Book Review

Thomas Olander (ed.). 2022. *The Indo-European language family: A phylogenetic perspective*. Cambridge: Cambridge University Press, pp. xvi + 298. ISBN: 978-1-108-49979-8.

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This volume grew out of a workshop held in Copenhagen in February 2017, "The Indo-European family tree", organized by Thomas Olander who invited scholars to discuss "methodological issues and the phylogenetic relations of each of the main Indo-European subgroups" (p. 2). Some chapters represent the written versions of the contributions to the workshop, others have been added by invitation to the book project. The first four chapters deal with questions of the methodology of reconstruction and phylogenetic analysis, followed by chapters discussing the individual established or supposed subbranches of the language family and the features speaking in favour of subnodes. The impulse for the workshop were the recent computational approaches to linguistic phylogenetics working either with datasets including phonological and morphological features and some basic vocabulary items (e.g., Nakhleh et al. 2005; Ringe et al. 2002) or exclusively with lexical data using Bayesian methods (e.g., Bouckaert et al. 2012; Chang et al. 2015; Gray and Atkinson 2003). The volume does not reflect these studies themselves, but presents surveys of the traditional comparative method and a discussion of the possible contribution of computational methods to the reconstruction of language families. The authors of these chapters do not advocate the substitution of one for the other, but rather argue for a complementary use of both. As the editor states in his introduction (Chapter 1), the book "may be seen as a traditionalist reaction to modern computer-assisted approaches to linguistic Indo-European phylogenetics" (p. 3) which, according to him, have been hampered, at least in the case of Indo-European languages, by erroneous data and/or a bad choice of data which led to unreliable results. Also the technical language in which some such studies are couched have made them difficult to judge by non-computational linguists. Hence, their impact on Indo-European studies has been limited. The editor is convinced that "traditional approaches still have a lot to offer" (p. 3). However, it must be said that since no new data are available, many of the chapters in the book present well-argued points of view, but not positions that have not been argued for already in the past. While one can certainly agree with the editor's statement in the introduction (pp. 14–15) that "if we are able to obtain a relatively solid picture of the higher-order subgrouping of the

Indo-European language family, the family tree may serve as vital means of solving problems of Indo-European reconstruction. Any reconstruction should be evaluated in the light of the family tree", it is precisely the question of these higher-order subgroupings that have proved to be most difficult to reconstruct, and the papers in this volume are not exempt from this, as can best be seen in the various scenarios proposed for the prehistory of Greek, Armenian, Phrygian, and Albanian. The problem obviously remains as long as we lack further data that might help in deciding in favour of one of them.

In Chapter 2 "Methodology in Linguistic Subgrouping", James Clackson reviews early discussions about subgrouping, starting with Schleicher (1861) "who included a schematic *Stammbaum* at the beginning of his *Compendium* (1861: 7) although there was no explanation of how the groupings had been arrived at" (p. 19). The work of the neogrammarians such as Delbrück and Brugmann (Brugmann 1884) provided the basic insights still valid today, i.e., the principle of the "common innovation" as relevant criterion as against common archaisms or retentions, irrelevant for establishing subgroups, and the caution to be taken with lexical items since they can be borrowings. Beyond this background, it is surprising that in a number of papers in the volume lexical items feature prominently as arguments in favour of a certain subnode and also common loss of a feature is often adduced as an argument. Brugmann assumed two possible subgroups, Indo-Iranian and Balto-Slavic, and as Clackson rightly points out: "It is significant that since 1884 there have been no serious suggestions for some of the higher order groupings proposed seen in Schleicher's family tree, and the Indo-European family continues to be thought of in terms of the branches Brugmann identified" (p. 21). Intermediate groups such as Schleicher's "Graecoitalokeltisch" and "Slawodeutsch" have disappeared from the scholarly debate. Clackson then proceeds to discuss two basic problems connected to the question of shared innovations: (1) the assessment of what counts as such; (2) ways to avoid "false positives", that is, apparent shared innovations which actually arise by chance or through language contact. As for (1) he argues that shared innovations that are easiest to recognize are mergers in phonology (mergers cannot be undone) and that phonology and morphology are easier to handle than semantics and the lexicon in general, e.g., the rise of new inflectional categories or the merger of inflectional categories. As for (2), he points out that identical innovations may occur in separate languages, e.g., due to language contact. Already Meillet (1908: 10) pointed out that it is vital to set up a relative chronology of changes "in order to determine which shared developments are common shared innovations and which are not". When the data are not sufficient to establish a relative chronology, researchers frequently resort to language typology in order to see whether a certain change is frequent in general and hence probably not a diagnostic for shared innovations. The question of how many innovations are necessary to set up a subgroup is left open (to

the reviewer's mind, one undisputable case is sufficient). Beside classical tree models Schmidt's wave model from 1872 emphasised dialectal differences already in the proto-language, probably, e.g., in the use of oblique case endings with either *-b^h-* or *-m-*, the latter in Germanic, Baltic and Slavic, which do not per se form a higher node on the tree: "the supposition of a 'dialectal' Proto-Indo-European could help explain the existence of a small number of exclusive and significant innovations shared between two or more branches, and also the overlapping nature of these agreements, so that some features might be shared between Germanic and Balto-Slavic, and others between Balto-Slavic and Indo-Iranian" (p. 27). However, as Clackson rightly remarks, variation in time and space is difficult to falsify for reconstructed languages. One may certainly assume that a substantial number of Indo-European languages have been lost completely that together with the languages known to us formed a dialect continuum and that innovations may have spread across this continuum now lost to us. This may make it difficult to assess whether a feature is actually an innovation shared by two languages exclusively or whether it spread across the continuum that was later "pruned" by loss of intermediate languages (as argued by Garrett 1999, 2006). However, as Clackson rightly remarks, we cannot operate with the "unknown unknowns", but only with the data we have. Historical linguistics proceeds by inductive reasoning, and "to abandon the whole enterprise of subgrouping because we don't know what we are missing seems a step too far" (p. 29). This survey thus presents a good overview of the methodology and its difficulties despite which the comparative method seems to remain as the gold standard for reconstruction and devising family trees.

In Chapter 3, Dariusz Piwowarczyk discusses "Computational Approaches to Linguistic Chronology and Subgrouping", noting a certain reluctance among historical linguists to use such methods because the way in which results are arrived at are not always clear (as a kind of "black box" phenomenon), and that quantitative approaches such as glottochronology and lexicostatistics have rather increased the scepticism, assuming as they did e.g. constant rates of change in languages, which seems to ignore the contingency of human history. Piwowarczyk therefore rightly stresses that "1. The computer is only a tool and the results yielded will always ultimately depend on the quality of the algorithm, the input data and how they are converted into a machine-readable format (together with all the judgements made by the researchers at this point)" and "2. Research results from using computational methods have to be interpreted, and the method itself is usually meant as a supplement to traditional methods, not a replacement". While historical linguistics looks first at phonology and morphology, computational models usually work most or exclusively with lexical data, which are inherently unreliable. Piwowarczyk reports on various projects relevant for Indo-European studies such as the one on "Computational phylogenetics in historical linguistics" by Ringe, Taylor, Warnow,

and Evans which used 22 phonological, 13 morphological and 259 lexical features as coded characters, and which produced a tree with a "perfect phylogeny" algorithm (cf. Nakhleh et al. 2005) that tracked the branching of twenty-four ancient and medieval Indo-European languages. More controversial has been the study of Gray and Atkinson (2003), using word lists for 87 Indo-European languages and "the algorithms for estimating the divergence time of DNA from evolutionary biology calibrated to the dates of the languages' known split times". The tree generated by this method was in line with C. Renfrew's theory about the Anatolian homeland of Indo-European, while the study by Chang et al. from 2015 which included ancestry constraints such as "Latin is the parent of the Romance languages" pointed rather towards the steppe hypothesis. It seems to be an unresolved question "whether computational methods can give us a reliable chronology of the splits of the individual branches" (p. 38) and what we gain if the trees obtained are more or less a replication of what has been achieved without the computational models. The same problems apply in the case of computerized forward reconstruction, i.e., in the application of the known or assumed sound changes and their relative chronology to a reconstructed form in order to test if the resulting form equals the form actually attested. This then is taken to show that the assumed sound changes and chronologies may be correct. Attempts in this sense started already in the late 1960s (Smith 1969 on Russian) and continue today (e.g. Sims-Williams 2018 on Celtic). Typical problems here are lack of good data and the danger of circularity in coding. More on the practical side, Piwowarczyk is certainly right in pointing out that more publications and datasets with explicit coding, e.g., of sound changes, relative chronologies, etc. of the individual languages are needed in order to improve the modeling of language change (cf. e.g. for the coding of features List 2017). He also advocates studies including morphology and proposes a database complete with all sound changes and morphological innovations assumed for the Proto-Indo-European daughter languages. This, he argues, could then be used as a testing tool also for the morphology of the Proto-Indo-European daughter languages, help in assessing the probability of assumed analogical changes, etc. Working with computational models has, as Piwowarczyk points out, certainly the advantage that it forces scholars to be explicit about their data and their decisions, in annotating them, etc. Apart from the possible gains from computational models, this would in itself be a welcome contribution from this field of research to Historical linguistics in general, irrespective of whether there is (or will be) a "quantitative turn" (p. 47).

A similarly cautious position is taken by Don Ringe in Chapter 4 "What We Can (and Can't) Learn from Computational Cladistics" which focusses rather on the limits of this method. Cladistics, he argues, can be seen as the inverse of outgroup analysis: the latter takes the genetic tree for granted and tries to figure out the changes that have led to the attested forms, while the former takes the changes for granted and

tries to figure out the tree that best fits them, often by the criterion of "maximum parsimony", i.e., "the optimal tree is the tree on which the smallest number of individual changes is required to account for the observed data" (p. 53). However, this requires automation, since the number of possible trees rises massively with the number of languages. Ringe points out the well-known problems with the data: there may be parallel semantic developments, undetected borrowings, recurrent and hence probably independent phonological and morphological change, etc. As an example of "good" data Ringe takes the combined sound changes in Germanic (cf. also Ringe 2012) including Grimm's law and Verner's law and calculates the likelihood that this combination may occur by chance and in that sequence both as 0.00009. Hence, as most scholars would agree, these events happened only once and only in Proto-Germanic. Usually, however, data are not that good, either, as Ringe argues, the "diversification of a family of languages simply hasn't been treelike" (p. 57), hence there is no point in producing trees or "there is a treelike signal in the data, but […] it has been obscured by undetectable borrowing between the languages" (p. 58). Apart from these problems with the data, Ringe discusses dubious claims that one can recover the "approximate time in prehistory when each instance of diversification in a tree occurred. The most recent such claim was made by Russell Gray and his coworkers (first in Gray and Atkinson 2003) – and demolished by Andrew Garrett's team at Berkeley (Chang et al. 2015)". The problems with such assumptions are well known and have been extensively discussed: lexical data are "the least reliable for cladistics" (p. 59), the rate of vocabulary replacement does not proceed at a constant rate, and it is impossible to know if and how many intermediate replacements may have taken place. For the discussion about the Indo-European homeland (cf. the remarks on Chapter 3), the decisive step was not cladistics, but new aDNA data (cf. Haak et al. 2015) which showed that "there was a major population incursion from the steppes into Europe in the middle of the third millennium BCE – more or less exactly as the steppe hypothesis had posited – and that the distribution of steppe DNA correlates well with later populations known to have spoken Indo-European languages (see especially Mallory 1989). Those findings are irreconcilably inconsistent with Renfrew's scenario". Ringe rightly concludes that data from all fields must be taken into account for a reasonable reconstruction of prehistory and that in the ideal case such independent data converge on a plausible unified hypothesis.

Chapter 5 by Alwin Kloekhorst reviews the evidence for the earliest attested branch of the family, Anatolian, starting with "Kanišite" Hittite, known "from hundreds of personal names and a handful of loanwords attested in Old Assyrian texts" (ca. 1935–1710 BCE; cf. details in Kloekhorst 2019). Common innovations of the Anatolian languages discussed by Kloekhorst are, in phonology, the merger of voiced and voiced aspirated stops (**d*, **d*^{h} > PAnat. **t*) versus the continuation of the voiceless

stops as fortis (**t* > PAnat. /t:/), Eichner's lenition rules, the lengthening of accented **ó* > **ő*; the development of **$h_2u̯$* > PAnat. /qw/ (e.g., in **$tr̥h_2u̯ent$-* > PAnat. /t:rqw(ə)nt-/, Hitt. *tarḫuu̯ant-*, Lyc. *trqqãt*, *trqqñt* /trkw(a)nt-/, Car. *trqδ-* /trkwnt-/; the dissimilation of the word-initial nasal in PIE **h_3neh_3mn-* 'name', Hitt. *lāman-*, HLuw. *álaman-*, Lyc. *alãma*, in morphology, the creation of an ACC/DAT 1SG pronominal form /?mu-/ 'me' versus PIE "**h_1mme-*" in Kloekhorst's notation, and the development of the *ḫi*-conjugation. Among the features common to all Anatolian languages, Kloekhorst includes the loss of the subjunctive and optative moods. Apart from the question whether these categories can be safely reconstructed for the common ancestor of Anatolian and "Core-Indo-European", "common loss" does not seem a valid criterion for setting up language groups, as Kloekhorst himself states on p. 76 ("only secured common innovations can be used to this end", i.e., for setting up family trees of languages). The chapter discusses in detail the Luwic branch encompassing without doubt CLuw., HLuw. and Lycian as shown by a list of common developments, e.g., in phonology, PAnat. **ḱ* > *ts* (CLuw. *ts*, Hluw. *ts*, Lyc. *s*, Mil. *s*, Car. *s*, Sid. *ś*) versus Hitt. *k*, Pal. *k*, Lyd. *k*, and, in morphology, "i-mutation". The position of the lesser known languages is naturally less clear, Kloekhorst discusses some possible isoglosses speaking in favour of a common subbranch comprising Lycian, Milyan and Carian. For Palaic Kloekhorst presents some evidence (following Oettinger 1978) for common innovations with Luwian, e.g., DAT 3SG enclitic pronoun = *tu* 'to him/her' = CLuw. = *tu*, HLuw. = *du*/*ru* versus Hitt. = *šše*/ = *šši* and Lyd. *-mλ*, originally (as suggested by Oettinger) the 2SG DAT which was extended to the 3rd person; on the other hand, Palaic does not show the development **ḱ* > *ts* as the Luwic branch, nor NOM PL COMM in *-Vnsi*, but *-aš*/*eš*, so probably it branched off very early from a common Luwo-Palaic node. Lydian shares *-i*-mutation with the Luwic branch, and extends the 1SG ending *-ō* at the cost of athematic *-mi* and *-ḫi* (CLuw. *-u̯i*, HLuw. *-wi*, Lyc. *-u*) versus Hitt. *-mi* and *-(ḫ)ḫi*. Kloekhorst (p. 74) includes words for 'father' here, too, (Lyd. *tada-*, CLuw. *tāti-*, Lyc. *tedi-*) versus Hitt. *atta-*, and Pal. *pāpa-*. This again raises the question of methodology: can single lexical items be used to establish language relationship? They may be borrowings or calques. Lydian is then said to derive from a common node preceding Proto-Luwic ("Luwo-Lydian" which split into Lydian and Proto-Luwic): the Lyd. DAT SG of the 3rd person enclitic pronoun = *mλ* 'to him/her' is derived by Kloekhorst from PIE **-smei̯*/*smoi̯* (related to the element *-sm-* seen e.g. in some of the oblique case forms of the Skt. demonstrative pronoun, e.g., DAT SG M *tasmai* 'to him'). Hence, Lydian did not take part in the innovation of Luwic = *tu* (2nd > 3rd person, v. supra). In contrast to the detailed discussion of Luwic, Hittite is given short shrift, its innovations as against the other branches are only mentioned in a single sentence and not further discussed. Kloekhorst dates PAnat. to 3000 BCE, but he does not explain how he arrives at this date, apart from the claim that PLuwic and PHitt. are likely to be dated around 2000 BCE. It is unclear which rate of change has to be assumed. As for the "Indo-

Hittite" or rather "Indo-Anatolian" discussion, Kloekhorst follows the now common assumption that Anatolian was the first branch to separate from the proto-language and gives a selection of possible common innovations of "core PIE" which would show that after the split of Anatolian there remained a coherent language (or a group of closely related languages) from which all the other attested branches of the family developed. This is shown in semantic innovations such as Hitt. *ḫarra-* 'to grind, crush' versus 'to plough' in core Proto-Indo-European languages, Hitt. *mer-* 'to disappear' versus 'to die' in CPIE; the case of **h_1eh_1s-* 'to sit/sit down' seems quite debatable to the reviewer, however: Kloekhorst assumes an "expansion of the meaning of **h_1e-h_1s-* from 'to sit down' to 'to sit', with replacement of **h_1e-h_1s-* 'to sit down' by **sed-*" in CPIE. One might also argue for the opposite, i.e., loss of **sed-* in PAnatol. and semantic expansion of **h_1eh_1s-* (or rather **$h_1ēs$/h_1es-*) 'to sit' to 'to sit down'. In morphology, the creation of the feminine gender in CPIE seems a valid point, while one wonders how "trivial" cases of thematization are as seen in "Anat. **$h_1ek\acute{u}$-* versus CPIE **$h_1ek\acute{u}$-o-* 'horse' […] and Hitt. *ḫuu̯ant-* < **h_2uh_1-ent-* versus CPIE **$h_2u̯eh_1$nt-o-* 'wind'". The ideal shared innovation would rather seem to be one which happened once and then ceased to be productive (unlike the proliferation of *-o*-stems). While one may agree that "the Indo-Anatolian hypothesis can thus be regarded as virtually proven", it seems difficult to combine such structural features with absolute time frames, as Kloekhorst does arguing that "since the number of arguments listed is relatively large and some of them concern significant structural innovations (especially the rise of the feminine gender in CPIE, including the creation of the accompanying morphology), it has been argued that the temporal gap between the Anatolian split and the subsequent Tocharian split […] may have been in the range of 800–1,000 years". Do we know how long it takes to create a new gender? This seems to be the same problem as with cladistics working with hypothetical constant rates of lexical change (cf. the discussion on Chapter 4 above).

Michaël Peyrot's discussion of Tocharian in Chapter 6 starts with a selection of the more important common innovations establishing the Tocharian subphylum with its two varieties. These include the loss of distinction between the three stop series collapsing into voiceless stops, the rise of distinctive and morphological palatalization, of agglutinative case inflection in the noun and agglutinative number inflection in some noun classes, and of a complex system of verbal derivation to form intransitives and transitives or causatives. The substantial differences between Tocharian and the other Indo-European languages are taken by Peyrot to be due largely to substrate influence, probably from Uralic languages. Peyrot himself has argued for an early form of Samoyedic to be the most likely candidate for this (Peyrot 2019). The significant influence of Iranian on the lexicon of Tocharian is apparently mostly late and probably occurred after the split between Tocharian A and B, as seen, e.g., in the differing vowels of Toch. B *akālk* versus Toch. A *ākāl* 'wish' < Bactr. αγαλγο /aγalg/.

Regarding the relationship between Tocharian and other branches of Proto-Indo-European, no closer affinities can be established, i.e., Tocharian represents a separate split with no intermediate nodes in common with other branches and features shared with Anatolian are likely to be retained archaisms. Regarding the idea that Tocharian split off second after Anatolian, Peyrot discusses as a probable post-Anatolian innovation shared by Tocharian the metathesis of *-*ur* to -*ru* (cf. Lubotsky 1994: 99–100): Del Tomba (2021) argues that Toch. B plurals in -*wa* to nouns in -*r*, e.g., *tarkär* 'cloud', PL *tärkarwa*, presuppose this metathesis, on which the PL -*r-wa* < *-*ru-h*$_2$ was built. In morphology, Peyrot briefly describes the debate about the *s*-preterite in Tocharian which shows -*s* only in the 3SG (e.g., 3SG *prek-sa* vs 3PL *prek-ar*), which may be compared to the Hittite preterites with -*š* only in the 3SG, e.g., 3SG *ākkiš* 'died', 3PL *aker*. It has both been claimed that this is an archaism, i.e., in the other languages -*s*- was generalized from the 3SG to the other forms of the paradigm (as argued e.g. by Jasanoff 2003: 204–205); while others, including Peyrot, take the -*s* in Hittite to be "somehow" secondary and that in Tocharian -*s*- was lost by sound law and analogy in most forms of the *s*-preterite. As Peyrot does not go into the details here, the account remains a bit unsatisfactory. It might have been useful to be more detailed about this famous bone of contention. He then discusses the middle endings in -*tor/ntor* assumed to be primary endings originally in a number of branches including Italo-Celtic and Phrygian; he points out that the various Indo-European languages attest a variety of forms and questions whether -*tor* was in fact a primary ending. Following Kortlandt (1981) he assumes that *-*to*, *-*nto* served as both primary and secondary endings originally, and that the contrasts found later (*-*to-r*, *-*tro*, *-*toi*) were also created later in the individual branches. Hence, the endings do not help for the classification of Tocharian. Since the thematic optative in *-*o-ih*$_1$- seen in Indo-Iranian, Greek, Balto-Slavic and Germanic, is not found in Tocharian, one could interpret it as an innovation after Tocharian had split off, where only the athematic optative is found. Furthermore, he argues, if the thematic optative is also lacking in Italo-Celtic, there is no evidence that Tocharian split off before this branch. A short discussion of Cowgill's idea that the Latin subjunctives in -*ā*- actually represent *-*oi̯h*$_1$- (> *-*oi̯a* > *ā*, Cowgill 1965: 160 fn. 43) and of suggestions to find remnants of -*oi*- in Latin (note the discussion on *OPETOIT* in the Duenos inscription cf. Eichner 1988–1990; Meiser 2010: 201; Weiss 2020: 444; differently Vine 1999; Tichy 2004) might have been in order here.

Michael Weiss (Chapter 7) argues in favour of an Italo-Celtic node in the Indo-Eurpean family tree, a position commonly held in the 19th c. after it was first proposed by Schleicher (1858), and disputed at least since the 1920s (e.g., by Carl Marstrander and Giacomo Devoto). On the one hand, many similarities are not telling, e.g., verbal middle endings in -*r*- are also found elsewhere (cf. the discussion above on Chapter 6); the development *p … k^u > *k^u … k^u often taken as a possible common development

(cf. *$penk^{\mu}e$ 'five' > OIr. *cóic*, Lat. *quinque*) is contradicted by Lat. *quercus* 'oak' < *$perk^{\mu}u$-, where the assimilation precedes the change *$k^{\mu}u$ > *ku*, and the Celtic place-name *Hercynia (silva)* 'oak forest' from the same root, where the change *$k^{\mu}u$ > *ku* 'bleeds' the assimilation. Weiss points out that the change *$k^{\mu}u$ > **ku* may already have happened in Proto-Indo-European, hence the input forms would be **p … ku* for both branches and one has to assume that in Latin the labiovelar was restored at some point. Hence, one cannot use the example to establish a common chronology of sound changes. In morphology, the *ī*-genitive (Ogham Ir. *MAQQI* 'of the son', Gall. *Segomari*, Lat. *-ī*) is not the unique ending in Italic (cf. e.g. in Satricum *VALESIOSIO*), so there was no common replacement of PIE **-osio* by **-ī* in Italo-Celtic. Weiss wonders whether the use of nouns in *-ī* (the feminines in other branches, Ved. *vr̥kīḥ*, etc.) as attributes of nouns was the common Italo-Celtic innovation which then led to the independent emergence of the *ī*-genitive. The superficial identity of OIr. *-bera*, Lat. *ferat* has led many scholars to assume a common subjunctive in *-ā-*, while others, starting with Rix (1977), derive the Insular Celtic *a*-subjunctive from **-ase-*, the desiderative morpheme PIE *$-h_1se$- or the *s*-aorist subjunctive added to seṭ-roots. According to Weiss, the strongest argument in favour of Italo-Celtic is the superlative formation in **-ism̥mo-*, e.g., OIr. *tressam* 'strongest', MW *hynaf* 'oldest', Lat. *maximus* etc., beside which Italic preserves the inherited superlative in isolated forms like *iuxtā* 'nearest' and probably *ioviste* 'youngest' (as argued by Watkins 1975). In the lexicon, Weiss gives some examples of common and non-trivial semantic shifts, e.g., Lat. *saeculum* 'lifespan' and MW *hoedl* 'lifetime' from PIE *seh_2i- 'to bind', which, of course, could also be due to early contact. As for the preposition and prefix **dē* common to both branches, Weiss argues that "though just a little word, *deh_1's import is considerable since it is part of a relatively small set of quasi-functional prepositions" (p. 107). Here a discussion about Arm. *t-* 'not' would be required, for which derivations from **dus-* and **dē-* have been proposed (cf. Kölligan 2019: 92–95). Taking for the sake of the argument Italo-Celtic as a reality, Weiss looks for innovations found only in the other Indo-European branches except Anatolian and Tocharian which might show Italo-Celtic as the third group to have branched off. He discusses two possible instances for this: (a) the thematic optative in *$-oih_1$- for which he claims that it occurs in Germanic, Balto-Slavic, Indo-Iranian, Greek, Armenian, Phrygian, and Messapic; cf. again the remarks above (on Chapter 6) on Cowgill's idea of PIE *-oi̯H- > Lat. *-ā-* and Lat. *OPETOIT*. The Armenian case is quite doubtful, Weiss does not discuss the evidence; (b) *r*-endings used as primary middle markers replaced by *-i* "in Greek, Phrygian, Indo-Iranian, Germanic, Albanian, and possibly Balto-Slavic" (p. 109). In the lexicon, it is noteworthy that the archaisms pointed out already by Vendryes (1918) shared by Italo-Celtic and Indo-Iranian such as *$h_3rēǵs$ 'rule/king' (OIr. *rí*, Lat. *rēx*, Ved. *rā́ṭ*) and *$ḱred(s)d^heh_1$- 'to trust < place one's heart' (OIr. *creitid*, Lat. *crēdō*, Ved. *śraddhā-*) do not also appear in Proto-Anatolian and Proto-Tocharian.

In Chapter 8 on Italic, Michael Weiss takes Venetic and Sicel to be part of the Italic branch, the latter being the only language showing voiced reflexes of the Proto-Indo-European voiced aspirates in initial position in this branch (cf. *geped* 'had'). Common innovations of Latin, Venetic and Sabellic are the merger of *b^{h}- and *d^{h}- as **f-*, the gerundive in **-nd-*, the imperfect subjunctive in **-sē-*, the imperfect in **-βā-* (the more probative morphological features are unattested in the fragmentary Venetic corpus). The assumption of Proto-Italic as common ancestor of these languages had been challenged since Walde (1917) who took Latino-Faliscan and Sabellic to be two independent branches that underwent a secondary process of convergence. While there are in fact clear cases of convergence such as the rhotacism affecting Latin and Umbrian, but not Oscan, or the change of initial **di̯* > *i-* in Latin, Umbrian and Oscan which "happened within the historical record for Oscan and Latin at least" (p. 116), no borrowing of morphology occurred, cf. the innovated perfect formations differing from language to language (Latin *-v-*perfect, Oscan *-tt-*perfect, etc.), the Oscan infinitives in *-om* versus Lat. *-s/re*, etc. Weiss takes this to show that since apparently morphology was not borrowed between these languages, shared morphological features are likely to be inherited. Beside discussing the common phonological innovations, Weiss makes the important point that "the realm of derivational morphology [is] typically underexploited in discussions of subgrouping [and] also displays a number of striking shared Italic innovations" (p. 121), e.g., the suffix **-āsiio-* (Umbr. *fatariur* NOM.PL.M 'pertaining to grain' = Lat. *farrārius*) and **-kelo-* used to form diminutives to non-thematic bases (Osc. *zicolom*, Umbr. *tiçel* 'day, date' <> Lat. *diēcula*). As for connections outside the Italic group, Weiss mentions some features shared with Germanic, such as the suffix *-no-* in **duis-no-*, Lat. *bīnī* 'two at a time' and Germ. **twizna-*, ON *tvennr* 'two-fold', OHG *zwirnōn* 'to twine'; which as such, however, is also found elsewhere, e.g., Skt. *purāṇá-* 'ancient' from *purā́* 'of old'. Futhermore, "Assuming Germanic **ga-* really is cognate with Latin *com-*, the match between Lat. *commūnis* and Goth. *gamains* etc. is striking" (p. 129, cf. Hill et al. 2019 for a discussion). Weiss takes Venetic *sselboisselboi* 'for himself' to be the result of a "one-off borrowing from Germanic" (cf. especially OHG *selbselbo*). This would, in the reviewer's mind, allow an explanation of these forms as originally Germanic going back to something like **s(u̯)e-lp-ó-* '(with) one's own skin' from PIE **lep-* 'to peel off; husk, skin', cf. Gr. λώπη 'covering, robe, mantle', etc.

One of the problems with Celtic languages, treated by Anders Richard Jørgensen in Chapter 9 is the poor attestation of continental Celtic languages. The discussion must mostly rely on historical phonology, because there is not enough evidence for historical morphology: it is difficult to project "innovations such as the *t*-preterite, the *s*-preterite and the *ā*-preterite back to a specific stage beyond 'Insular Celtic'" (pp. 135–136). Phonological common features of the Celtic languages are the centum merger, the merger of **ku̯* and **k^{u}*, the development of syllabic liquids > **ri/li* before

stops and **m* and to **ar*/*al* elsewhere; the development of syllabic nasals (**N̥ > aN*), the delabialization of **gʷ* in front of **i̯*, and Joseph's law (**eRa > aRa*). The position of Dybo's law is uncertain, as it also occurs in Germanic and Italic, but the exact conditioning is disputed, hence also its chronology (cf. Zair 2012). In morphology, the levelling of the pronominal paradigm **so*/*to-* in favour of **s-* is noteworthy; however, Jørgensen argues extensively with the loss of elements, such as the "loss of the agent noun suffix **-ter-/-tel-*". As remarked above, it is doubtful that loss is a valid instance of a common innovation. The same applies to other cases adduced by him such as the "elimination of the present and past active participle as part of the verbal paradigm" and the "loss of the inherited categories of subjunctive and optative". The internal grouping of Celtic is still not settled. Jørgensen argues that Celtiberian is probably an early or even the first off-shoot known to us, cf. the clitic relative particle **i̯o* in Gaulish, Goidelic and Brittonic versus the fully inflected relative pronoun **i̯o-* in Celtiberian (as in DAT.SG *iomui*). While Goidelic as a subbranch is unproblematic showing sufficient innovations separating it from the other Celtic languages such as **o > a* in final syllables, VNT > V(:)D as in **kanto-* '100' > **kænto-* > OIr. *cét*, the position of Brittonic is an open question: is it part of Insular Celtic (Brittonic + Goidelic), is there a Gallo-Brittonic node separate from Goidelic or was there a dialect continuum in which Brittonic would share innovations with both Gaulish and Goidelic? All these positions have been put forward, pointing out Gallo-Brittonic common features such as **kʷ > p* (Gaul. *Epona*, the name of the goddess of horses, MW *ebaul* 'foal' vs OIr. *ech* 'horse'), and **oRa > aRa* (an expanded version of Joseph's Law) seen in MW *taran* 'thunder', Gaul. *Taranis* versus OIr. *torann* 'thunder'. Jørgensen argues (p. 148) that "it is difficult to point to any significant Gaulish innovations not shared with Brittonic" – i.e., Brittonic could simply be continuing a dialect of Gaulish. Shared features of Brittonic and Goidelic could then be a feature of *Sprachbund*, e.g., the difference between absolute and conjunct verbal inflexion. Regarding the relationship between Celtic and other branches Jørgensen points out that "the absence of any securely identified innovations in the realm of inflectional morphology between Celtic and Germanic makes it very likely that [the] relatively impressive collection of lexical isoglosses is due to borrowing" (p. 149). He calls the use of **nu* as sentence initial particle in Hittite and Old Irish an "apparent shared innovation" (p. 149). This is probably just a case of imprecise terminology, as this cannot be a shared innovation unless we reconstruct a common ancestor of Hittite and Old Irish.

In Chapter 10 on Germanic Bjarne Simmelkjær Sandgaard Hansen and Guus Jan Kroonen first list the well-known common features exclusive to this subgroup including, in phonology, Rask/Grimm's law, Verner's law, Kluge's law, the shift of stress to the first syllable of the word, and the development of syllabic liquids (*R̥ > uR*). As argued also by Ringe (cf. Chapter 4), it is unlikely that these innovations happened independently in the individual languages. In morphology, the organization of the

verbal system into strong versus weak verbs is a noteworthy innovation and the authors argue that also the group of preterite-presents are based on inherited material but "their regrammation and reparadigmatisation into a coherent system is a purely Germanic innovation" (pp. 154–155). In the nominal domain, the differentiation between strong and weak adjective inflexion is a Germanic innovation using *n*-stem versus *o/ā*-inflexion. Here a discussion of the comparable feature of Baltic and Slavic also differentiating between two types of adjective inflexion using the suffix *-io-* might have been in order. This homology could well be a contact-induced feature. As for the internal structure of Germanic, the traditional separation into East, North, and West Germanic remains undisputed. Features of East Germanic are, e.g., in phonology word-final devoicing of *-z*, in morphology the paradigmatic levelling of Verner's Law forms, and the creation of a deictic pronoun *sah* 'this' < **so-k^{u}e*. It is a bit surprising to see retention used as an argument for subgrouping, the methodological usefulness of the concept should be discussed. The authors also use the non-trivial notion of common loss as an argument, e.g., in the case of West Germanic: "the loss of word-final PGmc. **-z* in unstressed syllables prior to its merger with regular *r* (PGmc. **fiskaz* 'fish' > OHG *fisc* ~ Goth. *fisks*, ON *fiskr*)" (p. 157). More difficult is the question if there was an additional node under Protogermanic before the split into the three branches. Both North-East Germanic ("Gotho-Norse") versus Westgermanic and Northwest versus East Germanic have been proposed. For the first option, one diagnostic seems to be the *Verschärfung* of PGmc. **-jj-* and **-ww-* > Goth. *ddj*, ON *ggj* and Goth. *ggw*, ON *ggv* versus retention in West Germanic (Goth. *twaddje*, ON *tveggja*: OHG *zweio*) etc. The authors refer to Rasmussen who argued that this process may have been Proto-Germanic with West-Germanic losing the result again as it might be seen in OHG *reia* 'female roe', OE *raege* < PGmc. **raigjō*. They also point to similar processes in Faroese and Romance languages, arguing that this process may be rather trivial (at least, not unparalleled). One further point that could be made is that the results in Gothic and Old Norse are not identical (at least in Goth. *-ddj-* vs ON *-ggj-*), hence a further assumption is required if one wants to set this up as a common innovation, e.g., **-i̯i̯-* > **-ddj-* (Gothic) > **-ggj-* (ON) (or vice versa?). For the second option the authors regard as a non-trivial innovation the creation of a new demonstrative pronoun with **-si*: Runic Danish *sasi* 'this': OHG *dese*. A methodologically rather questionable argument in favour of North-West Germanic seems to be "the analogical replacement of reduplication in strong verbs by the secondary diphthong PGmc. **-ea-* ~ **-ia-* also known as **ē*^{2} (ON *lét*, OHG *liaz* 'let' ~ Goth. *laílot*). The latter process in particular consists of so many subprocesses that it would be inconceivable to claim independent developments in North and West Germanic. In addition, although many of the remaining shared innovations may indeed be trivial, the sheer number of instances in itself suggests a period of North–West-Germanic unity" (p. 159). Does this imply that many weak arguments make a strong one? Could

these weak points, which are not detailed in the paper, not rather be a sign of secondary contact? As for the first point, the subprocesses are not discussed in detail, so there is no actual demonstration that this must be a common innovation. Could we assume a series of language specific remodelings based on various sound changes? As a result of their discussion, the authors propose a dialect continuum in which there was first a phase of closer contacts between North and East Germanic, the time in which the common *Verschärfung* took place, then a separation of East Germanic followed by a period of North-West Germanic contacts. Regarding the relationship of Germanic with other branches, the authors discuss similarities with various other subgroups, e.g., with Italic in the development of TT > *ss* and of the syllabic liquids to /oR/ in Italic next to /uR/ in Germanic, the generalization of the *ō*-grade in f. *n*-stems in Germanic (Goth. *tuggo* 'tongue'), and apparently in Illyrian (NOM.SG *Aplo*, *Aplōnis* [PN]) and the similar formation of the 3SG possessive pronoun **sṷeḭno-* 'his/her' in Germanic (Goth. *seins*) and Messapic (ACC *veinan*), the use of *-m-* in DAT ABL INSTR PL case forms in Baltic and Slavic versus *-b^h-* in other branches, and the formation of the numerals '11' and '12' which they deem a "highly non-trivial way by compounding" (p. 164). However, this may easily have been calqued from one language into another (on pattern replication in numerals cf. Matras 2007: 50, e.g., "a combination [of] lexemes ('ten-and-one') replace[s] single lexemes ('eleven') in some varieties of Kurmanji, replicating the Turkish arrangement"). In sum, they do not find any clinching arguments for a closer connection of Germanic to other subgroups. They try to show a certain degree of conservatism in Germanic by pointing out the retention of ablaut especially in heteroclitic nouns such as 'sun' and 'water' and the productivity of the preterite-presents which they compare to that of the Hittite *ḫi*-conjugation claiming that "it is tempting to conclude […] that the Germanic preterite-presents, whatever their ultimate origin, were still a productive verbal category when Germanic split off from Proto-Indo-European. This is more reminiscent of the situation in Hittite, where the *ḫi*-conjugation is still a fully functioning verbal category, than of the situation in the remaining Indo-European branches, where it has largely disappeared and can only be traced through isolated remnants" (p. 168). But this depends on what one believes about the origin of this formation. If one takes these preterite-presents to continue a Proto-Indo-European perfect with resultative-stative meaning, they continue a category well known from Greek and Sanskrit and there is nothing particularly archaic about their preservation in Germanic. On a more general level, this probably confuses conservatism with possible evidence for an early split-off, and the authors' assumption that "Germanic broke off from Proto-Indo-European after Anatolian and just before or after Tocharian" (p. 168) does not seem to be an unavoidable conclusion.

The following Chapters 11–13 deal with a group of languages for which some kind of connection has repeatedly been claimed and denied. It is interesting to see that

also in this collected volume the proposed solutions are quite different from each other and since they are more or less based on the same data one must probably accept the fact that our current knowledge is not sufficient to settle the question.

In Chapter 11 Lucien van Beek sets out to list all innovations of Greek vis-à-vis the other branches of Indo-European, arguing against Garrett's statement that "there are hardly any demonstrable and uniquely Proto-Greek innovations in phonology and inflectional morphology". In phonology, these are, e.g., the three laryngeal reflexes; the assumed and disputed "laryngeal breaking" as in ζωός 'alive' versus Skt. *jīva-*; in morphology, e.g., the kappa perfect, the *t*^{h}*ē*-aorist; probably due to lack of space not all forms are discussed in detail, e.g., for the infinitives van Beek only lists immediate predecessors, but does not further explain these (p. 179). For the DAT LOC PL in *-si* with *-i* probably taken from the LOC SG, one should point out the similar development in the Albanian ABL.PL *-sh* < **-si*. This has often been regarded as a possible common innovation of Albanian and Greek. In word formation van Beek lists the nouns in *-eu-*, but does not refer to the discussion about whether this is something inherited or borrowed from a non-Indo-European language (cf. Meißner 2017). Regarding "the use of **-tero-* as a comparative suffix with gradable adjectives" (p. 180), one wonders how he envisages the same use in Sanskrit; in view of the oppositive function elsewhere – in Greek itself e.g. in θηλυτερ- 'female (as opposed to male)', Lat. *dexter*, *sinister* etc. – this is likely to be secondary, but it would merit a comment. As for the internal subgrouping of Greek, van Beek discusses the views of Porzig (1954) and Risch (1955, 1963), with the now standard subgrouping by the well-known isoglosses such as the "south Greek" assibilation of **-t(*^{h}*)i* > *-si*, simplification of *-ss-* > *-s-* after vowels, the replacement of the inherited NOM PL of the demonstrative pronoun **toi* by *hoi*, etc. As innovations exclusive to Myc., not shared by any of the later dialects, he mentions e.g. the raising *e* > *i* before labials and palatalization of *sk* possibly seen in the variant spellings *a-ke-ti-ri-ja* / *a-ze-ti-ri-ja* for original /askētriai/. For Arcado-Cypriot van Beek mentions "word-final *-o* > *-u* and diphthongization in the gen.sg. -ᾱο > Arc. -αυ, Cypr. /-au/" and goes on "as for the raising […] of word-final *-o*, these phenomena are not attested in Mycenaean spelling" (pp. 183–184) – one wonders how Myc. *a-pu* in forms such as PY Ta 641 *a-pu ke-ka-u-me-no* and the frequent *a-pu-do-si* /apudosis/ fit into this. The mixed picture of Aeolic remains difficult to assess with Lesbian showing *-ti* > *-si* in contrast to Thessalian and Boeotian; van Beek takes Lesbian as a bridging dialect between Aeolic and South Greek, which partook in this one Southern Greek innovation. The other Aeolic dialects he takes to belong to a North Greek node including Doric and Northwest Greek versus a South Greek node as ancestor of Achaean (=Myc. and Arc.-Cypr.) and Ionic-Attic. Regarding Greek and other languages, he takes Macedonian to be a North-West Greek dialect originally – this remains of course difficult to assess due to the limited evidence. Van Beek follows Ligorio and Lubotsky (2018) in assuming a common Graeco-Phrygian node; however,

a number of isoglosses quoted could be loanwords, e.g., Phryg. *onoman* from Gr. ὄνομα, Phryg. *avton* from Greek αὐτόν, and some features are trivial and methodologically difficult, e.g., the common "loss of word-final occlusives: 3sg. impv. -του = Gr. -τω < *-*tōd*", cf. e.g. Latin *lupōd* > *lupō* or in Skt. the reduction of word final consonant clusters. Also in the case of OPhr. (probably 3SG OPT) *kakoioy*, *kakuioy* next to Greek κακόω 'maltreat' where the claim is that "both the type of factitive formation and the lexeme are exclusive to Phrygian and Greek" (p. 192), it would be helpful to point out that the root is probably also found in Albanian *i keq* 'bad' < **kakiu̯o-* (cf. Orel 1998: 175) and Avestan *kasiah-* 'smaller, lesser', and in compounds such as *kasu-xratu* 'of little insight', superlative *kasišta-* 'smallest'; so the root itself is probably not restricted to the Balkans and verbs in *-oō* have been explained as a late inner-Greek innovation (cf. Fawcett-Tucker 1990); again a borrowing from Greek into Phrygian seems possible. Regarding the isogloss "Phr. δεως (instr.pl.) and Gr. θεός reflect PIE **dʰh₁s-ó-* 'god', while most other languages have a reflex of **deiuó-*" (p. 193), mention ought to be made of Arm. *d‘* 'god(s)' < **dʰeh₁so-*. Regarding a closer connection with Armenian van Beek's position remains sceptical and he thus rather sides with Clackson (1994) and Kim (2018).

This forms an interesting contrast to the position of Birgit Anette Olsen & Rasmus Thorsø in the following Chapter 12 on Armenian. Here the authors first present a list of innovations in phonology, a balanced overview always representing also differing opinions, including the development of the stop system, the representation of laryngeals (with or without "laryngeal breaking" in certain contexts), the development of /i̯/ (cf. also Kölligan 2012), etc., in morphology, innovations such as the homology between *-e-*verbs and the present and imperfect of the copula in which the *e*-vowel has been generalized (*berem* 'I bring': *em* 'I am', *beres*: *es*, etc.), the creation of a new mediopassive in *-i-*, a new imperfect, a new aorist in *-c´-*, maybe a remodeling of inherited *-s-*aorists or a reanalysis of *sk*-past tense forms, etc., in the noun the rise of GEN DAT ABL PL in *-c´*, a new LOC SG in *-i* and new heteroclitic paradigms with *-r* und *u*-stem inflexion (*barjr*, GEN *barjow* 'high'). Regarding its position to other languages, the authors assume a Balkan IE subphylum from which Armenian, Graeco-Phrygian and Albanian branched off. Against among others Clackson (1994) and Kim (2018) and van Beek in this volume (Chapter 11), Olsen & Thorsø argue in favour of a close relationship between Armenian and Greek and discuss a number of possible common innovations in phonology, none of which are however probative and universally accepted (e.g., laryngeal breaking, if accepted for Greek and Armenian, has also been assumed for Tocharian). Better are the morphological innovations, such as the *nu*-present of PIE **u̯es-* 'to clothe' seen only in Arm. *z-genowm* and Gr. ἕννυμι (probably replacing the inherited causative **u̯os-eie̯/o-*), and the reduplicated aorist of **h₂er-* seen only in Arm. *ar-ar-i* 'I made' and Gr. ἤραρον 'I fitted'. The authors also discuss a number of lexical isoglosses, such as μῆδεα

'thoughts': Arm. *m‘* (mostly used in the plural), with a correspondence both in the frequent plural inflexion and in the long root vowel which seems to be an innovation; Arm. *sowt* 'false': Gr. ψεῦδος 'lie'; and **$d^{h}eh_{1}$-s-* 'god' as in Greek and Phrygian as opposed to HLuw. *tasan(za)-* 'stele', Lyc. *θθẽn-* 'altar' < *'votive, sacred thing', etc. They do not see a closer relation of Armenian with Phrygian, which they rather position as the next of kin of Greek (in this respect their scenario would fit e.g. that of van Beek). For the much-discussed presumed isogloss Arm. *oč‘* 'not', Gr. οὐ, Alb. *as*, mention might have been made of different proposals such as Clackson (2004/2005) and Fortson (2018/2019) and the proposals to connect Lat. *haud* (Garnier 2014) and Toch. A *mā ok*, B *mawk*, too (Fellner 2022).

In turn, Adam Hyllested and Brian D. Joseph (Chapter 13), argue for a Graeco-Albanian subgroup. They list unique innovations for Albanian, e.g., **s* > /ɟ/ <gj> before a stressed vowel as in *gjashtë* '6' < **sék̑s-tV-* versus *shtatë* '7' < **septm̥-tV-*, **$ǵ^{h}$* > /ð/ as in *udhë* 'way' < **u$ǵ^{h}$o-* related to Lat. *vehō* 'to drive', **ē* > *o* in *mos* '(do) not!' < **$meh_{1}k^{u}id$*, **ō* > e in *tetë* '8' < **ok̑tō-tV-*, etc. and give a brief review of the inner-Albanian dialectology (nasalized vowels subsist in Geg and are lost in Tosk, e.g., *âsht* 'is' vs Tosk *është* < **en-esti* 'is inside'), *-n-* > *-r-* in Tosk, e.g., Geg *venë* 'wine' versus Tosk *verë*, briefly discuss supposed isoglosses with Slavic, such as Winter's law which could be seen in *rronj* 'endure' < **rēg-n-* (Gr. ὀρέγω) and *erë* 'smell' < **$h_{3}ed$-r-* (Lat. *odor*), but these could also show loss of the stop followed by compensatory lengthening. They do not find many Albanian-Armenian isoglosses, one being Alb. *zog* 'bird, nestling': Arm. *jag* 'little bird, sparrow, nestling' (but the root etymology is unknown and this could be a shared retention or a common loanword), another the numeral 'one' **smi̯i̯o-* in Alb. *një*, Arm. *mi* (*-o-*). The bulk of the discussion focusses on supposed shared innovations with Greek including the double representation of PIE /i̯/ in Greek and Albanian. Its conditioning in Greek is highly disputed, and the authors point out that a similar feature is seen in Albanian and that the distribution over lexemes matches that of Greek, as in Alb. *n-gjesh* 'knead' (< **i̯ós-(i)i̯e-*) ~ ζέω 'boil, seethe' < **i̯es-* 'boil; ferment'; Alb. *gjesh* 'gird' ~ Gr. ζώννυμι 'id.' < **i̯eh_{3}s-*, versus Alb. *ju* 'you (PL)' ~ Gr. ὑμεῖς 'id.' (but the latter may continue an ACC **us-mé*); Alb. *a-jo* 'she' ~ Gr. REL.PRON.F ἥ < **i̯eh_{2}*; and Alb. *josh* 'to fondle, caress' < **i̯eu̯d^{h}-s-* (cf. for the meaning Lith. *jaudà* 'seduction') ~ Gr. ὑσμίνη 'battle' < **i̯ud^{h}-s-* from **i̯eu̯d^{h}-* 'care for, be engaged in'. As for morphology, the authors adduce the use of active endings in middle/passive paradigms, i.e., the Greek aorist forms in *-$t^{h}ē$-* + active endings and a similar development in Albanian which uses the reflexive **su̯e* (*u lava* 'I was washed' etc.); but e.g. North Germanic languages do the same with **sik*, and the *-$t^{h}ē$-*aorist formation is an inner-Greek innovation. As for common morphosyntax they argue that the use of the negation **meh_{1}* in 'fear'-complement clauses is a functional innovation found exclusively in Albanian and Greek (Alb. *kam frikë mos e kam infektuar* 'I-have fear lest I-have infected him', Gr. δέδοικε μὴ διαφθαρῶ 'he-feared lest I-be-corrupted'). If

Latin *nē* goes back to the same proto-form (remodeled after the factual negation **ne*), this might be an inherited feature (*timeo nē* … 'I fear that … '). Also the use of **meh$_1$* in "tentative" questions which they classify as a unique feature of these two languages (e.g., Alb. *mos e njihni*? 'Do you perhaps know him?', Gr. μή σοι δοκοῦμεν 'Do we perhaps seem to-you… ?') is also found in Armenian with *m'ē* 'could it not be that … ', e.g., Matthew 26:25 *M'ē e'em?* (Judas asking Jesus): 'Could it be me?'. The authors muster quite an impressive list of further possible isoglosses, such as the thematic aorist of PIE **h$_1$ger-* 'to wake up' which they reconstruct for OAlb. 3SG. AOR *u n-gre* 'arose': Gr. ἔγρετο 'woke up', but not all seem to be of the same value, e.g., the frequency of prefixed verbs with **peri-* as in **peri-k^{u}l-n-h$_1$-* > Alb. *për-kul* 'to bend, curve': Gr. περιτέλλομαι 'go around in circles', also seen in Vedic *pari-car-*; or an **eh$_2$-* stem built on **sper-* 'to spread, sow', Gr. σπορά: Alb. *farë*, a type productive in most IE languages. One wonders about the Greek phonology in the proposed equation of "a result noun **ǵ^{h}ud-tlo-* from the root **ǵ^{h}eu̯d-* 'pour': Alb. *dyllë* 'wax; sap', Gr. χῡλός 'juice'" (p. 235). As for *sot* 'today' they adduce Joseph's hypothesis of a compound **ḱi̯-āmer-* 'this day', reanalyzed as **ḱi̯ā-* and by replacement of *-āmer-* with Alb. **diti-* 'day' > **ḱi̯āditi-* > *sot*. Here one should discuss Arm. *serkean* 'today('s)' which has been argued to show a similar structure with **ḱ(i)i̯ā-* (cf. Dumézil 1939: 51; Viredaz 2004–2005: 94–96). Regarding the etymology of Gr. *Persephone*, the authors do not discuss Wachter's explanation of Περσόφαττα, probably the oldest form of the name, as equivalent of Ved. *parṣa-* 'sheaves of corn' combined with *han-* 'to beat', i.e., 'thresher of corn' (RV 10.47.7 *khále ná parṣán, práti hanmi bhúri* 'As the sheaves on the threshing floor, I beat them in masses', cf. Wachter 2006, 2007), but take over Janda's hypothesis (2000: 224–250) as **pers-e-b^{h}h$_2$nt-ih$_2$* 'she who brings the light through' which would correspond to the Albanian dawn-goddess, *Premtë, P(ë)rende*. Among the arguments adduced in favour of a Palaeo-Balkanic group, such as the possessive pronoun **emos* (Alb. *im(e)*, Gr. ἐμός, Arm. *im*), the suppletive aorist of **h$_1$ed-* 'to eat': **g^{u}erh$_3$-* > Alb. AOR.3SG *angrë* (Buzuku), Gr. ἐβρώθην (with a typo on p. 237: "Arm. *owt'em*, aor. *k'er-*" instead of *owtem*: *ker-*), one wonders how the phonology of the supposed common root **klau̯-* 'to cry' is supposed to work in Armenian: Alb. *qaj*, OAlb. *klanj*; Gr. κλαίω; Arm. *lam* seems easier to connect with Lat. *lāmentum*, Lith. *lóti* 'to bark', etc. As for the centum-satem division, the authors retain Pedersen's claim (1900) that Albanian shows a triple reflex at least before front vowels, cf. *thotë* 'says' < **ḱeh$_1$-ti* (cf. Old Persian *θātiy*), *kohë* 'time' < **kēsḱo-* (cf. OCS *časъ* 'hour'), and *sorrë* 'crow' < **k^{u}ērsno-* (a vr̥ddhi derivative of 'black', cf. Sanskrit *kr̥ṣṇá-*); for thorn-clusters they assume that Alb. *vdjerr* 'to disappear' and *vdes* 'to die' correspond to Gr. φθείρω and φθίνω respectively, claiming that *v-* reflects the labiovelar of the original cluster **d^{h}g$^{u̯h}$-* and *-d-* the "thorn" element (**g$^{u̯h}$þ-*). They do not explain the details of the assumed sound changes, however, nor the reconstruction **g$^{u̯h}$þoi̯-k^{u}-éi̯e-* 'leave behind' (→ 'depart') with an extra labio-velar which cannot be a suffix.

For Indo-Iranian (Chapter 14), the least disputed of all subbranches, Martin Joachim Kümmel discusses as possible innovations Bartholomae's law ("Since there are hardly any traces of this law outside of Indo-Iranian, it is disputed whether it can be a PIE law or an IIrn. innovation", p. 247), Grassmann's Law to which there are cousins in Tocharian (cf. *tsikale* 'should be made' < *d^hig^h- with Toch. /ts/ going back to /d/ < /d^h/; otherwise /d^h/ becomes /t/), in Latin (*trahō*, cf. Weiss 2018) and possibly Armenian (only after nasal? Cf. *pndem* 'insist, bind' < *b^hend^h-, Martirosyan 2010: 726); Brugmann's law (PIE *o > $ā$ in open syllable) with a number of exceptions which may show paradigmatic levelling (such as *pati-* 'lord', if one does not restrict its operation to the position before resonants); the merger of all non-high short vowels into /a/ and of the long vowels into /ā/, whereas the merger of /a/ and /o/ is quite widespread, and might thus be a "part of a larger areal development" (p. 249); the liquid merger of /r/ and /l/ into /r/ not found anywhere else in the IE language family; aspiration of stops due to laryngeals which is seen uncontroversially only in Indo-Iranian; laryngeal vocalization of CHC > C*i*/øC only seen in this language family – but Indo-Aryan usually has /i/ and Iranian mostly zero, so probably this is a post-PIIrn. feature, and /i/ is rather like the shwa secundum in Greek (as in πίτνημι 'to spread out' next to the full grade form πετάννυμι, etc.). As for the internal structure of Indo-Iranian, the main differences between earliest Iranian and Vedic are in phonology and lexicon, not in morphology or syntax. Kümmel gives two useful tables showing the main differences in phonology (e.g., deaspiration in Iranian etc.) and morpho-syntax, including e.g., GEN SG 1st person pronoun **mana* (cf. OCS *mene*) versus Ved. *máma* (but cf. Khot. *mamä*), 2PL NOM Iran. **yuž-am* versus Indic *yūyám* showing influence of *vayám* (1PL NOM). Nuristani is classified by him as a probably separate branch, since these languages differ from both other branches in many respects. As for the relationship with other branches, he views IIr. as part of the languages that show what he calls the "central IE sound shift" assuming a chain shift of PIE **d*: *ɗ* [i.e. implosive d] > Central IE **d^h*: *d*. The question then is if Iranian took part in this shift too, since there are few direct traces of aspiration in this group (and Bartholomae's Law may have operated already in PIE, v. supra). Kümmel proposes to see them in **teng^h* > **t^hang-* > Iran. **θang-* 'to pull' and **kumb^{h}a-* > **k^humba-* > **xumba-* 'pot'. As remarked by various authors in the volume, the languages of the satem-group are geographically closer to one another than those of the centum-type, so the latter are probably the more conservative languages, while in the satem-group a chain shift occurred, according to Kümmel, with **k^{μ}*: *k* > **k*: *c* (if one assumes only two original stop-series). For the "ruki" development of *s* > *š* after non-anterior sounds, he proposes to see this as the phonologization of an allophony with /s/ which only happened in the satem languages because they developed additional sibilants from

other sources. Kümmel then reviews assumptions about the position of IIr. on the family tree and its possible appurtenance to larger subphyla; nearly all possible combinations have been proposed and none could be proved. Hence his conclusion: "Indo-Iranian does not have a clear next relative" (p. 264).

The same applies to Balto-Slavic (Chapter 15), discussed by Tijmen Pronk. Baltic and Slavic had been conceived of as a single branch of the IE family throughout the 19th c. This was challenged at the beginning of the 20th c. foremost by Antoine Meillet who argued for parallel developments; during the last 25 years the trend has gone back to assume a Balto-Slavic unity based on probable common innovations such as, in phonology, Hirt's Law, the development of the syllabic resonants, Lidén's Law and Winter's Law, and, in morphology, e.g., the replacement of the thematic GEN SG by the form of the ABL. As for internal grouping, there is no dispute about a Proto-Slavic, but arguing for a separate Proto-Baltic has proved more difficult: this has to be shown by innovations later than Proto-Balto-Slavic and which can be shown to have never existed in Slavic. According to Pronk, "the most robust evidence for a Proto-Baltic period is […] presented by the productivity of nominal *ē*-stems (whatever their origin), the (near) merger of 3sg. and 3pl. verbal forms, the loss of **-j-* between a consonant and a front vowel and the identical evolution of a number of former consonant stems and root nouns" (p. 278). As for possible East Baltic + Slavic versus West Baltic innovations such as the apparent common GEN SG of *o*-stems Lith. *-o*, OCS *-a* from the PIE ABL **-o-ed* versus OPr. *-as*, Pronk argues that the latter is not to be explained from PIE **-oso*, but may show a remarking of the ABL **-ād* with genitive *-s*. As for outward connections, Pronk argues against a Balto-Slavic + Germanic node. The DAT PL in *-m-* is taken to be a retained archaism (one might interpret this as a result of language contact, i.e., a retained archaism as an areal feature). Finally, the problem of the lack of satem-reflex in a number of words in Baltic and Slavic is explained by Pronk not as due to language contact or borrowing from one or various unknown centum-language(s), but rather as due to sound change: velar reflexes would be expected "when the following syllable contains a resonant or the semi-vowel **-u̯-*" (p. 284), e.g., Lith. *pẽkus*, OPr. *pecku* 'cattle' with *k* from the oblique cases, cf. Skt. GEN SG *paśvaḥ* < **pek̑u̯os*. The list in which the relevant examples are discussed is very succinct, however, and in many instances more details would have been useful, and it is not exempt from some apparent *ad hoc* assumptions of analogy, e.g. OCS *ostrъ* 'sharp' < **h₂ek̑ro-* instead of expected **okrъ*, for which Pronk argues that "*-k̑-* [was] reintroduced from the comparative stem **h₂ek̑-i(e)s-* and/or from derivatives, cf. OCS *osla* 'whetstone', *ostьnъ* 'sharp point', *osъtъ* 'thistle'" (p. 285).

Summary: the volume presents a very useful discussion of the methodology of linguistic subgrouping, methods of computational cladistics and the features allowing the establishment of the individual subbranches of Indo-European and speaking for or against possible higher intermediate nodes. The lack of new data

applicable to the well-tried comparative method results in a certain lack of novelty in the individual discussions of the branches; however, they will certainly be useful for the further discussion especially in areas such as the "Balkan group", where the ambiguity of the data apparently does not as yet permit firm conclusions.

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