

# 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 explanation must lie in massive language levelling in the period from 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 sociolinguistic processes which levelled divergent speech forms. Historical linguists have been wary of invoking such processes until recently, but evidence is mounting for their importance in many and varied cultures, including 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). 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 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 (though see a negative evaluation in Kossmann 2013). Nonetheless, Berber must once have been the dominant population throughout much of North Africa and the Sahara in the past (Basset 1952; Camps 1980; Willms 1980; Ameer 1990; Brett & Fentress 1996; Blench 2001). Although the Tuareg are presently the most widespread group, found across much of Algeria, Niger and southern Libya (Bernus 1981), their expansion is probably relatively recent as they may have entered the south-central Sahara as late as the 6<sup>th</sup> century AD (Camps 1974).

The Berber remain a highly mobile group, the Tuareg in particular forming new communities in the coastal cities of West Africa and are adept at maintaining a strong media presence. The Zenaga in SW Mauretania were a significant group when first described, but are now down to some 300 speakers (Faidherbe 1877; Masqueray 1879; Basset 1933; Dubié 1940; Nicolas 1953; Taine-Cheikh 2008, 2010). North of Agades in Niger live the Tetseret, whose language shows correspondences with Zenaga and who are now encapsulated by the Tuareg (Attayoub 2001; Lux 2013). Other islands of Berber speakers occur with the Arabic-speaking zone further east, most notably at Awjila (أوجلة) (Paradisi 1960; Putten 2013), formerly at El-Fogaha (Paradisi 1963) and Siwa (Laoust 1932). Furthermore it is often 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 1965).

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 (cf. Kossmann 2013: 14). This suggests that it must have split from Afroasiatic at quite some time-depth. Estimates of this date have been canvassed, reviewed in Kossmann 2013: 14 fn2), which range from nearly 9000 BP to 3800 BP. These are based on various types of algorithm, rather than a synthesis of historical linguistics and archaeology, and are as wayward as might be expected.

The problem is that the internal diversity of Berber is extremely low. The French tradition, dating back to the 1840s (Venture de Paradis 1844) is to treat *la langue berbère* as if it were a single language. Although this is not the case, neither can Berber be divided into twenty-six languages as Ethnologue (2013) has it. Borrowing and various contact phenomena between already closely related languages suggests that it is more helpful to conceptualise it as a dialect chain with outliers, including Zenaga and Siwi. If this is the case, then this low level of diversity points to a recent epoch for the dispersal of proto-Berber. Indeed, evidence from Neo-Punic and Latin borrowings points to a date of 100-200 AD. Blench (2001) argued that this dispersal was correlated with the expansion of pastoralism across the Central Sahara, dated to 5-4000 BP. While neither the archaeological dates nor the proto-Berber forms are in dispute, there is a severe mismatch between the two. Either it is the case that pastoralism was initially spread by a now-vanished group which was wholly replaced by the Berber at a later epoch, or else a sociolinguistic process occurred subsequently which caused Berber lects to become homogenised subsequently. Blench (2001) speculated on contact between mobile pastoralists as a force keeping Berber lects intertwined, as is the case with Fulfulde lects in West-Central Africa. The unfinished language atlas folios of Basset (1936, 1939) which cover livestock names certainly point to such a process in the desert areas.



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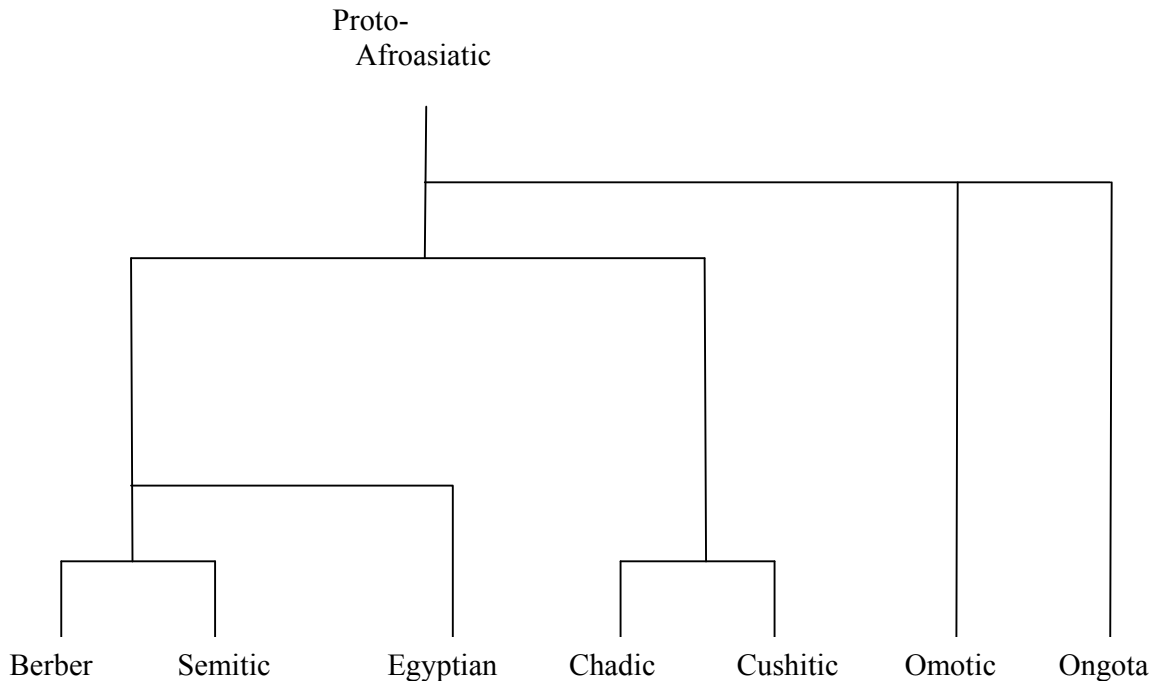
However, as a global explanation, this is clearly inadequate. Common lexicon for agriculture, conservation of Latin borrowings and homogeneity of quite isolated montane populations in Morocco argue that pastoralism can only have played a limited role in reducing diversity. One explanation can be safely excluded, the ‘mystery population’ explanation. If there really was an unknown population who were dedicated pastoralists dispersing across the Sahara seven thousand years ago, whose entire lifestyle and pastoral system was adopted by subsequent Berber migration, there would be more evidence in the livestock terminology, scatters of unexplained terms adopted from these prior herders. It is worth noting that there is evidence for interaction with resident Saharan foragers, in terms of innovative terms for fauna (Blench 2014). Processes internal to Berber remain the most credible explanation.

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

The internal structure of Afroasiatic is far from resolved, and the literature contains many competing models (cf. review in Blench 2006). Nonetheless, the grammar of Berber 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).

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 (Diakonoff 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. Given the broader uncertainties, Figure 1 shows a compromise genealogical tree for Afroasiatic;

**Figure 1. Internal structure of Afroasiatic**



Models for the homeland of the Berber languages are intimately connected with hypothesised trees of Afroasiatic. If the argument for a link with Semitic is accepted, then Berber must surely have originated somewhere near the Nile Valley. If, on the other hand, you believe, as Ehret apparently does, that Chadic is its closest relative, then a migration across the Sahara must be posited. The only way to account for the distinctiveness of Berber is to suppose that either speakers of the proto-language must have been resident

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somewhere for a long period, diverging from Afroasiatic but not diversifying internally, or they did indeed diversify but the variation vanished following an episode of language levelling.

The closeness of Berber lects argues for a social or economic change which must have transformed their society, stimulating a major expansion. Blench (2001) identified this with pastoralism, on the basis that a quite detailed lexicon of livestock-keeping can be reconstructed for proto-Berber. This should correspond to the expansion of pastoralism across the Central Sahara, which is around 5-4000 BP (Brooks et al. 2009). These dates are difficult to reconcile with the lack of diversity within Berber and there are three possible explanations;

- a) either the early wave of pastoral expansion was a quite different group of people who have vanished without trace
- b) or Berber has diversified extremely slowly compared with other world language families
- c) or Berber underwent a major episode of language levelling around 100-200 AD, eliminating prior diversity

This paper considers the possible alternative explanations for the modern situation of Berber.

### **3. Berber and pastoral expansion in the Sahara**

Blench (2001) livestock production can be reconstructed for proto-Berber and it may thus seem reasonable to associate Berber with 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). The westward expansion culminates in Mauretania by ca. 3500 BP (Vernet 1993). These dates are strikingly similar to the first appearance of pastoral nomadism in the south of the Arabian Peninsula (Martin 2009; Blench 2012) 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.

To identify pastoralism with the primary expansion of Berber languages does not 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 the pastoral 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 2013). 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

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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. Punic is an extinct Semitic language spoken in the overseas Phoenician empire in North Africa, which included Carthage and some Mediterranean islands (Segert 1976). The Phoenicians originated in what is now Lebanon and created a sea-borne empire. Carthage (Arabic: قرطاج *Qartāj*, Berber: ⵓⴰⴳⴷⴰⵢⵏ ) was established as a Semitic-speaking colony in North Africa by 800 BC and destroyed in 146 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). It is known from inscriptions (most of them religious formulae) and personal name evidence (Jongeling & Kerr 2005). The play *Poenulus* by Plautus contains a few lines in spoken Punic which has provided key evidence for its transliteration because vowels are represented (Sznycer 1967). A series of late trilingual funerary texts found in the Christian catacombs of Sirte, Libya are in Classical Greek, Latin and Punic. The language continued to be spoken until around the 6th century AD and Al-Bakri (c. 1014–1094), an Andalusian Muslim geographer, describes an unknown language spoken in Sirte in the tenth century, so it is conceivable Punic survived as a spoken language into the medieval era. Part of the interest of Punic is that there are identifiable borrowings in proto-Berber, which implies that the culture of Carthage preceded the break-up of Berber (Vycichl 1952). In addition, the nature of the loans provides useful information on the interaction of the two cultures. Examples of Punic loans into Berber are reviewed in Malášková & Blažek (2012) and Kossmann (2013:58) and are shown in Table 1;

**Table 1. Punic borrowings into proto-Berber**

Gloss	Neo-Punic	Proto-Berber	Berber gloss if different
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.ḥ.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>	<i>əgəl</i>	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 (Lipschitz et al. 1991; 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

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borrowed into Berber after 140 BC, when Punic culture was re-established. Kossmann (2013:59) notes the absence of Punic loans in Zenaga, which may reflect the nomadic lifestyle of the desert nomads (most Punic loans are nouns associated with settled life) but possibly showing the migration of the Zenaga prior to the period of significant interaction.

On a larger scale are the Latin loans into Berber (Schuchardt 1918; Dallet 1982, 1985; 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, Kabyle examples**

Kabyle	Other	Gloss	Source
<i>afalku</i>		<i>faucon</i> [hawk]	Latin <i>falco</i>
	<i>laktu</i> Iznasen	elevated part of the bedroom	Latin <i>lectus</i> bed
<i>tagerfa</i>		<i>corbeau</i> [crow]	Latin <i>corvus</i> . Dallet (1982: 272) assumes a Latin loan but cf. possibly also Arabic <i>ġurba</i> (Ghadames <i>ugerf</i> , <i>tugerft</i> )
<i>errigla</i>		<i>règle (pour tracer)</i> [(drawing) rule], also <i>tarigla</i> , <i>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>
	<i>tkirda</i> (Oaurgla)	<i>paper</i>	Latin <i>carta</i> paper

Sources: Adapted from Dallet (1982), Kossmann (2013:69)

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.

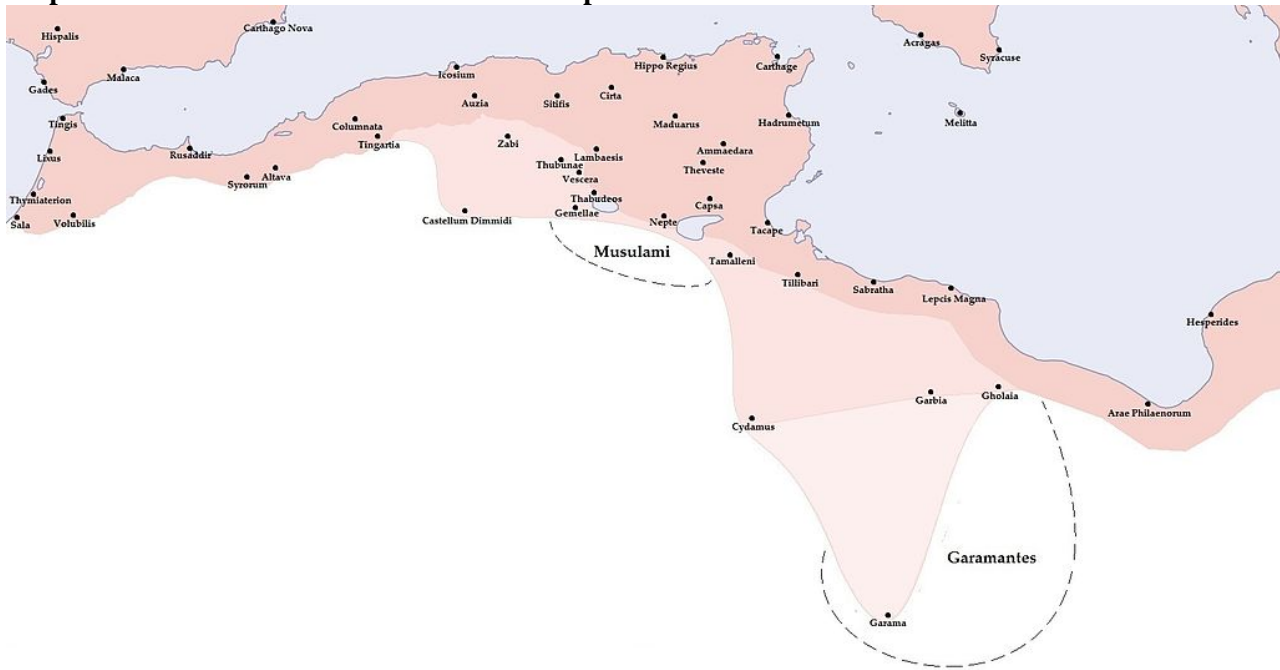
### 5. Language levelling: the Roman *limes* and the camel

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 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 (Mattingly & Hitchner 1995.). 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.



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



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* (Cherry 1998). This had an important impact on the Berber tribes beyond the line, as 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 Septimus Severus (ruled 193-211 AD) which makes clear that all the Berber groups were potentially in contact with it.

There is another reason why trade would have accelerated 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 occasionally represented in Egypt from the early Dynastic period, but whether as an exotic import or a working animal is disputed (Ripinsky 1985; Rowley-Conwy 1988). 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 policy of Septimus Severus to further the prosperity of Leptis Magna in particular by introducing the camel on the caravan routes to the Fezzan (see also Shaw 1979).

**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**



Source: CC

‘Camel’ can be reconstructed in proto-Berber as *\*l.y.m* or similar (Kossmann 2005:27-55). This looks suspiciously similar to the widespread Semitic *g.m.l* root which is borrowed into Latin, although Kossmann (2005:41) concludes that it is unrelated. 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 development 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 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>aṭmun</i>	<i>timon (de la charrue)</i> [plow beam]	Latin <i>tēmō</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>tayugg(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>

Sources: Adapted from Dallet (1982), Kossmann (2013:69)

Some Berber dialects also have more local loans, for example Ntifa *səkka*, *ta-skki-t* ‘*soc de la charrue* [ploughshare]’, Mzab *skkə-t* ‘*charrue* [plow]’, *skka* ‘*labourer* [to plough]’ (Laoust 1920: 282 & 285) corresponding 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 modern 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 and other Berber lects (Table 4);

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

Kabyle	Other	Gloss	Source
	<i>abiw</i> (Ouargla)	celery	Latin <i>apium</i>
<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>bliṭu</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>felix</i>
<i>ifires</i>		poires [pears]	Latin <i>pirum</i>
	<i>ikikr</i> (Tashelhiyt)	red pea	Latin <i>cicer</i>
	<i>tayda</i> (C. Morocco)	pine	Latin <i>taeda</i>
	<i>tafəsnaxt</i> (Tashelhiyt)	carrot	Latin <i>pastinaca</i> parsnip
<i>taktunya</i>		coing, cognassier (quince(-tree))	Latin <i>cotonea</i> < Greek <i>cydonia</i> .
	<i>tilintit</i> (Tashelhiyt)	lentil	Latin <i>lens</i>
<i>ulmu</i>		orme [elm]	Latin <i>ulmus</i>
<i>urti</i>	Iznasen <i>urṭu</i>	verger (spécialement de figuiers) [orchard (especially of fig-trees)]	Late Latin ( <i>h</i> ) <i>ortus</i> , with initial <i>h</i> -deleted

Sources: Adapted from Dallet (1982), Kossmann (2013:69)

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 should be linked to Berber expansion. It summarises

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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. Language change over this period would explain the erosion of common Afroasiatic vocabulary. There is clearly a link between the Berbers and pastoralism, but livestock herding in the Sahara is very early and does seem to be coherent with the modern pattern of Berber. Nonetheless, the alternative is to postulate a mystery group of people who were the earliest herders who have completely vanished. There is no evidence for the language and culture of these peoples and it seems more credible to suppose that Berber did indeed expand outwards from the Nile Valley at an early period following the introduction of cattle, and diversified according to normal linguistic modes, although the need for continuing communication between herders may have slowed this process.

The impact of the Phoenicians on North Africa made a significant impact on Berber culture, but it is not until the establishment of North Africa as a major part of the Roman Empire that a process of language levelling began which eliminated much of the internal diversity of Berber. Even apparent geographical outliers such as Siwa and the Zenaga were affected by these changes. This process can be compared to other episodes of language levelling where the diverse languages are already related to the dominant lingua franca. Malagasy, for example, has far less diversity than would be expected for an island settled for nearly 2000 years and this is probably the consequence of the expansion of the Merina kingdoms in the medieval period (Blench 2014).

It is likely that 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 isolated 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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