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BERBER NUMERALS

§1. Classification

In recent years the most detailed classifications of Berber languages have been presented by Ajxenval'd (1987), using a structural-typological approach, and by Militarev (see Ajxenval'd & Militarev 1991: 157–59) working with lexicostatistics. Their results are as follows:

1. East Berber branch

Siwa (oasis Siwa in West Egypt), Zurg (oasis Kufra in East Libya), Fezzan (oases Tmessa and El Fodjaha in South Libya), Augila (oasis Djalo in North-East Libya), Sokna (North Libya), Ghadames (oasis Ghadames in West Libya).

2. South Berber (= Tuareg) branch

North group: Tuareg of the oasis Kufra, Tuareg of the oasis Ghadames, Imanghassaten, Uraghen, Ghat, Ahnet (Plateau Muydir); "Tamahaq": Emmidir, Taitoq, Ažžer (Plateau Tassili), Ahaggar; Ayr (Plateau Ayr, Kel Ui, Kel Feruan, Kel Tafidet, Ibabidayan etc.), Tuareg of Borku (Chad), Tuareg of Zinder (Niger), East Tawllemmet (= Iulimidden or Awlemidden; Niger-Mali-Burkina bordeland).

South group: Kel Arokas; "Tamašeq": Heyawa, West Tawllemmet, Takarangat, Tagdhaq (= Ifoghas; Plateau Adrar), Taneslemt; "Tamažeq": Ida u Sak (= Dausak), Ighauilen, Imažoghen (= Iguhadaren).

3. West Berber group

Zenaga (= Taddungiyah; Mauretania — Senegal).

4. North Berber group

4.1 Atlas group:

a) Tašelhait (= Šilha): Tinduft, Ait Umbribed (basin of Dra and Djebel Bani); Izemdaln, Imežžad, Ida u Zikri, Ait Isaffen, Amanus, Ait Mzal, Igliwa, Ait Wazgit etc. (Antiatlas); Tazerwalt, Ait Baamrani, Hawwara, Ida u Semlal, Aštuken, Masst, Tiguga, Seksawa, Ait Wadjes, Ida u Izimmer, Demsira, Ida u Geriun, Demsira (basin of the river Sus); Tuggana, Igedmiun, Ait Immur, Ihahan, Imeghran, Ida u Tanan, Ida u Zikki, Ida u Zal, Ntifa (High Atlas);

b) Tamazight (= Beraber): Ait Messad (region of Demnat); Ait Izdeg, Ait Yahya, Ait Sliman, Ait Khebbaš, etc. (upper river Dades, High Atlas); Ait Sadden, Ait Yusi, Izayan, Ait Sgugu, Ait Mgild, etc. (Middle Atlas); Ait Ndir, Ait Naaman (region of Meknes);

4.2. Zenatiya group:

a) "compact": Ait Seghrušen; Ghmara, Žbala (region of Tanger-Tetuan); Rif: Ait Uriaghel, Ibokkoyen, Ait Tuzin, Temsaman, Ikrayen, Ait Said, Ait

Ittift etc.; Bettiwa; Senhaža; Ait Warain; Beni Iznasen; Beni Snus, Beni bu Said (region of Tlemsen); Matmata, Harawa, Ašaša, Halima, Beni Rašed, Beni Ferah, Gheraba etc. (region Frenda-Warsenis); Beni Menaser; Šenua; Beni Salah, Beni Messaud, Beni Misra (region of the mountain Blida); Šawiya (= Tašawit); East Zenatiyan: Sened, Tmagurt (region Gafsa in Tunis), Djerba (island Djerba); Zrawa, Taužžut, Tamezret, Šnini, Dwiret (South-East Tunis), Zwara;

b) "of oases": Nefusa (Djebel Nefusa, North-West Libya); Righ (Tuggurt), Wargla Mzab (all in East Algeria); Figig (South-East Morocco); Tamentit, Tittaf (Twat); Tit (Tidikelt); Ksurs (Gurara — all the oases are in Central Algeria);

4.3. Kabyle (= Taqbaylit) group: At-Halfun, At-Yiratena, "Zuawa", Iržen, At-Hišema, At-Mangellat etc. (North Algeria).

§2. Data

Table 1: Proto-Berber and South Berber

	Proto-Berber Prasse 1974 m. (/f.)	Tawllemmet Alojaly 1980 m. / f.	Tahaggart Prasse 1974 m. / f.	Taitoq Masqueray 1893 m. / f.	Kel-Ui RB 1883 m.	Ghat RB 1883 m.
1	**yīwăn*	*əyyăn / əyyăt*	*iyăn / iyăt*	*yen / yet*	*ian*	*ian*
2	**sīn / *sinăt*	f. *săṇatăt*	f. *sănât(ăt)*	*sen / senatet*		*sin*
	**hissīn*	m. *əshin*	m. *əssin*		*issin*	
3	**karaḍ*	*kăraḍ /-ăt*	*kăraḍ / kărâḍăt*	*keradh*	*ḳaradh*	*ḳaradh*
4	**hakkūẓ*	*əkkoẓ /-ăt*	*ŏkkoẓ / ŏkkôẓăt*	*okkoẓ*	*okkoz*	*sekkuz* !
5	**sammūs*	*səṃṃos /-ăt*	*səmmus / səmmûsăt*	*semmus /-et*	*sammus*	*sommus*
6	**saḍīs*	*səḍis /-ăt*	*səḍis / səḍîsăt*	*sadhis /-et*	*sadis*	*sadis*
7	**săh*	(*sah/-at* RB)				*sa*
	**hissăh*	*əṣṣa /-yăt*	*əssa / əssâhăt*	*essa / essahet*	*essâ*	
8	**tăm*	(*taman/-et* RB)		*ettam /-et*	*ettam*	*tam*
	**hittăm*	*əttaṃ /-ăt*	*əttâm / əttâmăt*			
9	**tiẓ(ẓ)ăh*	*tăẓa /-yăt*	*təẓẓa / təẓẓâhăt*	*teẓẓa / teẓẓahet*	*tezza*	*teza*
10	**marăw*	*ṃăraw /-ăt*	*măraw / mărawăt*	*maraw / merawet*	*maraw*	*meraw*
20		*săṇat(ăt)*	*sănât*	*senatet*	*essin*	*senat*
		təṃərwen	*təmərwîn*	*temerawin*	*maraw*	*merawin*
100	**tē-mihḍay*	*temeḍ*	*temeḍe*	*timidhi*	*timadhi*	*timedi*
(pl.)	**tī-muhāḍ*	*timaḍ*	*timaḍ*	*timadh*		
1000	**ā-gihīm*		*aǧim*	*adjim*		*ajim*

RB = René Basset

Table 2: East Berber West Berber

	Ghadames Lanfry 1973 m. / f.	Ghadames Motylinski 1904 m. / f.	Zenaga Basset 1909 m. / f.	Zenaga Nicolas 1953 m. / f.
1	*yụụn / yụụt*	*iun / iut*	*iun & né-iun / čuač*	m. *(əy)yu'n^h, nəyu'n^h* f. *č-uwət*
2	*sən / sənet*	*sen / sinnet*	*šinan / šenaneth*	*šənən^h / ča-šənən^h*
3	*kaareḍ / kerḍet*	*karedh / kareṭ*	*karaḍ / karaḍeth*	*kăr̆ăḏ^h / karāḏəṭ*
4	*aqqụz / aqqụzet*	*aḳḳiz / aḳḳizet*	*akoz*	*akkuṭ^h / akkūḍəṭ*
5	*səmməs / səmməsət*	*semmis*	*šommuš / šomušeth*	*šəmmuš / šəmmūšəṭ*
6	*ṣuz / ṣuḍset*	*çoz / çoṭset*	*šodeš / šodešet*	*šuḏəš / šoḍešəṭ*
7	*saa / saat*	*sa / sat*	*iššа / iššadet*	*əššəh / eššă'ḏəṭ*
8	*taam / taamet*	*tam*	*ittem*	*ittəm^h / ittāməṭ*
9	*təṣụụ / təṣụụt*	*teçu / teçut*	*tuza*	*tuṯăh / tuḏāəṭ*
10	*maraw / maraawet*	*meraw / merawt*	*mêrêg / meregeth*	*mərəg^h*, pl. *tmərīn^h*
20			*tešinde*	*taššəndəh*
30			*tukarḍa*	*tukarḏa*
100			*timaḍi*, pl. *temaḍan*	*tə̣măḏih*, pl. *tmuḍa'n^h*

Table 3: North Berber

	Tašelhait of Tazerwalt Stumme 1899 m. / f.	Tašelhait Aspinion 1953 after Penchoen m. / f.	Tašelhait of Semlal Woelfel 1954 m. / f.	Tašelhait of Sus ('Amiln) Klingenheben m.	Tamazight of Demnat Woelfel 1954 m. /f.	Beni Mzab Hanoteau 1860 m. / f.
1	*yăn / yăt*	*yan / yat*	*yan / yăt*	*yẽn*	*yan / yat*	*iggen/igget*
2	*sin / snăt*	*sin / snat*	*sin / snat*	*sĭn*	*sin / senat*	*sen /senet*
3	*krâḍ / krâṭṭ*	*kraḍ / kraṭṭ*	*kṛaḍ / kṛaṭṭ*	*karắt*	*kradh*	*šared/šaret*
4.	*kûz /-t*	*kkuz / kkuṣt*	*qquz / qquṣt*	*kōs*	*akkoz /-t*	*okkoz /-t*
5	*summus /-t*	*səmmus /-t*	*səmmŭs /-t*	*sɪɱmús*	*s(em)mus / semmust*	*semmes /-t*
6	*sddis /-t*	*sḍis /-t*	*sḍis /-t*	*sḍdĭš*	*s(ad)dis / saddist*	*sez / sesset*
7	*ssă /-t*	*sa /-t*	*sa / săt*	*sa?*	*sa /-t*	*saa /-t*
8	*tam /-t*	*ttam /-t*	*t(t)am / tamt*	*săm !*	*tam,tem / tamt,temunt*	*tam /-et*
9	*tẓẓâ /-t*	*ttza /-t*	*tza /-t*	*cắwuz*	*dza /-t*	*tes / tesset*
10	*mĕrâŭ /-t*	*mraw /-t*	*mraw /-t*	*mçrâw*	*mraw / merawt*	*meraw /-t*
20	*mĕrâwin*					
100						*twinest*

Table 4: Non-decimal (quinary. ternary, trigesimal) numeral systems

all m.	Mozabi Hanoteau	Ued Ghir Letourner	Djerba R. Basset	Djebel Nefusa Klingenheben		
1	*igguen*	*ighem !*	*iẓẓen*	*udžun*	15	*šaret n ifessen* 3 hands
2	*sen*	*tzem !*	*thin !*	*sen*	20	*okkoz n ifessen* 4 hands
3	*šaredh*	*šaret*	*šaredh*	*šaret*	25	*zegni n uyer d* $^1/_2$ 30 + *sen n ifessen* 2 hands
4	*okkoz*	*occas*	*šaredh d' iẓẓen* 3 + 1	*okkoz*	30	*uyer* month

all m.	Mozabi Hanoteau	Ued Ghir Letourner	Djerba R. Basset	Djebel Nefusa Klingenheben		
5	*fus* hand	*fus*	*afus*	*ufes*	50	*zegni n temiţi* $^1/_2$ 100
6	*fus-igguen*	*fus-ighem*	*afus d'iẓẓen* hand + 1	*ufes d udžun*	60	*sen n yaren* 2 x 30
7	*fus-sen*	*fus-tzem*	(*sebyath* < Arabic)	*ufes d sen*	80	*zegni n temiţi* $^1/_2$ 100 *d uyer* + 30
8	*fus-šaredh*	*fus-šaret*	*attam*	*ufes d šaret*	90	*šaret n yaren* 3 x 30
9	*fus-okkoz*	*fus-occas*	*attam d'iẓẓen* 8 + 1	*ufes d okkoz*	100	*temiţi*
10	*meraw*	*merawn*	*akardaš*	*sen n ifessen*	2 hands	

Klingenheben 1926–27: 44 found traces of the vigesimal system in the dialect of the tribe of Ámiln (region of Sus) based on the Arabic borrowing *ášẹrīn* "20": *ʔāšẹrín zẹ mẹráw* "30" = "20 + 10", *sín izẹ ʔāšẹrīn* "40" = "2 x 20", *sín izẹ ʔāšẹrín zẹ mẹráw* "50" = "2 x 20 + 10" etc.

There were at least two or three ancient epigraphic "Libyan" languages related to the Berber language family: East Numidian, West Numidian and Fezzan-Tripolitanian. The best known East Numidian (= "Massilian") language was used in old Numidia (North-East Algeria and North Tunis). Unfortunately, in the known texts from the 2nd cent. BC no numerals are identified.

Besides the "continental" Berber-Libyan languages there are their insular relatives — the languages of the Guanches, aborigines of Canary Islands, definitively assimilated in the 18th cent. The exhaustive information concerning numerals of Guanches was collected by Woelfel 1954:

Table 5: Guanche

	Gran Canaria ?	Tenerife?					
	Niccoloso da Recco		Cedeño de Chil	Marín y Cubas	Berthelot	Pseudo-Sosa	Pseudo-Sosa after Rixo
1	*nait*	1	*ben*	*been*	*been*	*ben*	*ben*
2	*smetti* = **sin-*	2	*lini*	*liin* or *lini*	*lini*	*lini*	*sijn* or *lini*
3	*amelotti*	3	*amiet*	*amiat*	*amiat*	*amiat*	*amiet* or *-at*
4	*acodetti*	4	arba	arba	arba	arba	arba
5	*simusetti*	5	cansa	canza	cansa	cansa	cansa
6	*sesetti*	6	*sumus*	*sumus*	*sumus*	*sumus*	*sumus*
7	*satti*	7	*sat*	*sat*	*sat*	*sát*	*sa* or *sát*
8	*tamatti*	8	*set*	*set*	*set*	*set*	*set*
9	*alda-morana*	9	*acot*	*acot*	*acot*	*acot*	*acot*
10	*marava*	10	*marago*	*marago*	*marago*	*marago*	*marago*
11	*nait-marava*	11	*ben y marago*	*benir marago*	*beni marago*	*benir marago*	*benir marago*
12	*smatta-m.*	12	*lini marago*	*sinir marago*	*lini marago*		
13	*amierat-m.*	20	*limago*	*linago*	*linago*		
14	*acodat-m.*	30	*amiago*	*amiago*	*amiago*		
15	*simusat-m.*	40	arbago	arbago	arbiago		
16	*sesatti-m.*	50	camago	cansago	cansago		
		60	*sumago*				

	Gran Canaria ?	Tenerife?				
	Niccoloso da Recco		Cedeño de Chil	Marín y Cubas	Berthelot	Pseudo-Sosa	Pseudo-Sosa after Rixo
		70	*satago*				
		80	*setago*				
		90	*acotago*				
		100	*bemaraguin*	*bemaraguin*	*beemaragoin*		

Berber-Libyan-Guanche (shortly Berber) languages represent one of the six branches of Afroasiatic macro-family together with Semitic, Egyptian, Cushitic, Omotic and Chadic. Only the Semitic and naturally the Egyptian numerals can be projected on the proto-language level, cf. table 6:

	Proto-Semitic (Dolgopolsky 1995, p.c.)		Proto-Egyptian (Vycichl // Loprieno)	
1	**ʔaḥ(ḥ)ád-u(m)* m.	**ʔaḥ(ḥ)ád-at-u(m)* f.	**wiʃyaw // *wúʃʃuw* m.	**wiʃi.t* f.
2	nom. **t̠in-ā(-ni)*	**t̠in-at-ā(-ni)*	**siny-ū-āy*	**sỉni.t-āy*
	acc.-gen. **t̠in-ay(-ni)*	**t̠in-at-ay(-ni)*		**sinya.t-āy*
3	**š/t̠alāt̠-u(m)* f.	**š/t̠alāt̠-át-u(m)* m.	**ḫamtaw*	**ḫamta.t*
4	**ʔarbáʃ-u(m)*	**ʔarbaʃ-át-u(m)*	**ifdaw*	**ifda.t*
5	**ḫamiš-u(m)*	**ḫamiš-át-u(m)*	**dỉwey // *dỉyaw*	**diwi.t*
6	**šid[u]t̠-u(m)*	**šid[u]t̠-át-u(m)*	**si[r]sáw // *sáʔsaw*	**si[r]sa.t*
7	**sábʃ-u(m)*	**sabʃ-át-u(m)*	**safḫaw*	**safḫa.t*
8	**t̠amānáy-u(m)*	**t̠amā nay-át-u(m)*	**ḫamā́/ūnaw*	**ḫamā́/ūna.t*
9	**tiššʃ-u(m)*	**tiššʃ-át-u(m)*	**pisỉ́daw*	**pisỉ́da.t*
10	**ʃášar-u(m)*	**ʃašar-át-u(m)*	**mū́d̠aw*	**mū́d̠a.t*
20	**ʃášar-ā* = dual of **ʃašar-* "10"		**d̠awā́tay* < **mūd̠awatay* = dual of "10" f.	
30	**š/t̠alāt̠-ú/ỉ́-ma* = plural of **š/t̠alāt̠-* "3"		**maʃbVr/l*	
40	etc.		**ḥVmέw*	
50			**diw-ỉy-ū* = plural of "5" // **dỉyyaw* etc.	
100	**miʔát-u(m)* f.		**ši[nyu]t*, cf. dual **šinyūtay* "200"	

§3. Comparative — etymological analysis

1. Berber m./f. **yīw-ăn/-ăt* (Prasse) or **iyyaw-an/-at* (Militarev) and Guanche of Tenerife *be(e)n* < **wayn* (Militarev) represent a participle "being alone, sole, unique" (Prasse 1974: 404) from the root **y-y-w* comparable with Eg *wʃy* "to be alone", *wʃjw/wʃjt* m./f. "1", *wʃʃw* "Alleinsein, solitude, privacy" (Edel 1955/64: 167; Wb. I: 277) and Semitic **w-ʃ-y* > Ar *waʃā* "rassembler, réunir sur un seul point, être guéri (se dit d'un os fracturé dont les éclats se réunissent); to collect, gather", He *yāʃāh* "ramasser, balayer; to sweep together and carry away" (Klein 1987: 261). The correspondence of Be **y* vs. Eg & Se **ʃ* is regular (Vycichl 1991: 383–86). On the other hand, in spite of Zyhlarz (1931: 135), Zavadovskij (1974: 105) and recently Schenkel (1990: 55), Se **w-ḥ-d* (Ak *wēdu* "only, alone, single", Ug *yḥd* "person without kin, an only son", Syrian *īḥīḏā* "only one, unique", He *yāḥīḏ* "only one", Sabaic *k-wḥd* "in unison, together", Ar *waḥīd* "alone, unique", Śheri *šēḥad* = √*w-ḥ-d*, Geez *wāḥəd* "unique, only, one" — see Leslau 1987: 609–10) do not be-

long here. The same root appears probably in Se **ʔaḥ(ḥ)ad-* "1" < **ʔa-wḥad-* (cf. Dombrowski 1991: 344). The most hopeful cognate can be found in Berber: Ghd m./f. *iḍen,-et*, pl. *əḍn-in* "other", *wīḍen* "another" vs. m./f. *wa-/ta-yiḍ*, pl. *wi-/ti-yyiḍ* "some, any", Ahg m./f. *hăḍăn,-ăt*, pl. *hăḍnîn* "other" vs. m./f. *wi-/ti-yoḍ* "some, any" etc. (Prasse 1969: 20, 45 reconstructs $\sqrt{h_2\text{-}h_1\text{-}ḍ}$; cf. further Prasse 1972: 211–15).

The parallelism of Guanche (f.) *nait* (Gran Canaria ?) and Zenaga m. *néiun* is remarkable.

The origin of this "prefix" could be in the genitive construction known e.g. from Ahg *wa n-iyän* "the first", lit. "that who is the first" (Prasse 1974: 407).

The seemingly different forms, like Ued Righ and Šenua f. *išt*, Snus *išts*, *yîšts* etc. (e.g. Zavadovskij 1974: 105 compares these forms with Se **ʕaštiy-(ān-)* "1") are regularly derivable as follows: **yīwăt* > **yīwwăt* > **yīggät* (Mzab, Wargla *igget*, Siwa *iget*) > **yiǯǯət* (Izdeg *iǯt*) > *išt* etc. (Woelfel 1954: 22).

Concerning Guanche (Tenerife ?) *be(e)n* "1" Woelfel 1954: 22 quotes very suggestive parallels from various West African languages: West Atlantic: Wolof *bene*, *wîan*, Temne *p'in*, cf. *tr'ofat win* "11"; Mande: Soninke *bani* etc.; South-Central Niger-Congo: Nupe *wêni*. Is it an accidental similarity or any areal influence ?

2. Be (m.)**sīn* (*& *hissīn*) and Guanche **siyn-/*syin-* (> **ŝin-* > *lin-* ?) "2" correspond perfectly to their counterparts in Se (m.) **ṯin-ā/ay-* and Eg (m.) **siny-ū-āy*, reflecting AA **čin(y)-* "2". The final extension in *-an/-ən* in Zenaga corresponds to the collective of other Berber languages, cf. Ahg m. *əssənən*, Kabyle m. *isnin*, f. *tisnin* "both of them" (Prasse 1974: 408). Projecting the Zenaga "2" in pBe **šinānā / *šinānatā*, Rössler 1952: 142 interprets the (unattested) termination as dual and compares it with Ak *šanānu(m)* "gleichen, gleichkommen mit" (AHw 1161; Leslau 1987: 504–05 has collected the other cognates as Syrian *šayyen* "to pacify", Geez *sən?* "peace, agreement", Tigre *(tə)sana* "to be friends", indicating pSe **š* and not **ṯ* as in the case of the numeral "2"). On the other hand, Zavadovskij 1980: 143 tries to prove the relationship of the numeral "2" in Berber, Egyptian & Semitic and the AA word "brother": Eg *sn* "brother, companion, boy-friend" (**sāniyaw* — see Vycichl 1983: 190) // Beja *san*; Awngi *sén* (but Bilin *dan*, pl. *šan* etc.) // ECh: Kera *seenə*, Mubi *sìn*, Migama *sín*, Jegu *šin* etc. "brother" (cf. Rössler 1979: 24). But this common AA isogloss "brother" agrees semantically better with the Se root *š-n-y/ʔ* "to be equal, be in agreement" than with the numeral "2".

Further attempts to find relatives in other branches are no more convincing: Dolgopolsky 1973: 111 followed by Diakonoff 1988: 67 seek parallels also in Central Cushitic (=Agaw) and South Cushitic. But it was already Reinisch 1887: 306 who recognized an Ethio-Semitic borrowing in Bilin, Qwara & Dembea *səna* "Gleichniss, Ebenbild, Art; (gleich)wie", cf. Geez *sənʔ(ā)*

"peace, agreement, harmony; like-minded", *sənʃəw* "equal, agreeing" etc. (Leslau 1987: 504–05). Iraqw *dangi* "twins" together with related Alagwa *irangayo* "twin", reflects SCu **ʔidaŋ-* (cf. Ehret 1980: 166), a form undoubtedly incompatible with AA **čin(y)-* "2". A more hopeful cognate for SCu can be found in WCh **ǯanV* "twins" > Angas & Ankwe *ǯan*; Ša (Ron group) *ǯân* 'suppletive plural to *'awúllàwúl* "twin" (Stolbova 1987: 195, # 465).

3.1. The only attempt to etymologize the Berber numeral **karāḍ* "3" on the basis of the Berber data was proposed by Zyhlarz 1950: 407–08. He interpreted it as "der Kratzer", cf. Tuareg *əkrəḍ*, Tašelhait *kṛḍ* etc. "to scratch", assuming that the original semantic development was "scratch-finger" > "middle-finger" > "third". Let us add that e.g. Fay 1910: 416 admited the same semantic motivation for the Indo-European numeral **tri-* "3", namely "rubbing/scratching [finger]" > "middle finger" > "third", cf. Latin *tritus* "rubbed", although he preferred the primary semantic motivation to have been "protruding [finger]".

Jungraithmayr seeks external parallels in West & Central Chadic: Hausa *úkù*, Sura *kún*, Bolewa *kunum*, Jimbin *kə̀ndí*, Geji *me-kan*, Ngizim *kwán*; Tera *kúnú*, Bata *mwa-kʌn*, Lamang *xkə́ná*, Glavda *xkə̀rda*, Sukur *máá-kʰə̀n*, Gisiga *maa-kar*, Daba *mə̀-kaaɗ*, Gidar *hóó-kuu*, Yedina *kaa-kénne*, Musgu *hu*, Zima-Batna *híndzìʔì* and within East Chadic isolated Mokilko cardinal *ʔáɗó* & ordinal *káɗùwé* (Jungraithmayr & Ibriszimow 1994/I:168 and II: 326; Lukas 1977: 211). But with the exception of Mokilko, this numeral has to be reconstructed only with medial **-n-*, regularly giving *-r-* in some Central Chadic languages (Newman 1977: 17, 18; Jungraithmayr & Ibriszimow 1994/I: XXIII), probably **kanu(-di)* > **kunu(-di)* or **kwan(-di)* > **kwardi* > **kwaɗi* or sim. The facultative extension in **-di* perhaps represents a numerative, cf. Kotoko **di* "thing" > Yedina, Logone *di*, Ngala *ndi* id., Affade *di-pal* "the first" vs. *pal* "one". It is apparently also added to the Chadic numeral "4", reconstructible in the form **faru-di* or sim. (> **fuardi* > **fwaɗi* etc. ?). Among the Chadic forms of the numeral "3", only one hypothetical cognate to the Berber counterpart remains, namely Mokilko *ʔáɗó* "3" & *káɗùwé* "3rd", derivable from **karɗ-*. In Mokilko and generally East Chadic the change **-n-* > *-r-* does not operate. In principle, the unique Mokilko form could be of Central Chadic origin, cf. Glavda *xkə̀rda* or Daba *mə̀-kaaɗ*. But these languages are not neighbors — today their distance is around 500 km — and in the area between them, the various different languages are spoken, incl. non-Chadic ones. The distance of the closest Berbers — Tuaregs of Borku in North Chad representing the second potential source — is still greater.

The attempt of Zavadovskij (1974: 107) to compare Berber "3" (**ḥṛṭ* in his "reconstruction") with Se "**t ɬ ṯ*", Eg "*ḥmt*" and Chadic "*kw(t)*", does not respect any known phonetic law and must be rejected.

3.2. Among the Guanche forms for "3", esp. those from Tenerife (*amiat*, *amiet*) resemble the Egyptian counterpart **ḫamt-*. Eg *ḫ* corresponds regularly

to Be *γ (Zyhlarz 1934: 113), cf. e.g. Kbl *γuṛ* "chez" and/or *γeṛ* "vers", Tamazight (Ait Ndhir) *γər*, (before pronoun) *γur* "to, toward", Ahg *γur*, Ghd *ɛūr* "chez" (Prasse 1972: 229) vs. Eg *ḫr* "bei, von, zu" (Wb. 3: 315–16; Edel 1955/64: 2). Another correspondent can be Berber **ḫ* (sometimes an allophone of **γ*), cf. Tuareg *éḫělbes* "papillon" vs. Eg *ḫnms & ḫnws* "moustique" (Wb. 3: 295, 290; Vycichl 1983: 260–61). Militarev (Ajxenval'd & Militarev 1991: 167–68) demonstrated that Be **γ / *ḫ* corresponds to Guanche *j* [= *x*], *x*, *ch*, *h*, *g* (probably only orthographic variants of the same sound of the type *ḫ*) and also ∅. Earlier Meinhof (1912: 233) and (Zyhlarz 1931: 136) had compared the Egyptian numeral "3" with Beja (North Cushitic) *maháy* (Halenga), *emhay* (Bišarin). It is possible only if metathesis from **hamay* is acceptable, perhaps caused by alliteration with the preceding numeral *mhaloo-* "2" (Hudson).

Later Zyhlarz (1950: 407) changed his adroit etymology and presented a new proto-Guanche reconstruction **amel'hǫḍ'* based on the forms with medial liquid *amelotti* "3", *amierat marava* "13" (Gran Canaria ?). He interpreted this compound as *"der anderer Zeiger" = "Mittelfinger", cf. Ahg *amel* "indiquer", Kbl *məl* "montrer" and Ahg *hăḍăn,-ät* "other" (see above). Let us mention that Stumme 1899: 207 derived the North Berber name of the index (Šlh of Tazerwalt *mällaγ*, Ait Ahmet *mulleγ*, Tlit *mellaḫ* etc.) just from the verb "to show, point" (Tazerwalt habitative *m(m)äl*). Laoust 1920: 118, fn. 5 asked how to explain the final radical *γ* and suggested a more convincing solution based on the verb "to lick" (Tazerwalt *lluγ*, Ahg, Siwa *əlləγ*), hence "index" = "lick-finger", cf. Greek *λιχανός* or Lithuanian *ližius* id.

4. Zyhlarz 1950: 408 proposed an archetype **aĝ∪koẓ* "4", deriving it from a hypothetical **awu-kúsur* "son of ring", hence "ring-finger". The first component is postulated on the basis of Libyan *w*; Ahg *ăw*, *ăgg*, Šlh *yu*, *yiwi*, Ghd *ụgg*, *ụ*, *awa* etc. "son" (Prasse 1972: 158 and 1974: 270 **ā-wihih*, a derivative of the verb "to give birth", e.g. in Ahg *iwi* < √*whh*, Ayr *əhəw* < √*hhw*). But Zyhlarz did not quote any evidence for his "ring" and that is why his etymology remains very problematic.

Zavadovskij 1974: 110 saw the source of the numeral "4" in the word "finger" attested in Djebel Nefusa *tukoḍ*, pl. *itukoḍ* (Laoust 1920: 118), cf. Nefusi of Fassato *tuqqåḍ & tukkåd* (Beguinot 1942: 230). The root of the type **-kVḍ-* is really compatible with **(ha-)kkūẓ* "4", cf. Prasse (1972: 111), quoting the Ahg doublet *tâḍəft // tâẓəft* "hache" or Militarev (in Militarev & Stolbova 1990: 48 and Ajxenval'd & Militarev 1991: 239, 242), who concluded that both **ḍ* and **ẓ* can represent continuants of both AA **č̣* and **ĉ̣* . But other cognates demonstrate that the original protofom was more complex: Ghadames *aḍəkkəd*, pl. *ḍuḍān* (Lanfry 1973: 81), Augila *táqt*, pl. *taqqîd(ẹn)* (Paradisi 1960: 165), Zenaga *aḍaγḍi*, pl. *ḍuγḍan* (Basset 1909: 105, 221) = *əďăγdi* (Nicolas 1953: 96). In the other forms, the difference between sg. and pl. was eliminated, e.g. Šlh of Tazerwalt *aḍåḍ*, pl. *iḍuḍån* (Stumme 1899: 157), Siwa *ṭāḍ*, pl. *iṭūḍān* (Laoust 1932: 227), Ahg *aḍaḍ*, pl. *iḍəḍwân* < **ā-ḍihāḍ /*

**ī-ḍuḍwān* (Prasse 1974: 185; Laoust (1920: 118) recorded the plural form *iḍūbḍân* in Zemmur (Morocco), where **-ḍw-* > *-bḍ-*). It is evident that any direct derivation of the numeral "4" from the "finger(s)" is not convincing, although semantically fully acceptable.

Another purely Berber etymology can be based on Zayan *aḵeẓẓiẓ* "une poignée de, un peu de" (Loubignac 1924: 553). In this case the primary meaning of the Berber numeral "4" would be "rather small quantity" or sim. So the semantic motivation is comparable e.g. with Anatolian **meyu-* "4", a derivative of Indo-European **mey-* "small, little", cf. Tocharian B *maiwe* "small, young" (Heubeck, Sprache 9[1963]: 201f).

Blažek 1990: 39 proposed a comparison of Be **(ha-)kkūẓ* "4" and West Chadic **kuçV* "9" (Stolbova 1987: 208), reconstructed on the basis of North Bauči **kuçiwa* (Siri *bu-kəçuwi*, Warji, Kariya *kuciya*, Miya *kučiya*, Mburku *kuča* — see Skinner 1977: 33) and Ngizim *kúdkûvdà* (Schuh 1981: 97). Esp. the latter form indicates an old compound with the second component identical with *vàad* "5" < West Chadic **(bV-)baçu* "5" (Stolbova 1987: 151). If we accept this idea, it is natural to identify the meaning "4" in the first component *kúd-*...

The attempts to connect Berber "4" with its counterparts in other AA branches (Egyptian **ifdaw/at*; Chadic **faru(-di)*; Cushitic: Beja **fa[rd]ig*, East Cushitic **ʔaf(f)ar- // *ʔaf(f)ur-*) based on erroneous Berber reconstructions, such as **wuẓ* < **fwuẓ/ḍ* (Zavadovskij 1974: 110) or **ʔfẓ* (Jungraithmayr & Ibriszimow 1994/I: 73) are not acceptable.

On the other hand, there are remarkably similar forms in some Nilo-Saharan languages, esp. in the Tama group (Chad-Sudan borderland): Tama, Sungor *kús*, Erenga *kús / kuz*, Miisiiri *kus / kuz* etc. (Edgar), Nyima (Nuba mountains in Central Sudan) *kudu* "4" (Meinhof). If these resemblances are not only accidental (and their genetic relationship across families is absurd), it remains to admit a direct contact, perhaps anywhere in North Sudan. This conclusion could support the well-known evidence of the presence of Berber-Libyan borrowings in Nile-Nubian.

5. Berber-Guanche **sammūs(-t)* "5" was compared with Semitic **ḫamíš-/*ḫamiš-át-* id. (Zavadovskij 1974: 108; Prasse 1974: 405 mentions Geez *ḫamus* "five days" with a similar internal structure; formally still closer is *ḫəmmus* "fivefold"). The only hopeful reason for the difference Be **s* vs. Se **ḫ* seems to be an alliteration to the following numerals "6" and "7" in Berber with initial **s-*, a phenomenon so typical for numerals (Diakonoff 1988: 67). This irregularity could indicate rather a borrowing than a genetic unity. On the other hand, the etymology of the Semitic numeral "5" is also unclear. Diakonoff 1988: 67 tries to etymologize the Semitic numeral "5" on the basis of Arabic *ḫamīs-* "troop, group" (Steingass 1988: 341 translates it more correctly as "army consisting of five parts", hence the derivative of "five") and Ak *ḫamāšu* "to flex, crook hand or foot" (in AHw 315 it is translated "abknicken" and compared with Ar *ḫamaša*

"to scratch, wound with the claws or nails" indicating the Se root **ḫ-m-ŝ* with the third radical different from -š- in the numeral "5").

Let us add that the Semitic numeral "5" penetrated at least in a part of Berber language territory. Vycichl (1951: 201–02) mentions Kbl (after Huyghe) *aḫěnšim* "fist", comparing it with his record *aḫušim* id. On the basis of final *-im*, he concludes that the word can represent a Punic borrowing. Vycichl is probably right concerning the Canaanean Semitic provenance of the hypothetical source. But in Phoenician / Punic, in the same way as in Hebrew, the proto-Semitic **ḫ* and **ḥ* have merged in *ḥ* . It means we have to seek the source in Semitic language preserving **ḫ*. A good candidate could be a language of the type Ugaritic, where *ḫmš* is attested, while Punic knows *ḥmš* and later even *ʕmš* "5".

Zyhlarz (1931: 137) admits that the etymology of the Berber numeral is unclear. Later he reconstructs a Punic source in the (unattested and rather artificial) form **sūʔʔumuś* "Aufhebung des Fünftels (des Hand)", representing a compound of Punic *nšʔ* "to carry; lift" and *ḥmš*, *ʕmš* "5" (Tomback 1978: 107, 221).

So far nobody tried to etymologize the Berber "5" on the basis of purely Berber data, although it is fully legitimate. So Prasse 1974: 406 thought that the parallelism to the Semitic counterparts and their derivatives indicates their verbal origin and saw in them participles or verbal adjectives (cf. ibid. 210f). A possible verbal candidate could be the *s*-causative of the root √*m-s* attested in Ghadames *məssu* "toucher" (Lanfry 1973: 218). Another solution might be based on a compound of the preposition known from Ahg *əs* "with, after, beyond, through, by, to", Šlh (of Tazerwalt) *s* "after, to, by, through" etc. & pBe **hammās* "centre, middle, interior" (Prasse 1972: 234) > Ghd, Šlh *ammas*, Ahg *âmmas* etc. id., cf. Sened *gemmes* "in the middle, between; half" with a frozen preposition *g* "in" (Provotelle 1911: 109, 113, 123). The semantic motivation can be illustrated on examples of a couple of Papuan languages of Huon family: Kinalakna *holi nembat*, Kumukio *suli nembat*, Selepet *bot nombot* "5", literally "hand(s)-half", Nabak *bet nambet delang*, lit. "hand-half-finished" (Smith 1988: 81–83). Could the Papuan typological parallels indicate a hypothetical syntagm (in Ahg) **əs-âmmas ən-ifassän* "to the half of hands"?

Alternative external parallels can be found in Central Chadic (Blažek 1990: 40): Gidar *še*, Glavda *ŝəm* (Kraft *thləm*), Paduko *zama* (Lukas), Mafa *zlam* (Kraft), Gisiga *dlom* (Lukas), Musgu *šem* (Decorse) = *ŝim* (Müller), Munjuk *slím* (Seignobos & Tourneaux) etc., Kotoko **ŝansi* > Yedina *sinjí* (Lukas), Kuri *šinʒi* (Decorse), Logone *šeeší* (Lukas), Affade & Gulfei *ṣensi* (Lebeuf), Ngala *ki-šenši* (Migeod), Makeri *ṣyensi* (Lebeuf), Kuseri *sasi* (Decorse) etc. (cf. Jungraithmayr & Shimizu 1994/II: 143). The initial lateral sibilant corresponds regularly to *s-* in the West & East Chadic plus Masa group of Central Chadic (Jungraithmayr & Ibriszimow 1994/I: XXVI-XXVII use the symbol **s*$_3$; Newman 1977: 10, 16 reconstructs **ʂ*).

6. North & South Berber **saḍīs* besides North Berber **saddīs* and East & West Berber **sūḍas* or **sūḍus* (Prasse 1974: 405) resemble Semitic **šid[u]ṯ-*, Egyptian **sirsáw* (Vycichl) or **sársaw* (Loprieno) and some Chadic counterparts: (W) Hausa *shíd(d)à*, Gwandara *šida*; Tsagu (North Bauči) *šīcə*; Ngizim *sedu* (Koelle) = *zì dù* (Schuh), Bade *əzdù* (Kraft) (Stolbova 1987: 176 reconstructs WCh **šidu)*; (E) Kwang *sidee*, Mokilko *zót* (both Lukas) = *zóo(t)* (Jungraithmayr). Greenberg 1963: 62, #66 adds CCh cognates: Gidar *serré* (Strümpell) = *širre* (Mouchet), Musgu *saara* (Decorse) = *ŝaara* (Krause), Munjuk *slàarà* (Seignobos & Tourneux), Mbara *łtrá* (Tourneux) etc. The initial lateral sibilant represents a regular Central Chadic innovation corresponding to pCh **s* (see §3.5). The medial *-r-* is derivable from **-d-*, cf. Gidar *biryạ*, Mbara *fré* "monkey" < pCh **bədi* (Newman 1977: 29, #85; Jungraithmayr & Ibriszimow 1994/II: 236–37) // Ahg *abiddaw*, Ghd *biddụ* id.

The correspondence of Be **-ḍ-* (~ **-dd-*) // Ch **-d(d)-* // Eg **-r-* // Se **-d-* is not regular. The Be emphatic **-ḍ-* can be perhaps derived from the geminate **-dd-* preserved in some North Berber languages. The form **saddīs* is really compatible with the Semitic counterpart in a genetic plan. The eventual borrowing opens a question of determination of the hypothetical Semitic source. Its West Semitic provenance is perhaps excluded, cf. Phoenician m./f. *śś / śiśt*, He *šeš / šiššā*, Ugaritic *ṯ ṯ (t)*, ord. *ṯdṯ*. The closest parallels appear in Ar ord. *sādis* and in Ethio-Semitic: Geez *səds* "6" (genus communis), *səddus* "sixfold", Harari *siddisti* "6". The most natural solution may be that it is a borrowing from Arabic introduced during the expansion of Islam in North Africa in the end of 7th and the beginning of 8th cent. It implies the same origin for the Guanche forms (Tenerife *set* "8", orig. perhaps "6" vs. Ar *sitt/-at* "6"; but Gran Canaria *sesseti* resembles rather Berber forms, e.g. Mzab f. *səssət*).

In contrast to Berber, the Semitic numeral is etymologizable within Semitic. There are two alternative reconstructions: (i) **šidš-*; (ii) **šidṯ-*. (i) The form **šidš-* (the variant **šidṯ-* can be a consequence of dissimilation) allows to assume an apocopy from a fully reduplicated stem **šidšid-*. Did it mean the sum "3 + 3" ? Cf. Ug *ṯlṯt w ṯlṯt* "6" = "3 + 3". (ii) If the final **-ṯ-* was apocopated from the numeral **ṯin-* "2", the hypothetical original form **šid-ṯin-* could reflect the multiplication "3x2". Cf. Ngala (Kotoko group of Central Chadic) *kingi ti kisang* "6" = "3" (*kingi*) x "2" (*kisang*). Both solutions identify the meaning "3" in the root **šid-*. Is there any support for this premise? Yes. A hopeful evidence can be found in the Akkadian length measure *šīzum*, *šizû* "Drittel-Elle", *šizât* = $^1/_3$ *uṭṭat* (*uṭṭat* = "wheat") (AHw 1254). But Ak *z* reflects Se **z* or **ḏ*. The latter possibility is probably compatible with both (i) and (ii), i.e. (i) **šiḏšiḏ-* > **šidš[id]-*, and (ii) **šiḏ-ṯin-* > **šidṯ-* > **šidṯ-* (incompatibility of **ḏ* and **ṯ*). The Akkadian word can be projected in pSe **šiḏC-u(m)*, where *C* = *w, y, ʔ, h, ḥ,ʕ,ġ* . Only for the combination **šiḏḥ-* there is an external evidence, concretely in East Cushitic **šizḥ-/*šazḥ-/*saziḥ-* "3" > Afar *sidoḥ*, gen. *sidiiḥa*, Saho *ʕadoḥ* (< **aszVḥ*), Somali (Isaq) *saddeḥ*, (Benadir) *siddáḥ*, Jiddu

seye, Rendille *séyyaḥ*, Bayso *seedi*, Oromo (Wellega) *sadii*, Konso *sessaa*, Arbore *seezzzé*, Elmolo *séepe* (*-p-* < **-w-* < **-y-* < **-z-*), Dasenech *seddi*, Dobase *siséḥ*, Tsamakko *zeeḥ*, Sidamo *sase*, Burji *fadiya* (*f-* after *foola* "4") (Sasse 1976: 138; Zaborski 1987: 331–42). Let us add that the hypothetical Semitic root **šid-/*šiḏ-* "3" is also comparable with Elamite (eastern neighbor of Akkadian) *zi-ti* "3" (Hinz & Koch 1987: 1305).

Rössler (1966: 221) has demonstrated that Egyptian **r* substitutes Semitic **d* in Egyptian transcriptions of Semitic proper names. It could also indicate a Semitic origin of the Egyptian numeral "6". There is an alternative solution consisting in a comparison of Eg **sirs-* (or **sars-* after Loprieno) with Se **ṯalāṯ-* "3". Phonetically it is fully acceptable and the semantic difference "6" vs. "3" is not invincible either.

The Chadic forms can also be explained independently. In Bade (WCh) Kraft quotes *ǝzdù* "6". But Koelle has recorded *badṣ ŏdi* "6" = *bădu* "5" + *gáde* "1". Similarly in Karekare (WCh, Bole group) *bǝcoɗi* "6" = *bǝɗì-*siwǝɗi* "5 + 1", *bǝcibèlu* = "5 + 2", cf. *bèlu* "2" (Kraft). The hypothetical conjunction **sV* appears e.g. in Hausa *(goma) sha ɗaya* "11", *(goma) sha biyu* "12", lit. "(10) plus 1", "(10) plus 2" resp. The same pattern is recognizable in East Chadic: Migama *bízgíɗì* "6" = *béeɗyá* "5" + *káɗyì* "1" (Jungraithmayr) or Dangla *bídígéɗy* "6" = *béɛ́ɗy* "5" + *kèeɗy* "1" (Lukas).

7. For the Berber numeral "7", Prasse 1969: 89 reconstructs a skeleton $\sqrt{h_1sh_2}$. Later he presents the protoform **sāh/-at* (and the longer variant **hissāh/-at*) compatible also with Guanche *satti* (Gran Canaria ?) & *sa(t)* (Tenerife ?). Comparing it with Se **sabʃ-(at-)* "7", Rössler 1952: 142 explains the loss of **b* through assimilation **-sb-* > **-ss-*, postulating a primary form **asbaʔu*. Perhaps a more probable solution consists in a specific development of the cluster **-bʃ-*. In certain conditions AA **b* is changed into *h/∅* in Berber, cf. e.g. the word "heart" reconstructed as $\sqrt{h_1lh_3}$ / $\sqrt{wlh_3}$ (Prasse 1969: 27, 76–77) = **huluh* or **wilih* (Prasse 1974: 72) > Taneslemt *ulh*, pl. *ulhawen*, Tawlimidden *ul*, *ǝwǝl*, Augila *ul*, Siwa *uli*, Ntifa *ull*, Zenaga *uǯ*, pl. *ellun* etc. Rössler 1952: 134–35 assumed the following development: **ulh* < **luh* < **lub* < **lubbu*, cf. Eg *ỉb* // Se **libb-* (Fronzarolli) = **libw-* (Vycichl) // ECu **lubb-* etc. On the other hand, AA **ʃ* gives regularly *y/∅* in the Berber languages (Vycichl 1991: 383–86). These phonetic laws can probably explain the vacillation *h/y* between Ahg f. *ǝssahāt* vs. Ayr f. *ǝṣṣayǎt* (cf. Prasse 1969: 19).

In Semitic the numeral "7" cannot be reconstructed without problems. Ak m./f. *sebe*, *seba / sebet(tu)* "7", *sebiat*, *se/abat*, *sebītum* "Siebentel" reflect pSe **sibʃ-* (but OAs *šabe* !), He *šéḇa / šiḇʕā*, Aramaic *šǝḇaʕ / šiḇʕâ* reflect pSe **šibʃ-* and finally OAs *šabe*, Ar *sabʕ- / sabʕat-*, Geez *sabʕ(u) / sabʕattu* reflect pSe **šabʃ-*. The Akkadian *s*-form is probably primary; only old **s-* in the numeral "7" can explain the surprising *s* in Ak *samāne* "8" instead of expected *š* attested in As *šamāne* < **ṯ* . The difference among initial syllables **si-/*ši-/*ša-* could consist in the mutual influence of the numerals **šid(V)šṯ-* "6",

**sabʕ-* "7", **ṯamānay-* "8" (> Canaanean **š-*). In spite of this uncertainty in reconstruction there is a hopeful properly Semitic etymology based on the word for "index(-finger)" attested in Ar *sabābat, sibbat, sabbāḥat* (Steingass 1988: 476–77). Perhaps the same biradical nucleus *s-b* appears in the verb *sabaʔa* "to take by hand". Outside Semitic a promising cognate appears in Somali *saʕab* "palm of hand with fingers" (< **sabʕ-* as *gaʕan* "hand" < **ganʕ-*, see Sasse 1982: 77). The semantic motivation "index" > "seven" is not isolated, cf. Zulu *isikhombisa* "7" and "index" (Hoffmann 1952–53: 72) or Malay *tuďuh* "7", a derivative of Austronesian **tuZuq* "index", orig. "to point" (Dahl 1981: 50).

Eg **safḫ-* corresponds unambiguously to its Semitic counterpart. In the final position we would expects ʕ. This irregular change could be caused by sandhi **sabʕ- *ḫamV̄n-* > **sabḫ- *ḫamV̄n-*. It remains to explain why there is *f* instead of **b*. One would expect spirantization **-bḫ-* > **-fḫ-*, but the sequence *-b(-)ḫ-* exists e.g. in *3bḫ* "to mix" or in *sbḫ.t* "a kind of amulet" (Vycichl 1983: 249, 185). Some combinatorical change connected with the presence of *s* has perhaps operated here, cf. the pair *ḫsf* vs. *ḫsb* "to succed in protecting" (Edel 1955–64: 51). Vycichl 1983: 240 mentions an analogical development in Eg *wsḫ* "to be wide" vs. Ar *wasiʕa* id.

Hypothetical cognates can also be found in the Matakam group of Central Chadic: Gwendele & Hurzo *cíbà* "7" (de Colombel) = Hurzo *cíɓà* (Rossing 1978: 322, #621).

8. Be **tām* (& **hittām*) and Guanche *tamatti* (Gran Canaria ?) "8" resemble suggestively Se **ṯamānay(-at-)* id. But in spite of Rössler (1952: 143) and Militarev (Militarev & Stolbova 1990: 48; Ajxenval'd & Militarev 1991: 242), the regular correspondence of AA **č* > Se **ṯ* is Be **s*. The only example supporting also Be **t* as a continuant of AA **č* is just the "eight"-etymology. On the other hand, there is at least one form with expected *s-*, namely *sām*, recorded by Klingenheben (1926–27: 44) in the area of the tribe 'Ámiln of Sus, which agrees with the phonetic law quoted above. It is possible to imagine the origin of the *t*-forms thanks to an alliteration to the following numeral **tiẓāh // *tūẓah* "9". But there is an easier explanation of the unique *s-* appearing only in one idiom, namely an alliteration to the preceding numerals "5", "6", "7", all with initial **s-*.

It means that it is necessary to look for another solution. Most natural is to presume a Semitic origin. There are evident Arabic loans preserving the third radical *-n-*, e.g. Tawlimidden m. *taman* (Basset) or Demnat f. *təmunt* "8". The other only biradical forms are probably older. The eventual borrowing should be realized from such a Semitic source, where the continuant of Se **ṯ* was either an interdental spirant **ṯ* (Ugaritic, Arabic, Epigraphic South Arabian, Modern South Arabian) or *t* (Aramaic), but not *š* (Akkadian, Hebrew, Phoenician/Punic, Ethio-Semitic). Besides Arabic appearing in North Africa from the end of the 7th cent. AD, only Epigraphic South Arabian or Ugaritic can probably be taken in account. In the latter case for its possible presence in the Delta

thanks to the movement of "Hyksoses" from the 18th cent. BC. In the first case there were rich commercial connections between Arabia and North Africa for a long time before the Muslim expansion. It can be documented by the evident influence of South and North Arabian scripts on the Libyan and modern Tifinagh scripts and on the system of figures preserved in Ghadames (Littman 1904 — see Ajxenval'd & Militarev 1991: 160; Vycichl 1952: 81–83).

If **karāḍ* "3" is an innovation limited only to Berber (the Mokilko parallel can be a Central Chadic or even Berber borrowing) and the Guanche counterparts (*amiat* etc.) represent an original form, there is a natural solution analyzing the numeral **tām* <**tā-Ham(-āh)* "8" = "three above" with augmentative confixes **tā- ...-āh*. The same internal structure can also be recognized in the following numeral **tūẓāh & *tiẓāh* "9" < **tā-kūẓ-āh & *tī-kūẓ-āh* resp. "four above" (see below). Accepting the Egyptian cognate **ḫamt-*, one expects **ḫ* or **γ* in Berber. Perhaps the vacillation *ḫ ~ h/∅* has operated here (Prasse 1972: 111 quotes the example *härnän* "montrer les dents" vs. *ḫärnän* "grincer des dents"). It is important to emphasize that also in some Afroasiatic branches just the numeral "8" is formed according to the quinary pattern: East Cushitic **š/sizḥeet- / *š/sizḥent- / *š/sazḥent-* "8" > Hadiya *sadento*, Sidamo *sette*, Kambatta *hezzetto*, Burji *hidítta* (**ḥizzeet- < *ḥiszeet- < *sizḥeet-*); Somali *siddeed*, Oromo *saddeet*; Gollango *sette*, Tsamakko *sezzen*; Yaaku *siite* (Sasse 1982: 95), analyzable as a compound of ECu **s/šizḥ-* "3" and the numeral "5" preserved yet in HECu **omut-* > Burji *umútta*, Sidamo *onto* etc. (Sasse 1982: 184; Haberland & Lamberti 1988: 136–37) and Eg **ḫamV̄n-* "8" vs. **ḫamt-* "3" (Holmer 1966: 35).

The possibility of an external comparison within Afroasiatic cannot be excluded either. So Ehret 1980: 290 reconstructs SCu **ʔitām-* "3" > Iraqw, Burunge, Alagwa *tam*, Qwadza *tami*; ? Dahalo *ʔíttaantóóni* "third day after tomorrow". It is plausible to connect it with the Berber **tām* (~ **hittām*) "8" again on the basis of the additive pattern "[5 +] 3". In spite of its semantic and phonetic acceptance, this etymology remains questionable for the isolation of the South Cushitic examples within Afroasiatic.

On the other hand, the Semitic numeral "8" probably represents a derivative of the numeral "2", as the confrontation of the skeletons: *ṯ-n-y* "2" vs. *ṯ-m-n-y* "8" can indicate. The primary shape might be reconstructed as **ṯāniy-mā* or **ṯanīy-mā* "the second not" (cf. Ar *mā* "not" — so Blažek 1990: 1990: 31) or **ṯāniy-/*ṯanīy-* + **min-* [**ʃaśar-*] "the second from [ten]" — cf. Se **min* "from" (Gray 1934: 71, 74) and Be **mīn* "without" (Prasse 1972: 230), naturally with the following metathesis.

Bomhard (1984: 152) compares the Berber and Semitic numerals "8" with ECu **tom(m)an-* "10", reconstructing AA **tʾam(a)n-* "8". The difference "8" vs. "10" remains unexplained.

9. Reconstructing pBe **taṣṣaʔu* "9", Rössler (1952: 143) proposes a cognate in Se **tiśʃ-* id. In spite of his categorical affirmation "Entlehnung aus-

geschlossen", the Semitic origin is quite possible, esp. when Guanche cognates are missing. After all, the rather devious form *cə́wuz* "9" recorded by Klingenheben by 'Amiln in the Sus area is evidently influenced by Moroccan-Arabic *cʕūd* "9".

Two forms for "9" are known from Canarian Islands: (i) *aldamorana* (Gran Canaria ?), (ii) *acot* (Tenerife ?). The form (i) consists of *marava* "10" (with emendation *n* = *u* ?), while *alda-* can be identified with Šawiya *ald(a)* "jusque, jusqu'à", hence "9" = "up to ten" (Woelfel 1954: 11). The form (ii) corresponds evidently to *acodetti* "4". It implies an original ellipse from **sumus akod/t.*. "5 + 4" or sim.

This second pattern opens a possibility to analyze the properly Berber numeral "9" in a similar way. Vycichl 1961: 253 described a specific Berber grammatical category **augmentative** formed by pBe confixes **tā-...āh* (cf. Šlh *abrid* "Weg" vs. *tabrida* "breiter Karawanenweg"). If we apply this pattern for the numeral "4", we get **tā-kūẓ-āh* *"four more" or *"four above"; further perhaps **tāūkẓāh* > **tūẓ(ẓ)āh* > Zenaga *tuḍa* (so Prasse 1974: 406 who reconstructs **tūẓah*, seeing in the vowel *u* an influence of the numeral *šuḍəš* "6"). The *ū*-vowel is also attested in Ghadames *təṣū(t)*, with *ū* in the second syllable probably appearing thanks to metathesis. The North & South Berber variant **tiẓ(ẓ)āh* can represent a plural of the same formation (**tī-kūẓ-āh* ?).

Let us add that the Semitic numeral "9" probably also continues in the subtractive pattern (cf. §3.8.). It is very remarkable that Se **tišʕ-(at-)* "9" and one of the Semitic numerals for "one", namely **ʕaštiy-(ān-)* (Ak m./f. *ištē/īn(um)*, *ištiānum / ištiat*, *ištē/īt(um)* "1", *ištēnšeret*, poet. *ištēnešret*, Ug *ʕšt ʕšr / ʕšt ʕšrh*, He *ʕaštēʕāśār* "11", Epigraphic South Arabian *ʕs¹tn* "1") differ only in the order of consonants. This fact can represent a key to the etymology. If metathesis could really serve as a way of expression of the semantic polarity (cf. examples collected by Majzel' 1983: 246 as Ar *ǧamīl* "fair, excellent" vs. *lamīǧ* "disfigured", etc.), it is possible to understand the opposite order of radicals forming the numeral "9" just as the expression of an "absence of one". An alternative solution can consist in a radical simplification (haplology ?) of a hypothetical syntagm **ʕaštiy- *ʕašti/u *ʕaśar-* "one from ten", cf. Ak *išt(um)*, *e/uštu* "from, of" (AHw 401) and Eblaite ÁŠ-DU "out from", ÁŠ-TI "from" (Diakonoff 1988: 68 and 1990: 28).

10. It was already Meinhof (1912: 240) who connected Be **marāw(-at)* "10" with Eg **mūḏ-aw*, *-at* id. This comparison was accepted by Zyhlarz (1931: 137 and 1934: 104, 106), assuming a regular correspondence between Be **r* & Eg *ḏ*. Rejecting this comparison just for the incompatibility of these consonants in Berber vs. Egyptian, Vycichl (1983: 124) also mentions that *-w* represents an integral part of the root of the Berber numeral, while it serves only as a masculine marker in Egyptian. Rössler (1966: 227) modified the comparison, postulating a primary form **m3ḏ.w* for Egyptian and **m-r-ʔ-w* for Berber. The loss of medial *3* is not unusual in Egyptian. So Edel 1955–64: 58 quotes e.g. *zb* vs. 'standard' *z3b* "jackal". Rössler assumed a regular corre-

spondence between Eg *ḏ* and unattested Be **ʔ*, which has to reflect AA **ʕ*. But AA **ʕ* has been preserved in Egyptian (Ember 1930: 32–33; Cohen 1947: 85–90). There are really a couple of examples which should demonstrate the regularity of the correspondence between Eg *ḏ* and Se **ʕ*: *sḏm // *s-m-ʕ* "to hear", *nḏm // *n-ʕ-m* "sweet", *nḏs* "to be small" // **n-ʕ-ś* "to be weak" (Albright 1918: 92, fn. 4; Ember 1930: 111–12), although they are not unambiguous. Perhaps an easier solution could consist in the modification of the Berber reconstruction in **marāgw* giving **marāw(w)* in most of languages, and **marāg(g)* in Zenaga and Guanche of Tenerife. It is generally accepted that Eg *g* before **u* has been palatalized in *ḏ*. Let us mention that the vacillation *w* ~ *g* has been usually interpreted as a result of development of the original **ww* (Prasse 1972: 64–65).

So far there has probably been no attempt to find the etymology within Berber. Analyzing the Berber numerals 3–10, Prasse (1974: 406) formulated a tempting hypothesis that they can be interpreted as the 3rd person of perfect of the conjugation IV (verbs of permanent quality with the same vocalic patterns **ă-ā*, **ă-ī*, **ă-ū* as the numerals 3–10 and with zero ending in masculine and **-at* in feminine). If we accept this 'verbal' hypothesis, in the form **marāw* "10" the reflexive prefix **m-* may be identified (cf. Prasse 1973: 61). This identification leads to the root √*(H)-r-w*, which can be found in Zayan *uɬu*, pl. *uɬawen* "content of two joined hands" (Loubignac 1924: 422).

Not regarding the preceding etymology and with respect to the problematic cognate in Egyptian, the question of external origin should also be admitted. There are suggestive Nilo-Saharan parallels: pNubian **muri* "10" > Hill Nubian **bure* // Taman *mar-tɔk* "10" = "10 x 1" // Bari (East Nilotic) *mɛrɛ gɛlɛŋ* "10" = "10 x 1" // Tubu (Saharan) *múro* "10" etc. (Blažek 1997: 167) etymologizable within Nilo-Saharan, cf. Nilotic **mɔr* "finger" (Dimmendaal) > South Nilotic **mɔɔrɪn* id., East Nilotic: Bari pl. *mɔrɪn* or West Nilotic: Jumjum *mɔreen* "all" (Bender).

11. Stumme 1899: 34 opined that Šlh of Tazerwalt *měrâwin* "20" represents a relic of an old dual from *měrâw* "10". Diakonoff 1988: 64 analyzed the ending *-in* < **-ay-* & **-n*, hence the marker of dual in oblique cases plus nunation. The same principle is also used in Semitic (**ʕâśar-ā* "20" = dual of **ʕâśar-u(m)* "10") and in Egyptian (**ḏwty* "20" < **ḏawắt-ay* < **mūḏawắt-ay* = dual f. of **mūḏaw* "10").

Zenaga *tešinde* (RB) = *tašəndəh* (Nicolas) "20" is derived from the numeral "2" probably by the same augmentative prefix forming the numerals "8", "9". In the suffix *-eləh* the original dual **-ay* can be recognized.

12. Zenaga (RB) *tukarḍa* "30" is probably also formed by the same augmentative confixes **tV- ..-āh* as "8", "9"; hence "30" = "super-three" ?

13. Klingenheben 1926–27: 42–43 assumed an Arabic origin for the common Berber numeral "100", which is reconstructed as **tē-mihḍay*, pl. **tī-muhāḍ* by Prasse 1974: 406. But there are more apparent borrowings of the Arabic *miʔa(t)* "100" in Berber: Ghadames *mia*, Šlh of Tazerwalt *miá & mīt* etc. This indicates that Arabic *miʔa(t)* "100", as the source of the form **tē-mihḍay / *tī-muhāḍ*, need not be unambiguous. Besides the Arabic form, Ph *mʔt*, Ug sg./pl. *mỉt/mảt* = **miʔt-/*miʔāt-* (Segert 1984: 191) and Sabaic *mʔt* should also be taken into account (in this case we must assume the development **-ʔt-* > **-ṯ* > *-ḍ-*).

An alternative Semitic source can be seen in Se **maʔād-* "many, plenty" > Ak *mādu*, Ug *mảd*, He *məʔōd* etc. (Klein 1987: 308).

Semantically fully legitimate is also the comparison with the numeral "10". So Eg **mw̌ḏ-* "10" agrees phonetically, because both Be **ḍ* and Eg *ḏ* can be derived from AA **ç̌* or **ĉ*. Similarly some East Chadic forms for "10" can be related: Sumrai *mwàj* (Jungraithmayr & Ibriszimow 1994/II: 321) = *moj* (Nachtigal) = *moid* (Adolf Friedrich) = *moet* (Decorse), Gabri, Dormo *moid*, Tchiri *mōdo* "10" (Lukas 1937: 74, 87). It is tempting to interpret the Berber numeral "100" as an augmentative of an unattested form for "10", corresponding to Egyptian and East Chadic counterparts, hence "100" = "super-ten".

Let us add that the Berber numeral "100" was borrowed into Fula in the forms *teemedere ~ teemerre*, pl. *teemeɗɗe ~ teemedde* "100" (Koval' & Zubko 1986: 118).

14. Hanoteau 1860: 260 quoted isolated Mzab ("Beni-Mozab") *twinest*, pl. *twinas* "100". Klingenheben (1926–27: 43, fn. 1) sees in it the primary Berber denotation of this numeral. Etymologically it could be connected with the word "ring, circle", known e.g. from Ayr *tawəynəst*, Ahg *tăwînəst*, pl. *tiwînâs* < **tā-wiynist / *tī-wuynās* or **tā-wihnist / *tī-wihnās* (Prasse 1974: 53, 133). The semantic motivation can be the same as in Eg **š(n)t*, Coptic ^{SB}ϣⲉ, ^{F}ϣⲏ "100", derived probably from *šnj* "to be round" (Wb IV: 489; Loprieno 1986: 1309). In the system of figures described for Ghadames the sign 'circle' means "ten" (Hanoteau 1860: 267–68; Vycichl 1952: 81–82; Lanfry 1973: 275). In Tifinagh and its predecessor Libyan script, the 'circle' designates *r*, perhaps a modification of North Arabian (Ṯamudic or Liḥyan) 'semicircle' designating also *r*. The meaning "10" of the 'circle' is probably borrowed from some South Arabian source, where the 'circle' designates both ʕ ('circle' = "eye" = Se **ʕayn-*) and "10" = *ʕs₂r* (Vycichl 1952: 83). The sign for *m* is also used for the numeral *mʔt* "100" in Epigraphic South Arabian. In the New Ṯamudic script from North Arabia, one of the signes for *m* is represented by two concentric circles (Jensen 1969: 329). The borrowing could have been realized either thanks to commercial contacts or after the invasion of various Arabian (not only Arabic !) tribes in North Africa in the second half of the 7th cent. (Ghadames, i.e. classical Cydamus, was conquered in 667 AD). In the present Ghadames system of figures the sign *b* "100" is used, probably representing

the modern Arabic letter *ṭ* (could it reflect the anlaut of one of the forms: Ahg etc. *temeḍe* or Mzab *twinest* "100" ?).

15. SBe **ā-gihīm*, pl. **ī-gihmān* "1000" (Prasse 1974: 407) has no safe etymology within Berber, perhaps with the exception the comparison with Ghd *egm* "to grow" (Lanfry 1973: 112).

There are also at least hypothetical parallels outside Berber: WCh **(n-)gʷam-* " to fill, be full" > Montol *gum*; Bolewa *gom* etc. (Stolbova 1987: 217–18) or **gam* "to finish, complete" > Hausa *gámà*; Sura *gam*; Saya *gəmà* etc. (Stolbova 1987: 218) and Se: Ar *ǧamm* "plenty, abundance; numerous" besides *ǧamaʕa* "to gather, assemble", *ǧimāʕ* "whole, entire, all; sum, total, the whole, plenty" etc. (Steingass 1988: 243–45). The semantic motivation can be illustrated by ECu **kum-* "1000" > Somali *kun*, pl. *kuman*, Oromo *kuma*, Sidamo *kume* etc. (Sasse 1982: 120), maybe a borrowing from Omotic, cf. Wolaita *kum-* "to be full, fill" (Cerulli).

§4. Conclusion

1) The most archaic Berber numerals are "1" and "2" with convincing cognates in Egyptian and Semitic (AA roots **w-ʕ-y* and **čin(y)-* resp.).

2) The numerals "3" and "4" are etymologizable on the Berber level ("3" < "scratch[-finger]", "4" < "handful of"), although there are more or less hopeful Chadic parallels.

3) The different Guanche **ami(r/l)at* "3" is perhaps related to Eg **ḫamt-*, and maybe also to Beja *mahây*, if it is derivable from **hamây*.

4) The Berber numerals 5–9 resemble suspiciously their Semitic counterparts. At present, at least for the numerals "5", "8" and "9" there are independent Berber etymologies possible. The situation can be demonstrated as follows:

	Semitic	etymology	Berber	etymology
5	**ḫamiš-*	?	**sammūs*	? **yis-hammās* [*ən-Ifahāsan*] "to the half [of hands]"
6	**šidš-* or **šidṯ-*	**šid-šid-* "3 + 3" or **šid-ṯin-* "3 x 2"	**saddīs*	?
7	**sabʕ-*	"index (finger)"	**sāh*	?
8	**ṯamānay-*	**ṯāniy-mā-* "2nd not" or **ṯāniy-min-* "2nd from"	**tām*	**tā-Ham-(āh)* "super-three" = "three above"
9	**tišʕ-*	**ʕašti-* **ʕašti/u-* [**ʕaśar-*] "one from [ten]"	**tūẓāh*	**tā-kūẓ-āh* "super-four" = "four above"

If the proposed etymologies are correct, the Semitic numerals "8" and "9" represent the subtractive pattern of formation, while in the Berber counterparts the quinary structure is recognizable. The traces of the quinary system also appear in Guanche (Tenerife) *acot* "9" = "[5] + 4" and in some modern languages (see Table 4) as an innovation copying perhaps the old pattern. It

seems that in the history of the Berber numerals 5–9, a contamination of native forms with the quinary structure and Semitic borrowings (probably preceding the Arabic influence) has taken place. A more precise determination of the Semitic source is difficult. The phonetic features (*ṯ > ṯ) and the historical circumstances indicate two candidates: Ugaritic and pre-Arabic languages of the Arabian peninsula, on the other hand Phoenician / Punic is excluded (*ṯ > š). The process of borrowing (or better accomodation) of Semitic numerals into Berber could be connected with the borrowing of script and figures.

Still more complicated is the situation of the Guanche numerals 5–8, which reveal the same Semitic influence as their Berber counterparts. It is difficult to imagine that the first migrants from the continent brought already "contamined" numerals. The typological analysis of the archeological material allows to date the first settlement of the Canary Islands already to the 3rd mill. BC (Bol'šakov 1980: 45). But there were more migration waves (Bol'šakov 1980: 50). So Militarev 1988: 101–07 tried to demonstrate the presence of the speakers of Tamahaq (Tahaggart etc.) on the Canary Islands, putting it between the 7th and 10th cent. AD, hence to the time, when the contamination of the Berber and Semitic numerals was certainly started. The forms *arba* "4" and *cansa* "5" (Tenerife ?) represent late Arabic borrowings.

5. For the numeral "10" there are (i) an internal Berber etymology, (ii) an Egyptian parallel, (iii) Nilo-Saharan parallels. The case (ii) seems to be least convincing, esp. for the phonetic incompatibility.

6. The numeral "100" can be of Semitic origin; alternatively it is compatible with the numeral "10" in Egyptian and some East Chadic languages. The isolated Mzab *twinest* "100" = "circle".

7. In spite of some possible parallels within Berber and other Afroasiatic branches the origin of the numeral "1000" remains obscure.

8. Besides the AA archaisms "1" and "2", there are hypothetical isoglosses connecting the Berber & Chadic numerals "3", "4", "5" and perhaps "100"/"10", and/or Berber & Nilo-Saharan numerals "4", "10". Regardless of the other possible interpretations, they can represent early contacts perhaps in the Saharan-savannah borderland somewhere in northern Sudan.

Abbreviations

AA Afroasiatic, Ahg Tahaggart, Ak Akkadian, Ar Arabic, As Assyrian, Be Berber, Ch Chadic, Cu Cushitic, E East, Eg Egyptian, Ghd Ghadames, H Highland, He Hebrew, Kbl Kabyle, N North, O Old, p proto-, Ph Phoenician, S South, Se Semitic, Šlh Tašelhait, Ug Ugaritic, W West.

References:

AHw *Akkadisches Handwörterbuch*, compiled by W. von Soden, I-III. Wiesbaden: Harrassowitz 1965–80.

Ajxenval'd, Aleksandra Ja., 1987: *Strukturno-tipologičeskaja klassifikacija berberskix jazykov. Sintaksis. Kratkaja istorija klassifikacij berberskix jazykov. Rezul'taty strukturno-tipologičeskoj klassifikacii berberskix jazykov.* Moskva: Nauka.

Ajxenval'd, Aleksandra Ja. & Militarev, Aleksandr, Ju., 1991: Livijsko-guančskie jazyki. In: *Jazyki Azii i Afriki IV.2.* Moskva: Glavnaja redakcija vostočnoj literatury izdatel'stva "Nauka", pp. 148–267.

Albright, W.F., 1918: Notes on Egypto-Semitic Etymology. *The American Journal of Semitic Languages and Literatures* 34/2, pp. 81–98.

Alojaly, Ghoubeïd, 1980: *Touareg-Français.* Copenhague: Akademisk Forlag.

Aspinion, R., 1953: *Apprenons le berbère. Initiation aux dialectes chleuhs.* Rabat: Moncho.

Basset, André, 1929: *Études de géographie linguistique en Kabylie (sur quelques termes berbères concernant le corps humain).* Paris: Leroux.

Basset, René, 1883: Notes de lexicographie berbére: Dialectes du Rif, de Djerbah, de Ghat, des Kel-Ouï. *Journal Asiatique* VIII ser, T. I, pp. 281–342.

Basset, René, 1887: Vocabulaire du Touat et du Gourara (Argot du Mzab), dialecte des Touaregs Aouelimmiden. *Journal Asiatique* VIII ser., T. X, pp. 365–464.

Basset, René, 1909: *Mission au Sénégal, T. I: Étude sur le dialecte zénaga.* Paris: Leroux.

Beguinot, Francesco, 1942: *Il Berbero Nefûsi di Fassâṭo.* Roma: Istituto per l'oriente.

Blažek, Václav, 1990: A Comparative-Etymological Approach to Afrasian Numerals. In: *Proceedings of the Fifth International Hamito-Semitic Congress, Vol. I*, ed. H.G. Mukarovsky. Wien, Afro-Pub, pp. 29–44.

Blažek, Václav, 1997: Saharan Numerals. *Archív orientální* 65, pp. 159–70.

Bomhard, Allan R., 1984: *Toward Proto-Nostratic. A New Approach to the Comparison of Proto-Indo-European and Proto-Afroasiatic.* Amsterdam — Philadelphia: Benjamins.

Bol'šakov, A.A., 1980: Korennoe naselenie Kanarskix ostrovov na rubeže XV i XVI vekov. *Sovetskaja Étnografija* 1980, pp. 45–58.

Brugnatelli, Vermondo, 1982: *Questioni di morfologia e sintassi dei numerali cardinali semitici.* Firenze: La Nuova Italia Editrice.

Calassanti-Motylinski, A. de, 1904: *Le dialecte berbère de R'edamès.* Paris: Leroux.

Cohen, Marcel, 1947: *Essai comparatif sur le vocabulaire et la phonétique du chamito-sémitique.* Paris: Champion.

Cortade, Jean-Marie, 1967: *Lexique français-touareg. Dialecte de l'Ahaggar.* Paris: Arts et métiers graphiques.

Dahl, Otto C., 1981: Austronesian Numerals. *Nusa* 10, pp. 46–58.

Dallet, J.-M., 1985: *Dictionnaire français-kabyle. Parler des At Mangellat (Algérie).* Paris: SELAF.

Diakonoff, Igor M., 1988: *Afrasian Languages.* Moscow: Nauka.

Diakonoff, Igor M., 1990: The importance of Ebla for History and Linguistics. In: *Eblaitica: Essays on the Ebla Archives and Eblaite Language*, vol. 2, ed. C.H. Gordon. Winona Lake: Eisenbrauns, pp. 3–29.

Dolgopolsky [Dolgopol'skij], Aron, 1973: *Sravnitel'no-istoričeskaja fonetika kušitskix jazykov.* Moskva: Nauka.

Dombrowski, F.A. & B.W.W., 1991: Numerals and numeral systems in the Hamito-Semitic and other language groups. In: *Semitic Studies. In honor of Wolf Leslau.* Wiesbaden: Harrassowitz, pp. 340–81.

Edel, Elmar, 1955–64: *Altägyptische Grammatik.* Roma: Pontificium Institutum Biblicum.

Ehret, Christopher, 1980: *The historical reconstruction of the Southern Cushitic. Phonology and vocabulary.* Berlin: Reimer.

Ember, Aaron, 1930: *Egypto-Semitic Studies.* Leipzig: Verlag Asia Major.
Fay, Edwin W., 1910: Composition, not suffixation: the comparative and superlative. *American Journal of Philology* 31, pp. 404–27.
Gray, Louis H., 1934: *Introduction to Semitic comparative linguistics.* New York: Columbia University Press.
Haberland, Eike & Lamberti, Marcello, 1988: *Ibaaddo ka-Ba'iso.* Heidelberg: Winter.
Hanoteau, A., 1860: Lettre adressée à M. Reinaud par M. Hanoteau. *Journal Asiatique* XVI, sér. 5, pp. 264–69.
Hinz, Walter & Koch, Heidemarie, 1987: *Elamisches Wörterbuch.* Berlin: Reimer.
Hoffmann, Carl, 1952–53: Zur Verbreitung der Zahlwörtstamme in Bantusprachen. *Afrika und Übersee* 37, pp. 65–80.
Holmer, Nils M., 1966: The Semantics of Numerals. *Årsbok* 1963–64[66], pp 14–48.
Jensen, Hans, 1969: *Die Schrift in Vergangenheit und Gegenwart*$_3$. Berlin: VEB Deutscher Verlagder Wissenschaften.
Jungraithmayr, Herrmann & Ibriszimow, Dymitr, 1994: *Chadic Lexical Roots, I-II.* Berlin: Reimer.
Klein, Ernst, 1987: *A Comprehensive Etymological Dictionary of the Hebrew Language.* New York — Leiden: Macmillan.
Klingenheben, August, 1926–27: Zu den Zählmethoden in den Berbersprachen. *Zeitschrift für Eingeborenen-Sprachen* 17, pp. 40–51.
Kluge, Theodor, 1941: *Die Zahlenbegriffe der Dravida, der Hamiten, der Semiten und der Kaukasier.* Berlin: Selbstverlag.
Koval', A. I. & Zubko, G.V., 1986: *Jazyk fula.* Moskva: Nauka.
Kraft, Charles H., *Chadic Wordlists*, I-III. Berlin: Reimer.
Lanfry, J., 1973: *Ghadamès II: Glossaire (Parler des Ayt Waziten).* Font National: Fichier.
Laoust, E., 1920: *Mots et choses berbères.* Paris: Challamel.
Laoust, E., 1932: *Siwa.* Paris: Leroux.
Leslau, Wolf, 1987: *Comparative Dictionary of Geʕez (Classical Ethiopic).* Wiesbaden: Harrassowitz.
Loprieno, Antonio, 1986: Zahlwort. In: *Lexikon der Ägyptologie*, Bd. VI, eds. W. Helck & W. Westendorf, cc. 1306–19.
Loprieno, Antonio, 1995: *Ancient Egyptian. A linguistic introduction.* Cambridge: University Press.
Loubignac, V., 1924: *Étude sur le dialecte Berbère des Zaïan et Aït Sgougou.* Paris: Leroux.
Lukas, Johann, 1977: Tschadischen Studien I: Beiträge zur Kenntnis des Mukulu (République du Tchad). *Afrika und Übersee* 60, pp. 1–58, 192–225.
Majzel', Solomon S., 1983: *Puti razvitija kornevogo fonda semitskix jazykov.* Moskva: Nauka.
Masqueray, Émile, 1893: *Dictionnaire français-touareg (dialecte des Taitoq).* Paris: Leroux.
Meinhof, Carl, 1912: *Die Sprache der Hamiten.* Hamburg: Fridrichsen.
Militarev, Aleksandr, 1988: Tamahaq-speaking Tuaregs in the Canary Islands (Linguistic evidence). In: *Progressive Traditions in African and Oriental Studies*, eds. S. Brauner & E. Wolff. Berlin: Akademie-Verlag, pp.101–07.
Militarev, Aleksandr & Stolbova, Olga, 1990: First Approach to Comparative-Historical Phonology of Afrasian (consonantism). In: *Proceedings of the Fifth International Hamito-Semitic Congress, Vol. I*, ed. H.G. Mukarovsky. Wien: Afro-Pub, pp. 45–72.
Nehlil, 1909: *Étude sur le dialecte de Ghat.* Paris: Leroux.
Newman, Francis William, 1887: *Kabail Vocabulary.* London: Trübner.
Newman, Paul, 1977: Chadic classification and reconstructions. *Afroasiatic Linguistics* 5/1, pp. 1–42.
Nicolas, Francis, 1953: *La langue berbère de Mauritanie.* Dakar: Mémoires de l'Institut Français d'Afrique Noire 33.
Paradisi, Umberto, 1960: Il berbero di Augila. Materiali lessicale. *Rivista degli studi orientali* 35, pp. 157–77.

Paradisi, Umberto, 1961: El-Fogăha, oasi berberofona del Fezzân. *Rivista degli studi orientali* 36, pp. 293–302.

Penchoen, Thomas G., 1973: *Tamazight of the Ayt Ndhir.* Los Angeles: Undena.

Prasse, Karl-G., 1969: *Á propos de l'origine de* H *touareg* (tăhăggart). Copenhague: Det kongelige Danske Videnskaberne Selskab Historisk-filologiske Meddelelser 43,3.

Prasse, Karl-G., 1972, 1973, 1974: *Manuel de grammaire touaregue* (tăhăggart) *I-III:Phonétique — Ecriture — Pronom; VI-VII: Verbe; IV-V: Nom.* Copenhague: Akademisk Forlag.

Provotelle de Gafsa, 1911: *Étude sur la tamazir't ou zénatia de Qalât es-Sened (Tunisie).* Paris: Leroux.

Reinaud, M., 1860: Sur le systéme primitif de la numération chez la race berbère. *Journal Asiatique* XVI, sér. 5, pp. 107–14.

Reinisch, Leo, 1887: *Wörterbuch der Bilin Sprache.* Wien: Hölder.

Rossing, Melvin O., 1978: *Mafa-Mada: A Comparative Study of Chadic Languages in North Cameroun.* Madison: PhD. Diss.

Rössler, Otto, 1952: Der semitischen Charakter der libyschen Sprachen. *Zeitschrift für Assyriologie und vorderasiatische Archäologie*, NF 16(50), pp. 121–50.

Rössler, Otto, 1966: Das ältere ägyptische Umschreibungssystem für Fremdnamen und seine sprachwissenschaftlichen Lehren. In: *Neue Afrikanistische Studien*, hrsg. J. Lukas. Hamburg: Deutsches Institut für Afrika-Forschung, pp. 218–29.

Rössler, Otto, 1979: Berberisch-tschadisches Kernvokabular. *Africana Marburgensia* 12/1–2, pp. 20–32.

Sasse, Hans-Jürgen, 1976: Weiteres zu den ostkuschitischen Sibilanten. *Afrika und Übersee* 59, pp. 125–42.

Sasse, Hans-Jürgen, 1982: *An Etymological Dictionary of Burji.* Hamburg: Buske.

Schenkel, Wolfgang, 1990: *Einführung in die altägyptische Sprachwissenschaft.* Darmstadt: Wissenschaftliche Buchgesellschaft.

Schuh, Russel, 1981: *A Dictionary of Ngizim.* Berkeley — Los Angeles — London: University of California Press.

Segert, Stanislav, 1984: *A Basic Grammar of the Ugaritic Language.* Berkeley — Los Angeles — London: University of California Press.

Skinner, Neil, 1977: North Bauchi Chadic Languages: Common Roots. *Afroasiatic Linguistics* 4/1, pp. 1–49.

Smith, Geoffrey P., 1988: Morobe Counting Systems. In: *Papers in New Guinea linguistics*, No. 26. Canberra: Pacific Linguistics, A-76, pp. 75–106.

Stolbova, Ol'ga V., 1987: Sravnitel'no-istoričeskaja fonetika i slovar' zapadnočadskix jazykov. In: *Afrikanskoe istoričeskoe jazykoznanie*, ed. V. Ja. Porxomovskij. Moskva: Nauka, pp. 30–268.

Stumme, Hans, 1899: *Handbuch des Schilchischen von Tazerwalt.* Leipzig: Hinrichs.

Tomback, Richard S., 1978: *A Comparative Semitic Lexicon of the Phoenician and Punic Languages.* Missoula: Scholars Press.

Vycichl, Werner, 1951: Punischer Spracheinfluss im Berberischen. *Journal of Near Eastern Studies* 10, pp. 198–204.

Vycichl, Werner, 1952: Das berberische Ziffernsystem von Ghadames und sein Ursprung. *Rivista degli studi orientali* 27, pp. 81–83.

Vycichl, Werner, 1961: Diminutiv und Augmentativ im Berberischen. *Zeitschrift der Deutschen morgenländischen Gesellschaft* 111, pp. 243–53.

Vycichl, Werner, 1983: *Dictionnaire étymologique de la langue copte.* Leuven-Paris: Peeters.

Vycichl, Werner, 1987: Les berbères des Iles Canaries. Élements historiques et linguistiques. *Études et documents Berbères* 2, pp. 42–62.

Vycichl, Werner, 1991: Die pharyngalen Laute **'Ayin** und **Ḥā'** im Berberischen. In: *Komparative Afrikanistik* (Gs. H.G. Mukarovsky), hrsg. E. Ebermann, E.R. Sommerauer & K.É. Thomanek. Wien: Afro-Pub, pp. 383–86.

Wb. Erman, Adolf & Grapow, Hermann, 1926[71]: *Wörterbuch der ägyptische Sprache*, I-VI. Berlin: Akademie-Verlag.

Woelfel, Dominik J., 1954: Les noms de nombre dans le parler guanche des iles Canariens. *Hespéris* 1954, pp. 1–33.

Zaborski, Andrzej, 1987: Basic numerals in Cushitic. In: *Proceedings of the 4th International Hamito-Semitic Congress*, eds. H. Jungraithmayr & W.W. Müller. Amsterdam — Philadelphia: Benjamins, pp. 317–49.

Zavadovskij, Jurij N., 1967: *Berberskij jazyk*. Moskva: Nauka.

Zavadovskij, Jurij N., 1974: Les noms de nombre berbéres a la lumiere des études comparées chamito-sémitiques. In: *Actes des Premier Congrés international de linguistique sémitique et chamito-sémitique* (Paris 1969). Paris: Mouton, pp. 102–12.

Zavadovskij, Jurij N., 1980: Filologičeskie zametki. In: *Drevnij Vostok 2*. Moskva: Nauka, pp.136–43.

Zyhlarz, Ernest, 1931: Die ägyptisch-hamitisch Dekade. *Zeitschrift für Ägyptische Sprache und Altertumskunde* 67, pp. 133–39.

Zyhlarz, Ernest, 1933: Ursprung und Sprachcharakter des Altägyptischen. *Zeitschrift für Eingeborenen Sprachen* 23, pp. 25–45, 81–110, 161–94, 241–54.

Zyhlarz, Ernest, 1934: Konkordanz ägyptischer und libyscher Verbalstammtypen. *Zeitschrift für Ägyptische Sprache und Altertumskunde* 70, pp. 107–22.

Zyhlarz, Ernest, 1950: Das kanarische Berberisch in seinem sprachgeschichtlichen Milieu. *Zeitschrift der Deutschen morgenländischen Gesellschaft* 100, pp. 403–60.