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Diversity vs. Uniformity: Europe before the arrival of the Indo-European languages – A comparison with prehistoric Australia

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1. Introduction

In the typological literature Europe ranks low on the scale of linguistic diversity, whereas, for instance, Aboriginal Australia is usually counted among the linguistic hotspots of the world (Evans 2010: 17). Though this is certainly true from a typological viewpoint, it may be pointed out that the continent does boast languages from four different lineages with no immediately tangible top node (Indo-European, Uralic, Altaic, Basque and Semitic) in contrast to Australia, where all languages presumably are related to each other, despite being typologically very diverse. However, if the obvious explanation for Europe's paucity in typological diversity lies in the dominance of Indo-European languages, the question arises what Europe looked like before the spread of this language family. This is relevant for at least two reasons. First, linguists have wondered about the role language contact played in the constitution of the Indo-European daughter languages, and whether this may explain the significant differences between Indo-European languages from different branches. Second, this could shed some light on the origin of some of the lost and unaffiliated languages of Europe, such as Basque but perhaps also Etruscan and Iberian.

This paper wants to explore different perspectives on the linguistic map of pre-Indo-European Europe, which includes an instructive comparison with the linguistic history of Aboriginal Australia. I will argue that Europe and Australia share two significant parallels, namely the spread of a dominant language family and an upheaval as a consequence of the last glacial maximum.

The ice depopulated Europe north of the Alps and caused people to take refuge in much more confined areas, which led to a reduction of linguistic diversity. It was only when Europe was repopulated mainly from the continent's south-west that people and languages were given space to go separate ways for a few thousand years until the arrival of the Indo-European languages. Though the last glacial maximum did not have such an

immediate and drastic effect on the population in Australia, the rising of the sea levels following the last ice age did cause major population shifts, most notably in the spread of the Pama-Nyungan languages across seven-eights of the continent, soaking up whatever languages had been there before. In both cases, languages on the fringe have to be considered important witnesses to earlier stages. It will be argued that pre-Pama-Nyungan Australia is instructive for the reconstruction of pre-Indo-European Europe and also for modelling the spread of Indo-European. I will also underline the significance of the homogenous system of river and place names known as "Old European Toponymy" (coined by Theo Vennemann after Krahe's "Alteuropäische Hydronymie" 'Old European Hydronymy'). Its existence presupposes a fairly homogenous layer of languages, and since it cannot be assumed that this was formed by Indo-European languages, this strongly suggests that at some point the linguistic map of Europe was not too diverse. I will argue that the assumption made by Theo Vennemann that Europe after the last ice age was indeed in such a state is not implausible, though this probably was different at the time when the Indo-Europeans arrived in Europe several millennia later.

This paper is structured as follows. Section two summarises the archaeological facts on prehistoric Europe. Section three discusses hypotheses on the linguistic situation up to the early Neolithic period. In Section four surveys the linguistic map of prehistoric Aboriginal Australia In section five a hypothesis on the linguistic picture of pre-Indo-European Europe is outlined before the main results of this paper are summed up in a concluding section.

2. People and languages of prehistoric Europe

According to the general opinion, modern humans (*homo sapiens sapiens*) entered Europe about 35,000 years ago from Africa, living alongside the Neanderthal man (*homo sapiens neanderthalensis*), whose traces in southernmost Spain are dated around 24,000 BC. Climatically, this time was characterized by the last glacial (about 110,000 to 10,000 BC), in which periods of low temperature and repeated glaciations alternated with shorter periods of higher temperature, during which humans could live in central Europe, having to retreat to more hospitable southern areas during glaciations. The end of the Palaeolithic

in Europe coincides with the end of the last glaciation, when the whole continent became suitable for human survival again. The following period is usually referred to as the Mesolithic, which came to an end with the arrival of agriculture in Europe, which is dated to about 7000 BC and which marks the beginning of the Neolithic period. There is little we can say about the languages that were spoken before the existence of written records, which do no appear in Europe until the second millennium BC. However, as will be shown in the following sections, some robust inferences make it possible to a great deal to sketch the linguistic map of pre-Indo-European Europe.

2.1 People in Palaeolithic Europe

Throughout the Palaeolithic (until ca. 9,000 BC) people lived as hunter-gatherers in Europe, though during the time of the last glacial maximum (around 18,000 BC) only significant traces can be found south of a line stretching from southern France in the west to south-eastern Ukraine in the east, excluding the Alps, which were covered with a thick ice sheet during the entire time. This means that whatever humans who had lived in northern and central Europe before would have had to retreat to the warmer south if they wanted to survive, joining groups of people who had already been settling there. Usually, it is assumed that there were three main refuge areas: southern France and the Iberian Peninsula, south-eastern Europe and, to a lesser degree, also Italy. However, there are no clear traces that would indicate a continued contact between these three groups, which also has linguistic ramifications, since it has to be assumed that their respective languages would have diverged due to a period of isolation from each other that lasted several thousand years, even if they were probably at least distantly related (Kallio 2003: 228). When the ice began to recede, from about 15,000 BC onwards with e.g. northern Germany being ice-free around 12,000 BC, humans repopulated the continent, moving out from the refuge areas towards the north with an average speed calculated at 0.4 – 1.1 km/year (Fort et al. 2004)[1]. It therefore can be expected that humans lived in virtually all of ice-free Europe by the start of the Mesolithic period (ca. 9,000 BC), but this does not mean that the continent was already completely repopulated; this is usually assumed for the Mesolithic. This is mainly because the climatic conditions did not improve on a more

[1] See also Winterhalder (2001) for general movement patterns of hunterer-gatherers.

permanent basis until about 9,500 years ago (Adams & Otte 1999: 74).[2] In the wake of these migrations the eastern Palaeolithic group probably came into contact with the western group, so that the people in the contact areas, e.g. the human pioneers in the area east of the Baltic Sea originally belonged to both groups and were therefore not likely to be linguistically homogenous(Kallio 2003: 229).

Archaeologically, several different cultures and cultural groups in Palaeolithic Europe can be differentiated.[3] The widespread pre-glacial-maximum Gravettian Culture[1] (about 26000 to 21000 BC) was superseded by the Magdalenian (the main western culture from 18000 to 10000 BC) and Solutrean Cultures in the west and by the Sviderian, Ahrensburg and Hamburg Cultures in the east until the final stages of the Palaeolithic period. The traces left by these groups of hunters and gatherers are impressive, including tools made of stone and bone, art and small settlements, yet nothing is known about the languages they spoke. People generally lived in groups of 25 to 100 during this time.

2.2 People in Mesolithic Europe (9000 – 7000 BC)

The trend towards complete occupation of the European continent had already started in the last stages of the last ice age, and continued in the Mesolithic period, which began in the 9th millennium BC, when the temperature increased rapidly. From the south-west and, to a lesser degree from the south-east, people moved northward as northern Europe became more hospitable. Both movements cannot only be traced archaeologically, but also genetically (see Villar & Prosper 2005: 397–419 for an overview of the genetic research). With regard to south-eastern Europe, however, archaeologists generally do not speak of a Mesolithic period: firstly, because the area was only very sparsely populated, and secondly because the first farmers, and with them the Neolithic period, became

[2] Adams & Otte (1999: 74) even think that "the earlier climate transition (about 12,000 14C or 14,500 calibrated years ago) to the much colder, arid Younger Dryas could well have eliminated much of the previous Late Paleolithic population of northern and central Europe or at least drastically reduced interior population densities." For instance, Finland was "'reasonable well' settled" only by 8,000 BC (Anttila 2000: 482).

[3] From an archaeological point of view, there is a terminological difference between the terms *culture* and *group*. The former refers to a complex phenomenon consisting of tools, economy, art, settlements, burial rites and anthropological characteristics, whereas for groups not all of these elements can be described. In this narrow sense, the pre-Neolithic cultures are rather like groups, and it is only from the Neolithic onwards that archaeologists speak of cultures (Probst 1999: 227).

established in Greece already around 7000 BC (van Andel & Runnels 1995: 481). During the Mesolithic period people lived as nomadic hunter-and-gatherer groups, but in contrast to their Palaeolithic ancestors they established comparatively large settlements for up to 100 people, consisting of wooden huts in which they lived over several months (Probst 1999: 170). There is clear indication that the way of life of hunter-gatherers in the Mesolithic became increasingly complex (Rowley-Conwy 2001: 51). As far as we can tell, the people of the Mesolithic were virtually exclusively native in the sense that they were descendents of the Palaeolithic population of Europe.

2.3 People in Neolithic Europe until the Bronze Age (7,000-2,000 BC)

The characteristic developments of the Neolithic period in Europe are the spread of agriculture, stockbreeding, pottery and, later, metallurgy. This era also witnessed the arrival of immigrant people and languages. The various kinds of pottery found from this time are frequently used as technical terms to characterize a particular culture, such as Linear Ware, Combed Ware, Corded Ware, etc.

The beginnings of agriculture in Europe, and hence of the Neolithic period, are commonly dated somewhere in the seventh millennium BC. From its beginnings in Greece, agriculture spread to the Balkan area and then within only 500 years through central and western Europe, manifesting itself culturally in the shape of the Linear Ware Culture, which is found all over this area. There were two main paths along which agriculture spread throughout Europe, one to the northwest and one to the west of the Balkans, both joining up about half a millennium later in western Germany. The material and genetic evidence strongly supports a spread of agriculture by cultural as well as demic diffusion, but there is neither an archaeological nor a genetic indication for a major population invasion during the Neolithic (see Bentley et al. 2003, Haak et al. 2005, Häusler 2003a, Otte 1997 and Richards 2003).[4]

The Neolithic is the first period for which more secure inferences can be made about languages that were spoken in Europe, though the diverging opinions on this matter bear witness to the considerable amount of speculation that is involved in this.

[4] On the basis of Y-chromosome analysis Chikhi et al. (2002) argue for demic diffusion during the Neolithic. Richards (2003) provides a thorough critique of this study.

Commonly, it is assumed that the Uralic and the Indo-European languages appeared in Europe during the Neolithic, but whereas the discussion in the former case largely involves the putative homeland, the discussion in the latter case revolves around both the homeland and the spread of the language family. The next section reviews some theories on the linguistic situation before the arrival of the Indo-European languages, briefly touching on hypotheses on the origin and spread of Indo-European in Europe.

3. Languages in Pre-Indo-European Europe and Indo-Europeanisation

As there is no direct evidence that permits a clear statement on how many and which languages were spoken in the Palaeolithic, Mesolithic and early Neolithic, any statement on this necessarily involves a great deal of speculation. At best, some inferences can be drawn either from known parallel cases, from the situation documented by later attestations or from relics found at later stages. Methodologically, one has to be careful not to equate particular archaeologically or genetically tangible groups with particular languages that are or were spoken in the relevant area, though it is possible to look for the archaeological or genetic manifestations of a known language (Kortlandt 1990: 131). Likewise, a particular language may not be represented by a homogenous cultural or genetic group. However, this may not be taken as a counter-argument against the notion of a reconstructed protolanguage (as e.g. in Häusler 2003b). As argued in Mailhammer (forthc.), "the assumption of one, even though idealized, protolanguage is a methodological necessity from a linguistic point of view" (see also Schlerath 1973: 6–8). For the investigation of prehistoric languages different methods have been employed (Zimmer 1990: 11–12).

a) The lexicon of a language is used to draw conclusions about the speakers' culture and their habitat (linguistic paleontology).
b) Loanwords are used as evidence for contact between languages and their localization.
c) Due to their stability, toponyms can provide reliable evidence about prehistoric stages, provided that their language(s) can be identified.

d) Based on the known locations of languages and their speakers in historical times, inferences are made about the relative position of these languages in prehistoric times.

To these glottochronology may be added as a means of working out the age of a particular language. It is probably linguistic paleontology and glottochronology which have given rise to most controversial discussions. However, in spite of the principal validity of the main counter-arguments directed against these methods, their basic assumptions seem generally correct and both can be used to investigate the distant prehistory of languages though in their application investigators have to be careful.[5]

Two main arguments have been advanced against linguistic paleontology. First, the fact that the lexicon of a particular language possesses a word for a certain item, concept, plant, and so forth does not permit the inference that the speakers of this language possessed it; it may merely signify that they know it (see e.g. Schlerath 1973: 14–15, Zimmer 1990: 14). Though this is true, in a lot of cases this can still be enough to roughly date a language. For instance, what can be called the wheeled-vehicle argument, i.e. the fact that Proto-Indo-European had a fairly secure terminology for wheeled vehicles (cf. Anthony 1995), may not prove beyond doubt that the speakers of Proto-Indo-European possessed wheeled vehicles, but it certainly proves that they knew them, which permits the inference that Proto-Indo-European was spoken at the time when wheeled vehicles were around. Second, it has been pointed out that the reconstructed meaning of a particular term may not have been the meaning it had in the protolanguage, because two daughter languages may show parallel but independent semantic developments, which creates the illusion of a proto-meaning based on these two seemingly agreeing daughter languages (see Schlerath 1973: 14–15, Clackson 2000: 444. However, it is clear that this is a fundamental issue of linguistic reconstruction and not just a problem for linguistic paleontology. No-one would seriously advocate the invalidity of the comparative method just because of the possibility that two daughter languages developed, say a particular ending, independently of each other, such as the second person present tense ending *-st* in German and in English (Dixon 2001: 66). Hence, while linguistic paleontology may have its risks and problems – just the

[5] See below on the assumption of a constant rate of change in earlier glottochronological research.

comparative method – there is no reason to abandon it as a method, because the obviously close connection between language and culture cannot be denied, and this can clearly be used to examine the cultural reality of a language.[6]

The debate around glottochronology has been much more heated; with the basic point of criticism is the obvious fact that languages do not change at constant rates (see e.g. Blust 2000). However, glottochronological research has worked towards solving this problem by refining approaches (see Embleton 2000 for an overview of the history of glottochronology and the relevant papers in Renfrew et al. 2000, as well as e.g. Gray & Atkinson 2003). Another point of criticism is that virtually all approaches rely on cognate sets that have been assembled by humans, which has a high error potential, because misjudgements can seriously distort the result (Holman et al. 2009).[7] However, despite all the shortcomings, it seems intuitively obvious that languages could be dated if the change they have undergone can be measured and translated into a time-frame. Consequently, glottochronology, like linguistic paleontology, should not be completely abandoned, just because the method needs further refining. From a conceptual viewpoint neither method is flawed from the beginning or unscientific, and in the investigation of a field which is not exactly rich in data, one should perhaps not lightly throw away unwieldy or inexact methods if they should work in principle.

3.1 Languages of Palaeolithic and Mesolithic Europe

As mentioned above, there is no direct evidence of the languages that were spoken in Europe during the Palaeolithic and the Mesolithic period, and for the vast majority of languages it can be assumed with reasonable safety that they arrived in Europe at a later date (cf. Mailhammer forthc. for an overview).[8] There is one exception, though and this is the language(s) of which Modern Basque is the sole descendant. The overwhelming number of genetic studies argues in favour of the view that the ancestors of the speakers of Modern Basque belong to an ancient stratum of Palaeolithic humans, though there are

[6] Simms-Williams (1998: 509) warns also that loanwords may pose problems for linguistic paleolontology. However, this is also true for the comparative method, which is an established method and which has found ways of dealing with this problem (see e.g. papers in Durie & Ross 1996 and Salmons, this volume).
[7] Holman et al (2009) attempt to solve this problem by using automated cognate sets.
[8] Of course, there some languages with unknown affiliations and uncertain history, such as Minoan and Pictish; these will be discussed in 3.2 below, since all we know is that they were spoken in Neolithic and post-Neolithic times.

traces of Neolithic immigrants, just as in the rest of Europe (Alzualde et al. 2005and Alzualde et al. 2006). Since no secure linguistic connections to other language families have been found, the general opinion is that "Basque is the only surviving pre-Indo-European language in western Europe" (Trask 1998: 313; see also Gorrochategui 2007-2008).[9] The situation in northern and eastern Europe is less clear. The speakers of Saami seem also to be autochthonous in Europe, though their language has been replaced by Uralic, so that there are no traces to be found of the earlier Palaeolithic language (see Kallio 2003 for details and Mailhammer forthc. for a brief discussion).

This means, linguistically, we are left with Modern Basque as the only possible window into the distant past. The reconstructions of older stages of Basque generally claim validity for a time-depth of around 2000 years (cf. Trask 1997 and Trask 1998), but what Basque looked like before that no-one really knows, though the conservative nature of Basque has often been commented on (see e.g. Trask 1998). Trask (1998) asserts that only the phonology and the lexicon have markedly changed due to continuing influence from Indo-European languages). As a result, it can be assumed that some form(s) of Pre-Basque was spoken in Mesolithic and probably also Palaeolithic Europe. The general opinion seems to be that there were quite a number of languages in Europe at that time, which then formed various layers of substrates and/or were pushed into fringe positions by the spreading Uralic and Indo-European languages (see e.g. several papers in Bammesberger & Vennemann 2003).

However, there are also other views. One goes by the name of "Palaeolithic Continuity Theory" (see http://www.continuitas.com/), and holds that there was an uninterrupted continuity from the Palaeolithic to the Neolithic period with respect to the Indo-European (and also the Uralic) languages. The key assumption is that the differentiation into distinct branches of Indo-European (and Uralic) took a very look time and was already in place by the beginning of the Neolithic period (see Alinei 2004 for an introduction and Häusler 2003a for further details).[10] This theory is based on the fact that there are no genetic and archaeological traces of major population invasions after the last

[9] (Calderón et al. 1998) argue that the ancestors of the Basques were Neolithic immigrants on genetic evidence. However, this is problematic, because it confuses genetic groups with linguistic groups (see also Mailhammer forthc. for discussion).

[10] According to the "Palaeolithic Continuity Theory", Etruscan is related to Hungarian.

glacial maximum, and the fact that there is cultural continuity on the periphery from the Palaeolithic to the Neolithic period (Otte 1997). The orthodox version of this theory is that the Indo-European languages spread a lot earlier than generally assumed (see 3.2 below), whereas a slightly different version posits a rapid spread at the beginning of the Neolithic (Adams & Otte 1999). The case of Indo-European will be discussed in more detail in 3.2 below, but suffice it to say that this theory is linguistically highly improbable, as the body of evidence strongly suggests that the Indo-European languages spread after the arrival of agriculture in Europe. Whether the speakers of the Indo-European languages were descendants of the original Palaeolithic population and whether or how their language is related to other languages of the time are separate issues (see 3.2 below).

In somewhat of a contrast to the theory of a linguistically highly heterogeneous Europe after the last glacial maximum stands Theo Vennemann's theory on the linguistic prehistory of Europe north of the Alps. Basically, it follows from what is known from archaeology, namely that Europe was repopulated mainly from the southwest after the last glacial maximum and the fact that Basque was spoken in southern France and northern Spain in antiquity (as, in fact, today). The genetic data linking the speakers of modern Basque to the Mesolithic process of repopulation renders material support to the theory. The key point Vennemann makes is that Europe north of the Alps was all but devoid of humans when the ice began to recede, and that there was not enough time for a highly diverse patchwork of languages to develop.

> Denkt man über die vorgeschichtliche Sprachlandschaft Europas nördlich der Alpen nicht nur in unbegründeten Parallelen, sondern unter Berücksichtigung der spezifischen Entwicklungsbedingungen der fraglichen Regionen nach, erweist sich die Fleckerlteppich-Theorie sofort als unangemessen. Wann und wo sollen sich denn alle diese Sprachen entwickelt haben? Woher sollen sie gekommen sein? Europa – und ich spreche ja im wesentlichen von Europa nördlich der Alpen – Europa ist nicht Papua-Neuguinea, wo sich Sprachen in Jahrzehntausenden entwickeln und auseinanderentwickeln konnten, bis mehrere hundert Sprachfamilien auf engem Raum koexistierten; es ist auch nicht die Iberische Halbinsel, die, vom Klima begünstigt, stets ein Magnet für Völkerschaften aus Nord und Süd war, zu Lande und zu Schiff. Das Europa (nördlich

> der Alpen), mit dem wir uns als Linguisten befassen, existiert erst seit einem einzigen Jahrzehntausend, seit dem Ende der letzten Eiszeit. (Vennemann 2003b: 552–553)[11]

According to Vennemann's theory, the so-called "Vasconic" languages (i.e. languages that are related to Modern Basque) formed a substrate layer for the languages arriving in (Sub-)Neolithic times, which shows up in the shape of a variety of phenomena, such as the remarkably uniform system of river names, discovered by Hans Krahe, lexical substrates and structural features in the languages of Europe (see Vennemann 2003a for an overview). As I have argued elsewhere (Mailhammer forthc.),, "the criticism against this theory has neither been able to falsify it nor been able to present a plausible alternative" (see Mailhammer forthc. for further details). As will become clear further below, the view of an at least genetically fairly homogenous Mesolithic Europe is so far the only convincing explanation for Krahe's "Old European Hydronymy", which remains one of the most important linguistic monuments of prehistoric Europe.[12]

[11] 'If one considers the prehistoric landscape of Europe north of the Alps not only in terms of unfounded parallel cases, but with relation to the circumstances in which the regions in question developed, the patchwork theory immediately turns out to be inadequate. When and where are all these languages supposed to have developed? Where are they supposed to have come from? Europe – and I am mainly speaking about Europe north of the Alps – Europe is not Papua-New-Guinea, where languages were able to develop and diverge within a period of tens of millennia; it is not the Iberian Peninsula either, which, treated favourably by the climate, has always attracted peoples from north and south, by foot and by ship. The Europe (north of the Alps) which we deal with as linguists has existed for only ten thousand years.' [All translations are mine, unless indicated otherwise.]

[12] It has repeatedly been claimed that the Indo-European character of was proven (cf. recently Baldi & Page 2006). However, this is largely based on Schmid (1987) and Kitson (1996). The problem of Schmid's study is that he is forced to assume a Post-Proto-Indo-European construct that is highly problematic, because this is simply not the way Proto-Indo-European split up (see e.g. Mallory 1997: 103). Kitson's study shows only that there are river names that can be explained from Indo-European and that this includes cases which are also found in Eastern Indo-European languages, such as Old Indic (e.g. *Dravantī*). But it does certainly not show that all the material of Krahe's Old European Hydronymy is Indo-European. Moreover, his study also suffers from great weaknesses that cast considerable doubt on Kitson's argumentation. For instance, he (1996: 83) asserts that *r* in the river names *Acrista* and *Indrista* "looks likely to be part of the lexical base", which is impossible due to the constraints on Indo-European root structure (see Mailhammer 2004 for further details). In addition, neither Schmid's nor Kitson's studies incorporate place names. Moreover, neither of them takes into account the distribution of the Old European Hydronymy/Toponymy, for instance that the Iberian Peninsula forms part of it. To summarise, it is far from accurate to say that these to studies prove that the Old European Hydronymy is Indo-European. For further arguments and details see Vennemann (1994 et passim) and Welscher (2005)

A number of authors have argued against the validity of toponymic evidence for historical reconstruction, e.g. Gorrochategui (2007-2008), or against an accidental similarity between the "Old European Hydronymy" and Basque positing a different "Mediterranean" substrate language (Untermann 1999). However, the significance of toponymic evidence to linguistic reconstruction can simply not be denied, and Untermann's position is a clear violation of Occam's Razor.

Whether or not one accepts the identification of the language of this toponymic system with a language (family/group) of which Modern Basque is a descendant, is a different kettle of fish altogether, and this will largely have to be left to future research (see also 5.1 below).[13]

To sum this section up, the genetic and archaeological data suggests that the population of Palaeolithic and Mesolithic Europe was largely autochthonous in the sense that they were descendants of the first big wave of immigration 35,000 years ago. The only piece of unanimously accepted linguistic link to that time is Modern Basque, which is believed to be the only surviving language that can directly be traced to the Palaeolithic period. In addition, Krahe's "Old European Hydronymy" can be added to the linguistic data from prehistory.

3. 2 Languages in Neolithic Europe

The Neolithic is the first period for which we have textual attestations for some of the languages that were spoken in Europe. These date from the second millennium BC, the beginning of the Bronze Age. We find Indo-European languages, Greek and Hittite, as well as unaffiliated languages, e.g. Minoan and the language of the Phaistos Disc (these two may perhaps be related to each other, see.Timm 2004). Apart from these clear cases, inferences can be made that also other Indo-European languages were spoken across the continent, as well as Uralic languages in the northeast and the ancestor(s) of Modern Basque (cf. 3.1 above). From languages that were spoken in antiquity, the existence of further languages and language groups/families can be inferred, though no attempts have been made to ascertain their time depths. As mentioned in 3.1, there is Pictish, for which several hypotheses of origin have been advanced, none of which has gained common acceptance. It seems, however, certain that Pictish is a non-Indo-European language, which formed a substrate for the Celtic languages and became heavily Celticised as a result (Forsyth 1997)[14]. Schrijver (2004) has shown how markedly Insular Celtic, and

[13] It should be pointed out that there has been very little thorough linguistic investigation of this matter. Trask (1997: 364–368) is an exception, but it is not comprehensive enough to prove or disprove anything.

[14] Simms-Williams (1998: 509) asserts that Pictish may have arrived after Celtic, but adduces no evidence in support of this position. He (1998: 509) also maintains that "identifiable substratum elements in Insular

Irish in particular, deviates structurally from other Celtic languages and argues for a situation of language shift.[15] This would fit well into a theory that links the Picts to either Palaeolithic (Kallio 2003: 232) or non-Indo-European Neolithic immigrants (Vennemann 2003a: 327).

Other languages that we know of from various attestations are Etruscan and its relatives Raetian and Lemnian, which have been connected to a so-called Aegean language complex of roughly the second millennium BC , though nothing is known about its ultimate origin (see Rix 1998, Rix 2004, Steinbauer 1999 and Bonafante & Bonafante 2002). It has furthermore been suspected that Tartessian and Iberian, two languages of the Iberian Peninsula, also belong to this language group. But this is almost pure speculation, since the former is completely obscure, and the written records of the latter are not yet understood, though it seems clear that Iberian is not directly related to Basque (Trask 1995).

Cases have also been made for other lost languages in Europe, which may well have arrived together with agriculture at the beginning of the Neolithic period (see e.g. Schrijver 2001. Some lost languages may even be Indo-European in origin, as Kallio (2003: 231) suggests for various loanword strata in Uralic languages, and as has been proposed for Greek (see Strunk 2003 with references).

Beside these lost languages, the Neolithic saw the arrival of two language families, namely Uralic and Indo-European, both of which probably co-existed with a sizeable number of languages from different families, and some of these probably go back to pre-Neolithic times, coming into contact with the immigrant languages and leaving their traces there. Hence, it is likely that most Uralic and Indo-European languages contain non-Indo-European elements (Simms-Williams 1998: 509). The remainder of this section will focus on the Indo-European languages for reasons of space, but similar considerations are in principle valid for the Uralic languages (see Kallio 2003 for a discussion and references).

Celtic" cannot go back to an insular substrate, but a continental substrate has to be assumed instead. However, the only example Simms-Williams (1998: 509) gives in support of his assertion is "the Insular Celtic element *carn-* ('cairn'), which has a good chance of being non-Indo-European", and which is also attested in Continental Celtic. Clearly, this is insufficient to warrant Simms-Williams's sweeping claim.

[15] Of course, this was argued for quite a while ago by Julius Pokorny (1927-1930).

Commonly it is assumed that these language formed substrate layers for the newcomers and that the Indo-European languages usually formed the top layer, but, as has been pointed out before, this need not be the case (Simms-Williams 1998: 509):

> Alongside that process [substratum influence], there would surely have been periods and places where non-Indo-European languages temporarily gained the upper hand over PIE, in the way that Turkish has done in the historical period.

This has important methodical ramifications for finding traces of these putative contact languages, as prototypically substrate influence is different from superstrate or adstrate influence (cf. e.g. Winford 2003).

This brings us to Proto-Indo-European and the spread of the Indo-European languages. Apart from the orthodox version of the "Palaeolithic Continuity Theory", all theories assume that the Indo-European languages spread from some homeland in Neolithic times no earlier than 6000 BC. It is also commonly accepted that the Indo-European languages came in contact with non-Indo-European languages. However, there is disagreement on reconstructional details of Proto-Indo-European, its proposed time depth, the homeland of Proto-Indo-European and the way and time of its dispersal (see Mallory 1997 for a good overview). Of course, identifying the time when Proto-Indo-European was spoken and when it possibly dispersed would give an important clue.

The literature gives a range of time-depths for Proto-Indo-European with different levels of confidence. Some are more like general considerations or even estimates, such as that it must "pre-date the earliest attested Indo-European language" and "since these three language families [Anatolian, Greek and Indo-Iranian] have each undergone a series of changes from the reconstructed proto-language, then PIE must be some time earlier than 1700 BCE" (Clackson 2000: 442). Some researchers have proposed quite elaborate models of a chronologically and dialectally differentiated protolanguage (see e.g. Meid 1975 and Adrados 1992 and the critical evaluation of such models by Schlerath 1981). The glottochronological measurements diverge widely and usually have a large margin of error. For instance, (Gray & Atkinson 2003) calculate a time frame for the break-up of

Proto-Indo-European between 5,800 and 7,800 BC, whereas according to Lohr (2000) it happened between 3300 – 5270 BC.[16]

Another way of determining the time when Proto-Indo-European was spoken is using linguistic paleontology. Despite the problems attached to this method, when it comes to dating Proto-Indo-European, a viable hypothesis has been advanced (Anthony 1995). Accordingly the common Indo-European terminology for wheeled vehicles shows that Proto-Indo-European was still spoken around 3,500 BC, which is when wheeled vehicles were invented (see also Kallio 2003: 232). There has been some general criticism directed against this thesis, but so far it has not been falsified. (see the sceptic accounts in Clackson 2000: 445 and Salmons, this volume and the detailed defence by Garret 2006: 144–145).[17] The wheeled-vehicles argument furthermore suggests that Proto-Indo-European was spoken in a relatively small area, the distributional pattern of these fairly specialised terms (see Anthony 1995: 557) strongly argues Proto-Indo-European being spread over a vast area like Europe. From this it follows that if the spread of the Indo-European languages is to be associated with the spread of agriculture in Europe, this can only involve a pre-Proto-Indo-European stage, which is exactly what Renfrew (2003) proposes in a modification of his earlier farming-dispersal theory. That Proto-Indo-European, just like any language, probably was synchronically diversified into different varieties and also has a chronology, is obvious, however, all the comparative method can give us is an idealised protolanguage. Any further inferences can be speculatively or once potential relatives of Proto-Indo-European are securely identified.[18] Hence, while it is certain that Proto-Indo-European has a history and that there were speakers of its pre-stages, any statements on this are even more speculative than on Proto-Indo-European itself, which is at least linguistically robust due to its

[16] The method used by (Holman et al. 2009) seems more promising: the calculated date is more realistic 3500 BC.

[17] The point raised by Mallory (1997: 101) that "mobile items in the reconstructed vocabulary (e.g. horses, wheeled vehicles etc.) may have entered any region later than the initial spread of PIE provided that they arrived before the IE language of the particular area had differentiated sufficiently to permit the detection of loanwords" is in principle valid. However, it has to be borne in mind that this is only theoretically conceivable. If one just looks at the distribution of the 'wheel'-words (cf. Anthony 1995: 557), this would mean that several distinct branches in distinct areas must have been in contact with one and the same contact language from which they all borrowed the same term. Looking at any linguistic map of prehistoric Europe, it seems difficult to imagine such a constellation.

[18] One well-known theory attempting to connect Proto-Indo-European with other language families is the Nostratic Theory (see Salmons & Joseph 1998 for an overview).

reconstruction by the comparative method. In other words, theories that operate with pre-Proto-Indo-European, pre-eastern, pre-western dialects and the like, are even more likely to be incorrect, because they work with languages that cannot even be reconstructed.

Regarding locating the Proto-Indo-European homeland, i.e. the area in which the speakers of Proto-Indo-European lived, there are a variety of different hypotheses. There is a basic difference between approaches that assume a spread from some area (big or small), and approaches that posit that the Indo-European languages developed in their historically attested locations. Evaluating all of these models would go well beyond the limits of this paper, but there is one fact that can at least separate the conceivable from the inconceivable ones. From a linguistic viewpoint any theory that assumes that Proto-Indo-European was spoken over a large area is *a priori* highly improbable. Although it is clear that Proto-Indo-European is an idealised concept and that there must have been dialectal variation, the Indo-European daughter languages agree enough to permit a clear reconstruction of a common ancestor which is too homogenous to be spread across thousands of kilometres. As Mallory (1997: 108) puts it in his evaluation of what he calls "Model 1", which assumes a homeland stretching from the Baltic to the Black Sea:

> It is nearly impossible to envisage why such populations, stretching from the Baltic to the Black Sea or Caspian might share at this time a common vocabulary for domestic plants, animals, and items of the late Neolithic/Early Bronze Age technology, such as wheeled vehicles, or gain this vocabulary without evidence of borrowings, thousands of years after the Mesolithic period.

The fact that Proto-Indo-European must have been spoken on a fairly small area pretty much also eliminates the "Palaeolithic Continuity Theory" from the list of plausible models. For further evaluations I refer the reader to Mallory's excellent paper (Mallory 1997; see also Nichols 1998 and Salmons this vol.} for a discussion of homeland and spread theories). Suffice it to say, that the homeland of the Indo-Europeans has not been found, though likely candidates have been identified.

For the linguistic history of Europe the homeland of the Indo-European languages is actually not of high significance, once it is accepted that these languages spread across virtually all of Europe. What is more interesting from a linguistic viewpoint, is the process of this spread. It is clear that the Indo-European languages did not move into a

linguistically blank continent. Consequently, it has to be assumed that there was contact between the newcomers and the already existing languages, and the social circumstances of this contact permits inferences of the possible linguistic effects of this contact. The genetic data very clearly suggests that there was no massive invasion of genetically different people (see 2.3 above), which means that either small groups which later assimilated to the local population genetically (cf. Bentley et al. 2003) or genetically similar people were the speakers of Indo-European languages (see e.g. Schlerath 1973, Schlerath 1981, Anthony 1995; Bentley et al. 2003; Nichols 1998, Schrijver 2004 and Haak et al. 2005 for the small-groups model and Renfrew 2003 and Fort et al. 2004 for a demic diffusion model). Another factor which has to be considered is the result of the spread, i.e. the phylo-genetic tree of Indo-European, which ought to be explained by a plausible model.

The concrete linguistic ramifications from this are twofold. First, how is the language contact situation to be conceptualised, and second, is it conceivable that languages spread without a substantial spread of population (see e.g. Bellwood 1997 for a sceptical view)? For instance, Nichols (1998) has drawn attention to the non-binary split of the Indo-European languages, and concludes that the family broke up in waves going in different directions. Watkins (2001) posits that each daughter branch formed a linguistic area of its own, which included pre-existing languages. These issues will be taken up in section 5 below after an examination of the situation in Australia, where similar problems have to be addressed.

4. The linguistic (pre-)history of Australian Aboriginal languages: a parallel case?

A comparison with the linguistic prehistory of Australia is instructive for mainly two reasons. First, like in Europe, a major language family spread all over the continent; second, like in Europe, there are languages on the periphery which may be able to contribute something to the situation prior to the linguistic dominance of that one family. However, unlike Europe, the linguistic fringe can provide much more detailed information on the linguistic history of the continent's language. I will argue that the way the Pama-Nyungan languages moved across Australia can be used as a model for the

break up of Indo-European, and that the situation on the linguistic periphery of Australia permits some inferences on pre-Indo-European/pre-Uralic Europe.

4.1 Diffusion vs. genetic inheritance: The Pama-Nyungan offshoot model

The oldest archaeological evidence for humans in Australia dates from roughly 50,000 ago. According to the general opinion, the entry point was Arnhem Land in Northern Australia and within 20,000 years we find evidence for human occupation everywhere in Australia, including Tasmania (Flood 2004). Until the end of the last glacial maximum, Australia was part of a bigger continent (called Sahul), comprising Tasmania and also New Guinea. After the last ice age, the sea levels rose considerably, finally severing New Guinea and Tasmania from Australia as well as swallowing up about one seventh of the Australian landmass (Flood 2004: 212). It is commonly believed that the indigenous people of Australia have always lived as hunter-gatherers and that they form the oldest continuing hunter-gatherer population of the world (Flood 2004).[19] Genetically and physically, the Aborigines show considerable diversity and links to New Guinea (White 1997: 69):

> There is substantial genetic diversity among the Aboriginal peoples of Australia, whether among Aboriginal 'tribes' in, and between, different cultural and environmental regions of Australia, or between neighbouring tribes. Much of this would have its origins in the early phase of colonialisation when small effective population sizes would have been especially conducive to random genetic drift compounding likely founder effects. [...] Over subsequent generations, genetic adaptation (natural selection) and gene flow, either through low-level long term intergroup marriages or through population movement, would have formed the genetic landscape that we observe today. Novel genes entering northern Australia have contributed to the regional heterogeneity. [...]
>
> Taken together the genetic data strongly differentiate peoples in northern Australia from those in the centre. Differences across the top of Australia appear to be compounded by the introduction of genes from New Guinea into Cape York on the one hand, and from South-East Asia into the Kimberley on the other. It is likely that the gene flow into the north-east has greater time-depth than that into north-west Australia.

[19] This may in fact be not exactly true, as traces of Pleistocene-age horticultural experimentation in various parts of Australia show (Denham et al. 2009). Louandros (2008) warns that the view of the Australian indigenous population being purely hunter-gatherers may be a partly ideological construct.

It is generally agreed on the fact that virtually all Aboriginal languages of Australia are related to each other and that they can in theory be reconstructed to a common ancestor (McConvell & Evans 1997: 4).[20] But it is unclear what the time-depth for this protolanguage (Proto-Australian) is. According to the general opinion, it is in the 8,000-10,000 BC "ballpark" (McConvell 1990: 8), though it could well be much older. As mentioned further below, the mainstream view in Australian linguistics puts the language family called Pama-Nyungan at roughly 3000-5000 years ago, in the mid-Holocene period (Evans & McConvell 1998).

The external relations of the Australian languages are unclear. Since Australia was joined to New Guinea for roughly 40,000 years, "it is very likely that a deep historical relation existed between Australian and Papuan languages" (Koch 2007: 29), but so far no compelling evidence for concrete relationships has been collected (cf. McConvell & Evans 1997: 5 and Koch 2007: 29, *pace* Clendon 2006; see also the responses to Clendon 2006 and Nichols 1997 for a typological comparison of selected features).

The linguistic landscape of attested Australian languages shows an apparent asymmetry (see Figure 2 below for an illustration):[21] The languages of roughly seven eights of Australia are typologically a great deal more homogenous than the remaining languages spoken in the north and the northwest of the continent (not enough is known about the languages of Tasmania, see Blench 2008 for an overview). Both groups are clearly set apart by obvious typological differences. This configuration has implications for the historical development, and is in need of an explanation.

[20] From his different view on the linguistic history of Australia, it does not follow whether Clendon (2006)disagrees with the concept of Proto-Australian. However, if his model is applied, the top node would probably be something like Proto-Sahul with an unclear time-depth. Dixon (2001: 87) remains somewhat indecisive whether all Australian languages are descendants of one common ancestor or whether they descended form several language families or groups. In his brief discussion he seems to lean towards the last-mentioned hypothesis, but does not take a clear stance. However, fairly solid evidence has been presented for the view expressed in the main text (cf. papers in Bowern & Koch 2004a and Evans 2003b). On typological grounds Nichols (1997) also doubts the idea of a "single proto-Australian), but her language sample as well as the number of typological features seem far too small to warrant such a conclusion.

[21] This has been disputed by Dixon (2001: 64), who says "there is no clear evidence for higher-level genetic grouping". Dixon's view has been rejected by the vast majority of Australianists for good reasons and shall not be discussed here (see Bowern & Koch 2004a, Evans 2003b, Evans 2005 and Sutton & Koch 2008), though the so-called Pama-Nyungan languages are possibly typologically more diverse than is commonly assumed (Nick Evans, p.c.). See also main text below.

> If the languages of Australia had gradually diverged in situ since an early settlement date of some forty millennia ago we would expect a deeply etched and diverse mosaic of groupings, more or less evenly spread across the continent. But we have known since the 1920s that this is not the case. The languages of the southern two-thirds are relatively homogenous, and those of the north very diverse. [...] The most obvious interpretation is that the northern pattern of heterogeneity continues a very old pattern of language settlement, while the southern homogeneity is the result of a relatively recent language spread. (Evans & Jones 1997: 385)

McConvell (1990: 5) voices a similar opinion, and also asserts that this is "one area in which anthropology and biological anthropology could collaborate with linguistics to find solutions." Two main solutions have been suggested. First, the Australianist mainstream opinion is that the Pama-Nyungan languages are innovative in comparison to the non-Pama-Nyungan languages, and that they spread from an area in North Australia across the entire continent, causing pre-existing languages to shift or replacing them in the process (cf. e.g. McConvell 1990, 1996, 2001, McConvell & Evans 1997and Evans & Jones 1997).[22] Second, there is the idea that the ancient continent of Sahul was a linguistic area and that what is known now as the Pama-Nyungan languages is in fact an ancient *Sprachbund*, which formed due to prolonged contact in a confined area (cf. e.g. Nichols 1997, Clendon 2006 and this is basically also the assumption of Dixon 2001 et passim). According to the former view, perceived similarities are due to a common genetic relationship between all Australian languages, and, in particular between those languages that are found in about seven eights of the continent. By contrast, the latter, diffusional view maintains that the Pama-Nyungan languages share typological features and lexical material because of diffusion processes, i.e. language contact.

The basic claim made by the diffusional view is that the Pama-Nyungan languages are typologically too diverse for a genetic group and that a common ancestor cannot be reconstructed (e.g. Dixon 2001: 89–98). However, a comparison with the Indo-European languages urges caution on these matters. First, typological diversity is clearly no argument, since Indo-European languages since the time of the first attestations have displayed a similar degree of diversity, but no-one would seriously dispute the

[22] A strictly binary classification of Australian languages into PN and NPN languages with a common top node PrAus is insufficient to account for the configuration of the Australian languages outlined above (see Evans 2003a: 9).

reconstructive reality of Proto-Indo-European. It also clear that if one wanted to reconstruct a common ancestor from, say Hindi and Modern Irish one would probably experience considerable difficulties [23]. Likewise, even though the percentages of shared vocabulary may be unusually low among Australian languages, this does not rule out a genetic relationship. In addition, as Evans 2003a: 6 points out "the extent and intensity of diffusion it [Dixon's model] needs to assume are far greater than the levels attested in detailed studies of intense cases of diffusion in Australia."

But it is clear that if indeed no linguistic arguments for a genetic grouping of the Pama-Nyungan languages could be found, then this would clearly be a grave problem for positing a linguistic family. The comparative method operates best on the basis of shared innovations. It has been claimed that the this method fails at reconstructing genetic relationships in extreme cases of diffusion, i.e. in linguistic areas (see e.g. Dixon 2001 and Ross & Durie 1996: 28–29). However, as has been shown in the literature, the method itself is quite able to handle even complex cases, provided proper care is taken on part of the investigator (see e.g. Watkins 2001, contributions in Durie & Ross 1996 and in particular Bowern & Koch 2004b). If the method of investigation should in principle be able to ascertain a genetic relationship between the Pama-Nyungan languages, what about the evidence, of which Dixon says, it does not exist?

First of all, as Evans (2003a: 6) points out, Dixon's assertion every linguistic feature that may be attributed to a putative Proto-Pama-Nyungan that could not equally well be attributed to Proto-Australian, i.e. that there is no node called Proto-Pama-Nyungan, "is simply false, and is an artefact of the heavy reliance on Pama-Nyungan data in his Proto-Australian reconstructions", a point also raised by others before. Evans (2003a: 6–7) goes on:

> Once substantial non-Pama-Nyungan data is factored in, the limitation of many of Dixon's 'Proto-Australian' features to Pama-Nyungan languages makes them unattributable to Proto-Australian and instead suggests they are Pama-Nyungan innovations.

Moreover, the non-Pama-Nyungan languages are a great deal more diverse that Dixon acknowledges, but there are clear correspondences between them, down to specific forms and grammatical paradigms, such as pronouns (see Evans 2003a: 7 and the contributions

[23] See Hock & Joseph (1996: 491) for a similar point.

in Evans 2003a). In addition, alongside their typological diversity, there are clear regional similarities and patterns of innovations among the Pama-Nyungan languages (see Evans & Jones 1997: 388–393 and the contributions in Bowern & Koch 2004a), which seem to warrant the postulation of genetic groups despite co-existing patterns of diffusion, e.g. subsection terms (see McConvell 1985 et passim). In addition, the languages in the border areas between the non-Pama-Nyungan and the Pama-Nyungan languages demonstrate the distinctness of the Pama-Nyungan languages (see Evans & McConvell 1998: 176). This renders further support to the view of Pama-Nyungan as an innovative group that separated from the other northern language at some point in time ("Pama-Nyungan offshoot model", see Evans & Jones 1997 and Evans 2003a).

The diffusional view cannot convincingly account for the clearly patterned similarities; it has not been able to prove the posited diffusion across the board on such a large scale. Methodologically, just as hypotheses based on internal change have to prove genetic relatedness by providing reconstructions, hypotheses based on language contact have to demonstrate that language contact is indeed responsible for specific changes (see Thomason & Kaufman 1987: 27–35 for details). As far as I can see, diffusional hypotheses have nowhere demonstrated that the similarities found among Pama-Nyungan languages *are* indeed due to language contact. All that has been said is that they *could* have been due to diffusion, which is clearly not enough to prove the point. Likewise, Clendon's hypothesis of similarities between Papuan and Australian languages is probable, but to have "compelling" evidence (Clendon 2006: 45) is highly exaggerated (see also the comments to Clendon's paper in the same volume of *Current Anthropology*).

To sum up, the case for the mainstream Australianist model has been argued for much more convincingly than the alternative view. Accordingly, the Pama-Nyungan languages are an innovative branch of the Australian languages which spread across the whole continent from a location in Northern Australia, leaving the more conservative non-Pama-Nyungan languages behind (Figure 1). While it is true that there is a high level of typological diversity, a low amount of lexical correspondence and a great deal of diffusion among the languages of Australia, this does not automatically mean every feature has in fact been diffused. As pointed out above, the diffusional side has so far

failed to convincingly support their position by adducing clear evidence, because it has not been demonstrated that specific shared similarities were in fact diffused, which is absolutely crucial for explanations based on language contact.

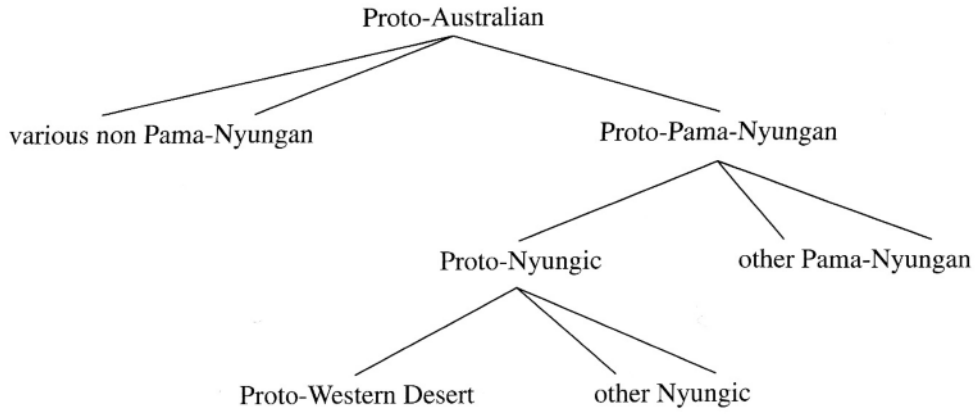

Figure 1: A simplified family tree of the Australian languages (from Evans & McConvell 1998: 174)

4.2 The spread of the Pama-Nyungan languages

This section examines the way the Pama-Nyungan languages spread across Australia, because this is instructive for the spread of the Indo-European languages. In particular, it shows that a combination of cultural diffusion, involving language shift without large movements of population, and demic diffusion, involving population movement, is a viable model of spread that can be supported by substantial evidence. Evans & McConvell (1998: 175) summarise this view:

> Linguistic and other evidence suggests that this movement [i.e. PN spread] was in two phases:
> 1 involving intense interaction with peoples already in occupation, including in favourable environments along the eastern coast
> 2 involving much less interaction with existing populations, a phase confined to the inland and in the central-south and west, where the pre-existing population was sparse

The reason for this is the linguistic picture of the Pama-Nyungan languages:

> Within Pama-Nyungan itself, there are also strong asymmetries of distribution. Virtually the entire western half of the Pama-Nyungan region is occupied by the relatively homogenous Nyungic group, and the plains between the Great Dividing Range and the Darling basing also host groups

> occupying large areas. Other regions (such as the southwest of the Gulf of Carpentaria, and the southeastern corner) are much more diverse. The nearest relatives of the Nyungic group are yet to be determined, but McConvell (1997) has demonstrated distinctive semantic shifts (from 'fish' to 'meat') suggesting close connections between Nyungic languages and those of the interior of Queensland and New South Wales.
>
> To summarize the linguistic picture: over the deeply etched mosaic of linguistic differentiation, still found in the northwest and presumably once found across the whole continent, there has been superimposed the relatively homogenous Pama-Nyungan family, whose similarities point to a Mid-Holocene expansion date. A second, more recent expansion (possibly around 2000-1000 BP) appears to have carried Nyungic speakers across the western half of the Pama-Nyungan region. Whatever led to the expansion of Pama-Nyungan, it does not appear to be linked (at least directly) to external contact since there have been no conclusively demonstrated loanwords [...] or other linguistic influences from non-Australian languages into Proto-Pama-Nyungan. (Evans & McConvell 1998: 178–179)

This model explains the typological diversity of the Pama-Nyungan languages by assuming processes of language contact:

> If Pama-Nyungan languages did not immediately take over in some regions but rather faced an extended period of societal bilingualism or multilingualism involving the older indigenous languages of the region, the linguistic borrowing and a degree of convergence between the languages would be expected to take place. [...] In fact there is possible evidence of substratum influence in languages which are Pama-Nyungan in many features but aberrant in some features [...], and such languages do occur in precisely those places where the local environment would have supported large populations which could have resisted and slowed the takeover by the incoming groups for longer periods, such as the Murray River valley. (McConvell 1990: 11)

Linguistically, this view is supported by a substantial body of evidence, which cannot be discussed here for reasons of space. I refer the reader to the relevant literature (e.g. McConvell 1985, 1990, 1996, 2001, McConvell & Evans 1997, Evans & Jones 1997 and Evans & McConvell 1998). It may suffice to point to the extensive spread of subsection terms across Australia, which parallels the Pama-Nyungan expansion and which is also interrelated to profound social changes (see McConvell 1985 for further details and also).

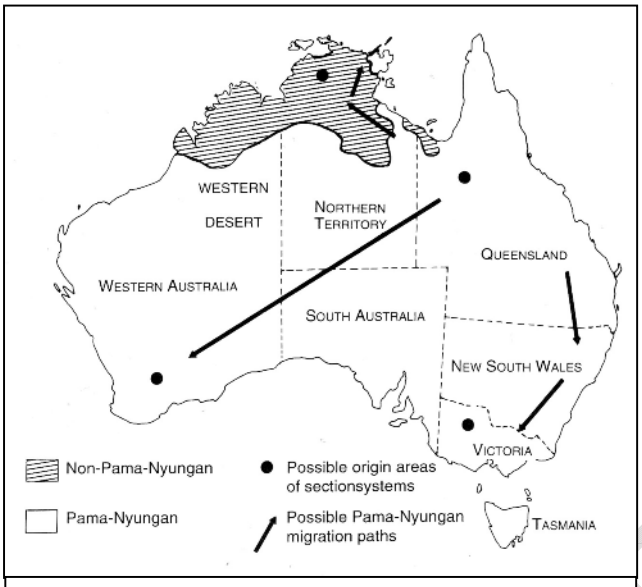

Figure 2: The spread of the Pama-Nyungan languages

In addition, this theory is supported by archaeological as well as biological data. The time when Pama-Nyungan supposedly spread is often referred to archaeologically with the term *intensification* (Bowdler 1997: 24). During this period, new tool types were introduced, whose distribution patterns show striking similarities with the distribution of the Pama-Nyungan languages (see in particular Evans & McConvell 1998: 179–181 and also Allen 1997). The different styles of rock art also parallel the linguistic grouping (Layton 1997: 381–384). Moreover, new vegetable foods are recorded together with new ways of food storage to support larger gatherings of people than before (see Evans & McConvell 1998: 182 with references).[24] These developments are also accompanied by social change. This comprises trade networks (Evans & McConvell 1998: 186, Allen 1997 and a marked increase in population and population density (cf. David & Lourandos 1998: 211). The genetic data likewise provides further support for the Pama-Nyungan expansion model (see e.g. Evans & McConvell 1998: 182–183 with references). White (1997: 79–80) concludes:

> Nevertheless, the pattern overall, together with the dermatoglyphic evidence from groups living along the southern Gulf of Carpentaria, favour a more recent common ancestry. The dispersal of these genetically related populations may have been associated with the displacement of people following the rising sea-levels during the early Holocene which flooded the Sahul shelf, [...]. Perhaps this was when PN languages and its speakers were first spreading from their area of origin.

[24] The areas of horticultural experimentation show a striking parallelism with areas in which either non-Pama-Nyungan languages were spoken or in which peculiar features cluster in Pama-Nyungan languages (see Denham et al. 2009: 637–639 for further details).

On a more detailed bio-genetic level, the picture bears witness to the spread, as the diversity in the spread areas is higher than in the peripheral parts (McConvell 2001: 159).

How did the Pama-Nyungan languages spread according to this model? As mentioned above, it is envisaged that there were two different ways, firstly expansion into areas that were not or only sparsely populated with only little language contact, and secondly expansion into areas already occupied. The former case is fairly uncontroversial and probably more marginal, since apart from the arid centre of Australia, which had been not as hospitable during the last glacial maximum, most regions would have been already settled for millennia. In the latter case a situation of language contact would have arisen, and from the outcome one has to assume that a process of language shift must have taken place on the part of the previously existing population. However, in some cases there also must have been quite substantial cultural contact resulting in borrowing of lexical items and cultural concepts, such as the subsection terms (see McConvell 1996: 128–130.

The crucial problem with proposing language shift by a more numerous population is providing a motivation. Why should a bigger group adopt the language of a smaller group instead of simply assimilating them? The usual reasons are that the shift was forced upon the bigger group by military, social or other pressure or that it was beneficial for cultural, technological or other reasons. Military dominance cannot entirely be ruled out in the case of the Pama-Nyungan expansion, but it is likely to have played a very minor role for cultural reasons. It is far more likely that the speakers of the Pama-Nyungan languages possessed technological advantages in the shape of the new small tools and perhaps also food-storage techniques, but, far more significantly in linguistic terms, their social organisation, e.g. kinship systems, marriage practices, the way information was controlled in the society and new, large-scale ceremonies, as well as perhaps new rock art styles are likely to have made Pama-Nyungan society and their language highly attractive for the indigenous population, eventually causing a shift and the loss of their native language (see in particular Godwin 1997 and Evans & McConvell 1998: 183–186 for further details including references). Surveying processes of hunter-gatherer spread, McConvell (2001) shows that all these factors contribute to a higher economic flexibility, increased mobility and better social and political organisation,

which enables smaller groups to overtake bigger and formerly stronger groups; he also points out parallel cases in Africa.

Social network analysis applied to language change differentiates between loosely and tightly-knit networks (see Wei 1996 for an overview). While the former are typically open and favour linguistic change, the latter are typically resistant to change (see Milroy 1992). Evans and McConvell posit that the language shift was facilitated by

> a shift from a social structure made of small, isolated, endogamous and inward-looking groups to one characterized by alliance, exogamy and the integration of other groups into ceremony, marriage and lithic technology. (Evans & McConvell 1998: 184)
>
> The relevant historical transition that we are proposing, then, is from an 'isolated' to a 'linked' structure. We suggest that this took place, as a sort of trans-continental chain-reaction, by the successive invitation of 'isolated' groups to become inducted in the ceremonial culture of the 'linked' Pama-Nyungan groups. (Evans & McConvell 1998: 185)

To sum up, the Pama-Nyungan languages spread from an area in Northern Australia across the entire continent in several waves, which exhibited different patterns. Small-group population movements occurred either into fairly sparsely populated areas with little language shift and a diversification over the occupied area or into already populated areas with ensuing language shift and/or cultural diffusion, due to the superior social, cultural and technological organisation and skills on the part of the migrants.

5. Pre-IE Europe and the spread of Indo-European revisited

This section examines the expansion of the Indo-European languages against the background of the situation in Australia sketched in 4. above. I will argue that this supports hypotheses that propose small-scale population movements alongside cultural diffusion causing the formation of small, regional linguistic areas leading to language shift and processes of convergence (see e.g. Watkins 2001 and Garret 2006). In addition, it will render further support to the assumption that pre-Indo-European Europe was initially (i.e. after the last ice age) linguistically fairly homogeneous and probably not a highly diverse patchwork of languages. General similarities to the situation in Australia have been pointed out before:

> The problem in Indo-European had been accounting for not only a spate of local expansion, but successive expansions involving (as it must) movement of at least some speakers of the language, resulting in the daughter languages occupying, within a couple of thousand years, most of Europe and a large part of southern Asia. [...] The problem in the explanation of the expansion of the Pama-Nyungan language family is similar, but clearly involves only varieties of foraging economy, not agriculture or pastoralism. (McConvell 1990: 9)

5.1 Pre-IE Europe

As mentioned in 3.2, there are basically two views about the linguistic map of Europe before the arrival of the Indo-European languages, namely diversity vs. uniformity. It is of course impossible to find out which of these is correct. However, there is one factor that has to be borne in mind, which has not been used much as an argument in this connection (except, of course, by Vennemann's theory on the prehistory of Europe), and this is Krahe's Old European Hydronymy (probably comprising toponyms in general). If it is believed that it is reality, and there is no reason to assume otherwise, and if it is believed that place names do have linguistic value for reconstructional purposes, which seems logical (see e.g. Evans 2010: 111–113 for some good arguments), but is not accepted by everyone (e.g. Gorrochategui 2007-2008: 1192–1195), then this linguistically homogeneous system of place names points to a fairly homogenous layer of languages that created it. Just how homogeneous is a question that can be debated, but it is clear that the layer must have shared a significant proportion of basic vocabulary that can be used to name places and possibly also some typological characteristics. A certain amount of diversity may perhaps be found with respect to the suffixes that immediately follow the root (cf. Vennemann 1994), but this is not clear, as there is no distributional study of these formatives.

As pointed out in 3.2 above, it is linguistically highly unlikely that this layer is Proto-Indo-European or a descendant, therefore it must be pre-Indo-European. Now it is important to consider that the "Old European Toponymy" (the extension of the Old European Hydronymy in Vennemann's theory) is reconstructed from modern place names via their earliest attestations. This means that chronologically it must belong to the last pre-Indo-European stratum, i.e. the immediately preceding stage. However, whether

this is the ultimate stratum is not certain. It is in principle conceivable that the above-mentioned suffixes belong to a different linguistic layer than the roots.

There are basically two logical possibilities: First, if all elements of the Old-European Toponymy belong to one linguistic stratum (not necessarily the same language), then the place names are either connected to the repopulation of Europe and did not change for millennia until the arrival of the Indo-European languages, when modifications – mainly additions – are attested, or they belong to a more recent but pre-IE linguistic stratum that re-named all exiting place names in a very homogenous way. Second, if the elements of the Old European Toponymy are not from the same stratum – only a separation into roots and suffixes would make sense here – then an older layer could have been superseded by a perhaps somewhat less homogeneous – but nonetheless not very diverse – later stratum which modified the existing names using suffixes in an agglutinative way. The second possibility seems intuitively more likely, since it is very hard to imagine that place names survive over millennia without the slightest modification. Schrijver (2007: 22) points to a linguistically homogenous layer of non-Indo-European loanwords:

> Er bestaat overigens onafhankelijk, lexicaal materiaal dat deze taalkundige verbinding van Klein-Azië met Centraal Europa via Griekenland en de Balkan bevestigt: er is een homogene laag vanniet-Indo-Europese leenwoorden in de Indo-Europese talen in dit gebied: Italo-Keltisch, Germaans en Balto-Slavisch, Albanees, Grieks en Anatolisch.12 Dit suggereert een niet-Indo-Europese taalfamilie in het gebied die woorden leende aan het later binnenkomende Indo-Europees.

He connects this layer to Hattic (Anatolia) and Minoan (see 3.2 above), and proposes that relatives of these languages are linked to the spread of agriculture in Europe. Apart from the fact that it seems difficult to believe that these immigrants re-named all existing places, there is another reason why it is unlikely that these languages are responsible for providing the lexical material for the Old European Toponymy: The Old European Typology does not include Anatolia, where Hattic was spoken in antiquity. In addition, as pointed out in 2.3 above, the demic impact of the Neolithic newcomers was all but negligible, which may indicate that they lacked the power necessary to turn the exiting

toponymy upside down. But they may well have been able to modify place names they encountered in the fashion that Vennemann (1998: 483 et passim) calls *head renewal*, i.e. the addition of a new semantic head because the old one is no longer understood, by addition of lexical elements with meanings, such as 'lake' or 'hill', (see Vennemann 1998: 494 for a list of such elements of Indo-European origin).

This discussion has made clear that if we are willing to take the Old European Hydronymy/Toponymy as serious linguistic evidence, it has actually quite a lot of predictive force. It requires a layer of enough linguistic homogeneity that the lexical elements are virtually identical and that the basic structure of specification and word order are also the same. This brings us to the question of whether this is a conceivable scenario for post-ice age Europe. As mentioned in 3.1, Theo Vennemann argues that there was not enough time for a highly divers patchwork to develop in Europe north of the Alps. Noticing that critics have rejected this idea, it is worth pointing out that no alternative scenario with any heuristic value has been proposed. In particular, the significance of the Old European Toponymy has been overlooked, probably because it is widely believed to be Indo-European. Nonetheless, as Vennemann (2003b: 550–553) also points out, merely to say it is inconceivable that there was a single linguistic stock spread over such a vast area is insufficient. In addition, it has been shown that such an assumption is not at all problematic (Bellwood 1997: 70).

Now let us examine this question against the backdrop of the archaeological chronology and the Australian situation. As established in 2.1, it probably took until well into the Mesolithic period until all of Europe was permanently occupied by hunter-gatherer groups. It has to be assumed that at least one of the linguistic lineages that were involved in this re-conquest leads to Modern Basque. But what about other possible languages? It is likely that the exodus that must have taken place before the last glacial maximum led to a concentration of more people in less space, i.e. in the refuge areas south of the Alps. Such a development probably caused a reduction in linguistic diversity with a fair amount of language shift and borrowing going on between the refugees and the established population. It is not inconceivable that during the last glacial maximum the linguistic diversity did not increase and that there was a general development of convergence between the languages spoken on comparably small areas. In addition, it is

likely that all original Palaeolithic languages were related on a deeper level anyway. Taken together, this does not make it unlikely that at least the languages of western branch, which was dominant in the repopulation of Europe, shared typological and lexical features, either through convergence/language shift or because they were indeed genetically related, such as the Paleo-Basque (Vasconic) lineage. But it is also not completely impossible that the eastern branch shared at least basic typological characteristics and basic lexemes as a common Palaeolithic heritage. Australia teaches is exactly that: even though the non-Pama-Nyungan languages are typologically very diverse, there are clear typological similarities, e.g. the basic set-up of verbal morphology and common vocabulary, such as verbs for 'hit', 'get' and 'stand' (see contributions in Evans 2003a for details).

The alternative is what Vennemann (2003b: 552) has called the "Fleckerlteppich-Theorie" ('patchwork theory') after a critical evaluation made by Trask (see Trask 1997: 364). While Vennemann Vennemann 2003b: 551correctly points out that Europe north of the Alps linguistically has only existed since the end of the last ice age, the question is nevertheless whether it is plausible that there developed a patchwork of highly diverse language families until the beginning of the Neolithic period, i.e. in, say, at least 5000 years. Given the considerations above, that the refuge period most likely reduced linguistic diversity, let us assume that the languages that repopulated Europe were not too diverse. Is it then likely that within about 5000 years or Trask's "patchwork of languages" would be able to develop? If the degree of linguistic diversity of e.g. the Pama-Nyungan languages in Australia, which are about 5000 years old, is considered, then clearly there is a potential for developing a considerable diversity during that time. And if a commonly assumed time depth of 10,000 to 12,000 years is considered for Proto-Australian, then the patchwork of non-Pama-Nyungan languages formed within this time. It is difficult to gauge the level of post-ice age/Mesolithic diversity, but it has to be borne in mind that the establishment of the toponymy is probably one of the first things to happen linguistically. This means that even if Trask's patchwork was there when agriculture arrived, the place names would not have reflected this stage of affairs but a much older and therefore less diverse situation. If one adds the predictive force of the Old European Toponymy, it is actually irrelevant how "patchy" the patchwork was,

because its very existence shows that there must have been a state when the linguistic layer was fairly homogenous, and the most likely time for this situation is after the last ice age.

This discussion has led to three important results. First, the lexical core of the Old European Toponymy is most likely to be as old as the repopulation of Europe after the last ice age. Second, its homogeneity requires an equally homogenous linguistic layer. Third, it is not implausible to assume that the repopulation of Europe was at least initially of such a required homogeneity. The last point is actually irrelevant if one accepts the full linguistic ramifications of the Old European Toponymy.

One final issue remains, and this is the significance of Modern Basque for the reconstruction of the Old European Toponymy. According to all that is known, it is highly likely that the ancestor of Modern Basque was present when humans re-entered Europe north of the Alps about 12,000 years ago. The only link to that time is the Old European Toponymy. Hence, the question is whether it is conceivable that Modern Basque should be of any help in shedding light on the meaning of these ancient place names, given the drastic changes a language can undergo during this long time. Although Basque is a highly conservative language (see e.g. Trask 1998), linguists have wondered whether it is likely that we should be able to identify words for 'valley' and 'path, road' after 12,000 years (see e.g. Baldi & Page 2006: 2190). However, it has to be taken into account that the Old European Toponymy really only permits a glimpse at the linguistic material just before the Indo-European stage, i.e. just before, say 4000 BC. Therefore, what we have preserved in this place-name material is "only" 4000 years older than Trask's (1998) Pre-Basque, and thus has the same time depth as Indo-European or Pama-Nyungan. Seen against this background, it is not outrageous to think that basic vocabulary can be preserved in toponyms. In addition, there is really no other choice than to see whether one gets anywhere, as all the other possible candidates for information, e.g. Minoan and Hattic, etc., are not known well enough to warrant any serious reconstructional attempt. Whatever its connection to the Old European Toponymy, Modern Basque is the last known survivor of Pre-Indo-European Europe and thus a rare possibility to reconstruct at least some of the linguistic situation in the Mesolithic and

Palaeolithic period; that much is certain.[25] Again, Australia provides an interesting parallel and this is the fact that the Pama-Nyungan offshoot model predicts that the non-Pama-Nyungan languages will be more important for the reconstruction of Proto-Australian (Evans 2003a: 10).

5.2 The spread of Indo-European

This section briefly looks at the Indo-European expansion in the light of the considerations in the previous sections. However, as the focus of this paper is really the situation before this historic event, this section will be rather brief in presenting some considerations on this matter.

As indicated in sections 2 and 3 above, the genetic and archaeological data do not support a massive influx of genetically different people after the Palaeolithic period, despite some noticeable migration in the Neolithic. This is a good argument to abandon any idea of an invasion from outside Europe; though to some degree new population could have assimilated (Fort et al. 2004). Consequently, there are two basic scenarios.

First, Indo-European came to Europe in small groups of non-European speakers which somehow caused the speakers of the indigenous languages to shift, much like the spread of Pama-Nyungan in Australia. In this case one would have to find advantages that the newcomers might have possessed, in order to cause this language shift, as this has been argued for in the case of Pama-Nyungan (see section 4 above). Second, the speakers of Indo-European languages were genetically Palaeolithic Europeans, belonging perhaps to the eastern group of the Palaeolithic refugees. One could hypothesise that Proto-Indo-European was a descendant of some earlier "macrofamily" like Nostratic, which broke up

[25] This question will be decided by the evidence and not by sweeping claims or basic skepticism. Over almost 20 years Theo Vennemann has collected a considerable amount of lexical correspondences between the language of the Old European Toponymy and Modern or Old Basque (see Trask 1997 and Trask 1998). Especially the fact that his toponymic reconstructions match up geographically is a strong argument in favour of his theory. All places with the element *aran-* are situated either in a valley or near one; and *aran* means exactly 'valley' in Modern Basque. Now one case could be a coincidence, but there are many more correspondences, which is very suggestive. Consequently, sceptics will have to disprove every single etymology with hard facts not with assertions. For instance, Vennemann (2003b: 179–180) connects the suffix *-a-* in Old European place names with the Basque definite article *-a*. However, Trask (1997: 367) says that this article is a more recent development in Basque and gives good reasons for this. But it is also clear that one or two counter-arguments of this kind will do little to advance the discussion. Critics – just like with any linguistic theory – will actually have to investigate all of the data.

into the different daughter languages, Uralic, Proto-Indo-European and so forth, which subsequently spread to their known locations.

It seems as if the majority of the recent literature is in support of the first position. The scenario sketched for the Pama-Nyungan expansion in 4. above makes it in principle plausible that the spread of languages is possible without an accompanying mass migration, particularly if the social network factors are in favour of the spreading languages. But what were these social network factors in the case of the Indo-Europeans? For instance, Schlerath (1973) argues for small, warlike groups of speakers of Indo-European languages, but gives no particular reasons why these groups should have been successful in taking over the existing population. Salmons (this vol.) provides a discussion of the language-shift theory in connection with the spread of Indo-European, drawing the conclusion that a coherent theory has still to be developed. One might not need to be this sceptical – the model for Pama-Nyungan seems rather convincing. What needs to be done is to adduce concrete evidence or at least some good indication that the speakers of Indo-European were likely to have possessed such advantages that would have made a language-shift proposal based on small groups possible. However, it may not harm combining both views. This means that the Indo-Europeans may well – at least partly – have been of Palaeolithic European stock.

Another issue that may be discussed in this connection is the way Indo-European spread out from its homeland. It needs to be taken into account that the Indo-European languages spread quickly across the entire continent, and how the Indo-European family tree is made up (Nichols 1998: 221). The role of contact between individual Indo-European dialects may have been underrated. Though from a heuristic viewpoint indispensable, the family tree model may stand in the way of reconstructing the way the Indo-European languages actually spread. In a detailed study Watkins (2001) shows that at least in Anatolia the newly arriving Indo-European languages formed small-scale linguistic areas with the local languages, e.g. Hattic, Assyrian, etc. Recently, Garrett (2006) has suggested that Indo-European dispersed in several waves, and that the well-known branches are at least partly due to convergence between different dialects of which some also have been lost.

Thus, whatever model future research may come up with, the way Indo-European broke up is possibly a more significant question than the old homeland problem, and this is because of its linguistic ramifications. Small groups, contact between dialects, all this ought to have left some traces even after such a long time, but it is only with a viable theory that we will be able to identify and interpret the traces correctly.

6. Conclusion

The central aim of this paper was to explore possible linguistic scenarios for a pre-Indo-European Europe. From the review and discussion of the archaeological, genetic and linguistic facts together with a comparison with the linguistic situation of historical Australia the following hypothesis can be sketched.

- After the last glacial maximum Europe the linguistic map was initially not too diverse, certainly not a patchwork of different language families and small languages. The main reasons for assuming a linguistically fairly homogenous Europe is the existence of Krahe's Old European Hydronymy (Toponymy), which requires such a constellation, and a different time for its creation is implausible largely because it is highly unlikely to be Indo-European. But even if this is rejected as a convincing argument, the assumption of a linguistic map of post-ice age Europe that is not highly diverse, sharing at least some basic typological and lexical elements, is not implausible for other reasons. This is because, firstly all European languages are related on some – admittedly very deep – level, and secondly because the spatial confinement of people in the refuge areas, conditions which rather reduce than increase diversity. Despite its high diversity, the situation in Australia actually supports this hypothesis of shared basic similarities, particularly if it is borne in mind that we do not know what the linguistic map of Australia looked like 12,000 years ago.
- During the repopulation of Europe north of the Alps people named all places they came across. This must have been largely completed in the early Mesolithic period when all of Europe was reclaimed by humans. As a result of the shared basic characteristics of the languages that were spoken in that time, a very homogenous system of place names was created. One of these languages or

language families must have been ancestral to Modern Basque. Whether this allows a linguistic explanation of the Old European toponymy will have to be left to future research. At the moment a lot of data has been collected in favour of a "Vasconic" system of place names, and only few solid counter-arguments have been published that have not been able to falsify this view.

- In the millennia that followed the repopulation of Europe the languages gradually diverged from each other, so that the linguistic map of Europe became more patchwork-like. It is, however, likely that the substance of the toponyms remained intact (as this is the case even today).
- With the spread of agriculture new languages entered Europe, which may have modified the existing place names to some degree, of which the various suffixes may be witnesses.
- At the dawn of the Indo-European (and, for that matter, Uralic) expansion, Europe was probably more like Trask's patchwork only with a very homogenous system of toponyms. Though the influx of the Indo-European languages has reduced the presumed diversity considerably, essentially this is similar to the situation today.

What the linguistic history of Australia can teach us with respect to the spread of the Indo-European languages is the fact that it is plausible to assume that small groups of people causing the pre-existing population to finally abandon their languages in favour of the various Indo-European dialects is plausible as long as the relevant network factors can be identified. It has to be agreed with Salmons (this vol.) the vague notion of "prestige" is not enough. In addition, one might want to bear in mind that at least some of the speakers of Indo-European languages were in fact "native" Europeans and thus genetically "invisible".

What this paper has illustrated is the high significance of linguistics for investigating history, especially in an interdisciplinary approach. However, to some degree the traces left in languages are even more telling than those left in stone or blood.

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