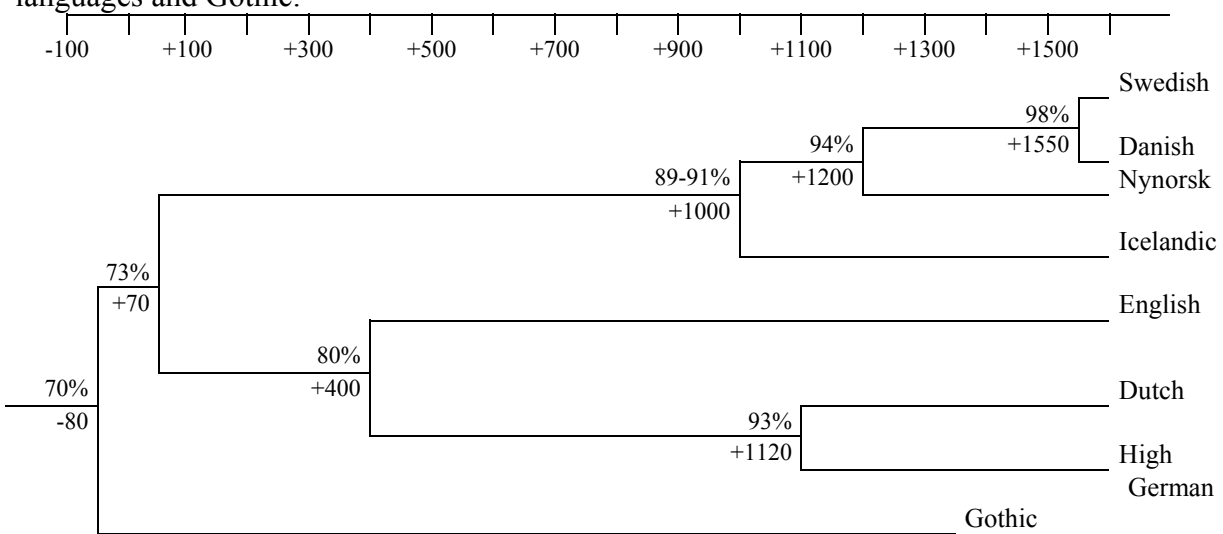
10.10. H. F. Nielsen (2000) returned to the traditional idea, identifying in Old Runic a direct ancestor only of the Scandinavian languages:



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

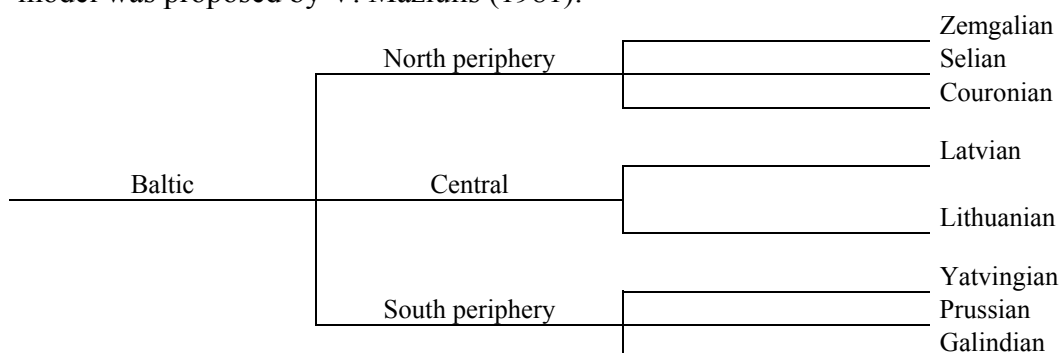


10.12. The most recent attempt to classify the Germanic languages was published by Starostin & Burlak (2001, 82-105). They applied Starostin's recalibrated glottochronology for 7 literary living languages and Gothic.

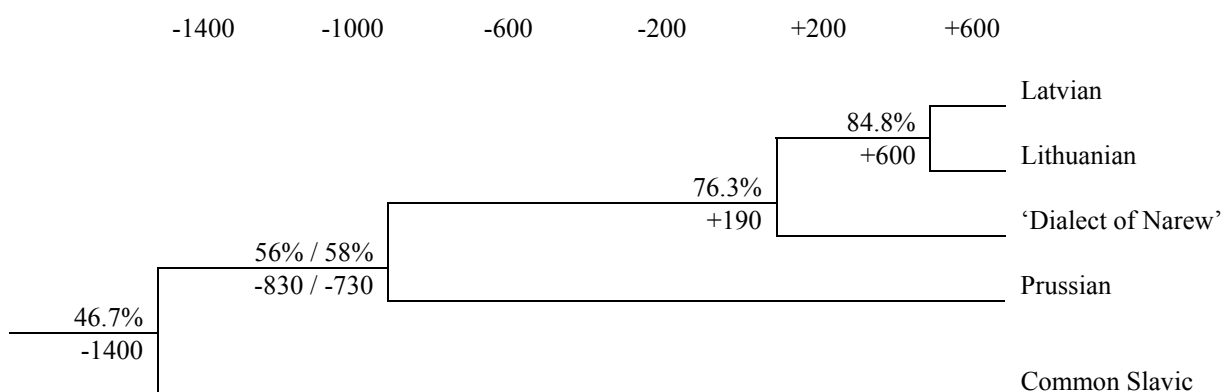


11. Baltic

According to tradition, the Baltic languages are divided into the west part represented by Old Prussian, from c. 1700 extinct, and eastern part, 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):



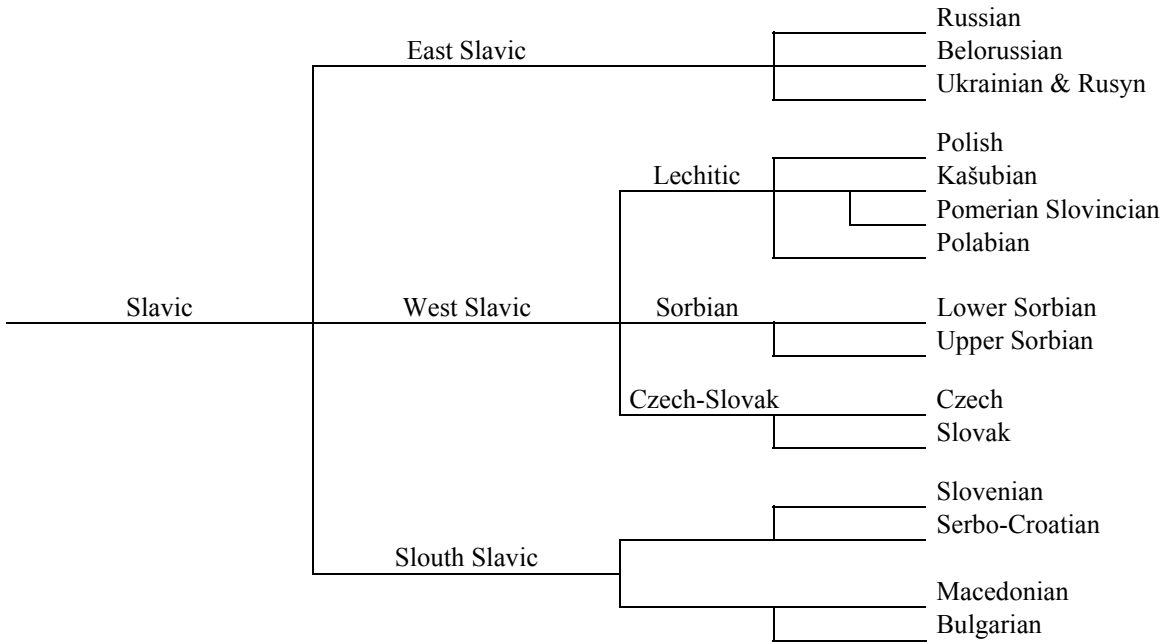
The first serious application of the classical glottochronology was used by Lanszweert (1984, xxxii-xxxvii), who has found 58,6% for Prussian vs. Lithuanian and 55,2% for Prussian vs. Latvian. The results of Girdenis & Mažiulis (1994, 9) are lower: 68% Lithuanian vs. Latvian, 49% Lithuanian vs. Prussian, 44% Latvian vs. Prussian. Starostin (Santa Fe 2004 and p.c., June 2005) dated the separation of Lithuanian and Latvian to 80 B.C., Lithuanian and the ‘Dialect of Narew’ to 30 B.C., Latvian and the ‘Dialect of Narew’ to 230 B.C. The position of Prussian in his calculations is rather strange, it has to be closer to Slavic than to Baltic. Novotná & Blažek (forthcoming), calculating the synonyms too, have reached the following results:



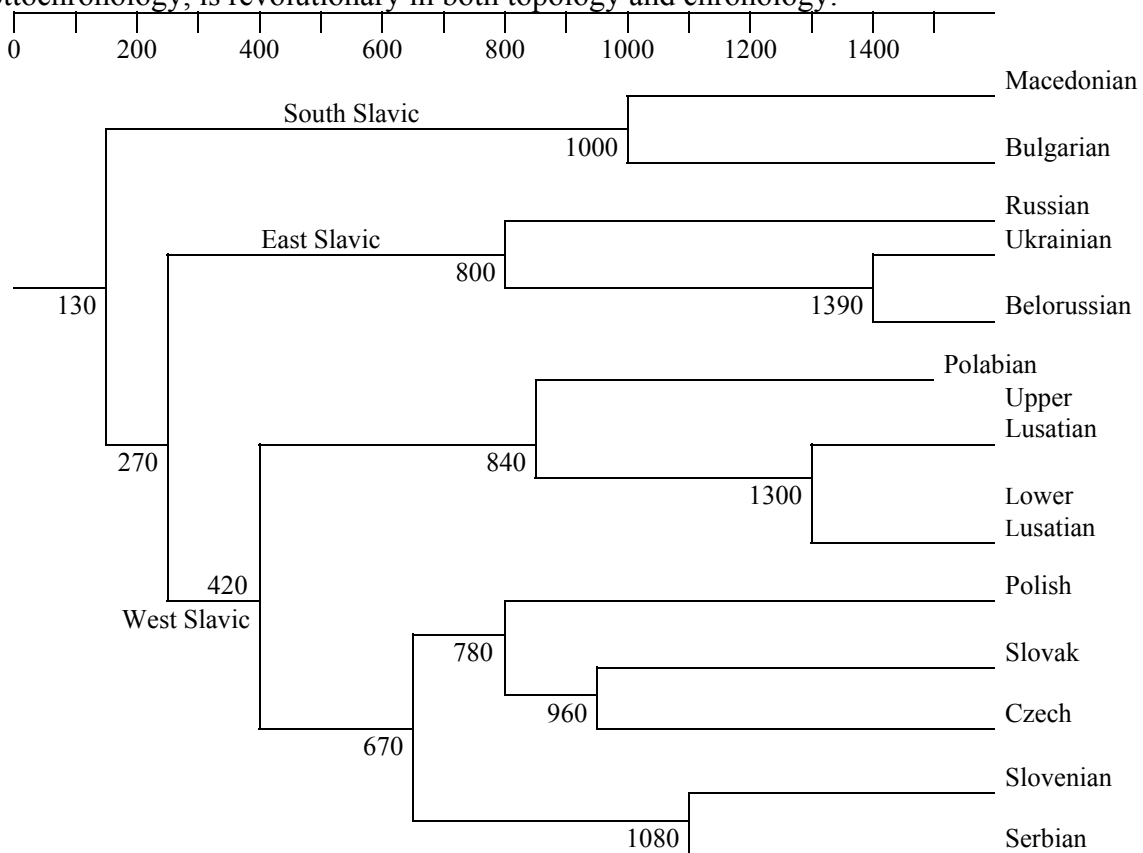
The double-result 58/56% for Prussian vs. other Baltic languages reflects the calculation without / with the ‘Dialect of Narew’. The score 43% between Prussian and the ‘Dialect of Narew’ (*Pogańskie gwary z Narewu*; see Zinkevičius 1984) in confrontation with 62% and 55.2% for Prussian vs. Lithuanian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

12. Slavic

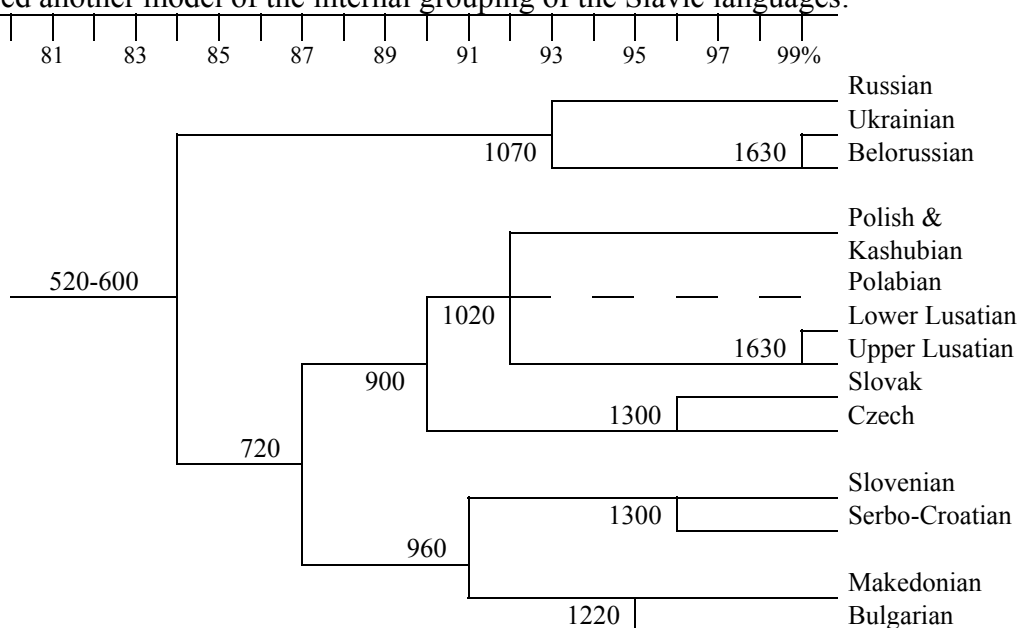
12.1. According to the traditional model the Slavic languages are divided into three parts (cf. e.g. J. & B. Grimes 1996, 58):



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



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



Comments.

The present choice is only illustrative, not exhaustive. The biggest controversy occurs in the case of the relic languages, where our knowledge especially of their lexicons is only 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 here confronted: [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, Taylor (2002), demonstrating the cladistic approach, and [0.6.] Starostin (2004), using his modification of the recalibrated glottochronology. Ringe, Warnow & Taylor were chosen for their ability to apply highly sophisticated mathematical methods for 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 in the same time (Gray & Atkinson 2003; Rexová, Frynta & Zrzavý 2003) only the mathematical approaches are accented. The results of both teams - the absolute dating of the beginning of the divergence of the Indo-European languages to the 9th mill. BP implies at least 5 millennia of the independent development before the first literary fixation of such languages as Hittite, Palaic, Luwian, Vedic, Avestan and Mycenaean Greek in the 4th mill. 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: $t = \sqrt{(\ln c) / \sqrt{-2\lambda \ln c}}$, 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 testing basic 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 mill., 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 7th mill. BP, i.e. 2 mill. 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 not easier, but paradoxically still more controversial. Let us confront e.g. 3 quite different classifications for the Anatolian branch, 5 for the Romance languages and 12(!) for the Germanic languages, although the

models of [10.9] Antonsen, [10.11] Embleton and [10.12] Starostin in principle reflect the same topology, although Antonsen worked especially with the phonological and morphological isoglosses, while both Embleton and Starostin developed everybody her/his own modification of glottochronology. In the case of the Slavic languages the situation is not more idyllic, 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 for the Slavic languages, Starostin [12.2] reached the results which were too old and too controversial in confrontation with the results of classification based on phonological and morphological criteria. But when the present author and his co-author Petra Novotná [12.3] did the only little correction in the method of Starostin, namely the 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 confrontation with his ones and the solution based on the inclusion of synonyms was fruitful.

Summing up, confronting the various methods of the genetic classification and their results, the following conclusions could be formulated:

- 1) The conclusions expressing the relative or absolute grade of the genetic relationship between two or more languages cannot be formulated without the quantitative approach.
- 2) Any calculation of the linguistic phenomena serving to demonstration of the genetic links or their grade 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 the genetic affiliation, e.g. in the case of the relic languages known only from stereotyp 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 the 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, etc., the probability of such the model grows.

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

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