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Proto-Indo-Anatolian, the “Anatolian split” and the “Anatolian trek”: a comparative linguistic perspective

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4 PROTO-INDO-ANATOLIAN, THE "ANATOLIAN SPLIT" AND THE "ANATOLIAN TREK": A COMPARATIVE LINGUISTIC PERSPECTIVE

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Since the so-called "Ancient DNA Revolution" of the past decade, which has yielded many new insights into the genetic prehistory of Europe and large parts of Asia, it can no longer be doubted that the Indo-European languages spoken in Europe and Central and South Asia were brought there from the late fourth millennium BCE onward by population groups from the Pontic–Caspian steppes who had belonged to the archaeologically defined Yamnaya culture.[1] We may therefore assume that the population groups bearing the Yamnaya culture can practically be equated with the speakers of Proto-Indo-European, the reconstructed ancestor of the Indo-European languages of Europe and Asia, and that the spread of the Indo-European language family is a direct consequence of these migrations of Yamnaya individuals into Europe and Asia.

Moreover, the last few decades have seen the growing consensus, within Indo-European linguistics, that the Anatolian branch of the Indo-European language family occupies a special position: most scholars nowadays seem to accept the idea that the first split in the Indo-European language family was between Anatolian and the other, non-Anatolian branches (including Tocharian), which at that point still formed a single language community that, for some time after, continued to undergo common innovations not shared by Anatolian.[2] In the following, I will use the term Proto-Indo-Anatolian (PIA) for the language stage preceding the "Anatolian split," and the term "Classical Proto-Indo-European" (CPIE, sometimes also called "Core Proto-Indo-European," "Nuclear Proto-Indo-European," *vel sim*.) for the mother language of all the other, non-Anatolian, Indo-European branches; cf. Figure 4.1.[3]

As the first split of Classical Proto-Indo-European can be equated with the large Yamnaya migrations of the latter half of the fourth millennium BCE, the Anatolian split should be dated before that period. However, no consensus has yet been reached on the amount of time that must have passed between the Anatolian split and the breakup of Classical Proto-Indo-European.

It is the aim of the present chapter to shed light, from a comparative linguist's point of view, on the possible dating of the Anatolian split, as well as the possible route along which the Anatolian languages were brought to Anatolia (the "Anatolian trek").

4.1 Dating the "Anatolian Split"

Before we embark on discussing the possible date of the Anatolian split, it is important to mention the fact that comparative linguistics does not provide a tool with which prehistoric language stages can be dated with exact precision in an absolute way: all dating is, in principle, relative. However, there are some arguments we can rely on to make educated guesses about the absolute dating of reconstructed languages. The most important of these is the number of linguistic innovations one must postulate between a reconstructed pre-stage and its daughter language: the higher the number of these innovations, the further back in time the reconstructed stage must have been spoken. Note, however, that – since it is known that in some situations, languages change more rapidly than in others – the correlation between the number of reconstructed innovations and the length of the period in which these innovations have taken place is certainly not a constant. Nevertheless, on the basis of a broad comparison with the linguistic histories of, e.g., the Romance languages and the Indic languages (the mother languages of which are attested and can be historically dated), it should be possible to give relatively precise estimates for the dating of linguistic pre-stages based on the number and nature of the linguistic innovations that have taken place between these pre-stages and one or more daughter languages.

[1] Allentoft et al. 2015; Haak et al. 2015; Jones et al. 2015; Lazaridis et al. 2016.

[2] For recent discussions, see Kloekhorst (2008a: 7–11), Oettinger (2013/2014), Kloekhorst & Pronk (2019), Melchert (forthc.), and, more skeptically, Rieken (2009), Eichner (2015), and Adiego (2016).

[3] Cf. Kloekhorst & Pronk 2019.

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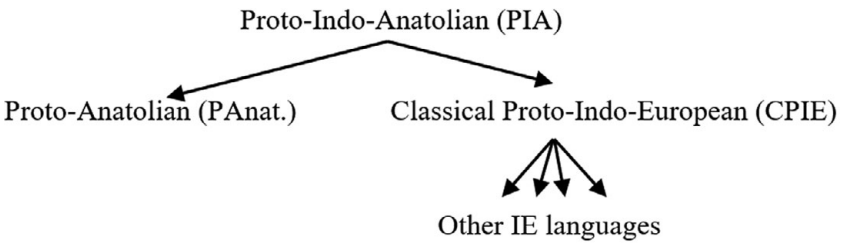

FIGURE 4.1. The family tree of Indo-European according to the Indo-Anatolian Hypothesis.

4.1.1 Dating Proto-Anatolian

Ten known languages are commonly regarded to belong to the Anatolian branch: Hittite,[4] Palaic,[5] Cuneiform Luwian,[6] Hieroglyphic Luwian,[7] Lydian,[8] Carian,[9] Lycian,[10] Milyan,[11] Sidetic,[12] and Pisidian.[13] Already in the very first documents written in ancient Anatolia (Old Assyrian clay tablets from the twentieth century BCE), we find references to Anatolian (Hittite) personal names, whereas the youngest attestations of an Anatolian language date to the second century CE (Pisidian grave inscriptions). It is commonly assumed that in the course of the first millennium CE, the entire Anatolian branch went extinct. In order to date the Proto-Anatolian mother language from which all these languages stem, we have to investigate the linguistic differentiation between them.

As noted above, the oldest attestations of an Anatolian language[14] are Hittite personal names attested in Old Assyrian documents, as discovered in Kültepe (ancient Kaniš/Nēša) and other sites and which date to ca. 1935 to 1715 BCE.[15] In Kloekhorst 2019, it is argued that these Hittite personal names, though unmistakably Hittite, display a distinct dialect when compared to the Hittite language as known from the later texts from Boğazköy (ancient Ḫattuša), which date to ca. 1650 to 1180 BCE. Moreover, this "Kanišite" Hittite dialect cannot be the ancestor of Ḫattuša Hittite, which means that the two varieties must linguistically be regarded as sisters, stemming from an earlier stage that may be called Proto-Hittite. Since the difference between the two Hittite dialects is small, not much time is needed to account for the diversification between the two, and it therefore seems safe to date Proto-Hittite to no more than a handful of generations before the earliest attestation of Kanišite Hittite, i.e., to ca. 2100 BCE.

The so-called Luwic languages (Cuneiform Luwian, Hieroglyphic Luwian, Lycian, and possibly Carian, Sidetic, and Pisidian)[16] form a distinct subbranch within Anatolian.[17] The two oldest attested languages within this group, Cuneiform Luwian (whose oldest texts date from the sixteenth century BC) and Hieroglyphic Luwian (attested from ca. 1400 BCE onward), are closely related dialects, and their common ancestor, Proto-Luwian, need not be much older than a handful of generations before the earliest Cuneiform Luwian attestations. It may thus be dated to the eighteenth or nineteenth century BCE. The third major Luwic language, Lycian, though attested considerably later (fifth to fourth century BCE), is, on the one hand, evidently closely related to the Luwian languages, but, on the other, also clearly distinct from them (especially with regard to the vowel system and certain morphological innovations).[18] Moreover, it is clear that Lycian cannot descend directly from Proto-Luwian. We therefore need to postulate a pre-stage of Proto-Luwian and Lycian, which we term Proto-Luwic. On the basis of the relatively small, but nevertheless clear linguistic distance between Lycian and the Luwian languages, we may assume that this stage preceded Proto-Luwian by a couple of centuries, and it therefore seems safe to assume that Proto-Luwic dates to the twenty-first to twentieth century BCE.

The status of the two remaining Anatolian languages, Palaic and Lydian, is somewhat debated,[19] though good arguments exist for assuming that they are more closely related to the Luwic branch, with Palaic sharing more common innovations with Proto-Luwic than Lydian does.[20] This means that we may view Palaic as a sister of Proto-Luwic, both deriving from an ancestor that can be called Proto-Luwo-Palaic. Lydian may thus be viewed as a sister of this latter language, both going back to a Proto-Luwo-Lydian ancestor language. However, since our knowledge of Palaic and Lydian is rudimentary, it is difficult to know the exact shapes of these ancestor languages. This also makes it difficult to give secure estimates of the lengths of the time gaps between Proto-Luwic, Proto-Luwo-Palaic, and Proto-Luwo-Lydian, respectively, although it seems reasonable to

[4] Hoffner & Melchert 2008. [5] Carruba 1970.
[6] Melchert 2003. [7] Payne 2010. [8] Gusmani 1964–1986.
[9] Adiego 2007. [10] Melchert 2008. [11] Gusmani 1989/1990.
[12] Orozco 2007. [13] Brixhe 1988.
[14] Note that Kroonen, Barjamovic, & Peyrot (2018) have recently claimed that a number of personal names that are recorded in texts from Ebla dated to the 25th–24th centuries BCE (Bonecchi 1990), and which refer to individuals said to be from the state of Armi (a toponym that is further unknown), belong to one or more languages "that clearly fall within the Anatolian Indo-European family" (2018: 6). If correct, these names, which predate the Kanišite Hittite names from the Kültepe texts by half a millennium, would be the earliest attested witnesses of the Anatolian language branch. However, Kroonen, Barjamovic, & Peyrot do not offer a detailed analysis of this material, and at present, I would therefore regard the linguistic status of these names as too uncertain to make any broad claims.
[15] Cf. Larsen 2015 for an introduction to Kültepe (Kaniš/Nēša) and the documents excavated there.
[16] Since our knowledge of Carian, Sidetic, and Pisidian is only rudimentary, their classification as Luwic remains uncertain.
[17] Rieken 2017: 299; Kloekhorst 2022a: 67–71.
[18] Kloekhorst 2013. [19] Cf. Rieken 2017: 303.
[20] Cf. Kloekhorst 2022a: 71–75, building on Oettinger 1978 and Yakubovich 2010: 6.

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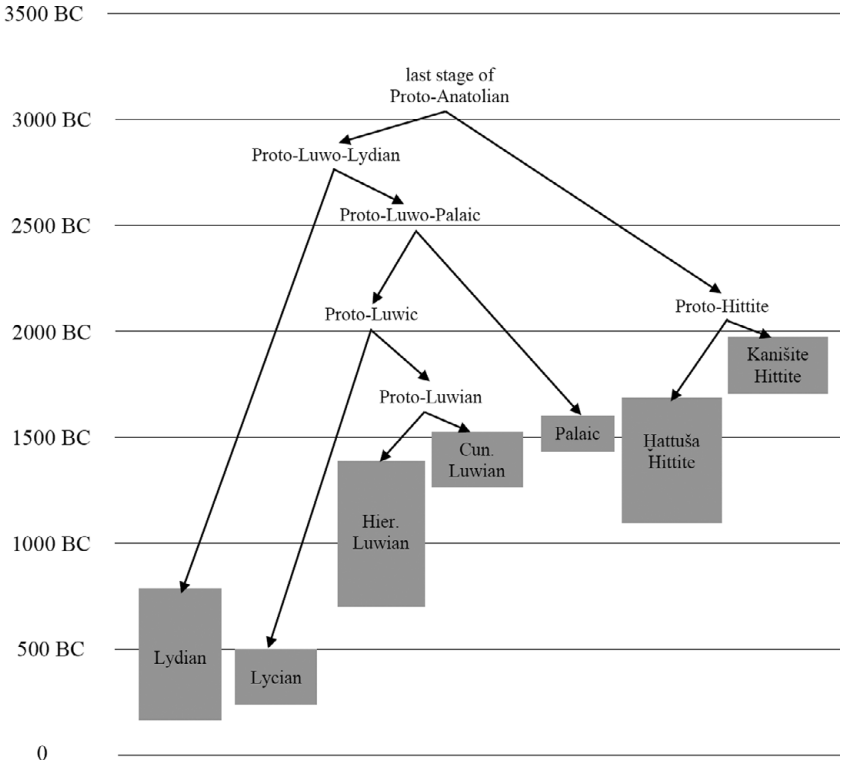

FIGURE 4.2. The phylogenetic composition of the Anatolian branch (gray blocks represent the period of attestation of that specific language stage).

assign several centuries to each of them. With Proto-Luwic probably dating to the twenty-first to twentieth century BCE, it seems plausible to date Proto-Luwo-Palaic to some point between the twenty-sixth and twenty-third century BCE, and Proto-Luwo-Lydian maximally to the twenty-ninth, minimally to the twenty-sixth century BCE.

Proto-Anatolian can now be defined as the ancestor language of, on the one hand, Proto-Luwo-Lydian (the ancestor of Lydian, Palaic, and the Luwic languages) and, on the other, Proto-Hittite. With Proto-Luwo-Lydian dating to the twenty-ninth to twenty-sixth century BCE, Proto-Anatolian must be dated before that time. This also applies when we compare the two language stages of the Anatolian branch whose shapes we can reconstruct relatively securely, namely Proto-Hittite and Proto-Luwic (which, as we saw above, seem to have been roughly contemporaneous, ca. 2100 BCE and the twentieth to twenty-first century BCE, respectively). If we look at the linguistic differences between these two languages, which is an indication of the distance from their pre-stage, we see that these differences are relatively sizable.[21] Proto-Luwic in particular seems to have undergone quite a number of phonological and morphological innovations vis-à-vis the reconstructable Proto-Anatolian stage: Čop's law, with later morphological restorations; the assibilation of the fortis palatovelar; the weakening of the lenis velars; the reduction of the vowel system; the massive spread of the so-called *i*-mutation paradigm; the grammaticalization of the genitival adjective; the reshaping of some nominal endings; etc. But Proto-Hittite too has undergone its share of linguistic innovations: the weakening of unaccented vowels; the assibilation of dental stop + **j*; the almost complete elimination of paradigmatic alternations between fortis and lenis stops; the reshaping of some verbal endings; the transfer of many *mi*-verbs to the *ḫi*-conjugation; the spread of the *n*-stem in the word for 'earth'; etc. Not only the number of different innovations, especially of the Luwic subbranch, is telling, but also their nature. For instance, the massive spread of the *i*-mutation paradigm in Luwic is an innovation[22] that must have taken at least several generations, perhaps centuries. On the basis of the linguistic distance between Proto-Hittite and Proto-Luwic, I assume that the time gap between the two may have been approximately a millennium. This would mean that Proto-Anatolian should be dated to sometime around the thirty-first to thirtieth century BCE. This is in line with the observation that Proto-Anatolian must predate the Proto-Luwo-Lydian stage, which can be dated to the twenty-ninth to twenty-sixth century BCE. Moreover, it would mean that the first dissolution of Proto-Anatolian was not too far removed in time from the breakup of Classical Proto-Indo-European (from 3400 BCE onwards; cf. § 4.1.2.1), which would fit the Indo-Anatolian hypothesis.

All in all, we may schematize the phylogenetic composition of the Anatolian branch as presented in Figure 4.2.

[21] Cf. Kloekhorst 2022a for a discussion of the innovations of both Proto-Luwic and Proto-Hittite.

[22] Cf. Norbruis 2021: 9–50 for a detailed analysis of this innovation.

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4.1.2 Dating Proto-Indo-Anatolian

From a comparative linguistic point of view, there are two approaches to evaluating the possibilities for the date of Proto-Indo-Anatolian: (1) assessing the possible length of the time gap between Proto-Indo-Anatolian and Classical Proto-Indo-European; and (2) assessing the possible length of the time gap between Proto-Indo-Anatolian and Proto-Anatolian.

In both cases, this assessment depends on making an inventory of all the innovations that have taken place between Proto-Indo-Anatolian and the respective daughter stage. This is a difficult task, however, since no consensus currently exists as to how Proto-Indo-Anatolian should be reconstructed. As a consequence, at present there is no commonly held view on the nature and number of innovations that distinguish Classical Proto-Indo-European and Proto-Anatolian, respectively, from their Proto-Indo-Anatolian mother language. The two paragraphs that follow therefore inevitably depend on my personal view of what the shape of Proto-Indo-Anatolian may have been, and which innovations may have taken place in the prehistories of Classical Proto-Indo-European and Proto-Anatolian.

4.1.2.1 The Gap between Proto-Indo-Anatolian and Classical Proto-Indo-European

As mentioned in the introduction of this chapter, the recent revolution in tracking prehistoric migrations on the basis of ancient DNA has erased all doubt that the speakers of Classical Proto-Indo-European can be equated with the bearers of the Yamnaya culture of the Early Bronze Age Pontic–Caspian steppes. The last phase of Classical Proto-Indo-European may be dated to the period directly prior to the migrations of the Yamnaya people to the east, into Central Asia, causing the rise of the Afanasievo culture (commencing ca. 3300 BCE),[23] which is generally seen as the ultimate ancestor of the Tocharian languages. The start of this migration, which we may term the "Tocharian split" and which constitutes the first breakup of Classical Proto-Indo-European,[24] may thus be dated a bit earlier than 3300 BCE, i.e. ca. 3400 BCE.

Recently, Tijmen Pronk and I have gathered a total of twenty-three examples that we regard as "good candidates" for possible linguistic innovations that have taken place between Proto-Indo-Anatolian and Classical Proto-Indo-European (Kloekhorst & Pronk 2019: 3–4). This list includes eight cases of semantic innovation (e.g. PIA **mer-* 'to disappear' > CPIE 'to die'),[25] ten morphological innovations (e.g. PIA **h₁eḱu-* > CPIE **h₁eḱu-o-* 'horse'),[26] three sound changes (e.g. PIA **h₂* = *[qː] > CPIE *[ħ] or *[ʕ]),[27] and two syntactic innovations (e.g. the marking of neuter agents).[28] Besides these twenty-three cases, we list another eleven examples that we regard as "promising, though perhaps less forceful" than the other ones, or as "requiring additional investigation before it can be decided whether we are genuinely dealing with an innovation of the 'classical' Indo-European languages" (ibid.: 4–5). Though it is possible that not every innovation on this list will ultimately be accepted by all specialists in the field, it seems unlikely that they will all be refuted. Moreover, some of the good candidates concern significant structural innovations (e.g. the rise of the feminine gender, including the creation of its morphological marking), which must have taken substantial time to develop. In Kloekhorst & Pronk 2019, we have therefore concluded that the time gap between Proto-Indo-Anatolian and Classical Proto-Indo-European (including Tocharian) may have been in the range of 800 to 1000 years. With the dating of Classical Proto-Indo-European to the period directly preceding the start of the "Tocharian split," i.e. ca. 3400 BCE, we would arrive at a date of ca. 4400 to 4200 BCE for the "Anatolian split," which means that the last stage of Proto-Indo-Anatolian must have been spoken before this date.

4.1.2.2 The Gap between Proto-Indo-Anatolian and Proto-Anatolian

In the period between Proto-Indo-Anatolian and Proto-Anatolian, linguistic innovations have taken place as well, but here, too, the same problem arises: there is no consensus on the exact shape of Proto-Indo-Anatolian; thus there is no generally accepted view on the nature and number of innovations that must have taken place in the period between these two stages.

Nevertheless, there are certain innovations in Proto-Anatolian that most scholars would agree on, namely with regard to the phonological system (the development of three consonantal series into two;[29] the "collapse" of the laryngeal system: the phonologization of coloring, partial merger of **h₂* and **h₃*, and development of **VHC* > *V̄C*;[30] the creation of a new labialized laryngeal **Hʷ*;[31] and lenition rules[32]) and especially the morphological system (a major reshuffling of the verbal system, including the loss of the optative and subjunctive categories, the loss of the present-aorist distinction, and probably the transformation of the perfect into the *ḫi*-conjugation,[33] but also the creation of sentence-initial particle chains).[34] The changes in the verbal system in particular seem to be innovations that would have needed considerable time to take place. We may therefore assume that the time gap between

[23] Anthony 2013: 10; Svyatko et al. 2017: 73.
[24] Cf. Peyrot 2019, who calls this stage "Proto-Indo-Tocharian."
[25] Kloekhorst 2008a: 8. [26] Kloekhorst 2008a: 10.
[27] Kloekhorst 2018. [28] Lopuhaä-Zwakenberg 2019.
[29] E.g., Melchert 1994: 60.
[30] Melchert 1994: 65–74; Kloekhorst 2006; Kloekhorst 2008a: 75–82.
[31] Kloekhorst 2006: 97–101; Melchert 2011: 129; Melchert 2020: 262.
[32] Eichner 1973: 79, 100[86]; Morpurgo Davies 1982/83; Kloekhorst 2014: 547–566.
[33] Oettinger 2017: 264–267, with references; Kloekhorst 2018.
[34] Luraghi 2017.

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Proto-Indo-Anatolian and Proto-Anatolian may have been at least 1000 years, or perhaps even 1200 years.

If our dating of the last stage of Proto-Anatolian to around the thirty-first to thirtieth century BCE is correct, we would arrive at a date of around the forty-third to fortieth century BCE for Proto-Indo-Anatolian.

4.1.2.3 Combining the Two Approaches

We see that both approaches yield a comparable result: if we take Classical Proto-Indo-European as our point of departure, we arrive at ca. 4400 to 4200 BCE for Proto-Indo-Anatolian, and if we take Proto-Anatolian as our starting point, we arrive at ca. the forty-third to fortieth century BCE. The two approaches overlap in the period 4300 to 4200 BCE, with a margin ranging from ca. 4400 BCE to the fortieth century BCE. In the remainder of the chapter, I will therefore use 4300 to 4200 BCE as a shorthand for the date of the "Anatolian split," but we must bear in mind that the first dissolution of Proto-Indo-Anatolian could have taken place a bit earlier (up to ca. 4400 BCE) or a bit later (until ca. the fortieth century BCE).

4.2 Locating Proto-Indo-Anatolian

The question of where Proto-Indo-Anatolian must have been located ties in with two issues: (1) the Indo-European "homeland" question; and (2) the possible genetic relationships of Proto-Indo-Anatolian with one or more other languages or language families.

4.2.1 The Indo-European "Homeland" Question: Analyzing the Anatolian Lexicon

For decades, linguists and archaeologists have engaged in discussion as to where the Indo-European mother language was spoken, focusing on two scenarios: the steppe hypothesis, which states that the Indo-European languages originated in the Pontic–Caspian steppes and was spread throughout Europe and Asia by nomadic pastoralists in the late fourth millennium BCE,[35] and the Anatolian hypothesis, which assumes that the Indo-European mother language was spoken around 8000 to 7000 BCE in Anatolia by the first farmers, who, by gradually colonizing Europe and Asia, not only spread agriculture, but also their language.[36] Nowadays, since studies in ancient DNA have shown that in the latter part of the fourth millennium BCE, massive migrations must have taken place from the Pontic–Caspian steppes into the areas of Europe and Asia where later Indo-European languages are spoken,[37] no one can seriously uphold the Anatolian hypothesis for Classical Proto-Indo-European anymore.

However, since Proto-Indo-Anatolian must be dated substantially earlier than Classical Proto-Indo-European (cf. Section 4.1), one could theoretically argue that the Anatolian homeland hypothesis still applies to Proto-Indo-Anatolian. One would then have to assume that this protolanguage originated in Anatolia, and that after the "Anatolian split," the Anatolian branch in fact remained where it was, and that the other branch, which was to develop into Classical Proto-Indo-European, ended up in the Pontic–Caspian steppes in some way or another, from which it spread further into Europe and Asia. If this is true, Proto-Anatolian would be indigenous to Anatolia.

From a linguistic point of view, this hypothesis can be tested by analyzing the Anatolian lexicon. Unfortunately, we do not have enough lexical material for all the Anatolian languages at our disposal, so we cannot make such an analysis for the entire branch. Nevertheless, it is possible to perform such an investigation for Hittite and, as we will see, the results are robust enough to assume that we can apply them to the Anatolian branch as a whole.

We can approach the Hittite lexicon from two angles: (1) by assessing the semantics of its borrowed lexicon; and (2) by assessing the semantics of its inherited lexicon.

4.2.1.1 The Borrowed Lexicon of Hittite

The Hittite lexicon, as attested in the texts known to us, consists of some 1900 word stems whose meanings are clear (although the exact meaning of some of these words is less certain than others). With the use of the methods of comparative linguistics, it is possible to distinguish between two types of lexemes: (1) words that have a good Indo-European etymology, and can therefore be regarded as inherited words (i.e., they must already have been part of the pre-Hittite lexicon from the Proto-Indo-Anatolian stage onward); and (2) words that do not have a good etymology, and are therefore very likely borrowings (i.e. words that entered the Hittite lexicon through contact with other languages in the period between Anatolian splitting off from the Proto-Indo-Anatolian language stage and the period from which the Hittite texts stem).

In my etymological database of the entire Hittite lexicon (compiled in preparation for Kloekhorst 2008a), some 890 words (i.e., ca. 46% of the lexicon) are classified as "non-Indo-European," and can therefore be regarded as borrowings. These words fall into the following semantic categories:

1. Animals / pertaining to animals (63 words)
2. Body parts / medical (67 words)
3. Buildings / parts of buildings (44 words)
4. Celestial phenomena (4 words)
5. Cultic terms (115 words)
6. Foodstuffs (89 words)

[35] Gimbutas 1973; Mallory 1989; Anthony 2007, 2013.

[36] Renfrew 1987, 2000, 2003; Gray & Atkinson 2003; Bouckaert et al. 2012. See Pereltsvaig & Lewis 2015, however, for a devastating review of the latter two articles.

[37] Allentoft et al. 2015; Haak et al. 2015; Lazaridis et al. 2016.

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7. Functionaries / professions (75 words)
8. Furniture (14 words)
9. Garments / clothing / wool (48 words)
10. Gems / materials (35 words)
11. Plants (80 words)
12. Royalty / rulership (18 words)
13. Tools / instruments (45 words)
14. Topographical features (34 words)
15. Vessels (58 words)
16. Other (101 words)

Several of these categories are interesting. Take, for instance, category 3 (buildings/parts of buildings): apart from the word *per / parn-* 'house', which may be of Indo-European origin, all other Hittite words for buildings are borrowings (*arkiu-*, *ḫištā-*, *kāškāštipa-*, *māk(kiz)ziia-*, etc.). The same goes for words concerning royalty and rulership: although the Hittite words *ḫaššu-* 'king' and *ḫaššuššara-* 'queen' are built from Indo-European elements, all other words dealing with royalty are borrowings: the title of the king and queen (*labarna-*[38] and *tawannanna-*), the terms for 'crown prince' (*tuḫkanti-*),[39] 'throne' (*ḫalmašuitt-*), and 'palace' (*ḫalentiu-*), etc. The number of borrowings denoting vessels ('cup', 'bowl', 'basket', etc.) is impressive, and this also goes for the number of borrowings denoting cultic items and concepts.

In other words, almost all the Hittite terms referring to the "high culture" of the city-states characteristic of Middle/Late Chalcolithic and Early Bronze Age Anatolia are borrowings. This situation is not consistent with a scenario in which Proto-Anatolian (and therefore Hittite) was indigenous to Anatolia: in such a case, we would expect the Hittites to have indigenous words for all aspects of the high culture of Anatolia (and to find some of these words in the other Indo-European languages as well). On the contrary, this situation implies that the speakers of Proto-Anatolian/pre-Hittite were immigrants into Anatolia, having taken over the high cultures of population groups who spoke a language or languages different from theirs, and extensively borrowing words for all kinds of items and concepts that were new to them.

We can therefore safely reject the Anatolian hypothesis for the Proto-Indo-Anatolian stage. From a linguistic point of view, there can be no question that Proto-Indo-Anatolian was spoken outside of Anatolia. In view of its being the ancestor of Classical Proto-Indo-European, which was spoken in the Pontic–Caspian steppes, it seems best to assume that Proto-Indo-Anatolian was spoken somewhere near that region as well.

4.2.1.2 The Inherited Lexicon of Hittite

In order to pinpoint a more precise location for the Proto-Indo-Anatolian homeland, we have to look at the inherited lexicon of Hittite.[40] The inherited lexemes of Hittite, i.e., words that have good cognates in the other Indo-European languages, must have been passed down all the way from Proto-Indo-Anatolian, and can therefore be regarded as representatives of the Proto-Indo-Anatolian lexicon. Using the concept of linguistic palaeontology,[41] we can assume that the words used by the speakers of Proto-Indo-Anatolian represented concepts that were known to them. Since the Proto-Indo-Anatolian lexicon contains words for e.g. 'horse' (PIA *$h_1e\acute{k}u$-), 'cow' (PIA *g^weh_3u-), 'sheep' (PIA *h_3eui-), 'yoke' (PIA **ieug-*), 'honey' (PIA **melit-*), and 'to pasture' (PIA **ues-*), which point to a pastoralist lifestyle, we may assume that the speakers of Proto-Indo-Anatolian were living in the steppes, just as their descendants, the speakers of Classical Proto-Indo-European, did. It should be noted that since the word for 'wheel' cannot be reconstructed for Proto-Indo-Anatolian (the Hittite word for 'wheel', *ḫurki-*, does not match the word for 'wheel' in the other Indo-European languages, which was *k^wek^wlo-), the Proto-Indo-Anatolians may not have known the wheel. This is consistent with the dating of Proto-Indo-Anatolian before ca. 4300 to 4200 BCE, a period that predates the invention of the wheel by more than half a millennium.[42]

4.2.2 The Indo-Uralic Hypothesis

In order to pinpoint more precisely where in the steppes Proto-Indo-Anatolian may have been spoken, it may be fruitful to look further back in time to see whether we can identify one or more languages or language families that could have been relatives of Proto-Indo-Anatolian.

Throughout history, there have been many attempts to connect the Indo-European language family with other language families (see Kloekhorst and Pronk 2019: 9 for a selective overview), most of which are regarded with skepticism by Indo-Europeanists. One comparison stands out, however: namely, the one connecting Indo-European with Uralic.[43] The similarities between these two language families are mostly found in morphology (Kortlandt 2002 lists no fewer than twenty-seven morphemes of Indo-European and Uralic that are phonetically so similar to each other that he regards them as "definitely Indo-Uralic"), but there are also some matches both lexically and structurally.[44]

If this connection between Indo-European and Uralic, the so-called "Indo-Uralic hypothesis," is valid (and I regard this as highly likely), it would mean that Proto-Indo-Anatolian and Proto-Uralic would both stem from a common ancestor, Proto-Indo-Uralic. With Proto-Uralic being spoken somewhere near the Urals,[45] and Proto-Indo-Anatolian being the ancestor of Classical Proto-Indo-European, which was spoken in the Pontic–Caspian steppes, it stands to reason that Proto-Indo-Anatolian should be located in an intermediate region, i.e., the northeastern part of the Pontic–Caspian steppes, near the Ural Mountains.

[38] Kloekhorst 2008a: 520–521, *pace* Melchert 2003b.
[39] *Pace* Rieken 2016.
[40] Cf. Kloekhorst 2008a.
[41] Cf. Olander 2017.
[42] Anthony 2007: 63–76.
[43] E.g. Pedersen 1933; Collinder 1934, 1954; Čop 1975; Kortlandt 1989, 2002; Kloekhorst 2008b.
[44] Kortlandt 1989; Kloekhorst 2008b.
[45] E.g. Sammallahti 1988: 480; Carpelan & Parpola 2001: 78; Janhunen 2009.

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4.3 Mapping the "Anatolian Trek"

In order to map, in time and space, the route by which the Anatolian branch may have been transferred from its presumed Proto-Indo-Anatolian homeland (northeast of the Pontic–Caspian steppes before 4300 to 4200 BCE) to the location where it is eventually attested (Anatolia, from ca. 2000 BCE onward) – which we may term the "Anatolian trek" – we have to answer two questions: (1) when did the Anatolian branch enter into Anatolia, and (2) via which point of entry did it do so?

4.3.1 The Date of Entry into Anatolia

The question of when the Anatolian branch was introduced into Anatolia ties in with the issue of whether Proto-Anatolian diverged inside Anatolia or rather outside of it. On linguistic grounds, this is not easy to answer with certainty at the moment. If we assume that Proto-Anatolian diverged outside of Anatolia, it would imply multiple, separate introductions of Anatolian-speaking population groups into Anatolia – for instance, speakers of (a pre-stage of) Proto-Hittite and those of (a pre-stage of) Proto-Luwo-Lydian. These immigrations would thus have taken place in the period after the first breakup of Proto-Anatolian (ca. the thirty-first to thirtieth century BCE) and the last stage of Proto-Luwo-Lydian (ca. the twenty-ninth to twenty-sixth century BCE).[46] However, simply because all known Anatolian languages were spoken in Anatolia, it is to my mind more economical to assume that the Anatolian languages arrived in Anatolia as a single group, which would mean that we are dealing with a single introduction, namely that of speakers of (a pre-stage of) Proto-Anatolian. This event should thus be dated before or to the thirty-first to thirtieth century BCE.

From a historical linguistic perspective, the "Anatolian trek" should thus have started around 4300 to 4200 BCE and would have transferred pre-Proto-Anatolian from the Proto-Indo-Anatolian homeland (the northeast of the Pontic–Caspian steppes) to Anatolia, where it was introduced at some time before the thirty-first to thirtieth century BCE.

4.3.2 The Point of Entry into Anatolia

There are, in theory, two routes leading from the Pontic–Caspian steppe region into Anatolia: one through the Balkan Peninsula, and one through the Caucasus.[47] From a linguistic point of view, it seems more probable that the Anatolian branch arrived in Anatolia from the west, i.e., via the Balkan route, than from the east, i.e., via the Caucasus route. This statement is based on the following four arguments.

4.3.2.1 The Western Location of the Anatolian Languages

In Figure 4.3, a reconstruction of the linguistic landscape of Anatolia at the beginning of the second millennium BCE is presented.

This map is based partly on information from contemporary sources,[48] as well as from later sources (both from the second and first millennium BCE). Some of the locations assigned to (pre-stages of) languages are based on a back projection of the later geolinguistic situation,[49] sometimes involving relatively complicated argumentation,[50] but the overall picture of the linguistic landscape of western, central, and southeastern Anatolia seems reasonably clear. Only for northeastern Anatolia do we have insufficient data to say anything about its linguistic make-up in this period.

It is striking that the Anatolian languages are found in west and south-central Anatolia, whereas the mid-central and eastern parts of Anatolia are occupied by non-Indo-European languages (Hattic, Hurrian), which to their south side are bordered by members of the Semitic family (Amorite, Babylonian, and Assyrian), which is non-Indo-European as well. This distribution, in which the Anatolian languages clearly cluster in the west whereas the rest of Anatolia is inhabited by non-Indo-European speaking groups, is best explained by assuming that the speakers of (pre-)Proto-Anatolian entered Anatolia from the west, via the Bosporus and/or Dardanelles. If they had entered Anatolia from the east, via the Caucasus, we would expect to find some traces of Anatolian languages from there all the way to western Anatolia. One could argue that since we do not have any solid evidence for the linguistic make-up of northeast Anatolia in this period, it cannot be excluded that some unknown Anatolian languages were spoken in this region. These would then form a trail from the Caucasus to the

[46] If Kroonen, Barjamovic, & Peyrot (2018) are right that Anatolian personal names are already recorded in Eblaite texts from the twenty-fifth to twenty-fourth century BCE (which, however, is difficult to assess; cf. footnote 14), this scenario, which implies that the speakers of Anatolian did not enter Anatolia until the first quarter of the third millennium BCE, becomes even more unattractive.

[47] A third route, namely going around the eastern coast of the Caspian Sea and then turning west through Iran, was probably taken by the speakers of Mittanni-Indic (showing up in Anatolia around 1600 BCE), but this is hardly an option for the Anatolians: the speakers of Mittanni-Indic possessed the horse-drawn chariot and were therefore much more mobile than the speakers of pre-Proto-Anatolian, who probably did not know the wheel, would have been.

[48] Cf. Kloekhorst 2019 for an analysis of the Old Assyrian and Old Hittite sources toward a reconstruction of the linguistic landscape of central Anatolia in the first half of the second millennium BCE.

[49] As in the case of pre-Caro-Lycian (the pre-stage of Carian, Lycian, Milyan, and possibly Sidetic), the location of which is based on a back projection of first-millennium Carian and Lycian.

[50] The location of pre-Lydian (the ancestor of Lydian, which was spoken in classical Lydia in the first millennium BCE) is based on the idea that the historical Lydians came from a more northerly region, namely the area that in Hittite times was called Māša. Cf. Beekes 2003: 10–24; Kloekhorst 2012: 49–50; 2022b: 208–9.

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FIGURE 4.3. Reconstruction of the linguistic landscape of Anatolia at the beginning of the second millennium BCE. Names in small caps are Anatolian (Indo-European) languages; names in italics are non-Indo-European languages. The gray arrows indicate language spread in historic times (that of Luwian to southeast Anatolia and northern Syria and of Hittite into central Anatolia).

Anatolian language of the west; however, there is simply no evidence for such languages. Even from later sources (from the first millennium BCE and the first centuries CE), which do offer information on the linguistic landscape of northeast Anatolia in these periods, I know of no evidence that could be interpreted as pointing to an earlier presence, in this region, of languages that might have belonged to the Anatolian branch.[51]

4.3.2.2 The Kızıl Irmak River as a Linguistic Border

One of the clear landmarks of central Anatolia is the Kızıl Irmak river, which after rising in the eastern part of central Anatolia first runs westward, then veers off to the north, after which it runs back eastward in a northern direction before eventually flowing into the Black Sea (see Figure 4.3 for the Kızıl Irmak's typical bend). Moreover, the Kızıl Irmak is wide enough to form an obstacle when traveling through Anatolia: through time, it often even functioned as a boundary between regions and states.[52] At the beginning of the second millennium BCE, the area encompassed by the Kızıl Irmak bend, which was then called Ḫatti-land (the region centered around the city of Ḫattuša), was in essence Hattic-speaking.[53] Although Ḫattuša later became the capital of the Hittite kingdom, and the land of Ḫatti is traditionally seen as the Hittite heartland, it was in fact not until Anitta, king of Kaniš / Nēša, conquered Ḫattuša around 1730 BCE and Ḫattuša was later chosen as the capital of the Hittite royal family (ca. 1650 BCE) that speakers of Hittite may have settled in this region in large numbers. The presence of speakers of Hattic, a non-Indo-European language, within the Kızıl Irmak's bend contrasts with the presence of Anatolian (Indo-European) languages on the other side of the river: Palaic on its northwest side, Luwian on its southwest side, and Hittite on its south side. This distribution of Anatolian languages on all sides of the Kızıl Irmak's bend, while a non-Indo-European language was spoken inside the bend, strongly suggests that the speakers of these Anatolian languages came from the west, but that their migration was initially blocked by the Kızıl Irmak river, which they were not able to cross in large enough numbers to settle on its east side. Only later on, in historical times, were speakers of Hittite able to successfully cross the upper, southern course of the river with enough troops that they could eventually conquer the region inside the bend.

I therefore view the fact that the Kızıl Irmak seems to function as a linguistic border between Anatolian Indo-European languages, on the one hand, and a non-Indo-European one on the other as an argument in favor of assuming that the speakers of (pre-)Proto-Anatolian entered Anatolia from the west, i.e. via the Balkan route.

[51] In this period, we do find evidence of Urartean, generally seen as a sister language of Hurrian, and of Armenian, an Indo-European language that forms its own branch, distinct from the Anatolian branch.

[52] For instance, in the second millennium BCE, it functioned as the border of Ḫatti-land; in the first millennium BCE, as the border between the Lydian and the Persian empires (Bryce 2009: 281); and, later on, as the border between the Kingdom of Pontus and the Kingdom of Cappadocia.

[53] Singer 1981: 120–125; Kloekhorst 2019: 246–247.

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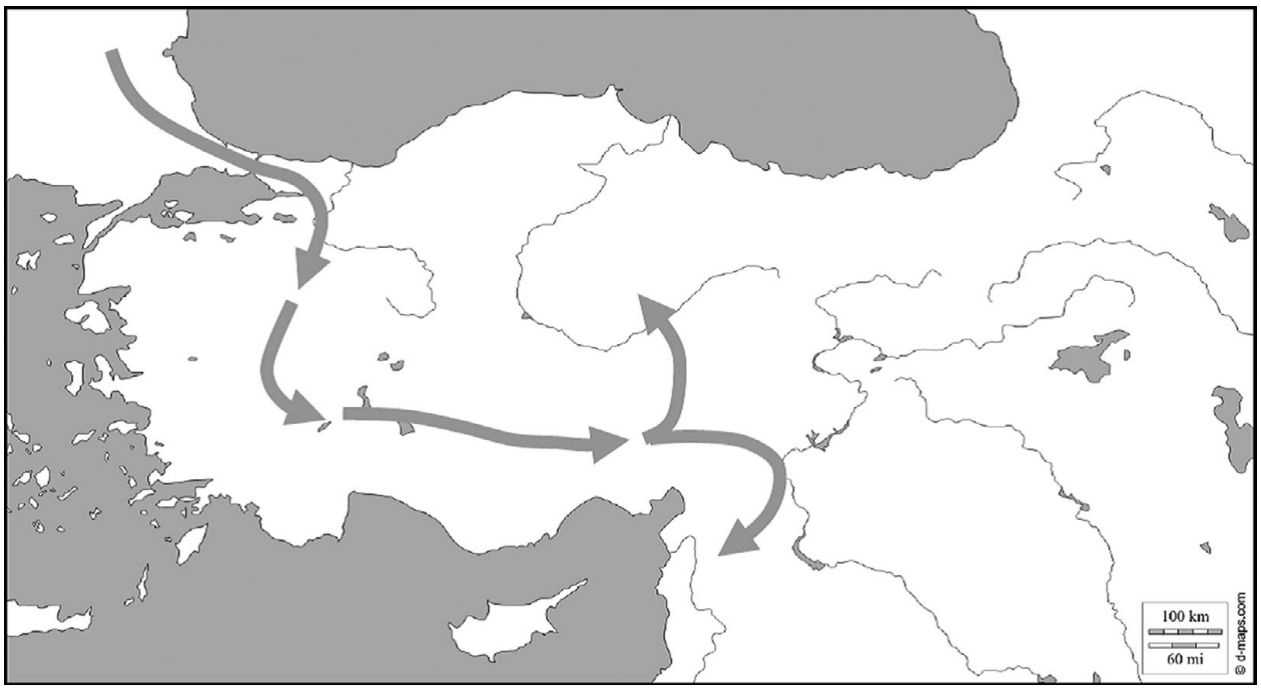

FIGURE 4.4. The route of the spread of (pre-stages of) Luwian within the Balkan scenario.

Within the scenario in which the Anatolian branch entered Anatolia from the east, i.e. via the Caucasus route, it is difficult to see how the distribution of languages on both sides of the Kızıl Irmak river could be explained in a natural way. We would then have to assume that in their move to the west, (the speakers of) (pre-)Proto-Anatolian did not enter the area to the north of the Kızıl Irmak, but instead took a route to its south, after which the Anatolian languages spread all over western Anatolia. But it is unclear why this would have been the case: what would have stopped these languages from spreading into the area north of the Kızıl Irmak river? Within the Caucasus scenario, I do not see any good explanation for this fact, whereas within the Balkan scenario, the initial absence of Anatolian languages inside the Kızıl Irmak bend can be linked to the shape of this river's course in a very natural way.

4.3.2.3 The "Drift" of the Anatolian Languages in Historic Times

Within the historical period, some Anatolian language spread into territories where they were not spoken previously. In Section 4.3.2.1, we saw that at the beginning of the second millennium BCE, Hittite was confined to the area south of the Kızıl Irmak River, but was able to spread to the north, into Ḫatti-land, in the eighteenth and seventeenth centuries BCE. Likewise, Luwian, which, at the beginning of the second millennium BCE, seems to have been at home in western Anatolia, is first attested in Kizzuwatna (present-day Adana province) (Luwian Kizzuwatnean ritual texts from the sixteenth century BCE), then spread to the Hittite heartland (influence on Hittite from ca. 1400 BCE onwards), and later moved eastward (all the way to the northern course of the Euphrates) and southward (into northern Syria) into areas where Semitic languages were originally spoken. It remained the dominant language there until the seventh century BCE.

This clear eastward drift of Luwian is particularly consistent with the Balkan scenario: we may thus see this movement to the east during the second and first millennium BCE as a mere continuation of the eastward movement that caused the initial entry of the Anatolian branch from the Balkan Peninsula into west Anatolia at the beginning of the third millennium BCE (cf. Figure 4.4).

Within the Caucasus scenario, we would have to assume that Proto-Anatolian first underwent a spread to the west, meanwhile diverging into different daughter languages, some of which ended up all the way in western Anatolia, and that, not much later on, one of these daughter languages, Luwian, started moving back all the way east again (cf. Figure 4.5). Although this may not be impossible, the scenario clearly seems less economical than the Balkan scenario.

4.3.2.4 Parallels from Later Times

The linguistic history of Anatolian is a rich one: throughout the past millennia, many different population groups have been able to settle in Anatolia from somewhere else, bringing their languages with them. Even nowadays, the modern state of Turkey is home to a dozen different languages. Some of these languages entered Anatolian through migrations from the west, via the Balkans. This is generally assumed to have been the case for Phrygian (entering Anatolia at the end of the second millennium BCE)[54] and Galatian (a Celtic language, entering in the third century BCE),[55] and likely applies to Armenian as

[54] Brixhe 2008: 69. [55] Darbyshire, Mitchell, & Vardar 2000.

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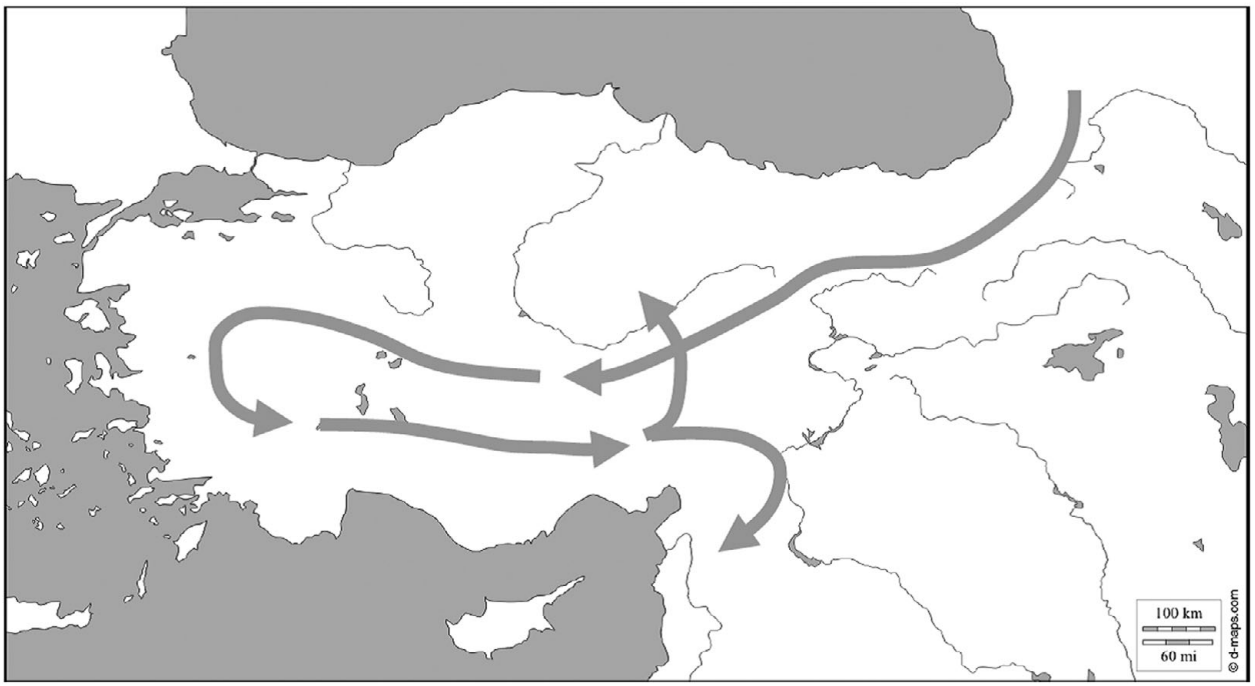

FIGURE 4.5. The route of the spread of (pre-stages of) Luwian within the Caucasus scenario.

well (entering together with Phrygian at the end of the second millennium BCE?).[56]

These cases therefore can serve as parallels to the arrival of the Anatolian languages in Anatolia, supporting the Balkan scenario.

Many other languages spoken in Anatolia in the past and present have come from the east, but in each case, these came either from the Levant or Mesopotamia (Phoenician, Aramaic, Arabic) or via the Iranian plateau (Mittanni-Indic, Kurdish, Zazaki, Turkish). It is true that there are some languages spoken in present-day Turkey that come from the Caucasus (Adygh, Laz), but these languages do not come from *beyond* the Caucasus, and therefore they cannot be used as parallels for a scenario in which the Anatolian languages spread from the steppes into Anatolia through the Caucasus.

It appears that there is no well-established parallel to the Caucasus scenario for the arrival of the Anatolian languages into Anatolia, whereas the Balkan scenario does have some clear parallels.

4.4 Conclusions on the Basis of Comparative Linguistic Arguments

Taking the identification of the speakers of Classical Proto-Indo-European with the bearers of the Yamnaya culture as an attractive working hypothesis, we arrive at the following reconstruction of the "Anatolian trek." First, the Anatolian branch must derive from Proto-Indo-Anatolian, which is the stage from which Classical Proto-Indo-European also derives. On the basis of the linguistic differences between Proto-Anatolian (which first diverged around 3100 to 3000 BCE) and Classical Proto-Indo-European (which first diverged around 3400 BCE, the time of the "Tocharian split"), it is estimated that Proto-Indo-Anatolian first diverged around 4300 to 4200 BCE. Because of its likely genetic relationship with Uralic, it must have been located to the northeast of the Yamnaya homeland. Moreover, since the Proto-Indo-Anatolian lexicon reflects a pastoralist lifestyle, the Proto-Indo-Anatolian homeland must have been in the steppes as well, probably the steppes near the Ural mountains. This is the location where, around 4300 to 4200 BCE, the "Anatolian trek" must have commenced.

On the basis of linguistic analyses of the Anatolian branch, it is likely that the Anatolian languages arrived in Anatolia before or around the thirty-first to thirtieth century BCE. On the basis of the geographical location of the Anatolian languages within Anatolia, their distribution along the Kızıl Irmak river, and their "drift" in historical times, taking into account historical parallels, it seems best to assume that their point of entry into Anatolia was the west, through the Bosporus and/or the Dardanelles. A hypothetical point of entry from the east, through the Caucasus, is very hard to reconcile with all these arguments.

With the northeast of the Pontic–Caspian steppes as the point of departure of the "Anatolian trek," and the west of Anatolia as its point of entry into Anatolia, the most economical assumption is that the intermediate route went through the Pontic–Caspian steppes and the east of the Balkan Peninsula, respectively. We can thus reconstruct the "Anatolian trek" as schematized in Figure 4.6. Note that this reconstruction is solely based on comparative linguistic arguments.

The dispersal of the Anatolian languages within Anatolia may be envisaged as indicated in Figure 4.7.

[56] Diakonoff 1984.

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FIGURE 4.6. Schematic route of the "Anatolian trek."

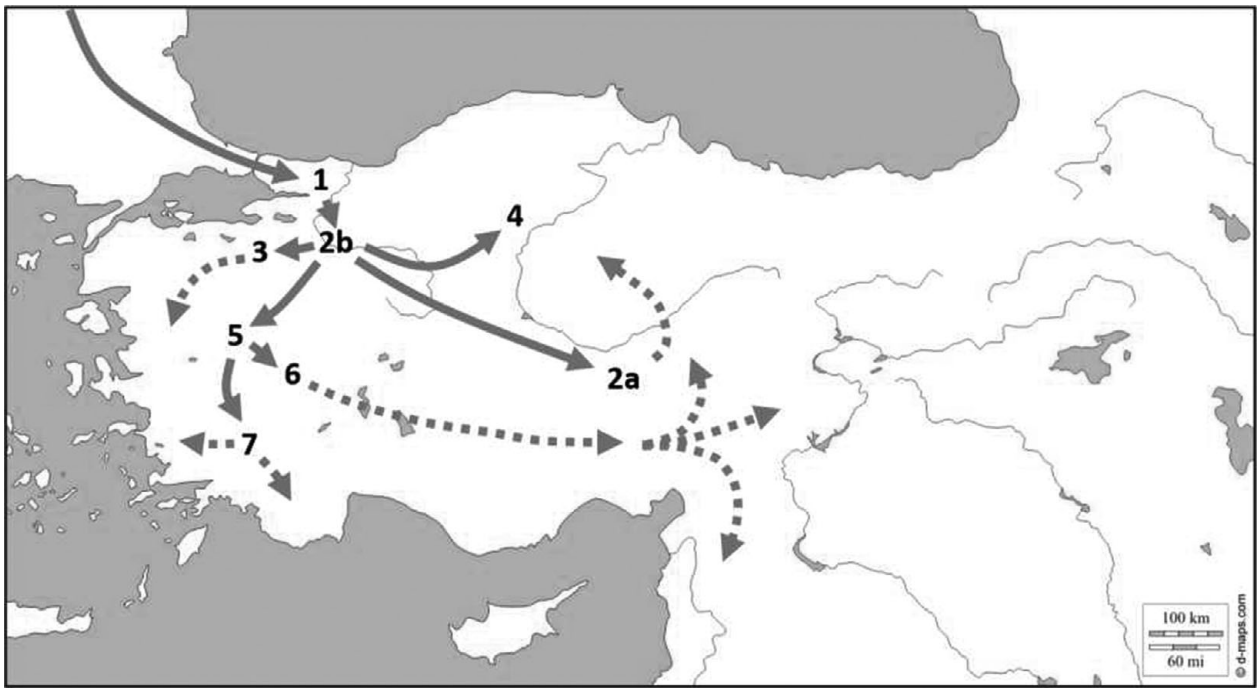

FIGURE 4.7. The dispersal of the Anatolian branch: 1. Proto-Anatolian (ca. 3100 BCE); 2a. Proto-Hittite (location around 2100 BCE, with northward drift in 18th and 17th c. BCE as a dashed line); 2b. Proto-Luwo-Lydian (ca. 2900–2600 BCE); 3. Pre-Lydian (location in 2nd. mill. BCE, with later drift into Classical Lydia after 1200 BCE as a dashed line); 4. Palaic (attested 16th c.); 5. Proto-Luwic (ca. 2200 BCE); 6. Proto-Luwian (ca. 19th c. BCE, with later eastward drift during the 2nd mill. BCE as dashed lines); 7. Proto-Caro-Lycian (ca. 1500 BCE?, with later drifts into Classical Caria and Lycia as dashed lines).

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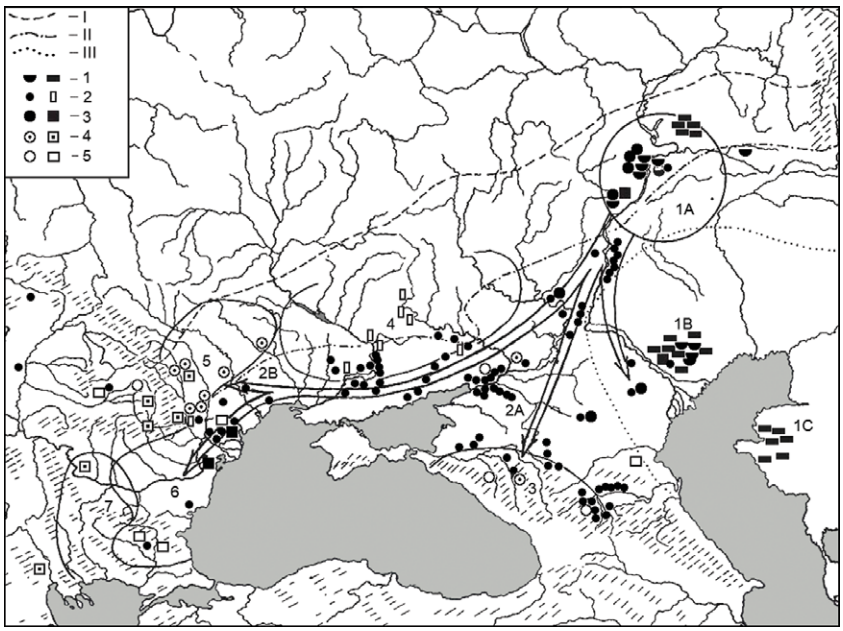

FIGURE 4.8. The spread of the stone horse-head maces in the Middle Eneolithic, (adapted from Dergačev 2007: 147). Ecoregions: I) southern border of forest-steppe; II) southern border of steppe; III) border of semidesert. Cultures: 1) burial complexes and settlements of Khvalynsk (1A – Middle Don; 1B – Northern Caspian; 1C – Western Caspian); 2) Burial complexes and remains of the Suvorovo-Novodanilovka type (2A – Eastern; 2B – Western); 3) Pre-Maikop; 4) Sredni Stog; 5) Cucuteni–Trypillia; 6) Bolgrad–Alden' – Gumelniţa–Karanovo VI; 7) Krivodol–Sălcuţa.

4.5 Mapping the "Anatolian Trek" onto Evidence from Archaeology

It goes beyond the scope of this chapter to discuss the entire archaeological side of the "Anatolian trek" question. It should be noted, however, that the reconstruction of the "Anatolian trek" as presented here – which, it must be stressed, is arrived at purely on the basis of comparative linguistic arguments – more or less fully coincides with Anthony's archaeological scenario for the spread of the Anatolian branch (Anthony 2007, 2013). My postulation of the Proto-Indo-Anatolian homeland in the northeastern part of the Pontic–Caspian steppes, near the Urals, before ca. 4300 to 4200 BCE would point to the Khvalynsk culture (4450–4350 BCE)[57] in the middle Volga region. My reconstruction of the first part of the "Anatolian trek," namely as commencing around 4300 to 4200 BCE and heading toward the Balkans, fits Anthony's description of how steppe herders spread into the lower Danube valley around 4200 to 4000 BCE, and "either caused or took advantage of the collapse of Old Europe" (2007: 133). According to Anthony (2007: 251), these herders, who formed the Suvorovo-Novodanilovka complex (ca. 4200–3900 BCE), "represent the chiefly elite within the Sredni Stog culture," which is situated in the middle Dnieper–lower Don area, i.e., in the western part of the Pontic–Caspian steppes. On the basis of Figure 4.8 (adapted from Dergačev 2007: 147), which depicts the spread of the stone horse-head maces that are one of the key attributes of the steppe herders who formed the Suvorovo-Novodanilovka complex (Anthony 2007: 234–235), it is likely that their origins go back to the Khvalynsk culture of the northeastern part of the Pontic–Caspian steppes.

We may therefore view this graph as a possible route map of the initial part of the "Anatolian trek."

The final part of the "Anatolian trek," i.e., the arrival of the Anatolian branch into Anatolia through the Bosporus and/or the Dardanelles, sometime before or around 3100 to 3000 BCE, is more difficult to trace archaeologically. A major factor in this is, as Bachhuber (2013: 279) observes, that archaeologists of Bronze Age Anatolia have for decades "struggled with [the concept of] large-scale population movements," and are hesitant to interpret changes in material culture as a signal of population spread. A notable exception is James Mellaart, who, in a series of articles, argued for interpreting archaeological facts as signaling the incoming of speakers of Indo-European into Anatolia from the west in the third millennium BCE.[58] However, cf. also Yakar 1981, who discusses archaeological data from sites like Demircihöyük (founded ca. 3000 BCE; ca. 30 km northwest of Eskişehir), which shows that, at the beginning of the third millennium BCE, there was "contact between the Danube, the Balkans, and Anatolia" (1981: 96). His conclusions – that "[t]he unmistakable southeast European

[57] Anthony et al. 2022.

[58] Cf. Bachhuber 2013 for an overview.

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traits in the EBI cultures [ca. 3000–2700 BCE, AK] of the western, central and north-central regions point to the presence in Anatolia of displaced elements from the Balkans and Danube" (1981: 106) – would be consistent with the scenario of the arrival of the Anatolian branch into Anatolia as advocated in Section 4.3.2. However, a full assessment of such archaeological arguments is something I will have to leave to the specialists.

4.6 Mapping the "Anatolian Trek" onto Evidence from Palaeogenomics

In the case of the palaeogenomic literature regarding the "Anatolian trek" question, it is likewise the case that full coverage goes beyond the scope of the present paper. Nevertheless, some observations are in order.

When it comes to the initial part of the "Anatolian trek" as proposed here, i.e. as proceeding from the northeastern part of the Pontic–Caspian steppes to the Balkans from ca. 4300 to 4200 BCE onward, it is interesting that Mathieson et al. (2018), in their paper on the genomic history of southeastern Europe, state that they have found steppe ancestry in two individuals from the Copper Age Balkans, namely one from Varna (northeast Bulgaria, on the Black Sea coast), ANI163, dated to 4711–4550 BCE, and one from Smyadovo (some 100 km west of Varna), I2181, dated to 4550–4450 BCE. Interestingly, according to the figure showing the ADMIXTURE analyses of the samples they used in their study (2018: 207), steppe ancestry is also found in a third Copper Age sample from the Balkans, ANI152 (albeit clearly less than in the other two), which belongs to the individual found in Varna grave 43, who "was buried with more gold than is known from all other Neolithic and Copper Age burials, combined" (ibid.: 197).

At first sight, the presence of steppe ancestry in these three individuals from the Balkans dating to ca. 4700 to 4450 BCE may be viewed as too early to fit my reconstruction of the "Anatolian trek" above, which commenced with the "Anatolian split" ca. 4300 to 4200 BCE. However, it must be taken into account that a linguistic split is the final outcome of a longer process of separation of a population group from their home region, which usually includes an initial number of migrants who can operate as scouts, and a period of some early groups that may have moved back and forth (including return migration); cf. Anthony 1990: 902–905. During this initial period, when there was still relatively frequent contact between the migrants and their home region, their language would still share the innovations of the language of the home region. Only when the group of migrant speakers is large enough that a majority of speakers no longer has direct contact with speakers from the home region, or when such contact has been lost altogether, and linguistic innovations are no longer shared, can we speak of a real linguistic split. The steppe ancestry of the three Balkan individuals dating to ca. 4700–4450 BCE may therefore be seen as marking the initial phase of population movements from the Proto-Indo-Anatolian home region into the Balkans, which did not result in a full linguistic split (the "Anatolian split") until several generations later. The fact that one of these individuals was found in the richest burial known from this period is consistent with Anthony's reconstruction that these migrants formed a chiefly elite.

With regard to the final part of the "Anatolian trek" I have proposed, i.e., proceeding from the Balkans into Anatolia, where the Anatolian branch must have arrived around 3100 to 3000 BCE, Mathieson et al. (2018: 201) note that "although [they] find sporadic steppe-related ancestry in Balkan Copper and Bronze Age individuals, this ancestry is rare until the late Bronze Age," and they therefore state that there is "no evidence" that the Anatolian branch "was spread into Asia Minor by the movements of steppe people through the Balkan Peninsula during the Copper Age at around 4000 BC." Indeed, apart from the three samples mentioned, none of the other Copper Age samples analyzed by Mathieson et al. (dating 4700 to 3500 BCE) show steppe ancestry: only in samples dating to the Bronze Age (from 3200 BCE onward) do we see some steppe ancestry, but these samples are too late to be part of the "Anatolian trek" as proposed above. I therefore agree with Mathieson et al. that their data show that the spread of the Anatolian languages through the Balkans cannot have been the result of a massive migration. However, since the archaeological and palaeogenomic traces of the individuals who moved from the steppes into the Balkans indicate that they formed a wealthy upper class, to my mind it cannot be excluded that their language was taken over as an elite language, in accordance with the "elite dominance model" of language spread.[59] In such a situation, it was not necessary for the speakers of this language to have been present in large numbers and thus to have had a great impact on the genetic profile of the population group that eventually took over their language. Moreover, with the Suvorovo-Novodanilovka complex lasting until ca. 3900 BCE (see Section 4.5), we still have a period of some 800 years (ca. thirty-two generations) to bridge before the entry of this language into Anatolia may have taken place. This seems time enough for an initially relatively small influx of steppe genes to eventually be fully diluted away from the later population group's genetic profile. I therefore agree with Mathieson et al. (2018: 201) that "it remains possible that Indo-European languages were spread through southeastern Europe into Anatolia without large-scale population movement or admixture."

This point is important to take into account when assessing ancient DNA samples from Anatolia. In a recent paper by Damgaard et al. (2018), genetic samples of twelve ancient humans from central Anatolia have been analyzed, "including 5 individuals from presumed Hittite-speaking settlements." They report that these samples "do not genetically distinguish Hittite and other Bronze Age Anatolians from an earlier Copper Age sample," and thus seem to show "Anatolian/Early European farmer ancestry, but not steppe ancestry." This is

[59] Cf. Matasović 2009: 514.

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interpreted as a demonstration that "the Anatolian IE language branch, including Hittite, did not derive from a substantial steppe migration into Anatolia."

First, we need to discuss the five samples that Damgaard et al. describe as coming "from presumed Hittite-speaking settlements." From the supplementary materials to this article, we learn that these samples were taken from the Kaman-Kalehöyük site (Kırşehir province, in the southwestern part of the Kızıl Irmak basin). Three of these (MA2205, MA2206, MA2208–2209) stem from stratum IIIc, "Middle Bronze Age ('Assyrian Colony Period') (~2000–1750 BCE)." As we have seen in Section 3.2.1, at the beginning of the second millennium BCE, the area within the Kızıl Irmak bend, where Kaman-Kalehöyük is situated, was probably home to speakers of Hattic, a non-Indo-European language. It may not have been until the time of Anitta, king of Nēša (reign ca. 1740–1725 BCE), that the first larger groups of Hittite speakers entered this area. Moreover, the establishment of a Hittite-speaking court at Ḫattuša took place only a century after the "Assyrian Colony Period" had ended, namely around 1650 BCE. The three individuals from Kaman-Kalehöyük stratum IIIc were therefore probably not speakers of an Anatolian language, and it is even dubious whether they could have been in (genetic) contact with people who were: the Kızıl Irmak River might not only have been a geographic obstacle that for a long time prevented language spread but might have blocked gene flows as well during this period. The other two samples from Kaman-Kalehöyük (MA2200–2201, MA2203–2204) stem from stratum IIIb, "Middle to Late Bronze Age ('Old Hittite period') (~1750–1500 BCE)." These individuals could thus indeed stem from the period in which Hittite was first introduced to the region inside the Kızıl Irmak bend and established as the elite language there. This depends, however, on whether these individuals stem from the earlier or latter part of this period. All in all, it may be clear that these five samples do not need to belong to speakers of an Anatolian language, and I think we should therefore be careful in using them to assess the palaeogenomic side of the "Anatolian trek."

The same goes for the three samples analyzed by Damgaard et al. (2018) that stem from outside the Kızıl Irmak bend, namely those from the site of Ovaören (Nevşehir province, 20 km south of the Kızıl Irmak river). These samples (MA2210, MA2212, MA2213) are taken from individuals dating to the Early Bronze Age II, which Damgaard et al. date to "~2200 BCE" (2018: 2). However, Yakar (2011: 68), for example, dates the Early Bronze Age II in Anatolia to 2600 to 2500 BCE. With the presumed dating of the arrival of the Anatolian languages into Anatolia around 3100 BCE (cf. Section 4.1.1), we may wonder whether they would have been able to fully disperse into the central part of Anatolia already by 2500 BCE. It seems quite possible to me that the arrival of the Anatolian languages into the Ovaören area postdates the period from which the three sampled Early Bronze Age individuals stem. If so, these samples would likewise be irrelevant for assessing the palaeogenomic side of the Anatolian trek.

What appears more relevant, however, are three samples analyzed by Lazaridis et al. (2017) that stem from the West Anatolian site of Göndürlü Höyük (Harmanören, ca. 150 km north of Antalya) and date to 2558 to 2295 BCE (I2495), 2836 to 2472 BCE (I2499), and 2500 to 1800 BCE (I2683), respectively (suppl. information, p. 24–25). The individuals from whom these samples are taken did live in a place and time where we may assume that speakers of one or more Anatolian languages were present. According to Lazaridis et al., these individuals genetically seem to be "a mixture of Neolithic Anatolians, Caucasus hunter-gatherers, and Levantine Neolithic" (suppl. information, p. 40), and thus show no steppe ancestry.[60] They therefore conclude that if the speakers of (pre-)Proto-Anatolian did come from the steppes, a "massive dilution of their steppe ancestry in the ensuing two millennia would be needed to account for its disappearance in the Bronze Age Anatolian sample" (suppl. information, p. 49). This is consistent with the rarity of steppe ancestry in the Copper Age samples from the Balkans (until 3500 BCE) as reported by Mathieson et al. 2018, and which was interpreted above as showcasing that the small influx of steppe genes onto the Balkans during the latter part of the fifth millennium BCE was, during the fourth millennium BCE, diluted away from the genetic profile of this population group, even though the language of these steppe herders, who formed an upper class in this area in the fifth millennium BCE, had been taken over as an elite language. We may thus assume that when the Anatolian languages spread into Anatolia at the end of the fourth millennium BCE, this was probably the result of a movement of speakers who no longer contained any traceable steppe ancestry.

Nevertheless, the absence of steppe ancestry in Anatolian Bronze Age samples has led some scholars to consider the possibility that the Anatolian branch was not originally spoken by a steppe population at all. Instead, the presence of Caucasian Hunter Gatherer (CHG) ancestry in these samples has led Damgaard et al. (2018: 8), for instance, to state that this would fit a "scenario in which the introduction of the Anatolian IE languages into Anatolia was coupled with the CHG-derived admixture before 3700 BCE." In the same vein, Kristiansen et al. (2018: 3) suggest that, possibly, "multiple groups moved into Anatolia from the Caucasus during the late fourth and third millennium BCE, including groups of [. . .] early IE Anatolian speakers."[61] Both Damgaard et al. and Kristiansen et al. do not make explicit, however, what their view on the location of the Proto-Indo-Anatolian homeland is, and how this relates to the

[60] Confusingly, in Mathieson et al. 2018: 207, these three samples are depicted as showing a considerable component of "Yamnaya from Samara" ancestry, namely some 30%. However, since in this depiction the admixture is constrained to show only four different components, namely Anatolian Neolithic, Yamnaya from Samara, EHG, and WHG, we may conclude that the ca. 32% CHG ancestry of these samples (as reported by Lazaridis et al. 2017) is forced here into the category of "Yamnaya of Samara" = steppe ancestry, even though they do not contain the necessary EHG component.

[61] Addendum: see now also Laziridis et al. 2022.

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Classical Proto-Indo-European homeland in the steppes. More explicit in this regard are Wang et al. (2019), who suggest the possibility of a Proto-Indo-Anatolian homeland "south of the Caucasus" (2019: 10). The spread of the Anatolian languages into Anatolia would thus be genetically traceable by the spread of CHG ancestry into Anatolia. According to Wang et al., not only Anatolian could have this South Caucasian origin; they regard it "[g]eographically conceivable" that Armenian, Greek, and possibly even Indo-Iranian also derive from this homeland. The Indo-European language(s) that must have been spoken by the bearers of the Yamnaya culture on the Pontic–Caspian steppes, and which spread from there into Europe and Central Asia, would thus have arrived in the steppes as a result of population movements that are traceable as a "subtle gene-flow" of CHG ancestry from south to north through the Caucasus (ibid.). From a linguistic point of view, this scenario runs into insurmountable problems. First, it does not account for the fact that the reconstructed Proto-Indo-Anatolian lexicon points to a pastoralist lifestyle by its speakers, which means that they must have lived in a steppe region. Secondly, it does not account for the linguistic connection of Proto-Indo-Anatolian with the Uralic language family, which was spoken to the northeast of the Pontic–Caspian steppes. Third, it does not account for all the indications that the Anatolian branch entered Anatolia from the west, namely: (a) the geographic clustering of the Anatolian languages in the west of Anatolia; (b) the distribution of the Anatolian languages surrounding the course of the Kızıl Irmak river on its west bank, whereas on its east bank, a non-Indo-European language is spoken; (c) the historical eastward drift of the Anatolian languages; and (d) the parallels from history. Moreover, the scenario of Wang et al. fully ignores the fact that in the Caucasus, three distinct, non-Indo-European language families are spoken – Kartvelian, Northeast Caucasian, and Northwest Caucasian – which are unrelated to any other known language family,[62] and for which there is no indication whatsoever that they were not present in the Caucasus for at least several millennia. It is disappointing, therefore, that Wang et al. (2019) present a scenario involving prehistoric language spread through the Caucasus mountain range without even mentioning these indigenous Caucasian language families.[63]

[62] However, Northeast and Northwest Caucasian are sometimes regarded to be related to each other.

[63] It seems more likely to me that CHG ancestry may be linked to the speakers of Hurrian. In the historical records from the third and second millennium BCE, the Hurrian language shows a westward spread from northern Iraq and northeast Syria into central Anatolia (Wegner 2000: 15). Moreover, Hurrian may be related to the Northeast Caucasian language family (Wegner 2000: 29–30). If the east-to-west spread of Hurrian in the third and second millennium BCE is the continuation of earlier movements, we may assume that Hurrian originated from the Caucasus and moved into eastern Anatolia and northern Mesopotamia in the fourth and third millennium BCE, which may thus be genetically traceable in the spread of CHG ancestry.

4.7 Conclusions

We can conclude that from a comparative linguistic point of view, the Indo-European Anatolian language branch ended up in Anatolia in the following way. The Anatolian branch derives from a Proto-Indo-Anatolian ancestor language that was spoken in the northeastern part of the Pontic–Caspian steppes in the fifth millennium BCE, probably by bearers of the Khvalynsk culture. Sometime around ca. 4300 to 4200 BCE, a group of speakers of Proto-Indo-Anatolian lost contact with the language community in the Proto-Indo-Anatolian homeland because they had moved away to different regions (the "Anatolian split"). From that moment onward, the language of these speakers underwent specific innovations that, in the end, transformed it into Proto-Anatolian. During this period, this language spread to new regions (the "Anatolian trek"), first from the steppes into the Balkan Peninsula, after which it entered Anatolia from the west, through the Bosporus and/or the Dardanelles, before or in the thirty-first to thirtieth century BCE. The initial part of this "trek," from the steppes to the Balkans, is traceable in data from both archaeology and palaeogenomics. We find evidence for steppe herders, coming from the Khvalynsk area in the latter part of the fifth millennium BCE, who form a "chiefly elite" within the Suvorovo-Novodanilovka complex in the Balkans (ca. 4200 to 3900 BCE). Genetically, the three Copper Age individuals from the Balkan with steppe ancestry (dating to ca. 4700 to 4450 BCE) may be viewed as representing the very first waves of Proto-Indo-Anatolian-speaking people in this area before all contact with the PIA home region had been lost. However, the final part of this "trek," from the Balkans into Anatolia, cannot be traced in data from these fields thus far. In the case of archaeology, this may be due to the fact that for decades, archaeologists of Copper Age and Bronze Age Anatolia have been hesitant to interpret changes in material culture as signaling population movements, a situation that will hopefully change in the years to come. In the case of palaeogenomics, the absence of any steppe ancestry in the DNA of Bronze Age Anatolian samples may be explained by the possibility that pre-Proto-Anatolian entered the Balkans as a language of relatively few steppe immigrants who nevertheless formed an elite in Balkan society. If, during the last quarter of the fifth millennium BCE, their language was taken over by the local population (according to the "elite dominance model" of language spread), it is possible that in the millennium that followed, this language lived on, while the genetic profile of these steppe individuals was diluted away. When, later on, (pre-)Proto-Anatolian moved on and entered Anatolia, it would have been brought there by speakers whose genetic ancestry no longer contained any traceable steppe component. This scenario may be confirmed in the future when a more fine-grained picture of the palaeogenomic interactions between the Balkans and Anatolia is achieved by analyzing further samples from chronologically more multi-layered sites from these regions.

Due to the absence of steppe ancestry in Bronze Age Anatolian aDNA in some recent palaeogenomic papers, an

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alternative scenario for explaining the presence of the Anatolian languages in Anatolia has been suggested – namely one that sees the Anatolian branch as coming from the Caucasus, either because the "Anatolian trek" would have gone through the Caucasus, or because the Proto-Indo-Anatolian homeland would have been located in or near the Caucasus. This scenario must be rejected, however: it is at present difficult to see how it could be reconciled with the evidence from comparative linguistics.

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