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Some Notes on the Development of Awjila Berber Vowels¹

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ABSTRACT

Awjila Berber is marked by a high frequency of the vowel *i*. This is due to historical development that caused **a*, **ə*, **ǎ* and **e* to merge with **i*. This article examines the conditionings of these developments, and discusses what effects these shifts had on the system of plural nouns in Awjila.

Keywords: *Berber, Awjila, historical linguistics, Proto-Berber, vowel shift.*

1. INTRODUCTION

The Awjila language is a Berber language spoken in the Oasis of Awjila, in Libya, about 350 kilometers south of Ajdabiya, and 400 kilometers west of the nearest Berber-speaking oasis, Siwa in Egypt.

Awjila preserves several ancient features such as the consonant *v*, *ə* in open syllables and *a*, presumably ancient, phonemic accent. While these features have received considerable attention (Beguinit 1924, Prasse 1989, Kossmann 1999, Lux 2013: 262), much is still unknown about the historical phonology of Awjila.

The most important source on the Awjila language are the word list and texts by Umberto Paradisi (1960a; b). The data presented here is all taken from these two sources unless explicitly stated otherwise. The transcriptions used here are a phonemic interpretation of Paradisi's highly phonetic transcriptions (for an explanation of this interpretation, see van Putten fthc.).²

The Awjila vowel system has undergone some radical changes. The most prevalent is the dominant presence of the vowel *i* in Awjila words. Words that

¹ In this article a variety of Berber dictionaries are consulted to provide comparative evidence. The languages and their respective abbreviation and source are: Sokna (Sok.), Sarnelli (1924); Nefusa (Nef.), Beguinit (1942); Siwa (Siwa), Laoust (1931) and Naumann (2012; unpubl.); El-Foqaha (Foq.), Paradisi (1963); Mali Tuareg (Mali To.), Heath (2006); other Tuareg dialects (H.: Ahaggar, N.: Niger, W.: Iwellemeden, Y.: Ayer), Ritter (2009); Zenaga (Zng.), Taine-Cheikh (2008); Ghadames (Ghd.), Lanfry (1973); Kabyle (Kb.), Dallet (1982); Ouargla (Ouar.), Delheure (1987); Mzab (Mzab), Delheure (1985); Middle Atlas Berber (MA), Taïfi (1992); Figuig (Fig.), Kossmann (1997); Aït Seghrouchen (Seghr.), Bentolila (1981).

² Nefusa, Sokna and El-Foqaha transcriptions have been interpreted phonetically using the same interpretations used for Awjila.

have an *a* vowel in all other languages, often have *i* in Awjila, e.g. *imín* ‘water’, cf. general Berber *aman* ‘water’.

Moreover, we find several cases where the short vowel **ə* (which goes back to Proto-Berber **ǎ* and **ə*) has shifted to *i*, e.g. *tyardímt* ‘scorpion’, cf. Ghd. *tašarđämt*; Ouar. *tyardəmt* ‘id.’ Finally, we find instances where a short vowel **ə* has shifted to a long vowel *a*.

In this article, I shall try to account for the vowel developments in Awjila from a comparative Berber perspective.³

The *a* to *i* shift has affected the apophonic plural, which in Berber languages is usually marked with a vowel *a* before the last root consonant but in Awjila it is usually marked with the vowel *i*, e.g. *tkərrišt* pl. *tkərriš* ‘knot’, cf. To. *tekərrest* pl. *tikərras* ‘id.’ These apophonic plurals have become productive and occur in broader environments than other instances of the *a* > *i* shift. Therefore, these words cannot be used as evidence for this development, and will be discussed in more detail after the discussion of the vowel developments.

2. Awjila *i* < **i* and **e*

The most straightforward origin of the Awjila *i* vowel are the Proto-Berber front vowels **i* and **e*. There are countless examples that show this correspondence, the list below only presents a small selection.

agəjt ‘bird’, cf. Ghd. *agədiq* ‘id.’; Siwa *aštít* ‘id.’ (Naumann 2012: 416)
agəllid ‘head of a tribe’, cf. Ghd. *ašəllid* ‘king’; MA *agəllid*, *ažəllid* ‘id.’
adbír ‘pigeon’, cf. Ghd. *adaber* ‘id.’; To. *edāber* ‘id.’
gzín ‘dog’, cf. Ghd. *əgzén* ‘puppy, small dog’; Nef. *ugzín* ‘puppy, small dog’
təsíli ‘sandal’, cf. Ghd. *tasile* ‘id.’; Foq. *tasíli* ‘id.’

3. Awjila *i* < **ənC*

There are several cases where the sequence **ən* in front of a consonant has become *i*.⁴ The clearest examples of this development are the verbs *ív* ‘to fall’, *íš* ‘to sleep’ *íž* ‘to be sold’ whose initial *n* can still be seen in the imperfectives *inávva*, *inášša* and *inážža*. The causative derivations of *ív*, *íš* and *íž* have undergone the same development: *šív* ‘to cause to fall’, *šíš* ‘to cause to sleep’ and *žíš* ‘to sell’.

Both *íš* and *íž* are well-attested in Berber languages, cf. Kb. *əns* ‘to spend the night’; Zng. *ənši(?)* ‘id.’; To. *əns* ‘to lie down, go to bed’, and Ghd. *ənz* ‘to sell’;

³ Proto-Berber reconstruction has received attention from several authors, most notably Prasse (1972–1974) and Kossmann (1999).

⁴ I would like to thank Lameen Souag (p.c.) for pointing out this development.

Foq. *zǎnz* ‘to sell’; Sok. *zǎnz* ‘to sell’; Nef. *sǎnz* ‘to sell’; Kb. *zzǎnz* ‘to sell’; MA *ǎnz* ‘to be sold’.

Another example of this development is found in the word *amišiw* ‘dinner’, a well-attested derivation based on the same root as *iš* ‘to rest; to sleep’, cf. Nef. *mǎnsí* ‘id.’; Foq. *mǎnsi* ‘id.’; Sok. *amǎnsí* ‘id.’; Kb. *imǎnsi* ‘id.’; To. *amǎnsi* ‘id.’; Fig. *amǎnsi* ‘id.’. Note however that Ghadames also lacks this consonant *n*: *amísi* ‘supper’.

Not all cases of **ǎnC* have shifted to **iC*. Triradical verbs with an initial consonant *n* never undergo this development, e.g.

ǎnsǎg impf. 3sg.m. *inǎssǎg* ‘to whistle’ (cf. MA *sinseg* ‘to whistle’)

nžǎy impf. *inǎžžǎy* ‘to pull; draw water’ (cf. Foq. *ǎnzǎy* ‘to draw water’; Ghd. *ǎnzǎy* ‘to pull’; Nef. *ǎnzǎy* ‘to pull’; Sok. *ǎnzǎy* ‘to pull’)

The fact that this development does not occur with triradical verbs, suggests that the conditioning environment of this shift should be specified more precisely. All verbs that have undergone this shift have the sequence |ǎnC| in word-final position in at least some of their forms (the imperative and future for the non-causatives, and the imperative, future and perfective for the causatives). The only word that never has this sequence in word-final position is the derived noun *amišiw* ‘dinner’, which may have undergone this sound law through analogy with the verb *iš* ‘to sleep’, which it is derived from.⁵

There are two counter-examples that cannot be easily explained this way: The first one is *tímǎnt* ‘honey’,⁶ cf. Ghd. *tamǎnt* ‘id.’; Kb. *tamǎnt* ‘id.’; Nef. *tamǎmt*, *tamǎnt* ‘id.’; Sok. *tamǎmt* ‘id.’ The other one is *tisǎnt* ‘salt’, cf. Ghd. *tésǎnt* ‘id.’; Nef. *tisǎnt* ‘id.’; Sok. *tisǎnt* ‘id.’; To. *tesǎmt* ‘id.’

The fact that these two words do not show this development can be explained if we assume that **ǎnC* > *iC* only occurred if the following consonant is a fricative.⁷

Another factor that one may consider to have played a role in the absence of this development in *tímǎnt* and *tisǎnt* is the presence of the root consonant *m*, as can be seen in Nefusa and Sokna for ‘honey’ and in Tuareg for ‘salt’. *mt* > *nt*, however, is not a regular assimilation in any of these languages that have a reflex *n* in these words (e.g. Awj. *tyardímt* ‘scorpion’; Ghd. *tašarđǎmt* ‘id.’). Therefore an explanation along these lines is problematic.

⁵ Note that the Ghadames cognate of this word *amísi* ‘supper’ also has *i* in place of **ǎn*. This is not a regular development in Ghadames. It may be an indication that this form in Awjila has a more complex history.

⁶ Note that the *a* in the initial syllable has unexpectedly shifted to *i* (see section 5.1).

⁷ This development is reminiscent of the English loss of *n* and lengthening of preceding vowel in front of fricatives, e.g. Dutch *gans* English *goose*, Dutch *tand* English *tooth*, German *fünf* English *five*.

4. Awjila $i < *ə$

In many cases Awjila has an i , which corresponds in other Berber languages to a short vowel followed by two (or three) consonants in absolute final position, cf.

təgərišt ‘winter’, cf. Nef. *təgrášt* ‘id.’; Sok. *təgrášt* ‘id.’; To. *tajrəst* ‘id.’
*tfiliggišt*⁸ ‘swallow’, cf. Ghd. *tafəlləlast* ‘id.’; Kb. *tifiləlləst* ‘id.’, cf. however MA *taflillist* ‘id.’
tyardímt ‘scorpion’, cf. Ghd. *tašardāmt* ‘id.’; Nef. *tyardəmt* ‘id.’; Sok. *tqardəmt* ‘scorpion’; To. *tāzardəmt* ‘scorpion’ (Prasse et al. 2003).⁹
tšərímt ‘gut’, cf. Siwa *tašrəmt* ‘intestine’; Mzab *tasrəmt* ‘bowels’.
tayəmmírt ‘armpit’, cf. Ghd. *taymərt*, *tayəmmərt* ‘elbow’; To. *taymərt* ‘id.’; Nef. *tuyumərt*, *tuymərt* ‘id.’
tagírf, *tagríft* ‘crow; owl’, cf. Ghd. *toğárf* ‘id.’, different formations: Kb. *tagərfa* ‘crow’; Sok. *tžárfi* ‘id.’; Ouar. *ažərfi* ‘id.’.
təkədírt ‘ear (botanical)’, cf. Nef. *tiddərt* ‘id.’; MA *taydərt* ‘id.’; Fig. *taydərt* ‘id.’
twəllíkt ‘louse’, cf. Ghd. *talləkt* ‘id.’, Fig. *tilləyt* ‘id.’, cf. however Tuareg *tillikk* ‘id.’
təríkt ‘bread dough’ has lost a final vowel,¹⁰ cf. Siwa *arəkti* ‘id.’; MA *arəkti*, *arəktu*, *arəšti* ‘id.’

In all these examples, the consonant that directly follows the short vowel is a voiceless obstruent f , k , $š$ or a resonant r or m .

There are a few counter-examples. First it seems that the $ə$ did not shift to i in front of n as in the nouns *tímənt* ‘honey’ and *tisənt* ‘salt’ mentioned above. Besides these we find three more counter-examples, cf.

təkábərt ‘shirt’, cf. Kb. *akbər* ‘id.’
tərakəft ‘caravan’, cf. Nef. *tərkəft* ‘id.’; Sok. *tirkəft* ‘id.’; Kb. *tirkəft* ‘id.’
azərg ‘stone’, cf. MA *azərg* ‘handmill’

tímənt ‘honey’ and *təkábərt* ‘shirt’ have penultimate stress, where normally final stress would be expected (van Putten fthc. 2.5.1.). The lack of an accent on the final syllable may have blocked this development. But note that *tərakəft* does have ultimate accent, and still did not undergo this shift.

azərg ‘stone’ may have undergone a different development because the final cluster is rg , rather than rt , as is the case with the other examples.

There are two cases where a $|əCt|$ sequence is lengthened to $|aCt|$ instead, which will be discussed in more detail in section 7.

taqəzzált ‘kidney’, cf. To. *tajəzzəlt* ‘id.’; MA *tigəzzəlt* ‘id.’; Kb. *tigəzzəlt* ‘id.’, but Ghd. *tagəzzəlt* ‘id.’
ayást ‘bone’, cf. Ghd. *yäss*, *yəšš* ‘id.’; Foq. *iyəss* ‘id.’; To. *eγəs(s)* ‘id.’; Kb. *iyəs(s)*.

⁸ While correspondence of gg to ll is irregular, the word is probably cognate to the other words.

⁹ The development of $\gamma > z$ in Tuareg, and $\gamma > š$ in Ghadames has been described by Vycichl (1990).

¹⁰ The loss of a final i is observed in two other words, namely *təvəl* ‘sheep’ (cf. To. *tehəle* ‘id.’) and *təžər* ‘moon’ (cf. Ghd. *tazíri* ‘full moon’).

5. Awjila $i < *a$

It was already noticed by Vycichl (2005: 64–65) that many, but not all instances of the Proto-Berber $*a$ have become i in Awjila. Vycichl considers the seemingly irregular nature of the shift as the effect of dialect mixing. This explanation is *ad hoc* and, more importantly, fails to explain words with originally two a 's in which one a has shifted to i while the other did not, e.g. *awíl* 'word' (cf. Ghd. *awal* 'id.'; Nef. *awál* 'id.'; MA *awal* 'id.'). In the following sections I will argue that the shift of $*a$ to i is irregular, but that several conditioning factors can be discerned.

5.1 No $*a > i$ in open syllables

The vast majority of the cases where $*a$ has shifted to i are found in closed syllables. Only a few nouns have undergone this shift outside of a closed syllable, cf.

imín 'water', cf. Pan-Berber *aman* 'id.'

Both the initial vowel and the final vowel have shifted to i . This initial i is difficult to explain.¹¹ There are several other cases with a shift of $*a$ to i in open syllables.

tímənt 'honey', cf. Ghd. *tamənt* 'id.'; Nef. *taməmt*, *tamənt* 'id.'; Sok. *taməmt* 'id.'
tísi 'liver', cf. Siwa *tsa* 'id.'; Kb. *tasa* 'id.', To. *tāsa* 'belly', *áwsa* 'liver'; Ghd. *tósa* 'id.'
təžiri 'small rope', cf. Ghd. *tazara* 'rope'

A special case of $*a > i$ in open syllables, are nouns that have the plural formation |ccic-ən| which corresponds to |i-ccac-ən| in other Berber languages.¹² While these forms have a comparable phonetic shape, it is difficult to establish a sound-law on the basis of these three words. An analogical development seems more likely and is discussed in more detail in section 8.2.

išyar pl. *šyírən* 'firewood', Foq. *išyárən*, *yəšyárən* 'id.', Nef. *isyárən* 'id.'; MA *isyarn* 'id.'
iškər pl. *škírən* 'nail', cf. To. *eskār* pl. *askarān* 'id.'; Nef. *aššár* pl. *aššárən* 'id.'; Ghd. *aškar* pl. *aškarān* 'id.'¹³
gmírən 'chest',¹⁴ cf. Nef. *idmarən* 'id.'; Kb. *idmarən* 'id.'

¹¹ For a fully unsatisfying explanation for the initial i see Vycichl (2005: 65).

¹² Another noun that may belong to this group is *íštən* pl. *ištínən* 'awl', but an analogous formation is unattested in other Berber languages, cf. Kb. *tistənt* 'id.'; Zng. *təssənt* 'id.'; To. (W., Y.) *əstan* pl. *əstanān* 'id.'

¹³ Siwa *aččər*, *ččərən* 'nail' shows a different formation, with a long vowel e in the root.

¹⁴ The shift of d to g in preconsonantal position is irregular. A similar development is found in Benghazi Arabic (Benkato fthc.).

5.2 No *a > i in emphatic environments

One of the clearest conditioning factors that block the shift of *a > i in Awjila is the presence of an emphatic environment. When an original vowel *a is found in close proximity to an emphatic consonant (*t*, *z* or *q*), it does not shift to *i*.

aṭár ‘foot’, cf. Ghd. *aḍar* ‘id.’; MA *aḍar* ‘id.’; Kb. *aḍar* ‘id.’
zzák ‘to be heavy’, cf. Ghd. *zak* ‘id.’; To. *izak* ‘id.’; MA *zzay* ‘id.’
ámza ‘ogre’, *támza* ‘ogress’, cf. Ghd. *amziw*, *tamza* ‘id.’; Nef. *amziw*, *tamzá* ‘id.’
təmazzált ‘muscle’, cf. To. (H.) *tāmazwalt* ‘flexor muscle’.
təmiṭást ‘scissors’, cf. Sok. *tmiṭást* ‘id.’; Siwa pl. *timiṭás* ‘id.’, cf. also Ghd. *tamiḍázt* ‘id.’
šṭáw ‘loom’, cf. Sok. *aṣṭṭa* ‘id.’, Siwa *aṣṭṭa* ‘id.’, Ghd. *aṣṭṭa* ‘id.’
azəlmát ‘left’, cf. Ghd. *azəlmaḍ* ‘left’
aməqqarán ‘big’, cf. MA *aməqran* ‘id.’; Nef. *aməqrán* ‘id.’; Fig. *aməqqran* ‘id.’
agəṭṭ pl. *gəṭṭ* ‘bird’, cf. Foq. *žadíd* pl. *iždád* ‘id.’; Sok. *aždít* pl. *iždát* ‘id.’; Ghd. *agəḍid* pl. *gəḍad* ‘id.’
yəqzər, *íqzər* pl. *aqzár* ‘mouse’, no cognates.

The shift is also blocked in the plural suffix *-an*. All other instances of the Berber plural suffix *-an* have shifted to *-in* in Awjila.

aziṭ pl. *ziṭ-án* ‘donkey’, cf. Ghd. *azéḍ* pl. *zédán* ‘id.’; To. *eṣeḍ* pl. *iṣeḍan* ‘id.’; Siwa *iziṭ* pl. *iziṭán* (Naumann 2012: 374)
ziúy, *zziúy* pl. *z-w-án* ‘palm’, cf. Siwa *tazwət* ‘palm leaf’
 pl. tantum *zz-an* ‘excrement’, cf. Kb. *izzan* ‘excrements’; Siwa *zzan* ‘faeces’ (Naumann 2013: 374)

5.3 No *a > i in front of certain consonants

The *a > i shift mostly occurs in closed syllables, but it is blocked if the syllable is closed by the voiced obstruents (*b*, *d*, *g*, *v*, *z*, *ž*, *ɣ*) and the semi-vowels (*w*, *y*). We find one example where the shift is blocked in front of the consonant *s*.¹⁵ Below follow several examples of *a* vowels in closed syllables.

abžáw pl. *abžáwən* ‘cheek’
adbír pl. *dbírən* ‘pigeon’, cf. Ghd. *adaber* ‘id.’, Kb. *itbir* ‘id.’
agmár pl. *gmárən* ‘horse’, cf. Ghd. *aǧmar* ‘id.’, Kb. *tagmart*.
agnáw pl. *gnáwən* ‘black slave’, cf. Ghd. *ǧanaw* ‘slave’, Nef. *agnáw* ‘black man, slave’.
mág ‘where?’
arráv ‘writing’, cf. Ghd. *orraβ*¹⁶
arəǧáz ‘person’, cf. Kb. *argaz* ‘man’, MA *argaz* ‘man’, Zng. *ärägäž* ‘man’
əngážv ‘type of palm tree’
taymáy pl. *taymawín* ‘thigh’, cf. Ghd. *tayma* ‘id.’, Nef. *taymá* ‘id.’, Siwa *tayma* ‘id.’, Sok. *táyma* ‘id.’
zwáy ‘red’, cf. Ghd. *azəǧgay* ‘red’, MA *azgg^way* ‘id.’
səndás pl. *səndásən* ‘lavatory’

¹⁵ The original Berber *s has split into two phonemes *s* and *š*, with no discernible distribution or conditioning.

¹⁶ This is an irregular verbal noun formation. Other verbs of this type have a uCuC verbal noun (van Putten fthc. 4.3.3.11), therefore this reflex cannot be explained as the result of analogy.

5.4 Cases of *a > i

Outside of emphatic environments, and not in front of voiced obstruents or semi-vowels, we find several cases of the *a > i shift in closed syllables (specifically, in front of the consonants *r, l, m, n, t, š*).¹⁷ Within this group there are consonants in front of which this shift happens quite consistently, while in front of other consonants the shift is rather sporadic. In the following sections we will discuss examples of the shift in front of different consonants, starting with environments where the shift seems quite regular, and ending with forms that have only a few examples, and many counter-examples.

5.4.1 *a > i / __n

By far the most consistent conditioning environment where the *a > i shift occurs is in a syllable that is closed by the consonant *n*.

The common Berber plural suffix *-an* in other Berber languages, has shifted to *-in* in Awjila.

aləyəm pl. *ləymín* ‘camel’ cf. MA *aly*(^w)*əm* pl. *iləyman* ‘id.’; Nef. *alyəm* pl. *iləymán* (also *iləymən*) ‘id.’; Foq. *alyúm* pl. *iləyman* ‘id.’
ayást pl. *yastín* ‘bone’, cf. Kb. *iḡəs(s)* pl. *iḡsan* ‘id.’; Fig. *iḡəs* pl. *ixsan* ‘id.’; Foq. *iḡəss* pl. *iḡásan* ‘id.’; To. *eyəs(s)* pl. *iḡásan* ‘id.’
ašúd pl. *šudín* ‘(wooden) pole’, cf. Siwa *sad* pl. *isudan* ‘id.’ (Naumann n.p.), perhaps also Zng. *äššäd* pl. *šugdän* ‘stick’; MA *aššad* ‘pole’

The Berber word for ‘water’ also underwent this shift in Awjila: *imìn* ‘water’ (cf. general Berber *aman* ‘id.’). In this word, the initial vowel irregularly shifted to *i*.

ižvín ‘palm fibres’¹⁸ cf. Ghd. *azβan* ‘id.’, Foq. *asán* ‘id.’; Nef. *asán* ‘palm fibres’

The word *ižvín* underwent a more complex development that deserves attention. The *a* of the plural suffix *-an* has shifted to *i* in front of *n*, and the initial *a* has shifted to *i* in front of an original *š (see section 5.4.2). As can be seen in the El-Foqaha and Nefusi forms, the initial sibilant was originally voiceless, and was probably voiced by assimilation to the adjacent voiced bilabial consonant *v* (and *β*) in both Awjila and Ghadames. Its historical development in Awjila can be represented as follows: **asβan* > **ašβan* > **išβin* > *ižvín*.

Not all cases of the **an* > *in* shift are found in the plural suffix *-in*: *təməttínt* ‘death’, the irregular verbal noun formation of *mmút* ‘to die’, has also undergone this shift. This form is well-attested with the final sequence |ant| in other Berber

¹⁷ Note that in front of the same group of consonants (resonants and voiceless obstruents) we also find shifts of *ə to *i*. For *a*, there are no examples or counter-examples of a shift **a* to *i* in front of *f* and *k*.

¹⁸ Kossmann (2002) suggests that this is an early loanword from Egyptian.

languages, cf. Ghd. *taməttant* ‘death’; Foq. *taməttánt* ‘id.’; Sok. *taməttánt* ‘id.’; Tuareg *taməttant* ‘id.’.

nəttín, əntín ‘he’ may be another example of **an > in*, where *an* does not represent the plural suffix, cf. Izn. *nətta, nəttan* ‘id.’ (Kossmann 2000: 79), Seghr. *ntta, nttan* (Bentolila 1981: 74), Kb. *nətta, nəttan, nəttani* (Naït-Zerrad 2001: 45). However, Beguinot (1921–1923: 390) lists an Awjila form without the final *n*: *nəttí* besides *nəttín*. The final *i* may therefore come from a form without the final *-n*, and rather be an example of an irregular **a > i* in word-final position.

The *-in* plural suffix from *-an* is quite common in Awjila, and appears on several words that otherwise lack good parallels, or do not have the *-an* plural suffix in other Berber languages:

akəššín, akšín pl. *kəššín* ‘core of a fruit’;
təfəlušt pl. *təfəlušín* ‘large spoon for cooking’ (cf. Kb. *tiflut, tifləwt* ‘ladle’ [no plural]).
aṭár pl. *ṭarín* ‘foot’, cf. Kb. *aḍar* pl. *iḍarṛən* ‘id.’; MA *aḍar* pl. *iḍarn* ‘id.’; Ouar. *ḍar* pl. *iḍarən* ‘id.’; Mzab *ḍar* pl. *iḍarən, iḍarrən* ‘id.’; Ghd. *aḍar* pl. *ḍarən* ‘id.’

Three words retain *-an* because of an emphatic environments (see section 5.2).

There are a few irregular cases where the sequence *an* is retained: The Awjila reflexive pronoun *imán* ‘self, by oneself’ is well-attested in Berber languages (cf. Ghd. *iman* ‘oneself’; Kb. *iman* ‘oneself’; Mali To. *iman* ‘soul, life force’). There is no explanation why the shift of **an* to *in* was blocked in this word.

Another counter-example is the word *iwín, iwínan, iwinán* f. *iwát, iwatan* ‘one’, which ends in *-an*. While there is no doubt that this word is related to words such as Ghd. *yón* f. *yót* ‘one’; Kb. *yiwən* f. *yiwət* ‘id.’; Zng. *yuʔn* ‘id.’ etc., its exact history is unclear, and the element *-an* is not found in this word in other Berber languages.

5.4.2 **a > i / __š*

There are several examples of this shift, but many of these have a complex history, which (partially) obscures the development.

aníš ‘nickel’, cf. MA *anas* ‘copper’; Tashl. *anas* ‘copper’; Sok. *nas* ‘copper’

This word provides a clear example of an **a > i* shift.

təníšt pl. *tníš, tníšin* ‘key’, cf. Foq. *tanást* pl. *tnisáw* ‘id.’; Sok. *tnást* pl. *tnisan* ‘id.’; MA *tanast* pl. *tanasin* ‘id.’ cf. however Ghd. *tonest, toness* pl. *təniso* ‘key’ Nef. *tuníst* pl. *tnas* ‘id.’

Most Berber languages that have this word have the vowel *a* in the final syllable of the singular, but Ghadames and Nefusa rather point to a vowel **e* in the final

syllable. If the Awjila word originally had *e* like Ghadames and Nefusa, this is not a case of **a > i* shift.

tšəllišt ‘darkness’, cf. Siwa *tasəlast* ‘darkness’; *asəllas* ‘dark’ (Souag 2010: 146); Sok. *tasullást* ‘darkness.’; Other formations: Ouar. *tsallast* ‘darkness’; Ghd. *tallast* ‘id.’; Figuig *talləss* ‘id.’

Awjila *tšəllišt* ‘darkness’ only has a few direct cognates. It corresponds to the feminine form of the Siwa adjective *asəllas* ‘dark’.¹⁹ If the <u> in Sarnelli’s Sokna form stands for ə, this is also a direct cognate. These forms, and probably also the Ouargla form, point to a shift of **-ast* to *-išt* in Awjila.

išf pl. *išfəwən*, *išfiwən* ‘day’ cf. Kb. *ass* pl. *ussan* ‘day, journey’; MA *ass* pl. *ussan* ‘id.’; Ghd. *ásəf* pl. *asfəwən* ‘id.’

Vycichl (2005: 54) notices the pair *išf* ‘day’ besides *ásəfa* ‘today’, and explains this from a difference in stress. He suggests that *išf* underwent the shift, because *a* was stressed, and that *ásəfa* originally had unstressed initial *a*. Vycichl ignores the stress marking by Paradisi, which he apparently does not consider reliable, but does not state this explicitly. He points out himself that his explanation fails to explain why his ***ašfá* did not become ***ašfi*; as a solution, he proposes that the ancient deictic particle *-a* was imported from a different dialect that did not undergo this shift. This explanation is not convincing. The deictic particle *-a* is not productive in Awjila, and should probably be considered an ancient relic rather than a loan. There is no other obvious explanation why *ásəfa* ‘today’ has not undergone the same shift as *išf* ‘day’.

ižvín ‘palm fibres’ is an example of this shift that has been obscured by a voicing assimilation. The development is discussed in section 5.4.1.

The two counter-examples of this shift are: *agəbáš*, the verbal noun of *gəbáš* ‘to encircle’ and *akəráš*, the verbal noun of *əkəráš*, *kəráš* ‘to hoe, dig’. |aCəCaC| is the regular pattern for verbal nouns of triradical verbs in Awjila Berber. Therefore, this unexpected *a* in front of *š* can be explained as an analogy to the other triradical verbs.

5.4.3 **a > i / __l*

The shift of **a* to *i* in front of *l* is clearly less consistent than in front of *n* and *š*, but there are several well-attested words that have undergone this shift.

The common Berber word for ‘word’ has shifted its final **a* to *i* in front of *l*: *awíl* (cf. Ghd. *awal* ‘id.’; Zng. *āwäy* ‘id.’, etc.)

¹⁹ The feminine form is expected to be *tasəllast* (Souag p.c.). Laoust (1931) has *tasəlast* ‘darkness’, with ə in open syllable, which is not allowed in Siwa. This probably represents a typographical error for *tasəllast*.

Two words that refer to metals have also undergone this shift:

zzál ‘iron’, cf. Foq. *uzzál* ‘id.’; Kb. *uzzal* ‘id.’; Nef. *zzəl* ‘id.’; Sok. *uzál* ‘id.’
tildúnt ‘tin’, cf. Zng. *āldūn* ‘lead’; To. (Ah.) *āhállun* ‘lead, tin’; To. (Y) *aldom, aldon* ‘tin, lead’; Kb. *aldun* ‘id.’; MA *aldun* ‘id.’

Several counter-examples to this shift exist, for example *mlál* ‘sand; dust’, cf. Sokna *umlál* ‘id.’, other formations are Ghd. *tamallilt* ‘dune sand’; Mali To. *temälält* ‘white sand’.

Another counterexample is *taržált* ‘wing (of a bird)’, cf. Sok. *taržált* ‘feather’; Ghd. *taržalt* ‘id.’; Zng. *tärgälL* ‘id.’. The historical development of this word is unclear. Sokna and Zenaga point to a Proto-Berber *ǧ. The regular reflex of this consonant is *g* and *ǧ* in Awjila and Ghadames respectively (Kossmann 1999: 138–173), but in this word the reflex is unexpectedly *ž*.

alál ‘tableware’ (cf. Fig. *alili* pl. *ilalan* ‘kitchen utensils’) is a counter-example whose exact formation is not attested in other Berber languages.

azzál ‘saddle’ and *aməsál* ‘crossbar between the two poles of a well’ lack cognates in other Berber languages, but form counter-examples.²⁰

The verbal nouns *agəwál* ‘seeing’, *anədál* ‘covering’ and *arəwál* ‘fleeing’ are regular verbal noun formations of triradical verbs, and are probably the result of analogy to the regular triradical verbal noun formation |aCəCaC| (van Putten fthc. Section 4.3.3.1).

5.4.4 *a > i / __m

There are only two examples that could be considered evidence of the shift in this environment:

imgər, yəmgər pl. *məg(ə)rən* ‘sickle’, cf. ; Kb. *amgər* ‘id.’; Foq. *amžər* ‘id.’; Nef. *məžər* ‘id.’; Siwa *amžir* ‘id.’. In Tashelhiyt (Stroomer fthc.), however, the word has initial *i*: *imgr* ‘id.’
pl. *dímmən* ‘blood’, cf. MA *idammen* ‘id.’; Ghd. *dämmän, dammän* ‘id.’; Foq. *idámmen* ‘id.’; Nef. *idəmmən* ‘id.’; Sok. *idámmən* ‘id.’

There are two counter-examples to this shift, the first is the agentive noun *anagám* ‘someone who draws water’, an agentive noun of the verb *ugám* ‘to draw water’.

The agentive noun formation with the prefix *m-* is very common in Berber languages. Compare the identical formation found in Middle Atlas Berber:

agəm ‘to draw water’ → *a-n-agam* ‘someone who draws water’

²⁰ Structurally, *aməsál* looks like a verbal noun, but the corresponding verb is unattested. If this form indeed is a verbal noun, the *a* in front of *l* may be explained as the result of analogy. Perhaps the word is to be connected with Ouar. *əmsel* ‘to close up’; MA *əmsel* ‘to close up holes with mortar’, but the semantic development is not straightforward.

It is tempting to explain this counterexample as the result of analogy, similar to how we explained the verbal noun of the type |aCəCaC|, like *anədál*, as the result of analogy. But this explanation must be used with some restraint. There are no other examples of agentive formations in Awjila; therefore there is little evidence that this is a productive class. This absence of evidence could be due to a lack of material rather than an absence of this regular formation, however.

asám ‘a stick for threshing barley in a special mortar’ is the other counterexample. It is not attested in other Berber languages.

The amount of examples in favour of this shift is just as numerous as counter-examples. Moreover, if we take the Tachelhiyt formation *imgr* as the cognate to Awjila *ímgər*, *yámgər*, rather than the *amgər* formation, only one example in favour of this shift remains.

5.4.5 **a* > *i* / __*r*

There are two words which seem to have undergone this shift. The vast majority of the words with a sequence *ar* have retained the *a*.

tamírt pl. *tmíra* ‘beard’ is a very common Berber noun, which has a vowel *a* that has shifted to *i* in its final syllable (cf. Kb. *tamart* ‘id.’; Mali To. *tāmart* ‘id.’; MA *tamart* ‘id.’; Fig. *tmart* ‘id.’; Ghd. *tomärt* ‘id.’). An alternative explanation is that this word is derived a form similar to Ghadames *tomärt* ‘beard’, which has a final short vowel in front of two consonants. This short vowel would have shifted to *i* too (see section 3).

The preposition *ir* ‘until’ corresponds to Kb. *ar* ‘id.’, Ghd. *ár*, Zng. *ār* ‘id.’, Mali To. *har* ‘id.’, MA *al, all, ar* ‘id.’

The adjective m.sg. *azəwwár* f.sg. *təzəwwárt* m.pl. *zəwwárən* f.pl. *tzəwwarín* ‘large’ is found in other Berber languages with and without an emphatic *z* (cf. Zng. *zəw(w)ur* ‘to be thick, be large’; Ouar. *zziwər* ‘to become thick’, versus Ghd. *zuwwər* ‘to be thick’; Kb. *uzur* ‘to be thick’; *azəwwar* ‘big’ (Naumann 2012: 211). It is conceivable that the emphatic consonant blocked the shift. But as there is no evidence for the emphasis in the transcription of the word, and because the neighbouring Siwa show no trace of this emphatic consonant, this word should probably be considered an exception to this shift.

The adjective m. sg. *atrár* pl. *trárən* f. sg. *tatrárt* pl. *tətrarín* ‘new, fresh’ (cf. Foq. *atrár* ‘new’; Sok. *trir* ‘new’;²¹ Siwa *atrar* ‘new’) is a counter-example that is not easily explained. The pattern aCCaC, which is a productive adjective pattern in other Berber languages, is not attested in Awjila outside of this word. Analogy therefore cannot be used to dismiss this form.

tazárt pl. *təzzár* ‘millstone, handmill’ has several possible cognates, cf. Kb. *tissirt, tassirt, tasirt* ‘mill’; Foq. *tasárt* ‘millstone’; Siwa *tasart* ‘handmill’, but

²¹ Note that Sokna surprisingly has a vowel *i* instead of the expected *a* in the root. The *a* to *i* shift is otherwise unattested in this language.

all these cognates have *s* instead of Awjila *z*. The historical development remains unclear, but the form is clearly a counter-example to the shift.

The well-attested Berber word for horse is another serious counter-example: *agmár* pl. *gmárən* (cf. Ghd. *aǧmar* ‘horse’; Kb. *tagmart* ‘mare’; Zng. *ägmär* ‘boy, young adolescent’, *tägmär*, *tägmärt* ‘mare’).

agəzzár pl. *gəzzárən* ‘leaf of a turnip’ and *təbazárt* pl. *tbazrín* ‘basket’ both did not undergo this development. Both these nouns have no Berber cognates.

5.4.6 **a* > *i* / __*t*

There are two cases that suggest *a* shifted to *i* in front of *t*, namely the preposition *dít* ‘in front of’ (cf. Ghd. *dát* ‘id.’; To. *dat* ‘id.’) and *tvittín* ‘sheep (pl.)’, the suppletive plural of *təvəl* (cf. To. *tihatten* ‘id.’; Zng. *tātən* ‘id.’).

There are a number of feminine nouns that end in the sequence *-at*. All nouns that end in this sequence are verbal nouns of the patterns t-CəCCa-t/t-CəĀa-t/t-CaCat (e.g. *təvərgát* ‘dream’, *tnəššát* ‘sleep’, *təfadát* ‘thirst’). Regular nouns never have the *-t* suffix after stem-final *-a*. Perhaps the final *-t* in the verbal noun formation is an innovation. These nouns probably cannot be considered counter-examples to this shift.

There is one noun of the pattern t-CəCCa-t that is not the verbal noun of an attested verb: *təmədyát* ‘clay; red earth’, the numeral *iwát* ‘one (f.)’ is another counter-example, but its historical development is unclear.

5.5 ISOLATED CASES

There are two words where **a* has shifted to *i* in contexts different than the ones discussed above. In both cases, the nouns originally had a sequence CaCa that has shifted to CiCi.

tísi ‘liver’, cf. Ghd. *tósa* ‘liver’, Kb. *tasa* ‘id.’, Zng. *taʃšäh* ‘liver’, To. *tāsa* ‘belly’.
təžiri pl. *tžiriwín* ‘small rope’, cf. Ghd. *tazara* ‘rope’.

One wonders whether the development CaCa > CiCi should be considered an additional condition where **a* shifts to *i*. There are several counter-examples to this shift:

tələba pl. *tələbiwín* ‘baraccan’, cf. Foq. *talába* ‘id.’, Sok. *tlába* ‘id.’, Kb. *talaba* ‘clothes’.
tala ‘kitchen’, but notice that the cognate in Ghadames, *tali* ‘room’, has final *i*.

5.6 SUMMARY OF THE DATA

In the previous sections, we have looked at the different environments in which we find shifts of **a* to *i*. While there are many counter-examples, some patterns can be distinguished.

If an original **a* is in the vicinity of an emphatic consonant, it never shifts to *i*. If the syllable is closed by voiced obstruents or semi-vowels we never find the shift either. If the syllable is closed by any other consonant, we find instances of the shift from **a* to *i*.

Rarely, we find cases of an apparent shift of **a* to *i* in open syllables. No conditioning factors can be identified with the limited data available.

One of the most regular environments of this shift is found in front of *n*. There are several cases of *a* that has shifted to *i* in front of *n*, in different morphological and phonological environments. Of the few counter-examples, *imán* ‘self, by oneself’ is very difficult to explain.

In front of *š* we find several strong examples of the shift from *a* to *i*, and *ášfa* ‘today’ is the only unexplained counter-example.

In front of *l* we find several strong cases of the shift, but we are also presented with counter-examples that cannot be explained easily.

There are two good examples of this shift in front of *t*, and very few counter-examples. The sequence **-at* is rare in Proto-Berber, which makes it difficult to find more examples and counter-examples.

The other environments (in front of *m*, *r*) have only a few cases where the shift has occurred, while they have many counter-examples. The shift of **a* > *i* in these environments is very sporadic.

6. ADDITIONAL EXAMPLES PROPOSED BY VYCICHL

Vycichl (2005: 64–65) was the first to give a preliminary description of the Awjila **a* > *i* shift. Many of the examples he cites have already been discussed in the pages above, but several remain that deserve attention.

aríng, *anírg* pl. *ringín*, *nirgín* f. *təringít* pl. *təringitín* ‘neighbour’, cf. H. To. *anārag* ‘neighbour’; N. To. *anhərağ* ‘neighbour’; Sok. *arnág* ‘neighbour’.

This is a problematic example. The formation in Awjila appears to be quite different from that found in Tuareg and Sokna. Moreover, note that the consonant *h* in Tuareg is not attested in Awjila as *v*, which would be the regular reflex of Tuareg *h*; it is therefore unclear how these words relate to each other exactly. This makes it difficult to determine whether this word is an example of the **a* to *i* shift.

Vycichl also cites several words that have the plural suffix *-iwən*, and considers this plural suffix the regular Awjila cognate of the plural suffix *-awən*.

He fails to mention that *-awən* also occurs as a plural suffix in Awjila and that the plural suffix *-iwən* is commonly attested outside Awjila. In general the distribution of the plural suffixes *-awən* and *-iwən* seem in Awjila correspond to cognates in other Berber languages, therefore there is no reason to assume that Awjila *-iwən* represents ancient *a*, cf.

Awj.		
<i>uláwən</i>	Pan-Berber <i>uláwən</i>	‘hearts’
<i>vəṭáwən</i>	Ghd. <i>eβāḍawǎn</i>	‘nights’
<i>škiwən</i>	MA <i>askiwn, aššiwn</i>	‘horns’
<i>išfiwən</i>	Ghd. <i>asfiwǎn</i>	‘days’.

Finally, Vycichl compares Awjila *iríw* pl. *iríwən* ‘boy, child’ to Tashelhiyt *arraw* ‘children’. These two words represent different formations from the same common Berber root, cf. MA *arəw* ‘to give birth’. Awjila does not have the gemination found in Tashelhiyt, moreover, the Awjila word refers to a single ‘child’, rather than plural ‘children’. These two forms cannot be used as evidence for an **a* to *i* shift.

7. INTERPRETATION OF THE DATA

It is now possible to examine the situation presented above, and develop a historical scenario that has yielded the high frequency of *i* vowels in Awjila.

We must assume that first word-final **əɳF*, where F stands for any fricative, lost *n* and as a result underwent compensatory lengthening of *ə*, which yielded *i*.

Later, the vowel **ə* is lengthened to *i* or *a* in word-final syllables before a |Ct| cluster. The most probable scenario that yields this situation is by assuming the **ə* first shifted to *a* in front of a word-final Ct cluster. After the lengthening of **ə* to *a*, the vowel *a*, both from an original **ə* and **a*, was raised to *i* in closed syllables. In emphatic environment and in front of the voiced obstruents (*b, d, g, v, z, ʒ, ɣ*), semi-vowels (*w, y*) and the consonant *s* the fronting was blocked. This chronology explains why *taqəzzált* ‘kidney’ and *ayást* ‘bone’ shifted **ə* to *a* rather than to *i*.

The shift of **a* to *i* does not seem to be consistent. While many nouns have undergone this shift, there remain several words that do not follow the proposed shift, where it is not easily explained. In front of *r* and *m*, the shift occurs only sporadically.

8. MORPHOLOGICAL REANALYSIS OF THE PLURAL SYSTEM

These proposed sound developments have led to a reanalysis of the nominal plural formation. This section will illustrate how these developments caused the

vowel *i* to become a dedicated marker of the apophonic plural in Awjila. Before we examine this development in more detail, we must have a look at the nominal plural formation in Berber.

8.1 BERBER PLURAL FORMATION

Berber plurals can be divided into three categories, suffixal plurals, apophonic plurals and apophonic plurals with suffixes.

Many Berber nouns form their plural with a suffix: usually **-ǎn* for the masculine and **-en* for the feminine. Feminine singular nouns have a final suffix *-t* that is absent in the plural. Some examples from Middle Atlas Berber from Penchoen (1973: 14) are shown below:

<i>asəgg^was</i>	pl. <i>isəgg^was-ǎn</i>	‘year’
<i>tafullus-t</i>	pl. <i>tafullus-in</i>	‘hen’

There are several other plural suffixes, such as *-awǎn* and *-iwǎn* (*-awen* and *-iwen* for feminine nouns).

Many other nouns have apophonic plurals. Such nouns insert a vowel *a* before the last root consonant, replacing the vowel (if any) in this position. If the stem syllable before it contains an *a* it is changed to *u*, for example in Middle Atlas Berber (Penchoen 1973: 18) we find:

<i>ayyul</i>	pl. <i>iyyal</i>	‘donkey’
<i>talxaṭəm-t</i>	pl. <i>tilxuṭam</i>	‘ring’

Finally, a few nouns undergo a vowel change in the root and receive a suffix in the plural. In certain formations, the final consonant of the root is lengthened (Penchoen 1973: 19):

<i>afus</i>	pl. <i>ifass-ǎn</i>	‘hand’
<i>afud</i>	pl. <i>ifadd-ǎn</i>	‘knee’

8.2 THE FATE OF THE APOPHONIC PLURAL IN AWJILA

The vowel changes described above have had a strong impact on the apophonic plurals in Awjila. Many nouns with apophonic plural that had *a* to mark the plural shifted this to *i* in Awjila, e.g.

<i>flališ</i>	pl. <i>fluliš</i>	‘inflorescence’
<i>amərtúf</i>	pl. <i>mərtíf</i>	‘measure of capacity’
<i>takəmmúšt</i>	pl. <i>təkəmmiš</i>	‘bundle of sticks, bundle’
<i>takkúkt</i>	pl. <i>təkkík</i>	‘worm’

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For feminine nouns, this sometimes means that the only way to distinguish the singular from the plural is the presence or absence of the feminine singular suffix *-t*, e.g.

<i>təništ</i>	pl. <i>tniš</i> (also: <i>tnišin</i>)	‘key’
<i>tkənzírt</i>	pl. <i>tkənzír</i> (also: <i>tkənzirín</i>)	‘nose’
<i>təqənvílt</i>	pl. <i>təqənvíl</i>	‘mucus’

Many of the apophonic *i* plurals can be understood as the result of the regular *a* to *i* shift described above, but the apophonic *i* plural has become productive and has spread to places where we would not expect it:

<i>azáləq</i>	pl. <i>zulíq</i>	‘billy goat’
<i>təmuzíst</i>	pl. <i>tmuzís</i> (also: <i>tmuzistín</i>)	‘threshold, doorstep’
<i>aqəžít</i>	pl. <i>qužít</i>	‘rooster’

**a* does not shift to *i* in front the emphatic consonants *q* and *t* or the voiceless obstruent *s*. Nevertheless, we find the plural marker *i* in these forms above.

Not all apophonic *a* plurals have been lost. All cases where the **a* was not replaced with *i* are found in environments where the **a* to *i* shift would not occur regularly.

<i>təmištást</i>	pl. <i>təmištaz</i>	‘scissors’
<i>təqəttúšt</i> ‘cat’	pl. <i>tqəttasš</i>	‘cats (coll.)’
<i>agəttít</i>	pl. <i>gəttat</i>	‘sparrow; bird’
<i>yəqzər, íqzər</i>	pl. <i>aqzár</i>	‘mouse’
<i>ayídəd</i>	pl. <i>yídád</i>	‘kid (goat)’

Apophonic plurals that receive a plural suffix besides a vowel change in the root are almost exclusively marked with the apophonic *i*.

There are several plurals that have the pattern $|-i\bar{c}-\bar{a}n|$ that in most other Berber languages have the form $|-a\bar{c}-\bar{a}n|$.

<i>təvəl</i>	pl. <i>dímmən</i>	‘blood’
<i>afúd, afúdd</i>	pl. <i>tvittín</i>	‘sheep’
<i>afús</i>	pl. <i>fíddən</i>	‘knee’
<i>tyətt</i>	pl. <i>físsən</i>	‘hand’
	pl. <i>tyíttən</i> (also: <i>tyəttən</i>)	‘goat’

Only *dímmən* and *tvittín* could be explained as the result of a regular sound law, the other forms could not be the result of such a sound law. It is unclear how the forms that could not have arisen through the sound law received this plural formation, as there is no strong analogical basis that these forms could be based upon.²²

²² Note that Siwa plurals *ifəssən*, *ifəddən* may come from **ifíssən*, **ifíddən* rather than **ifassən*, **ifaddən* (iCC is shortened to əCC, see Vycichl 2005: 66). It seems more likely

One noun does not have the apophonic *i* in the plural:

<i>ažár</i>	pl. <i>žárrən</i>	‘abdomen, belly’
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Several nouns have an apophonic *i* in the plural and a plural suffix *-ən*, but lack lengthening of the final root consonant:

<i>išyər</i>	pl. <i>šyírən</i>	‘firewood’
<i>iškər</i>	pl. <i>škírən</i>	‘nail’
	pl. <i>gmírən</i>	‘chest’

Comparative evidence shows these nouns originally had an apophonic *a* in the plural (see section 5.1). The apophonic *i* that has come from an original apophonic *a* in this plural type cannot be explained by the sound developments posited above.

This leaves us with a complex situation in the apophonic plural system of Awjila. In case of the apophonic plural without a plural suffix, the few cases where we find the regular apophonic *a* plural can be explained as regular reflexes with the sound laws that are proposed. The apophonic *i* plural is generally the result of the **a > i* shift, but has spread analogically to some positions where **a* would not have shifted to *i*.

However, both apophonic plural types that have a plural suffix besides the *i*-infix cannot be explained as the result of the sound laws, and need an alternative explanation.

Tentatively, it seems that the widespread shift of **a* to *i* in the suffixless apophonic plural type, may have caused the apophonic *i* to be felt as a more typical marker of the plural than the apophonic *a*. As a result, the apophonic *i* was spread to suffixless apophonic plurals that would not shift the *a* to *i*, and also to the apophonic plurals with plural suffixes that would never receive the apophonic *i* regularly.

though, that Siwa follows the general Eastern Berber pattern to have short vowel in the root of these plural types, cf. Ghd. *fāddān*, *fāssān*, *dāmmān* (and *dammān*); Nef. *ifāddən*, *ifāssən* (and *ifāssən*), *idāmmən*; Sokna *ifāssən* (but *ifāddən*, *idāmmən*).

9. CONCLUSION

In this article we have examined the origin of the Awjila vowel *i* and how it has affected the Awjila plural formations. It has been shown that the Awjila *i* can come from **i*, **e*, **a* and **ə*. **i* and **e* are reflected as Awjila *i* unconditionally. The situation of **ə* and **a* is more complex:

1. **ən* followed by a fricative in word-final position lost **n*, and lengthened **ə* to *i*.
2. **ə* shifted to *a* in front of two word-final consonants.
3. *a* irregularly shifted to *i* in closed syllables, save for some conditioning factors.

**a* does not shift to *i* in emphatic environments or in front of voiced obstruents, semi-vowels and probably *s*. In other types of closed syllables *a* often shifted to *i*, but there are many exceptions. Several well-attested Berber words such as *atrár* ‘new’, *agmár* ‘horse’ and *imán* ‘oneself’ did not undergo this development.

Several cases of the **a > i* shift lack a satisfying explanation. Some words that originally had two *a* vowels have shifted both vowels to *i* with no clear conditioning, e.g. *tísi* ‘liver’, *təžiri* ‘small rope’ and perhaps also *imín* ‘water’. Also the pair *íšf* ‘day’ ~ *ášfa* ‘today’ lacks a satisfying explanation.

The widespread shift of **a* to *i* has caused a change in the apophonic plural system. In most Berber languages, an *a* before the last root consonant marks the apophonic plural. While this formation still exists, the marker *i* has become productive, and has spread to forms where it cannot be the result of the proposed sound developments.

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