Recent developments in Semitic and Afroasiatic linguistics
Five teaching modules at Addis Ababa University, March 10–14, 2014
5. Root structure and noun patterns; comparative lexicography
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1 Common-Semitic noun patterns (Fox 2003)

– Isolated nouns

*/CaCC/
*/CiCC/
*/CuCC/

*/CaCaC/
*/CaCiC/
*/CaCuC/
*/CaCāC/
*/CaCīC/
*/CaCūC/
*/CuCuC/
*/CuCūC/
*/CiCaC/
*/CuCaC/
*/CiCāC/
*/CuCāC/
*/CāCiC/

*/CaC$_i$C$_i$aC/ ≈ */CaC$_i$C$_i$āC/
*/CaC$_i$C$_i$iC/ ≈ */CaC$_i$C$_i$uC/
/CaC$_i$C$_i$ūC/
*/CuCC$_i$uC$_i$/ ≈ */CuCC$_i$ūC$_i$/
*/CiC$_i$C$_i$aC/ ≈ */CiC$_i$C$_i$āC/
*/CuC$_i$C$_i$aC/ ≈ */CuC$_i$C$_i$āC/

– Patterns with geminate C$_3$

– Non-reconstructible patterns

2 Noun patterns in Biblical Hebrew

2.1 Derivation of surface vowels in Biblical Hebrew

*/ā/ > /ō/, e.g., *mā̊qōm* 'place (general Canaanite sound shift);

*/ī/ > /ī/, e.g., *šīr* 'song';

*/ū/ > /ū/, e.g., *gəbūl* 'border;

*/a/ > /ā̊/, e.g., *lēbā̊b* 'heart' (tonic syllable):

*/a/ > /a/, e.g., *ʾā̊martī* 'I said'

*/a/ > /i/, e.g., *yilmaḏ* 'he learns' (dissimilation of prefix-vowel: Barth-Ginsberg Law);

*/a/ > /ɛ/, e.g., *mélɛḵ* 'king' ("segholation" of */malk/);

*/a/ > /ə/, e.g., *dəbā̊rīm* 'words'; *yikbəḏū* 'they are heavy' (vowel reduction in pro-pretonic open syllables)

*/i/ > /ē/, e.g., *lēb* 'heart' (compensatory lengthening: < */libb/);

*/i/ > /i/, e.g., *libb-ī* 'my heart'

*/i/ > /a/ e.g., *bat* 'daughter (<*bint); *zā̊qantī* (<*/zaqintī/) 'I am old' (vowel lowering in originally closed accented syllables: Philippi's Law)

*/i/ > /ɛ/, e.g., *ṣédɛq* (<*(ṣidq/) 'what is right';

*/i/ > /ə/, e.g., *šōmərīm* 'guards'

*/u/ > /ō/, e.g., *dōb* (<*/dubb/) 'bear';

*/u/ > /u/, e.g., *dubb-ī* 'my bear';

*/u/ > /ā̊/, e.g., *ḥå̊ḏš-ā̊(h)* 'her new moon';

*/u/ > /ə/, e.g., *yišmərū* (<*/yišmurū/) 'they guard'

2.2 Derivation of surface forms

pattern	example (masc.)	example (fem.)
Uniradical forms:		
*/Cv̄/:	*ʾī* 'island'	——
Biradical forms:		
*/CaC/:	*yā̊ḏ* 'hand'	*śā̊p̄ā̊(h)* 'lip'
*/CiC/:	*ʾēl* 'god'	*mēʾā̊(h)* 'one hundred'
*/CuC/:	*tōr* 'turtle-dove'	——
Forms *mediae infirmae* (II-weak):		
*/CāC/:	*ṭōb* 'good'	*ṭōbā̊(h)* 'good'
*/CīC/:	*mīn* 'kind'	*bīnā̊(h)* 'understanding'
*/CūC/:	*šūr* 'wall'	*šūrā̊(h)* 'row'

Forms *mediae geminatae* ($C_2 = C_3$):

*/CaC$_i$C$_i$/:	*raḇ* 'great, much'	*rabbā̊(h)* 'great, much'
*/CiC$_i$C$_i$/:	*ʾēm* 'mother'	*pinnā̊(h)* 'angle'
*/CuC$_i$C$_i$/:	*kōl* 'all'	*sukkā̊(h)* 'booth'

Triradical forms:

*/CaCC/:	*mέlεḵ* 'king'	*malkā̊(h)* 'queen'
*/CCaC/:	*dəḇaš* 'honey'	*hăḏassā̊(h)* 'myrtle'

(Aramaic pattern; note the C_3-gemination in the feminine form)

*/CiCC/:	*sḗpεr* 'book'	*biqʿā̊(h)* 'valley'
	bέṭεn 'belly'	*ʿεḡlā̊(h)* 'heifer'
*/CCiC/:	*bəʾēr* 'well'	*qəhillā̊(h)* 'community'

(note the C_3-gemination in the feminine form)

*/CuCC/:	*ʾṓzεn* 'ear'	*ḥåḵmā̊(h)* 'wisdom'
*/CCuC/:	*bəʾōš* 'stench'	*səḡullā̊(h)* 'property'

(pattern of bound/construct infinitive (G))

(note the C_3-gemination in the feminine form)

*/CaCaC/:	*ʾā̊ḏā̊m* 'man'	*ṣəḏā̊qā̊(h)* 'justice'
*/CaCiC/:	*kåḇēḏ* 'heavy'	*bərēḵā̊(h)* 'pool'
*/CaCuC/:	*ʾā̊ḏōm* 'red'	*ʾăḏummā̊(h)* 'red'

(adjectives of color and space)

*/CiCaC/:	*ʿēnā̊ḇ* 'grape'	——
*/CaCāC/:	*šā̊lōm* 'peace'	——

(pattern of absolute infinitive (G))

*/CaCīC/:	*ṣā̊ʿīr* 'small'	*səlīḥā̊(h)* 'forgiveness'

(adjective, often with passive meaning; fem.: *nomen actionis*)

*/CaCūC/:	*ʿā̊ṣūm* 'mighty'	*qəḇūrā̊(h)* 'burial'

(passive participle (G))

*/CiCāC/:	*zərōaʿ* 'arm'	*ʿăḇōḏā̊(h)* 'work'
*/CuCāC/:	*rəḥōḇ* 'broad place'	*nəʿṓrεṯ* 'tow'
	qərā̊ḇ 'fight'	—— (Aramaic pattern)
*/CāCaC/:	*ʿōlā̊m* 'world'	——
*/CāCiC/:	*ʾōyēḇ* 'enemy'	*ḥōmā̊(h)* 'wall'

(active participle; *nomen agentis*)

*/CūCaC/:	*šōšan* 'lily'	——

*/CaC$_i$C$_i$aC/:   *dayyǻn* 'judge'   *yabbåšǻ(h)* 'dryness'

(*nomen agentis*)

*/CaC$_i$C$_i$aCt/:   *ʿawwéreṯ* 'blindness'

(the feminine form is a pattern denoting sicknesses/physical defects)

*/CaC$_i$C$_i$iC/:   *ʿiwwēr* 'blind'   ——

*/CaC$_i$C$_i$iC/:   *lə-ḏabbēr* 'to speak'

(infinitivus constructus (D))

*/CuC$_i$C$_i$aC/:   *sullǻm* 'ladder'   *qubbáʿaṯ* 'chalice'

*/CaC$_i$C$_i$āC/:   *qannō(ʾ)* 'jealous'

/CaC$_i$C$_i$īC/:   *ʿattīq* 'old'

/CaC$_i$C$_i$ūC/:   *ḥannūn* 'gracious'   *ḥabbūrǻ(h)* 'bruise'

Examples of forms with one or two reduplicated radicals:

*/CaCC$_i$aC$_i$/:   *raʿănǻn* 'green'

*/CaCC$_i$īC$_i$/:   *saḡrīr* 'rain'

*/CaCC$_i$ūC$_i$/:   *šaʿărūr* 'horrible'

*/CaC$_i$aC$_j$C$_i$aC$_j$/: *ʾăḏamdǻm* 'reddish' (color adjectives)

*/CaC$_i$aC$_j$C$_i$uC$_j$/: —— *šəḥarḥóreṯ* 'blackish'

*/CaC$_i$aC$_j$C$_i$ūC$_j$/: *ʾăsap̄sūp̄* 'mixed multitude'

*/C$_i$aC$_j$C$_i$aC$_j$/:   *galgal* 'wheel'

*/C$_i$uC$_j$C$_i$uC$_j$/:   *qåḏqōḏ* 'top of the head' *gulgóleṯ* 'skull'

*/C$_i$aC$_j$C$_i$ūC$_j$/:   *baqbūq* 'jug'

Examples of quadriradical forms:

*/CaCCaC/:   *ʿaqrǻḇ* 'scorpion'

*/CaCCuC/:   *karkōḇ* 'margin'

*/CaCCīC/:   *šarbīṭ* 'scepter'

*/CaCCūC/:   *galmūḏ* 'barren'

An example of a quinqueradical form: *ṣəp̄ardēaʿ* 'frog'.

References

Fox, Joshua. 2003: *Semitic Noun Patterns* (Harvard Semitic Studies 52). Winona Lake: Eisenbrauns.

Joüon, Paul and Takamitsu Muraoka 2006 (2nd edition): *A Grammar of Biblical Hebrew.* Rome: Editrice Pontificio Istituto Biblico.
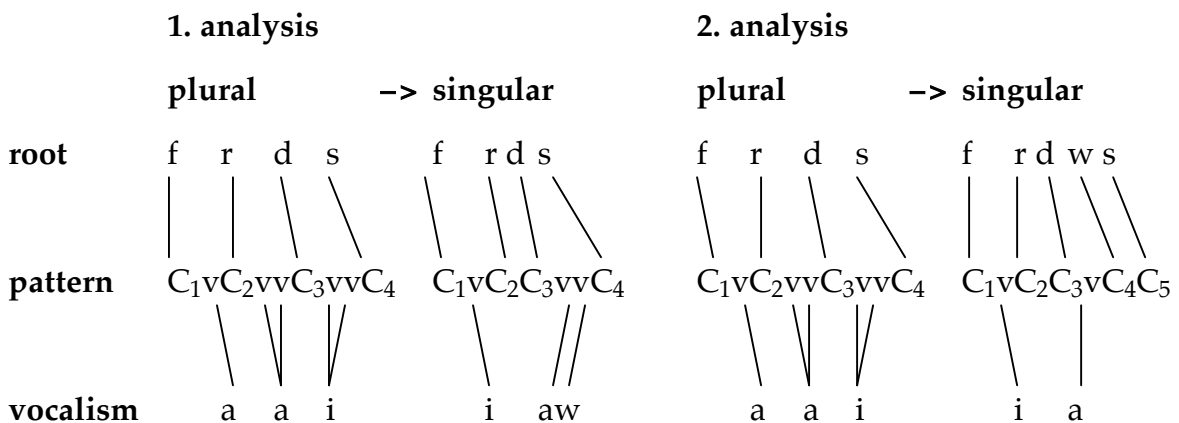
3 Semitic root structure and morpho-phonology

3.1 Root or base?

kataba   'he wrote'

yaktubu   'he writes'

(ʾu)ktub   'write!'

kātib   'writing, writer'

kitāb   'book'

maktab   'office' (place of writing)
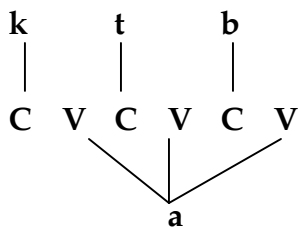
3.2 Integration of foreign vocabulary

The extrapolation of consonants of non-Arabic vocabulary when being incorporated into Arabic is a well-known process attested as such in nearly all ancient and modern Semitic languages. One interesting example in point is the "retrograde" derivation *firdaws* 'paradise' from Greek παραδεισος (*parádeisos*). *Parádeisos* is reanalyzed as the plural pattern $C_1aC_2\bar{a}C_3\bar{\imath}C_4$ to which a fictitious singular pattern $C_1iC_2C_3awC_4$ would belong (thereby, *r* and *d* are being "mapped" onto the C_2- and C_3-slots"). Alternatively, *firdaws* could be analyzed as a quinquiliteral back-formation (such nouns are regularly "reduced" to quadriliteral nouns in the plural, e.g., *ᶜandalīb –> ᶜanādil* 'nightingale') of the attested pattern $C_1iC_2C_3aC_4C_5$, in which *w* is taken as a root consonant and not as part of a diphthong. Here a formal representation of the two analyses is given:

	1. analysis		2. analysis	
	plural	**–> singular**	**plural**	**–> singular**
root	f r d s	f r d s	f r d s	f r d w s
pattern	$C_1vC_2vvC_3vvC_4$	$C_1vC_2C_3vvC_4$	$C_1vC_2vvC_3vvC_4$	$C_1vC_2C_3vC_4C_5$
vocalism	a a i	i aw	a a i	i a

3.3 Ablaut, apophony (Schramm 1991: 1405)

root/base	binyan I	binyan II	binyan IV	binyan V
kbur	*yakbur*	*yukabbir*	*yukbir*	*yatakabbar*

motivation

– *lašon* 'tongue' cannot be derived from a root √lšn; the verb *hilšin* 'he slandered' is thus denominative (semantically not a regular *hifᶜīl* form)

– some short words, notably prepositions, cannot be derived from roots at all:

    Hebrew   *ᶜal* 'on' <– √ᶜly

                  ᵓel 'to'   <– ???

– "philosophically" better to have one consistent system

3.4 Secondary formations (Ussishkin 1999: 407)

a. base		b. inflected base	
hitkamec	'to be stingy'	*kamc + an*	'stingy person'
kace	'edge'	*kic + on + i*	'extreme'
mica	'to exhaust'	*ta + mc + it*	'summary'
hixzik	'to hold'	*ta + xzuk + a*	'maintenance'
safar	'to count'	*mi + spar*	'number'

c. derived verb

hitkamcen	'to be stingy'
hikcin	'to bring to extremity'
timcet	'to summarize'
tixzek	'to maintain'
misper	'to enumerate'

a. base		b. "inflected" verb	
{slm}	'be secure'	*ᵓaslama,*	'to surrender o.s.',
		yuslimu	'to become a Muslim'

c. derived verb

ᵓaslama, yuᵓaslimu   'to islamize'

taᵓaslama, yataᵓaslamu 'to be islamized'

ᵓamrīkā   'America'

ᵓamraka   'he americanized'

taᵓamraka 'he became americanized'

3.5 Diachronic re-analysis

1. prefix + root:

Arabic *s*   +   {bqw / y}   --->   *sabaqa* {sbq}
     CAUS 'remain'   'leave behind oneself'

Arabic *m*   +   {dyn}   --->   *madīna* {mdn}
     LOC   'law / religion'   'place of court' / 'city'

2. root + preposition:

Arabic *jāʾa* {jyʾ}   +   *bi*   --->   *jāb* {jyb}
     'come'   'with'   'bring'

Syriac   {ntn}   +   *l*   --->   {ntl}
     'give'   'to'   'give'

3.6 Truncation and restitution of tri-radicalism

{bn}:   *(i)bn*   --->   *ʾabnāʾ*   'sons'

{bn}:   *(i)bn*   --->   *bunayy*   'little / dear son'

	imperfect	apocopate/jussive	imperative
sound	*yafᶜalu*	*yafᶜal*	*(i)fᶜal*
I w / y	*yaqifu / yaysiru*	*yaqif / yaysir*	*qif / ʾīsir*
II w / y	*yaqūlu / yasīru*	*yaqul / yasir*	*qul / sir*
III w / y	*yadᶜū / yarmī*	*yadᶜu / yarmi*	*(u)dᶜu / (i)rmi*
$C_2 = C_3$	*yaruddu*	*yardud / yarudda/i/u*	*(u)rdud / rudda/i/u*
I r, II ʾ, III y	*yarā*	*yara*	*ra(h)*
I w, II l, III y	*yalī*	*yali*	*li(h)*
I w, II ʾ, III y	*yaʾī*	*yaʾi*	*ʾi(h)*

Hebrew:

{ntn}:   --->   *ten* 'give!'

{lqḥ}:   --->   *qaḥ* 'take!'

Syriac:

{nsb}:   --->   *nessab* (< *nensab*) 'he takes'   --->   *sab* 'take!'

{slq}:   --->   *nessaq* (< *neslaq*) 'he ascends'   --->   *saq* 'ascend!'

3.7 Arabic grammatical tradition (Ibn Ǧinnī)

Synchronic, bit not diachronic, derivation of *qāma* 'he got up' from **qawama*

3.8 bi-radicalism vs. tri-radicalism (*ʾibdāl*, **"matrices et étymons"**)

{ptr}	'ablösen' ('to remove')
{pšr}	'auflösen' ('to dissolve')
{prr}	'auseinandergehen' ('to break up')
{prs}	'scheiden' ('to cut')
{prṣ}	'durchschlagen' ('to break through')
{prq}	'durchteilen' ('to part')
{prk}	'abriegeln' ('to shut off')
{pzr}	'sich verbergen' ('to hide')
{špr}	'senden' ('to send')
{ṭpr}	'vertreiben' ('to expel')
{kpr}	'abschneiden' ('to cut off')
{ḫpr}	'(weg)graben' ('to dig off')

jam-aᶜa	'to gather, collect'
jam-hara	'to reassemble, call together'
jam-ala	'to gather, collect'
jam-ara	'to gather, reassemble'
jam-ā	'to collect (water)'
jam-ma	'to be abundant (water, vegetation)'

laqaṭa	'to pick up' {lqṭ}
laqifa	'to grab' {lqf}
nahada	'to become buxom' {nhd}
nahaḍa	'to get up' {nhḍ}
liṯām	'a kind of veil' {lṯm}
lifām	'a kind of veil' {lfm}
ṯāba	'to return' {ṯwb}
tāba	'to repent' {twb}

madaha / madaḥa	'to praise'
qaṭaᶜa / qaṭama	'to cut'
taʾrīṯ / taʾrīf	'demarcation' / 'land survey'
mirḍaḫa / mirḍaḥa	'walnut-cracker' / 'hazelnut-cracker'

3.9 key consonants

ᵓarna-b	'hare'	ᵓimm-ar	'lamb'
dub-b	'bear'	baq-ar	'cattle'
ḏiᵓ-b	'wolf'	ḥim-ār	'donkey'
ḏub(ā)-b	'stinging fly'	kar-r	'lamb'
kal-b	'dog'	ᶜay-r	'ass-foal'
lab-b	'lion'	ṯaw-r	'ox'
ᶜaqra-b	'scorpion'	ᵓayy-al	'deer'
ṯaᶜla-b	'jackal'	jam-al	'camel'

3.10 Semitic roots in permutation

1. Permutated Arabic roots

{lmj} / {mlj}	'an der Brust saugen' ('to suck')
malᵓak / maᵓlak	'Bote' ('messenger')
samᵓal / saᵓmal	'Nordwind' (north wind')
baliha / bahila	'verwirrt sein' ('to be confused')
šarḫ / šaḫr	'Jugendblüte' ('blossom of youth')
{qms} / {mqs}	'eintauchen' ('to dive')
jazama / zamaja	'den Schlauch füllen' ('to fill the hose')
{blġr} / {brġl}	'a tribe of Rum' (= 'bulgur' / 'cracked wheat')
{nrjs} / {rnjs}	'an aromatic plant'
{rwnq} / {nwrq}	'splendor, glamor'
{jzr} / {jrz}	'to hold back' [not: 'to slaughter']
zaᶜaja / jaᶜaza	'to disturb'
jinzīr / zinjīr	'chain'
jawāz / zawāj	'marriage' [not: 'permit']
qarandalī / qalandarī	'wandering dervish'(?)

2. Permutated Semitic roots (non-Ethiopic – Ethiopic)

Akkadian	epēqu	'enclose'	haqafa	'hug, embrace, ...'
Hebrew	hāpaq	'embrace'		
Arabic	baḥaq	'leprosy'	ᶜabaqa	'itch, have scabies'
Akkadian	dišpu	'honey'	dbš	'honey' (epigraphic only)
Soqoṭri	ḍanaḥ	'breast'	ḥaḍana	'hold in the lap, nurse'
Arabic	falqaṭa	'hurry'	qalṭafa	'hurry'
Soqoṭri	igᶜalil	'roll o.-self'	ᶜagala	'place in layers, ...'
Arabic	jaraza / jazara	'tear, bite'		

Common Semitic	{grz}/{gzr}	'cut, tear, ...'	*gazara/ garaza*	'cut, circumcise'
Arabic	*iḥtadama*	'be hot'	*ḥamad*	'ashes, dust'
Arabic	*faḥara/ ḥafara*	'dig, notch'	*faḥara ḥafra*	'dig (up), bury' 'dig' (Tigre)

3.11 *al-ištiqāq al-ʾakbar* (Ibn Ǧinnī)

1. {jbr}, the common denominator being *qūwa wa-šadda* 'force and strength':

jabara 'to force'

mujarrab 'tested, proven'

ʾabjar 'obese, corpulent'

burj 'tower, castle'

rajjaba 'to frighten'

rabājī (?) 'boasting person'

2. {qsw}, the common denominator being *qūwa wa-jtimāᶜ* 'strength and togetherness':

qaswa 'hardness'

qaws 'bow, arch'

waqs (?) 'strong itching'

wasq 'load, cargo'

sūq 'market'

3. {slm}, the common denominator being *istimāl wa-mulāyana* 'inclusion and friendly attitude':

salāma 'soundness'

samal 'worn garment'

masl (?) 'water channel' (a variant of *masīl* (root {syl}))

lamasa 'to touch'

lasma (?) 'blow, breath' (a variant of *nasma*)

3.12 Evidence from psycholinguistics, aphasia, language games

permutations in a Bedouin Hijazi Arabic language game (Prunet et al. 2000: 623)

123:	*kattab* 'caused to write'	*s-t-aslam*	'surrendered	*ž-t-imaᶜ*	'met
321:	*battak*	*s-t-amlas*		*ᶜ-t-imaž*	
213:	*takkab*	*s-t-alsam*		*m-t-ižaᶜ*	
231:	*tabbak*	*s-t-almas*		*mt-aᶜaž*	
312:	*bakkat*	*s-t-amsal*		*ᶜ-t-ižam*	
132:	*kabbat*	*s-t-asmal*		*ž-t-aᶜam*	

4   Elements of Semitic lexicography

4.1 (Sumero-)Akkadian lexicography (incl. Eblaitic, Ugaritic, Hurrian, etc.)

– the principles of arrangement (cf. Cavigneaux, "Lexikalische Listen": 610; Civil, "Ancient Mesopotamian Lexicography": 2308f.):

	0	1	2	3	4	5
(a)	I	du-u	KAK	gakku	*banû*	–
(b)	–	tak-tak	$Tak_4.Tak_4$	tak minnabi	*ezēbu*	*arḫa dalumar*

(a): when pronounced du, the Sumerian logogram called gakku (but transliterated KAK by today's Assyriologists) means in Akkadian *banû*, "to build". The "I" at the left edge represents a vertical wedge, without any linguistic significance.

(b): when read tak-tak, the Sumerian logogram $Tak_4.Tak_4$ called "double (minnabi) tak" means in Akkadian *ezēbu*, "to abandon", and in Hittite *arḫa dalumar*, "forsaking".

lists with subcolumns 1 and 2:   "syllabaries"
other lists (with more columns):   "vocabularies"

– examples across the ages:
- the "sign-list" from Ebla (cf. Archi 1987: 93-99)
- two-word Eblaitic entries / bilingual vocabularies (cf. Pettinato 1982, Krebernik 1983, Fales 1984: 175-186)
- syllabary Proto-Ea (cf. Landsberger 1951)
- vocabulary Proto-Ea (Proto-Aa) (cf. Civil 1979)
- the polyglot S^a vocabulary texts (cf. Huehnergard 1987: 24-45)
- the synonym list *malku = šarru* (cf. Kilmer 1963: 424-429)

4.2 example of a list giving evidence of the "root":
the series $SIG_7.ALAN$ = *nabnītu* (cf. Finkel 1982)

nabnītu	'creation'
bunnan(n)û	'features'
būnu	'outward appearance'
amātum	'word(s)'
qabû	'speak'
muštabil amāti	'participant in a discussion'

amtum   'servant (f.)'
emēdu   'to lean o.s. on'
ummātum   'summer days'

4.3 Mediaeval Arabic lexicography

– the principles of arrangement:

1. Arab lexicographers such as al-Ḫalīl (*Kitāb al-ᶜayn*) and al-ᵓAzharī (*Tahḏīb al-luġa*) grouped together roots that were similar not only in composition, but also in their meaning. Their strategy was to give all attested permutations of a root after a given lemma. $\{C_1C_2C_3\}$ would thus be followed by $\{C_1C_3C_2\}$, $\{C_2C_1C_3\}$, $\{C_2C_3C_1\}$, $\{C_3C_1C_2\}$, and $\{C_3C_2C_1\}$. This strategy was also pursued by other early lexicographers such as al-ᵓAṣmaᶜī, Ibn Durayd, and Ibn Fāris in their works on *ištiqāq* (etymology). The earliest ordering principle was the Ḫalīlian "row". This principle has likely roots in the Indian grammatical tradition.

2. "rückläufige" dictionaries (ordered alphabetically according to the *last* radical, then alphabetically according to the first two radicals, perhaps to support poets): Ibn al-Manẓūr: *Lisān al-ᶜarab*, Murtaḍā az-Zabīdī: *Tāj al-ᶜarūs*

3. alphabetical dictionaries: Wehr, etc.

4.4. Mediaeval Hebrew lexicography

– important authors: Saᶜadia Gaᵓon, Judah ibn Qurayš, David ben Abraham al-Fāsī, Menaḥem ben Saruq, Dunash ben Labrat, Judah Ḥayyūj, Jonah ibn Janāḥ, Hai Gaᵓon, Abū l-Faraj, Samuel ha-Nagid, Abraham ha-Bavli, Moshe ha-Kohen ibn Gikatilla, Judah ben Balᶜam, Isaac ben Barūn

– Jonah ibn Janāḥ: explanation of Biblical lemmata in:
   Kitāb al-ᵓuṣūl = Sefer haš-šorašim (cf. Neugebauer 1875)
   √ ᵓb 'father', √ ᵓbh 'to love'

– al-Fāsī: comparison of three lemmata:
   Arabic √ ẓby / Aramaic √ ṭby / Hebrew √ ṣby 'gazelle', but not:
   Arabic √ ᵓrḍ / Aramaic √ ᵓrᶜ / Hebrew √ ᵓrṣ 'earth'

4.5 Modern comparative Semitic and Afroasiatic lexicography

– comparative word lists (genetic relationship):
   Bergsträsser-Daniels 1983: 210-223
– Swadesh list: Bennett 1998: 232-249
– comparative dictionaries:
   Cohen 1970-1997; Orel & Stolbova 1995; Militarev & Kogan 2000, 2005

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