

Linguistic and archaeological evidence for Berber prehistory



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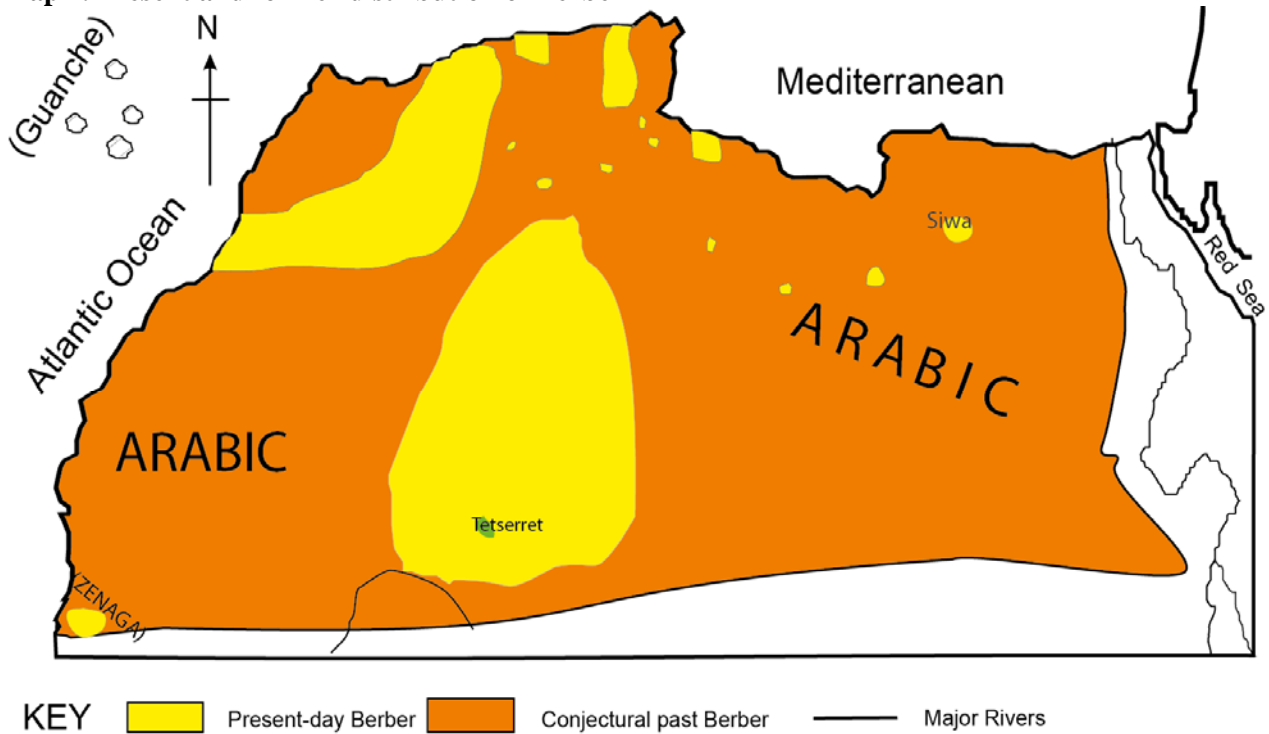
ABSTRACT

The Berber languages are relatively well-studied, and it is possible to explore their geographical extent today and in the past, and also reconstruct basic and cultural vocabulary which can be attributed to speakers of proto-Berber. However, there is a major problem reconciling this with textual and archaeological evidence. The proto-Berber we can reconstruct seems to be far too recent to match what we know from other evidence; indeed it seems to reach back to period as late as 200 AD. Textual evidence (and Canarian inscriptions) point to a period prior to 400 BC, while the most credible archaeological correlate would be the spread of pastoralism across the Sahara, pointing to the period 5-4000 BP. The paper explores this disjunction and suggests the underlying reason for it is massive language levelling in the period after 0 AD. In other words, the original speakers of Berber did indeed spread out westwards from the Nile Valley, 5-4000 years ago, but the diversity which evolved in this period was eliminated by a sociolinguistic processes which levelled divergent speech forms. Historical linguists have been wary of invoking such process until recently, but evidence is mounting for their importance in many and varied cultures, including China, Borneo and Madagascar. Hypotheses are evaluated to explain the Berber situation and it is suggested that a combination of the introduction of the camel and the establishment of the Roman *limes* were the key factors in creating this linguistic bottleneck.

1. Introduction

The Berber languages constitute a major branch of the Afroasiatic language phylum and are spoken both by settled and nomadic populations along the North African coast and far down into the Sahara, presently reaching the borders of Nigeria. Today, Berber languages are confined to a series of islands surrounded by Arabic except where they touch Sub-Saharan African languages (Map 1).

Map 1. Present and former distribution of Berber



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However, there is considerable evidence that the Berber must have been the dominant population throughout much of North Africa and the Sahara in the past (Basset 1952; Camps 1980; Willms 1980; Ameur 1990; Brett & Fentress 1996; Blench 2001). Although the Tuareg are presently the most widespread group, found across much of Algeria, Niger and southern Libya, their expansion is probably relatively recent as they may have entered the south-central Sahara as late as the 6th century AD. This is a considerable geographical range, but it has been regularly argued that Berber culture and by implication, people, reached as far as the Nile Confluence (e.g. Behrens 1985, 1989). Bechhaus-Gerst (1989) claimed to detect loans from Berber into Nubian and Behrens adduced cultural evidence from rock-paintings etc. Such a stretch is not inconceivable geographically, but the evidence for this remains weak, both linguistically and archaeologically.

The Berber remain a highly mobile group, forming new communities in the coastal cities of West Africa and are adept at maintaining a strong media presence. The Zenaga in SW Mauritania were a significant group when first described, but are now down to some 300 speakers (Tayne-Cheikh 2008). North of Agades in Niger live the Tətsərret, who language shows correspondences with Zenaga and who are now encapsulated by the Tuareg (Attayoub 2001; Lux 2011). Other islands of Berber

Figure 1. Bilingual Latin/Berber inscription



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speakers occur with the Arabic-speaking zone further east, most notably at Awjila (أوجلة) (Paradisi 1960), formerly at El-Fogaha (Paradisi 1963) and Siwa (Laoust 1932). Furthermore it is regularly claimed that Berbers reached the Canaries at an unspecified date in the past, leading to the formation of the Guanche, the now-vanished aboriginal population (Wölfel 1956). Berber is written with a script of varying readability which first appears in the 3rd century BC, but almost all texts are disappointingly short, hence the contribution of epigraphy to Berber history is limited (Chaker 2002). Figure 1 shows a bilingual Latin/Berber inscription from Roman North Africa published in Gsell (1934) which gives an idea of how these inscriptions can be transliterated.

Despite an abundance of information, there are a series of major unanswered questions about the affiliations, origins and date of diversification of the Berber languages. Berber is Afroasiatic, yet it retains only a very small corpus of established Afroasiatic roots once deep-level Arabic borrowings are weeded out. This suggests that it must have split from Afroasiatic at quite some time-depth, a hypothesis for which archaeological or linguistic support is lacking. Similarly, the dates of the expansion of Berber are unknown; its extremely low internal diversity points to a recent epoch. Evidence from Neo-Punic and Latin borrowings suggests a date for proto-Berber of 100-200 AD. This is difficult to harmonise with the expansion of pastoralism across the Central Sahara, which suggests a date of 5-4000 BP. If this is indeed so, what sociolinguistic process can be hypothesised which is somehow in consilience with the archaeological record? This paper is a preliminary attempt to provide some answers to these questions.

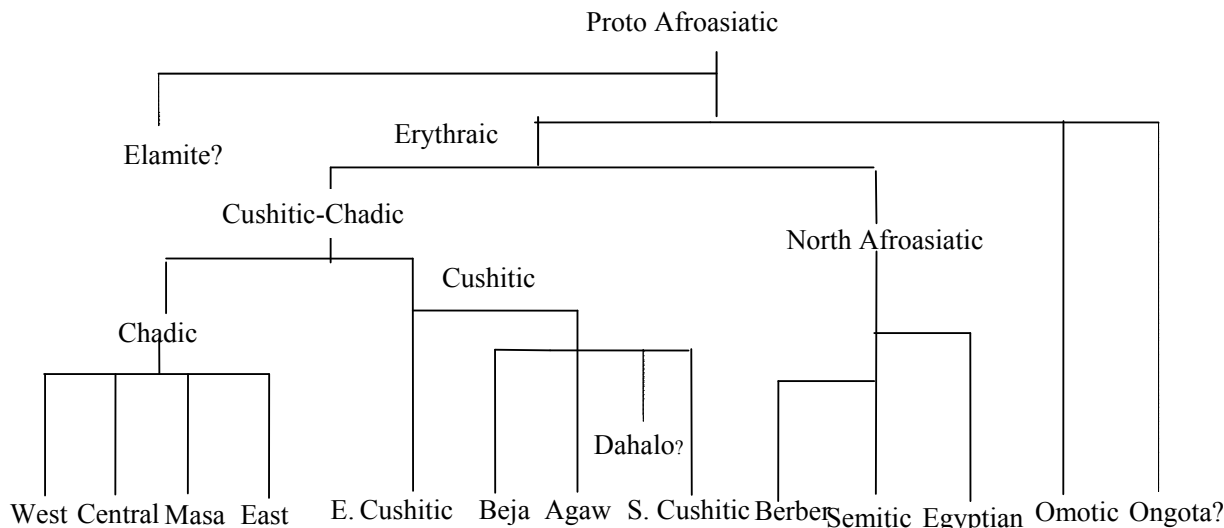
Berber is widespread and appears to be old, yet the Berber languages are surprisingly close to one another, so much so they are approach mutual intelligibility across much of their range. Berber itself is a highly idiosyncratic branch of Afroasiatic with many features that do not occur elsewhere, which suggests it split from the main 'tree' a long time ago. However, it has numerous well-assimilated loans from Arabic found virtually across its range. The difficulties of fitting Berber neatly into a story about the evolution of Afroasiatic led one of the major reconstructions of the phylum to omit it from consideration (Ehret 1995). The only way to account for this is to suppose that the speakers of proto-Berber must have been resident somewhere for a long period, diverging from Afroasiatic but not diversifying internally¹. Some major social or economic change must have transformed their society, stimulating a major expansion. Blench (2001) argued that this was pastoralism, on the basis that a quite detailed lexicon of livestock-keeping can be reconstructed for proto-Berber. While this remains the case, Kossmann (1999) points out that crop production terminology (olive production, cereals etc.) also seems to be part of proto-Berber. This is more difficult to assess, since many pastoral populations simply do not practice Maghreb-style agriculture.

2. Why is Berber so remote from the rest of Afroasiatic?

The internal structure of Afroasiatic is from resolved, and the literature contains many competing models (cf. review in Blench 2006). Nonetheless, its grammar aligns it strongly with Semitic, and most genealogical trees place these two branches in proximity. Berber verbal affixes are strikingly similar to those of Semitic, both in form, function and position as prefixes or suffixes, and must be inherited from the common ancestor of Berber and Semitic (Lipiński 2001:44). Figure 2 shows a compromise genealogical tree for Afroasiatic;

¹ Alternatively they could have diversified but the branches that developed at that period were then assimilated by Egyptian, for example.

Figure 2. Internal structure of Afroasiatic



The time-depth for Afroasiatic overall is difficult to gauge, and different for those who link its origins to the Near East and the Natufian (Diakonov 1988:32, fn. 14) and those who situate it in SW Ethiopia (Bender 2003). The earliest Semitic written material is Akkadian, dating from 2350 BC, but the city of Akkad is referred to in Sumerian documents of 2800 BC. This suggests a date of not less than 6000 BP for Semitic-speakers to enter the Near East and become established. This in turn implies a split from Berber prior to this, presumably in the Nile Valley, perhaps 6500 BP or earlier. A date such as this is reasonable in terms of the erosion of common Afroasiatic roots in Berber, but the contrast with the ‘dialect chain’ appearance of modern Berber becomes even more stark. Clearly a complex palaeosociolinguistic narrative is required for Berber to account for the present situation.

The primary assumption must be that the ancestral group which split from Semitic remained in the Nile Valley for some thousands of years, and did not expand demographically. They may have been an isolated fishing community, tolerated at the margins of the growing Egyptian kingdom. Unless there are as yet unidentified references in Egyptian records, we may never know the exact process which led to the persistence of pre-proto-Berber. However, it is likely that their transformation into pastoralists is reflected in the archaeological record.

3. Berber and pastoral expansion in the Sahara

As argued in Blench (2001) livestock production can be reconstructed for proto-Berber and it may thus seem reasonable to associate Berber with early pastoralism in the archaeological record. The difficulty with this is that cattle seem to be rather early in the Sahara, and thus not easily correlated with an undiverse linguistic group such as the Berber. The earliest dates for cattle in Africa are debated because it is difficult to be sure that skeletons represent domesticated species. Wild cattle existed in Northeast Africa, and by the time of Nabta Playa, they may have been managed by humans i.e. around 9000 BP (Gautier 1984, 1987). Di Lernia (2006) has now radiocarbon dated a large number of cattle burials in the Messak in southern Libya, and they give a fairly consistent suite of dates pointing to the introduction of livestock ca. 7000 BP. Bones of small ruminants also occur in these burials, together with occasional other species such as equids (presumably wild ass). This date is strikingly similar to the first appearance of pastoral nomadism in the south of the Arabian peninsula (Martin 2009; Blench 2011) and would seem to point to a rapid dispersal out of the Near East, heading both southwest into the Sahara and southeast into Arabia. These early Saharan pastoralists cannot be Berber; 7000 BP is prior to the usual date for the dispersal of Indo-European, whose internal diversity is evident to non-specialists.

It may be, however, that an important distinction is to be drawn between the management of wild cattle and their domestication for milking. Murdock (1959) long ago drew attention to the distinction between milking and non-milking cattle management in Sub-Saharan Africa and there is reason to think this marked a substantial break in pastoral practice. Recent evidence for the ‘milking revolution’ places this at about 5000

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BP (Dunne et al 2012). Isochronic maps of livestock in the Sahara do show a gradual expansion across to Mauretania, and there is a co-association with small ruminants. Unlike cattle, goats and sheep must be domesticated, as neither sheep nor goats are indigenous to Africa.

The westward expansion culminates in Mauretania by ca. 3500 BP (Vernet 1993). To identify this with the primary expansion of Berber languages (Blench 2001) is to fail to take into account the closeness of Berber lects, as demonstrated in Galand (1970-1971) and Willms (1980). Berber is hardly more than a dialect chain, with less diversity than, say the Romance languages. The period of >4000 years this model attributes to proto-Berber corresponds to well-dated language families such as Bantu and proto-Malayo-Polynesian, which respectively include 600 and 1000+ languages (Ethnologue 2009). Berber would then be extremely anomalous to say the least. To explain this mismatch between archaeology and language, there are essentially three possibilities;

- a) Berber behaves quite unlike any other known language family
- b) The pastoralists in the archaeological record were a quite distinct ethnolinguistic group speaking an unknown language, which was completely replaced leaving no modern representatives
- c) Berber originally was much more diverse, but passed through a ‘bottleneck’ as a result of a sociolinguistic process of levelling

Explanation a) is treated as non-explanatory, since there is no evidence for such an anomaly. Saying something is completely exceptional essentially has no content. Explanation b) is more plausible, but there are two pieces of evidence against it. It would be remarkable if modern Berber were so completely mapped on to a previous language family that no relatives remained. To cite a comparable example, the spread of Indo-European almost completely assimilated the older languages of Europe, but Basque and records of Etruscan survived to testify to their existence. Secondly, modern-day Berber languages seem to contain no obvious traces of a substrate language. In other words, their lexicon does not contain extensive evidence for borrowing from the languages which they should have replaced if this model is valid. Again, Indo-European languages, notably Greek, have extensive substrate lexicon derived from presumed former languages, thereby attesting to their existence. So, while not impossible, b) appears to be highly unlikely.

Given this, the most likely explanation is extensive language levelling. At some time in the past, a prestige lect began to spread among already related but diverse languages and gradually eliminated idiosyncratic lexicon and syntax. In time, the renewed proto-language began to rediversify, leading to the language pattern found in the present. To understand how this might work, take the analogy of the British Isles. When English dialects were first surveyed after the Second World War, a considerable number of divergent lexical items were recorded, and mapped in different geographical regions (Orton et al. 1962-71). With the spread of broadcast media, these have largely been eliminated and mainstream items substituted. If processes of social breakdown and climate change continue, the forces keeping English inter-intelligible will gradually weaken and English will rediverge. The hypothesis is that something similar happened with Berber. If so, the interpretative challenge is to know where and when this occurred and what were the social processes which drove it.

4. Dating the expansion of modern Berber

To model the levelling process, a date is essential, since it has to be congruent with the archaeological record. Fortunately we have two indicators of this, the forms of loans from Punic and Latin. Carthage (Arabic: قرطاج *Qarṭāj*, Berber: ⵏⴰⵔⵉⵙⴰ) was established as a Semitic-speaking colony in North Africa by 800 BC. Due to the destruction of the libraries following the Third Punic War (149-146 BC), records of the language are mainly in later neo-Punic (Kerr 2010). A number of Punic loans into Berber have been identified, shown in Table 1;

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Table 1. Punic borrowings into proto-Berber

Gloss	Neo-Punic	Proto-Berber	Berber gloss
Almond	Phoenician <i>š.q.d.m</i>	* <i>ā-sāyīd</i>	
Cucumber	<i>q.š.ʿ</i>	* <i>ā-γ[i]ssīm</i>	melon
Olive	Phoenician <i>z.t</i>	* <i>ā-zātīm</i>	
Onion	<i>b.f.l</i>	* <i>ā-b[i]zālīm</i>	
Reed	<i>q.n</i>	* <i>ā-γānīm</i>	
Bronze	<i>n.h.š.t</i>	?* <i>ā-niHās</i>	copper
Fortified camp	<i>g.d.r</i>	* <i>ā-gādīr</i>	
City	Phoenician <i>q.r.t</i>	* <i>γarat</i>	To be polite
Oil-lamp	<i>n.r</i> lamp, candelabrum	* <i>ē-niHir</i>	
To move, remove	<i>g.l.y</i>	əgəl	Tamasheq ‘to go away’
To read	<i>q.r.ʿ</i>	* <i>ayriH</i>	

Adapted from Malášková & Blažek (2012)

The word for ‘olive’ is a problematic case, since olives were known and used in the Maghreb well before the Phoenician period (Breton et al. 2009). Some Berber attestations of ‘olive’ are clearly secondary borrowings from Arabic. In other languages the root is a general term for ‘oil’ and it may be the Phoenicians introduced the process of pressing oil from olives as opposed to simply adopting them into cooking. The semantic fields of these loans are very indicative of the nature of Phoenician society compared with the Berber hinterland. Given the dates for neo-Punic, it is only possibly to assume these words were borrowed into Berber after 140 BC, when Punic culture was re-established.

On a larger scale are the Latin loans into Berber (Dallet 1982; Brugnatelli 1999; Adams 2003). Table 2 gives a sample of borrowings in general vocabulary, which include names of the months and miscellaneous birds. Table 3 and Table 4 in §7. illustrate the impact of Roman agricultural practice on Berber vocabulary.

Table 2. Latin loans into Berber, Kabyl examples

Kabyle	Gloss	Source
<i>fuṛar</i>	<i>février</i> [February]	Latin <i>februarius</i>
<i>yebrir</i>	<i>avril</i> [April]	Latin <i>aprilis</i>
<i>maggu</i>	<i>mai</i> [May]	Latin <i>maius (mensis)</i> , with <i>-i-</i> > <i>gg</i> also attested in Arabic loanwords
<i>tuber</i>	<i>octobre</i> [October]	Latin <i>october</i>
<i>buğamber</i>	<i>décembre, période de grand froid</i> [December, period of cold]	Latin <i>december</i> , although Kabyle has <i>b-</i> instead of <i>d-</i>
<i>afalku</i>	<i>faucon</i> [hawk]	Latin <i>falco</i>
<i>tagerfa</i>	<i>corbeau</i> [crow]	Latin <i>corvus</i> . Dallet (1982: 272) assumes it is from Latin but possibly also be Arabic <i>ğurba</i> Ghadames <i>ugerf, tugerft</i>
<i>errigla</i>	<i>règle (pour tracer)</i> [(drawing) rule], also <i>tarigla, montant vertical</i> [vertical beam of weaving loom]	Latin <i>regula</i>
<i>tberna</i>	<i>taverne, cabaret</i> [inn, pub]	Latin <i>taberna</i>

These words give us an approximate date, as it is unlikely they could have been borrowed before 0 AD. Since they are reconstructed for proto-Berber, the evidence points to language levelling occurring in the period approximately 0-200 AD. The challenge is to suggest both what sociolinguistic process occurred and why, based on the archaeological and textual record of the period.

5. Language levelling: the Roman *limes* and the camel

Language levelling occurs for a variety of reasons, the most well-known of which is the establishment of central political authority. This is clearly not the case for the Berbers, whose society is better characterised as an ‘explosive democracy’, in Ernest Gellner’s resonant term. Other potential motivations are persuasive religious practice, dominant trade languages, perception of cultural inferiority, and increased mobility

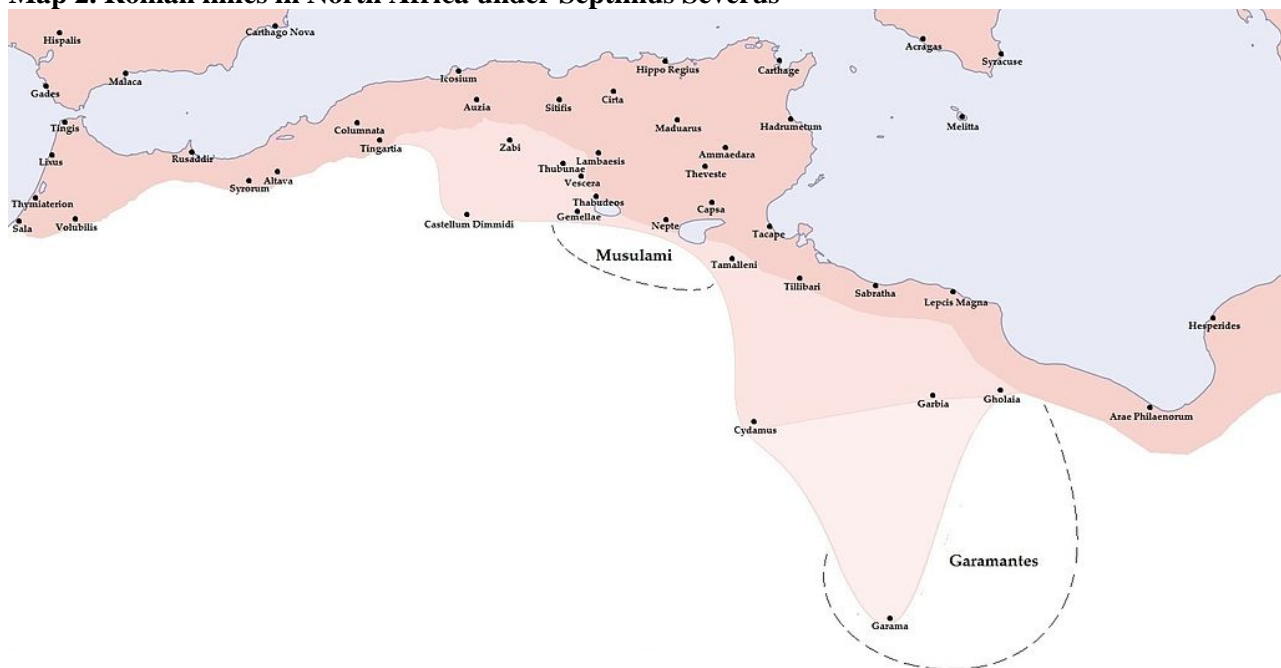
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leading to better communication. This paper argues that the key elements responsible for this major shift were the adoption of the camel and the establishment of the Roman *limes* in North Africa.

The Romans engaged in military activity in North Africa from the period when they first encountered the Carthaginians in the early third century BC. The three Punic wars finally resulted in the defeat of the Phoenicians and the destruction of Carthage in 146 BC. However, this did not lead to immediate Roman control over the hinterland and as Carthage was weakened, rather loosely organised Berber kingdoms, such as Numidia, gathered strength. Roman garrisons increasingly attempted to fill the power vacuum created by the fall of Carthage and by 24 AD, they brought the last of the territory north of Masinissa's line into Roman territory. For the next two centuries, until the revolt of the landowners in 238 AD, not only was Roman power consolidated, but North Africa became the breadbasket of the Empire. The other source of competing power, the Fezzan-centred Garamantian Empire, was destroyed by the Romans following an expedition by Lucius Balbus in 19 BC.

The Roman *limes* had two functions, to act as a boundary between the barbarians beyond it and to operate as a series of customs posts, to exact taxes on trade across the *limes*. This had an important impact on the Berber tribes beyond the line, as in order both to access Roman goods and make available the products of Sub-Saharan Africa, which would have included ivory, gold [?], carbuncles, slaves and wild beasts for the games, they would have had to deal with the merchants within the *limes* according to commercial norms. MacDonald (2011) is a useful summary of the desirable goods from Sub-Saharan Africa reaching North Africa, including those which were known about from as early as the Tichitt tradition. Presumably a lingua franca necessarily developed which was understood by all parties throughout the commercial zone along the *limes*. Map 2 shows the extent of the Roman *limes* in the time of Septimius Severus (ruled 193-211 AD) which makes clear that all the Berber groups were potentially in contact with it.

Map 2. Roman *limes* in North Africa under Septimius Severus



There is, however, a second important reason why trade would have been accelerating during this period, the regular use of the camel. The camel was first domesticated in the Arabian peninsula at about 3000 BC (Ripinsky 1975; Compagnoni & Tosi 1978). It is represented in Egypt from the early Dynastic period, but whether as an exotic import or a working animal is disputed (Ripinsky 1985). Alexander used camels in his expedition to Siwa in 332 BC and Ptolemy II Philadelphus exhibited camels in his procession in honour of Dionysus in 274 BC. Figurines of loaded camels are commonly found in the Delta in this period (Brogan 1954). Gsell (1933) argued that the use of the camel became general in Tripolitania through a deliberate

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policy of Septimus Severus to further the prosperity of Leptis Magna in particular by introducing the camel on the caravan routes to the Fezzan.

Photo 1. Camel in agricultural labour



Source: Brogan (1954)

Brogan (1954) concludes that the camel came into general use in North Africa in the first century AD as a baggage and transport animal. Several friezes also show the camel used to pull a plough, and as Table 3 shows, ploughing was a highly significant introduction. We can presume the camel was rapidly adopted by the Berbers and replaced the horse used on the trans-Saharan routes. Camel remains in West Africa, like those of donkey, are first documented from the Middle Senegal Valley, with a single first phalanx from the site of Siouré dated to AD 250–400 (MacDonald and MacDonald, 2000: 141–2).

Photo 2. Camel and donkey caravan in the Central Sahara



‘Camel’ can be reconstructed in proto-Berber as **l.y.m* or similar. This looks similar to the widespread Semitic *g.m.l* root which is borrowed into Latin. Why the Berber form should have undergone some type of metathesis or syllable reversal is unclear. Additional evidence of trans-Saharan contact is the reconstruction of ‘camel’, **yo*, in proto-Songhay, another language subgroup which seems to have dispersed at around the same period following the expansion of Sub-Saharan trade. The Songhay word has no obvious etymology, and must have developed as a borrowing from a language that has now disappeared.

6. Why were rural agricultural communities also subject to language leveling?

The argument that a common Berber arose through the evolution of a cosmopolitan trading community making use of the camel along the Roman *limes* may be convincing when applied to the subdesertic lects, but Berber is also spoken in rural montane communities which depend on small-scale farming. It is less obvious that these communities would have adopted such a speech. Indeed, they are obvious candidates to maintain older speech forms. Although we know from archaeobotany that there agriculture was early in the Maghreb, it now seems that Roman practices also transformed the lifeways of smallholder subsistence farmers. A major change to agricultural production systems was the introduction of the ox-plough. Table 3 shows a set of Latin loans into Kabyle relating to ox-ploughing which point to the Romans as the source of this technology.

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Table 3. Latin loans in Kabyle relating to ox-ploughing

Kabyle	Gloss	Source
<i>atmun</i>	<i>timon (de la charrue)</i> [plow beam]	Latin <i>timonem</i>
<i>iger</i>	<i>champ labouré et ensemencé</i> [plowed and sown field]	Latin <i>ager</i>
<i>ikerrez</i>	<i>labourer</i> [to plough]	Latin <i>carrus</i> but of Gaulish origin
<i>tayerza</i>	<i>labour</i> [ploughed field]	Perhaps Latin <i>aro</i> , or French <i>herser</i> < Latin <i>herpic-</i> . Given these other items, a Latin borrowing seems probable
<i>tayug(w)a</i>	<i>paire, couple ; joug de deux boeufs</i> [pair, couple; yoke of two oxen]	Latin <i>juga</i> pl. of <i>jugum</i>

Source: Adapted from Dallet (1982)

Some Berber dialects also have more local loans, for example Ntifa *sækka*, *ta-skki-t* ‘*soc de la charrue* [ploughshare]’, Mzab *skkə-t* ‘*charrue* [plow]’, *skka* ‘*labourer* [to plough]’ (Laoust 1920: 282 & 285). These should correspond to Gaulish *sokk-* ‘ploughshare’, Irish *socc* and Welsh *swch*. This suggests that the transfer of plough-agriculture permitted the establishment of montane agriculture and that this occurred subsequent to the formation of neo-Berber. Whatever subsistence strategies existed in the mountains prior to this period (foraging, pig-herding) were comprehensively ousted.

Apart from the plough, the Romans also introduced both orchards and the management of particular wild tree species, something also reflected in Latin loans in Kabyle (Table 4);

Table 4. Latin loans in Kabyle relating to orchards and farms

Kabyle	Gloss	Source
<i>akerruš</i>	broussaille de chênes verts [oak-tree grove]	Latin <i>quercus</i>
<i>amureğ</i>	marc d'huile [olive marc]	Latin <i>amurca</i> or maybe better Greek <i>amorgē</i> because of voiced <i>g</i>
<i>blitu</i>	blette [chard]	Latin <i>blitum</i> < Greek <i>bliton</i>
<i>fleggu</i>	menthe pouliot à fleurs bleues [pennyroyal]	Latin <i>pule(g)ium</i>
<i>ibawen</i>	fèves [beans] Ghadames <i>ababba</i> , Augila <i>biw</i> , Ghat <i>ababaw</i> , Siwa <i>awaw</i>	Latin <i>fava</i>
<i>ifilku</i>	fougère [fern]	Latin <i>filix</i>
<i>ifires</i>	poires [pears]	Latin <i>pirum</i>
<i>lemsetka</i>	mastic tiré du lentisque [kind of mastic]	Late Latin <i>masticum</i> < Greek <i>mastikhē</i>
<i>taktunya</i>	coing, cognassier [quince(-tree)]	Latin <i>cotonea</i> < Greek <i>cydonia</i> .
<i>ulmu</i>	orme [elm]	Latin <i>ulmus</i>
<i>urti</i>	verger (spécialement de figuiers) [orchard (especially of fig-trees)]	Late Latin (<i>h</i>) <i>ortus</i> , with no trace of initial <i>h</i> -

Source: Adapted from Dallet (1982)

From this we can conclude that the Berber adopted arboriculture and ploughing from the Romans after the formation of a common culture along the limes. Some communities moved up into defensible mountain villages while others used the camel to drive expansion into the desert and the formation of extensive trade networks.

7. Synthesis and conclusions

The paper begins with the enigma of the disconnect between the closeness of Berber lects and the apparent antiquity of the pastoral economy in the Sahara which it seems should be linked to Berber expansion. It summarises the links of Berber with Afroasiatic and notes that Semitic is its nearest relative. If this is so, the split from Semitic can hardly be later than 6500 BP, making Berber coherence all the more perplexing. Under all circumstances, the pre-Berber must have remained a small undiverse community, presumably

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resident in the western Delta of the Nile for several thousand years. Language change over this period would explain the erosion of common Afroasiatic vocabulary.

Although there is clearly a link between the Berbers and pastoralism, when and where this developed is uncertain. Cattle burials are found in the Messak as early as 7000 BP but the introduction of milking and small ruminants only slightly later may mark the transition to a true pastoral lifestyle. Pastoral expansion westwards reaches Mauretania by 3500 BP and it is assumed that this was indeed carried by speakers of an earlier type of Berber, for otherwise some trace of an otherwise unrecorded ethnolinguistic group would have been detected. However, it was the establishment of Phoenician and then Roman hegemony in North Africa which transformed Berber life economically and socio-politically. The consolidation of the Roman *limes* and the adoption of the camel for long-distance trade in the period 0-200 AD drove the creation of a lingua franca which became the ancestor of modern Berber lects. Older Berber varieties were effectively eliminated through relexification, the gradual replacement of lexical and grammatical structures. It might be assumed that montane agricultural communities would not be subject to the same pressures, but their subsistence systems were also premised on borrowed Roman technology, the plough and orchard cultivation. They adopted the *media lingua* before transferring to mountainous areas.

This model has the virtue of accounting for the striking internal coherence of Berber as a result of massive technological change and thus sociolinguistic dynamics. Archaeological correlates are weak in some areas, notably the transformation of montane agriculture in North Africa, and the expansion of the desert trade following the adoption of the camel. In principle, both of these are subject to further empirical confirmation.

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