CALL OF QATULLU:

TOWARDS AN UNDERSTANDING OF THE SEMANTIC ROLE OF TERMINAL ROOT CONSONANT

REDUPLICATION IN THE SEMITIC LANGUAGES

by

JASON HAGLER

(Under the Direction of Baruch Halpern)

ABSTRACT

This thesis attempts to explain the distribution of terminal root consonant reduplication in the Semitic languages. Non triradical roots have generally not been dealt with systematically in both the comparative grammars and the specific language grammars, obfuscating the nature of the phenomenon. This thesis suggests that terminal root consonant reduplication attested across the family is the result of an ancestral stem used to form adjectives.

INDEX WORDS: Semitic, Historical Linguistics, Verb Forms, Adjectivals, Reduplication. Partial Reduplication, Po'lel, Stem IX, Stem XI, Akkadian R Stem, F Stem, Color in Semitic

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DEDICATION

      To my parents because that seems like the time to do that sort of thing, to the Proto-Afroasiatic and Proto-Semitic populations for speaking such an interesting language, and to Dr. Oster of University of Maryland for showing me that there were mysteries yet in ancient languages.

Contents

1. Introduction
1.1 Semitic Languages in General

The Semitic languages are spoken in West Asia. The earliest attested language in the family is Akkadian, first appearing over 4,000 years ago. The feature of interest for this work in Semitic languages is their stem formations.

Though the precise taxonomy of the Semitic languages is still debated, (one scholar counted over 35 different theories of the precise placement of Ugaritic in 2006), the general model splits the family into three. The first to break off from a Common Semitic speech community is East Semitic, which includes languages such as Akkadian and Eblaite. Next is South Semitic, which includes Ethiopic and Modern Southern Arabian (Henceforth MSA). It can also include Arabic, depending on the scholar. Central Semitic includes Canaanite and Aramaic. While the precise boundaries of these subgroups are obscure, due in no small part to the contact between these languages and their neighbors, the three geographic and taxonomic poles of the family are Canaanite, Akkadian, and Ethiopic, represented here by Ge'ez. This gives us a sample from each of the three clear subgroups; and each of these is at the edge of the attested Semitic world.[1]

In principle, every root in the Semitic languages consists of three consonants. In reality, there are biconsonantal roots which are augmented in ways to make them triconsonantal (see below) . These roots are non-concatenative and vowels are inserted for grammatical rather than lexical information. There is a small set of affixes and stem forms that perform several functions that alter argument structure. For a generic diagnostic root *q-t-l*, we can represent these transformations by applying them *mutatis mutandis*. The most common ways of doing this include:

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[1] Weninger et al. 2011: 265.

-A *š- prefix, known as the C-Stem, generates causatives: *šaqtal, e.g. the Hebrew hifʕil[2] hiktib 'he caused to write'[3]

-An *n- prefix forms mediopassives, such as the Hebrew nifʕal.

Affixes also play a role in nominal formation, for example, the *m- locative which produces forms such as the Hebrew maqtal.

The most common derived stem is the D-Stem, which is formed by geminating the middle radical. It does several things, primarily generating transitive forms from intransitives, intensifying, producing verbal plurality, and deriving verbs from nouns.[4] These stems are all derivational mechanisms that take the basic G-Stem and transform it. There are also several less common forms attested. In particular, this paper seeks a function for the reduplication of the terminal radical.

1.2 Identifying Final Radical Gemination

In all Semitic languages there are lexical items of the form $R_1R_2R_3R_3$. The vowel template varies between qatlal and qatall. These are most cleanly delineated in Arabic, where they are recognized as Stem IX and XI verbs (the difference here being between qatlal and qatla:l). In Arabic, these forms are used exclusively for colors and defects of persons, such as red, green, hunchbacked, or blind. I looked both for words of the same stem form, i.e. $R_1R_2R_3R_3$, and for words belonging to similar semantic spheres. I could not use cognates for reasons that will become apparent below.

From this, I found that in other Semitic languages, colors and defects are typically of marked form and so I added forms such as $R_1R_2R_3\ R_2R_3$ to my list, reasoning that these might be by-forms of a paradigm in the proto-language that yields the $R_1R_2R_3R_3$ form I am focussing on. After tracking down examples in grammars and searching by semantic field, I did a random survey to find additional lexical

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[2] Linguistic traditions use different diagnostic roots in successor languages. Hebrew uses p-ʕ-l, Arabic f-ʕ-l, Akkadian p-r-s, Ethiopic q-t-l. This thesis makes use of q-t-l.

[3] *š>h in this case.

[4] Weninger et al. 2011: 156.

items, which I included in my analyses. I found that these forms are associated with adjectival values.

The fact that all Semitic languages show these same forms behaving in similar ways suggests that the association of the $R_1R_2R_3R_3$ stem with adjectival value goes back to proto-Semitic. Even the outliers formed part of the pattern, with inceptive values being the second most common, after adjectival, across the family. The distribution and function of the $R_1R_2R_3$ R_2R_3 stems also behaved consistently across the family, specifically in NW Semitic and Ethiopic. The $R_1R_2R_3$ R_2R_3 form in Ethiopic and Hebrew will be dealt with presently, but the close link between the $R_1R_2R_3R_3$ forms, colors, and adjectival values generally suggests that it played a role in adjective formation in the proto-Semitic period.

1.3 The Issue of Cognates

The analysis is complicated by the fact that there are few direct cognates in the semantic fields. Observe, for example, primary color words across the language family:

Table 1: Primary Color Terms Across Semitic

Language	Black	White	Red	Blue	Green
Arabic	*aswad*	*abyaṣ*	*aḥmar*	*azraq*	*waraq*
Akkadian	*ṣallamu*	*peṣum*	*sa:mu*		*warqu*
Aramaic	*ʔakkum*	*ḥewwar*	*summaq*		*yurraq*
Hebrew	*šaḥor*	*la:ba:n*	*ʔa:dom*		*ya:roq*
MSA	*ḥo:war*	*albo:n*	*ʔəferu:r*		*hśạ wr*
Ge'ez		*saʕidʕid*	*adam*		*ḥimilmi:l*

From this we glean a set of roots used as color words in Semitic. Here are some of the other referents for

these roots:

*š-ḥ-r—coal, dawn

*b-y-ṣ—egg

*ḥ-w-r—dawn

*w-r-q—vegetation

*ḥ-m-l—vegetation

*l-b-n—mud bricks, incense

*ḫ-m-r—dark liquids, wine, vinegar

*ʔ-d-m—earth, dirt, humans

This is not comprehensive, but the point is clear: Semitic languages show a wide variety of color terms. The roots themselves are shared, but their actual usage varies wildly between languages. An extreme example is ḥ-w-r, which in Modern Southern Arabian is 'black', but is 'white' in Aramaic, cf. §11. The important thing to note is that most of these roots are attested across the language family, but they are employed differently. The feature that unites these forms is that they have a marked primary form or by-form used specifically when they are a color term. Thus Hebrew ʔ-d-m is used in less marked forms for meanings such as dirt and humans. The G-Stem ʔa:dom 'red' is relatively unmarked. It is an infinitive form, applied adjectivally. However, ʔădamda:m 'reddish' is highly marked. Similarly, the persistent Stem IX and XI forms in Arabic are all highly marked.

In this case, the lexemes are not preserved from proto-Semitic to descendent languages. That is to say that there is regular lexical replacement of color words. This will be dealt with in more detail below, but because the lexemes for color are not shared in the various Semitic languages, it means that the words were replaced. Here, it is not a matter of finding cognates. Rather it is the structure itself that is preserved and used to derive new color words in each language. For all we know, none of the words now used for colors were used in this way in proto-Semitic, but the pattern of $R_1R_2R_3R_3$ probably was. Because structure is morphological in the Semitic languages, this is equivalent to tracking derivational affixes in an Indo-European language.

1.4 Methodological Corollary

I cannot track cognate forms across the family, as is typical in Indo-European work. Instead, I am tracking the relationship between semantics and stem formation, the pattern of root consonants in non-concatenative morphology, across the language family.

1.5 Previous Work

Little has been done directly on these forms, in part because grammars have focused on a single language and rightly treated these forms as outliers. As a result, what accounts do exist tend to be a minor facet of a larger, more comprehensive work on a specific language. Additionally, the terminology for these forms is unclear.

Historically, the focus has been on the doubled root-final consonant, meaning that roots of the type 1-2-2 have been considered as part of the type. As such the scope is poorly defined because these are very distinct phenomena. This will be dealt with at greater length later, but the usage does not pattern the same way, nor is their form consistent across the family.

For example, traditional accounts such as Wolfenson's 1906 treatment of the *piʕlel* do not actually look at *piʕlel*s at all. They look at *pilels*, i.e. words of the form 122, such as *hil:e:l* or *s-b-b*.[5] In the same paradigm, a number of grammars freely mix 122 and 1233 forms under the logic that both have geminate final consonants, perhaps also drawing on the notion that 122 forms are reduced triradical roots.

The cause of the doubling of the final consonant in stems of the form *q-t-t* is distinct from that of *q-t-l-l*. The behavior of the 122 roots is, in part, governed by analogy of pattern with the far more common triradical roots. When a root has a weak radical, i.e. a glide or laryngeal prone to elision, a speaker may not register it as a consonant. These weak roots have distinct behavior from strong roots, i.e. those in which all consonants register as such for the speaker.

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[5] Wolfenson 1906: 310.

In many of the cases cited, the form in 1-2-2 has a cognate form in a weak root. See the table below:

Table 2: Geminate and Weak Root Correspondence

1-2-2 Form	Reduplicated Form	Weak Root Form
ḥšš 'chaff' Ugaritic		*ḥwš* 'chaff' Ugaritic
ba:tat 'cut off' Heb., *batta* 'cut off' Arabic	*batbata* 'cut off' Ge'ez	
gll 'roll' Aram.	*gilgal* 'roll' Heb.	
r-m-m 'rise' Heb.		*r-w-m* 'rise' Heb.
gazza 'shear' Arabic		*g-z-y* 'cut off' Heb.
dkk 'crush, break' Ugaritic		*dwk* 'crush, break' Ugaritic

The 1-2-2 form may be a repair strategy for a weak root. Alternatively, the root in question may be inherently biliteral, with the weak form serving as a repair strategy.

Of course, I am not the first to propose this. Kuryłowicz[6] and Zygmunt Frajzyngier[7] have both suggested this as a solution for the strange behavior of biliteral roots and certain weak roots. The problem is that this has no use for our examination of terminal root reduplication in sound triliteral roots.

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[6] Kuryłowicz 1972: 12. *Non vidi.*

[7] Frajzyngier 1979: 1-5.

Similarly, when we see forms like 1-2-1-2, the root is biliteral. In these cases, the stem takes the form *qitqat* or *qatqata*, as in Hebrew *gilgal*.[8] However, a Qatlal such as *ʔamlel* shows an unexpected vowel pattern. Nor is the consonant pattern of a *qitqat* the same as that of a *qatlal*.

Other accounts lump these forms with any form that uses reduplication or quadriliteral roots and forms. A particularly egregious example can be seen in Alfadaly's account of Mehri, where the author uses *ləbenu:n* 'to become white' alongside *jəhesu:s* 'to intend'[9] as examples of quadriliteral roots, ignoring the fact that the first form is derived from the root *l-b-n*, which shows up as *lbu:n* 'white', while the other is cited as stemming from a root *j-h-s-s*. This is by no means unique, for Dillman et al.'s Ge'ez grammar does the same thing, i.e. treats this as a non-paradigmatic form in the language. Likewise, forms like *gilgal* and *kabkaba* are treated as quadriliteral. They are, but they are derived by reduplication from biliteral roots and the phenomena associated with them are going to be different from those we see with *qatlal*.

In addition, these forms are often all referred to as *qatlal*s or *qatull*s, which only confuses matters further. For example, Wolf Leslau's account of Ethiopic and Southern Arabian lists *miskin* 'poor', *idbehir* 'bee', *kibkib* 'star' and *qehelhin* 'egg' as "*qatlil*" forms.[10] Even the name *poʕlel* is confused. BDB use the term to describe roots with a medial waw in which the waw is not a consonant but a vowel marker, as with the root '*k-w-n*', which appears as the '*poʕle:l*' *ko:ne:n*.

Perhaps nothing is more emblematic of the overall confusion than the impetus for this paper. While reading Ezra in an Aramaic class, the question of the form *məso:bli:n* was raised. This form,

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[8] The matter of *gilgal* isn't quite so simple as for other lexical items. It has been suggested that gilgal is an importation of the PIE *$k^w ek^w lo$- 'wheel'. There are a few problems with this, most notably that *g-l* has broader uses in the Semitic languages, where we see it used to make 'skull', whereas in IE, *$k^w el$ is only linked to turning. It seems odd that a core body part, the skull, would be formed off a loanword, one shared with Ancient Egyptian, no less (*ḏꜣḏꜣ*) This sharing would suggest an Afroasiatic derivation, rather than a mutual loan from Indo-European in an archaic era. Reduplication is rare in the Indo-European noun.

[9] Alfadaly 2007: 42.

[10] Leslau 1943: 7.

according to the standard naming scheme, is a '*po:lel*' because of the waw following the first radical, s. When the form itself is treated, actual analysis is limited. Writers, mostly pre-Goetze, suggest that gemination and reduplication are archaic phono-aesthetic markers used for intensification and plurality marking.[11] In other words, the phenomenon is assumed to be unanalyzable, not part of a systematic paradigmatic process, but rather an ostensibly natural way that people mark big things and many of them.

The problem with assuming a purely phono-aesthetic motivation is that it fails to account for the function and distribution of these forms. This issue can be seen in Kouwenberg's recent work on gemination in the Akkadian verb, which revives the pre-Goetze analysis. He says, "in many other words reduplication is not onomatopoeic, but an extension..., which makes it more expressive or intensive."[12] He claims that Ar. *kabkaba* is derived from *kabb*, both of which he glosses as 'to overturn', but that the first is somehow a more intensive form due to its reduplication. This line of reasoning would argue that BH *gilgal* is an intensification of *g-l*, which seems suspect. More directly relevant for the matter, he cites forms of the 1-2-3-2-3 pattern, such as BH *ʔădamda:m,* as similarly indicating an intensification. Unfortunately for his model, it has exactly the opposite value in Biblical Hebrew. It, like the rest of the color Qataltal's in Biblical Hebrew, all signify diminutions of a color, i.e. 'reddish'.[13]

Similarly, in Ge'ez, *ʔădamdam* is simply the base form of 'red', while *saʕidʕid* means 'whitish'. Furthermore, and perhaps more importantly, this approach would fail to explain why we do not see these forms as regular intensifications of any adjective, such as a †*gadlulu* to *gadol* 'big'. Instead of appearing with these more commonly used words, the form's usage is confined to a comparatively limited distribution. A fuller discussion will follow an examination of the data.

V. Christian suggests that the original intensive stem is the **qatlal,* which merged with the

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[11] Kouwenberg 1997: 42.

[12] Kouwenberg 1997: 42.

[13] Brenner 1982: 42.

durative *qantal* to the *qattal*, thus generating the D-stem.[14] The veracity of this theory is not relevant to this thesis, but his suggestion that *qatlal* > *qattal* is very interesting for reasons that will be discussed later.

Whiting provides an excellent examination of the 'R' stem in Akkadian,[15] and this paper draws heavily upon it. Unfortunately, Whiting's work covers only Akkadian in any detail and does not really look beyond that language. Secondly, it focuses on roots with the R_2 reduplicated, dealing with R3 stems only as a potentially related subject. As a result, there is much work to be done on both the 1233 and 12323 forms.

Meanwhile, some recent work on the reconstruction and development of color terms in the Semitic languages has been done by Maria Bulakh.[16] She makes no mention of the irregular stems associated with them and does not try to systematize them. Nevertheless, she reconstructs a four-color system which will be discussed below (§11.4).

1.6 The F-Stem

In contrast to these approaches, I argue that neither the 12323 form or the F-Stem is a marginal form generated on the fly by iconic demands, but a historic and now submerged stem formation that dates back to the proto-Semitic era or earlier.

I propose that it was a means by which adjectives were formed from roots. This form had the greatest saliency in terms for colors. As the template became non-productive, existing words of this form were repurposed as derived nouns and as inceptives. It is distinct from other forms, such as the *qilqal*, nor is it a weak-root compensation strategy. I will refer to this form as the F-Stem. (For final reduplicate, given that R-Stem and D-Stem are already taken.)

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[14] Christian 1929: 209. *Non vidi*.
[15] Whiting 1981: 42.

[16] See series of works, Bulakh 2004-2006.

2. Notes on Defining the F-Stem
2.1 Terminology

Given the confusion surrounding the previous terminology, this paper will make use of the *q-t-l* root for discussing the stems/binyanim. There will be a one-to-one match between the consonants in this form and in the *q-t-l*-derived name, i.e. a word like *katab* is a qatal, while a word like *katabtab* is a qataltal. A quadriconsonantal root, as in a form *bagkapa* from a theoretical *b-g-k-p*,[17] would be rendered as a *qatlam*. Note that it has four distinct root consonants. Conversely, a form like *gilgal* from the root *g-l* would be a *qitqat* or *qilqal*. A "geminate" root as in *sabob* would be rendered as a *qalal* on the logic that it is a biradical root with the second radical reduplicated. For the reasoning for this, see below.

2.2 "Gemination"

Gemination is another term that must be defined for this discussion. Phonologically, gemination is the lengthening of a consonant, akin to a long vowel. It is not simply a matter of merging two identical consonants together, but rather is a distinct phenomenon. A true geminate consonant, i.e. a long consonant, cannot be dissected into two distinct segments but rather represents a distinct entity in the consonant inventory. Identical consonants run together can yield a long consonant—this is how we get them in English, e.g. *night train*. The *t* here is long, but never can a true geminate split and yield two short consonants.

Again, conventional discussions refer to roots like *s-b-b* as geminate roots, but at deep structure, the roots do not actually contain a geminate. Thus, if there is a form which shows two identical consonants divided by a vowel, then there are two of that consonant in the root. Between languages, this distinction may be lost, and the forms which show CVC may be lost, leaving either a single C: or C, which is what we see with forms such as Hebrew *ba:tat* 'cut in two' and Arabic *batta* 'cut off' in table 2 above. In those languages, we may safely assume that at deep structure there are not two of the same

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[17] Not an actual root, simply used here for convenience.

consonant in the root. Thus, the nomenclature geminate root is inaccurate for these roots.

Table 3: Geminate Roots: *s-b-b* and *r-d-d*

Prf	Imp
sabob	*yasob*

In Arabic:[18]

radda	*yardd-i ~ yardud*

In Arabic, the pattern of alternation between CC and CVC is the same as in the F-Stem, but the two are distinguished by the number of root consonants. Furthermore, in table 2 above, we have seen that these forms alternate with weak roots and reduplicated forms, as with Hebrew *r-m-m* and *r-w-m*. When attested as a weak root, the root inflects like a weak root of the class that it parallels.

There are also some cases where a geminate root attests to what appears to be a D stem, such as in Ugaritic, where *dl* 'poor' appears alongside *dll* 'to subjugate'. Despite this example, where we have both a 'G' and a 'D', most of the time geminate roots typically appear in only one form in any given language. Conversely, the F-Stem usually has an attested G-Stem, and when there is none in a particular language, a G-Stem cognate can usually be found elsewhere. Where we see multiple forms attested, there is almost always a difference in meaning between the F and the G Stems.

Finally, it is worth noting that gemination can arise phonologically to protect a short vowel.[19] This paper thus refers to roots with two radical consonants that alternate, either in a single language or across the

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[18] *radda* 'return' : *radadtu* 'I return'.

[19] Kouwenberg 1997: 24.

family, with a form with three radicals where radical two and three are the same, i.e. $R_1R_2 \sim R_1R_2R_2$, as biradical roots.

2.3 Weak Roots

Weak roots are of importance here in that they are a common source of irregular behavior in Semitic languages. The canonical form of a Semitic root is triradical. Three consonants are expected to be present. When this is not the case for one reason or another, the root interacts with inflection differently. For example, a medial glide may become part of a diphthong or act as a vowel. At other times, consonants assimilate and are lost in certain forms. An example of this is Hebrew root-initial *n*, which is assimilated to a following consonant when following a prefix,[20] e.g. perfect *na:fal* : imperfect *yi:pol (<*yinpol)* 'fall'. The *polel* may be a weak-root compensation strategy, but this form is not a *poʕlel*. The difference is between *qatat* and *qatlal*. If the form displays three root consonants, it cannot be a weak-root compensation strategy. Thus, weak-root phenomena cannot explain the *qatlal*.

3. Arabic

In Arabic, stem IX and XI verbs alternate between a *qatlul* and *qatullu* form based on inflection.

Table 4: Paradigm of Stem IX

Root	Perfect 1.sg..	Imperfect 1.sg..	Verbal noun	Participle
ḥ-m-r 'to turn red'	*iḥmarartu*	*ʔaḥmarru*	*iḥmira:r*	*muḥmarr*=case ending

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[20] Not all of them. For example, infinitive *linpol*, but *h-* prefix C-Stem *hipil.*

ḥ-w-l 'squint'	*iḥwalaltu*	*ʔaḥwallu*	*iḥwila:l*	*muḥwall*=case ending
ḳ-ḍ-r 'to turn dark green'	*iḳḍarartu*	*ʔaḳḍarru*	*iḳḍira:r*	*muḳḍarr*=case ending
z-r-q 'to turn blue'	*izraqaqtu*	*ʔazraqqu*	*izriqa:r*	*muzraqq*=case ending

This pattern holds for all such words, with Stem XI showing a lengthened initial vowel. The Qur'an shows only 11 instances of class IX verbs, which are actually variations on four roots:[21]

b-y-ṣ 'white' cf. Hebrew *beyṣa:h* 'egg'

ś-w-d 'dark'

ṣ-f-r 'yellow'

ḳ-ḍ-r 'green'

Other examples exist, such as *w-r-q,* cognate with Hebrew *ya:roq* and Akkadian *warqu,* while in Modern Standard Arabic, the pattern is still productive for colors.[22]

Sampling shows a few examples of $R_1R_2R_3R_3$s that do not inflect as above and are not colors:

1.   *buhlu:l* 'clown, fool', perhaps from *bahala* 'to curse'
2.   *fusṭa:ṭ* 'large tent', derivation unclear

There is also a form IX from the root *k-m-d* 'to darken, change color, (be) dull, be gloomy, be glum', which is of note in that it designates an optical effect, rather than a specific color.

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[21] cf. Dukes 2017.
[22] Ryding 2005: 579-581.

Traditional accounts of Arabic grammar have had conflicting explanations for the difference between Stem XI and IX verbs. Some claim it is a difference of intensity, while others suggest that Stem XI verbs indicate a temporary condition. As these stems differ only in the length of the vowel *qatlal* vs. *qatla:l* and are not readily distinguishable by speakers and scholars, it may simply be that the two forms are an artifact of prosodic variations at an earlier point in the language's development. Where it is word-final, the reduplication collapses to gemination and is simply preserved by adding a long epenthetic vowel to the end of the word.[23]

Based on the sample, it seems that terminal root reduplication is largely confined to Stem IX and XI forms. This is useful, since it gives us an example where the function of the form is clear.

4. Aramaic

Lexemes from Talmudic Aramaic have also been discounted, since they are often borrowed from Hebrew. For example, *ʔ-d-m* comes to be used as 'red' in Talmudic. Similarly, Aramaic shows an occurrence of *raʕănan*, but only in Daniel. There is, however, a cluster of color terms:

1. *yurraq* 'green/pale'

2. *ša:ḥar* 'black'[24]

3. *summaq* 'red'

4. *ḥewwar* 'white'

5. *ʔwkkm* 'black'[25]

6. *ṣhbyb < ṣhbhb* 'very yellow'

In Syriac, this pattern also comes to be used to derive nouns of action for D-stems.[26]

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[23] Fischer and Rodgers 2002: 29.

[24] Likely a loanword from Hebrew, though note the change in form.
[25] The older word for black, attested in Egyptian Aramaic.

Furthermore, sampling shows:

8. *bḥqḥwq* 'carefully', presumably from an unattested *bḥq*

9. *ble:ṣo:ṣi:* 'spark', from *b-l-ṣ* 'to blossom'

10. *baʕri:r* 'wild, brutish', from *b-ʕ-r* 'be an animal', or perhaps *b-ʕ-r* 'to burn'

11. *bṣlwlh* 'burning coal', root unclear

12. *brṣwṣ* 'crown of priestly turban', root unclear

13. *barqu:qa:y* 'a planet name', likely from *b-r-q* 'white, yellow, lightning'

14. *gaʔya:ʔi:t* 'haughtily', from *g-ʔ-y* 'be proud', though this may be the result of an -it ending

15. *gbšwšy* 'small pile of stones', from *gbš* 'to pile up', *gbšw* 'pile of stones'

16. *glšlš* 'baldness', from *glš* 'to be bald'

17. *gmzwz* 'juniperberry', derivation unclear

18. *grmrm* 'to be angered', derivation unclear[27]

19. *kdbb* 'to deny', from *kdb* 'to lie'

20. *kaslul* 'The name of a month'

21. *sglgl* 'v. make a ring around, adj. round', derivation unclear.[28] It may also be an irregular causative from *gll* 'round'

22. *sgnn* 'part of a boat', derivation unclear

23. *skrr* 'an unpleasant weather phenomenon', derivation unclear

24. *smqmyq* 'reddish', from *smq* 'red'

25. *splwl* 'plant name', derivation unclear

26. *sqʕwr* 'rabid', derivation unclear

27. *srṭṭ* 'to draw lines', from *srṭ* 'to scratch, draw'

Also, to colors we have:

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[26] Fox 2003: 289.

[27] There is a root *grm* 'bone; to cause to happen, pay a fine, err while slaughtering'.
[28] There is a D-Stem-only form *sgl* 'to acquire'.

28. *ḥwrwryn* 'glaucoma' from *ḥwr* 'white'

29. *hbrbr* 'to blind', here *w>b* from *ḥwr* 'white'

30. *šḥrwry* 'blackening' from *šḥr* 'black'

31. *dhbb* 'to be changed to gold', from *dhb* 'gold'

From these forms, we find 8 *qatlal*s with a clear derivation, 9, 10, 13, 15, 19, 27, 30, and 31, attesting at least two vowel patterns, *qte:lo:li:* and *qatli:l*. From such a limited data set, few conclusions can be drawn, but 15 is clearly a diminutive standing beside *gbšw* 'pile of stones'. 9 may be derived from something akin to 'blossom-ish'. 10 is straightforwardly derivable as 'animalistic'. Similarly, 13 makes sense as derived from 'yellowish'. 19 and 27 both seem to imply something about intention, while 30 and 31 have an inceptive value. There are also 4 *qataltal* forms of clear derivation: 16, 24, 28, and 29. Here, as elsewhere, when in relation to another color term, the *qataltal* modifies the intensity or is associated with a defect, in the case of 29, having a causative/inceptive value. The exception is 28, which is likely derived from "to become white", as evinced by the nominal ending, *-yn*.

The data here is not terribly clear, in part because of a very limited sample size due to a lack of good derivations for many of these forms. Nonetheless, 3 of our 8 *qatlal* forms make sense as extensions of an adjectival semantic value, and another 2 are inceptives. All 4 of our *qataltal*s are either inceptive or modify the intensity of another adjective.

What is clearer is that the basic color words are all marked in form. Even when they are likely to have been brought over as loanwords, the middle radical is doubled. Alone, this data is hardly conclusive, but it does fit the pattern that will be drawn across the rest of this thesis.

5. Akkadian

Some accounts of Akkadian also refer to an *š*-group of quadriliteral roots; for example, both

Caplice and Buccellati describe Akkadian quadriliterals as falling into two groups, an *š-* group, and an *n-* group of 4 unique radicals, with no mention of any other sorts.[29] [30]   However, there are also forms like *rašubbum*, which would fall into neither of these groups.   For this account there are three classes of interest.

5.1 *qatlal*

These forms show an early infinitive as *parusisum* or *parususum*, developing later into a *parussisum* or *parussusum*.[31]

Table 5: Paradigm of *parusisum*

Infinitive	Durative	Perfect	Preterite	Verbal Adj
parusis-um	*iparassus*	*iptarsas*	*iprasis*	*parussum*

These forms show *(u)qatallu(m)*:

1.   *šaqummu* 'silent, quiet, secluded, deserted', cf. *šaqummiš* 'in silence', *šaqummatu* 'silence of dejection, gloom', *šuqammumu* 'to fall silent'

2.   *šaḫurra=tu* 'awesome stillness', cf. *šaḫrartu* 'still', *šaḫurriš* 'in numbed silence', *šuḫurruru* 'to become dazed, still, numb with fear'

3.   *namurra:=ku* 'I am awe-inspiring', cf. *nama:rum* 'to shine', *nummuru* 'to illuminate, make glisten, sparkle, whiten, light a fire', *namrirri, namriri* 'supernatural, awe-inspiring luminosity (said of gods and daemons)'

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[29] Caplice 1988: 81.

[30] Buccellati 1996: 129.

[31] Huehnergard 2011: 42.

4.   *rašubbum* 'awe-inspiring', cf. *rašabum* 'to glow'

5.   *daʔummum* 'uncannily dark', cf. *daʔmum* 'dark'

6.   *šalummatu* 'brilliantly radiant', *šalummuku* 'I am of awesome radiance' (largely nonproductive)

7.   *namušušum* 'to die', cf. *nama:šum* 'to move'

There are also:

8.   *rapaššu* 'pelvis', likely from *r-p-š* 'to be wide'

9.   *šuqallulum* 'to hang', from *š-q-l* 'to hang'

10.   *šuparrurum* 'to spread out', from *š-p-r* 'to spread'

It is possible that 1, 2, 6, 9, and 10 are actually *š-* causatives. However this is very unlikely. No corresponding roots could be found for any of them. For 1, there is a *qamû* 'burn, consume by fire', *qummu* 'to burn'.[32] The closest I found for 2 was a *ḫara:ru* of uncertain meaning that seems to refer to a gesture of self-mortification. The CAD considers this a plausible analysis and for caution's sake I will disregard 2. For 10, no suitable root can be found synchronically, however, it is possible that *p-r* is an older biliteral root related to *p-r-s* cf. *parasu* 'to split'.

3 is a possible *nifʕal*, but no suitable root could be found. Cognates show *n-m-r* as a word for leopards and panthers. Given the lynx,[33] which has been suggested to derive from PIE **lewḱ* 'light', perhaps because of its shining eyes at night, it is possible that Semitic panthers were similarly named. More clearly and importantly, *n-w-r* is used for lanterns, and given the Akkadian alternation between *w* and *m*,[34] it is likely that *n-m-r* here is related to *n-w-r*, and is thus a probable F-Stem.

Random sampling also provided several distinct classes of words. Akkadian is riddled with loanwords:

11.   *balaggu* 'an instrument', Sumerian

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[32] I am reminded of Aramaic *kmm*.
[33] cf. Beekes 2009.
[34] Consider *Awel/Amel-Marduk, wardum, martum*.

12. *babrunnu* 'a color of horse', Indo-European via the Mitanni

13. *ditillu* 'final verdict', Sumerian

In addition to these clear loanwords, there are also a number of forms that are included on synonym lists or other catalogues and name specific species of flora and fauna, including:

14. *buṭna:nu:* 'a plant', though this may also be an -anu ending

15. *baluḫḫu* 'a tree and its resin'

16. *girillu* 'a tree'

17. *surinnu* 'a plant'

18. *durummu* 'a bird'

and so on. Similar to these are a number of trade goods, including textiles:

19. *dašannu* 'jewelry'

20. *gunakku* 'a kind of cloth', a wanderwort, cf. Aram. *gonakka* 'a kind garment' and Greek *kaunake:s* 'thin cloak'

21. *sasullu* 'a textile'

22. *sumukku* 'a textile'

23. *gusannu* 'a kind of leather bag'

24. *saddinnu* 'a cloth/garment'

25. *butinnu* 'a sandal button' and so on.

There are also a number of words which show no clear connection to a root:

26. *busukku* 'child'

27. *kalappu* 'ax'

28. *kalammu* 'part of a chariot'

29. *garakku* 'small ritual jug'

30. *gidimmu* 'a spade, shovel'

31. *garunnu* 'heap, mound'

32. *guzullu* 'a bundle of reeds'

33. *simakku* 'cella, sanctuary'

34. *sugullu* 'herd', potentially from *s-g-l* 'to acquire'

35. *surummu* 'part of an intestine'

In general, loanwords from Sumerian show a geminate final consonant, so the safe assumption is that the vast majority of these are Sumerian in origin. In addition to these, there are a number which show indications of phonological processes. These take a few forms. Adjacent consonants sometimes assimilate, typically dentals, as with *guḫalṣu ~ guḫaṣṣu*, but it can happen with anything, as with **kabkabu > kakkabu* 'star'. As a result, some of the forms found may be quadriconsonantals with regressive assimilation. A further class of geminate final consonant is triggered by the attachment of a feminine *–tu* ending, as with *balaṭu* 'healthy' : *balattu* 'reservoir (f.)'. Thus, whenever a form has a final doubled *t*, it could be due to a feminine ending.

Another phonological alternation is that between a:C and aC:, as in *sima:nu ~ siman:u* 'season, proper time, time',[35] *gusa:nu ~ gusan:u* 'leather bag with a cover', and *sala:ḫu ~ šuluḫ:u* 'sprinkle, moisten, wet'.[36] The latter form is specialized for ritual ablutions, but still freely alternates with the former. In addition, there is also a media-geminate form with an identical meaning to the former two forms, *sul:uḫu*. This even happens with Sumerian loan-words, such as *sapa:ru ~ sapar:u* 'net, thrown net'.

Nor is the phenomenon limited to [+Continuant], as may be seen with *suḫu:pu ~ suḫup:u* 'stock(?) (meaning uncertain)'. Given that 'geminate' consonants sometimes alternate with Sumerian long vowels, it has been suggested that 'gemination' in many of these cases does not represent a long consonant at all, but perhaps marks stress. As a result, 11-35 will be discarded for our analysis as likely loanwords. Nonetheless, there are forms which show a clear relationship to a root and do not attest a by-form with either a quadriradical or a long vowel and cannot be explained as involving an assimilation to a

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[35] Given *simtu* 'a person who is fitting' and *asa:mu* 'to be fitting', *sima:nu* has an *-anu* ending. Regardless, it geminates in the same way as other forms, indicating that the alternation is a natural prosodic one.

[36] The *š/s* alternation occurs sporadically in Akkadian.

feminine ending. In addition to the ones commonly discussed, the following forms belong to this category:

36.   *duluhhû* 'trouble, confusion', from *duluhu* 'to stir up'

37.   *sulummu* 'peace treaty', cf. *sala:mu* 'to become reconciled'

38.   *sapannu* 'a flat area, a plain', cf. *sapa:nu* 'to flatten', potentially an *–anu* ending

39.   *kurussu* 'a strap', cf. *kara:su* 'to tie, fasten'

40.   *kutummu* 'a veil, a cover, a lid', cf. *kata:mu* 'to cover, obscure'

41.   *kubussû* 'regulation', cf. *kaba:su* 'to stride, step on, regulate'

42.   *kudurru* 'boundary stele, boundary line', cf. *kuda:ru* 'a topographic feature of some sort'

43.   *kara:na:nû* 'wine-coloured', cf. *kara:nu* 'wine, grapevine', probably with an *–anu* suffix

44.   *šulummu* 'to become well', cf. *šala:mu* 'be whole, be well'

From this overview, there seem to be at least two distinct classes of derived lexemes showing the form *qatlal*: deverbal nouns (8 and 36-44), and adjectivals (4-6, 9, 43, and 44).

There are several plausible explanations for this distribution. First, it may be that these forms are the result of some number of distinct derivational mechanisms that have collapsed in form prior to recorded Akkadian. If this is the case, then some of these 'geminates' may indeed be phonologically derived either by the presence of a now lost long vowel, or some eroded suffix. However, given the larger pattern of adjectival association with terminal radical reduplication and no direct evidence of such a suffix in Akkadian or elsewhere in the language family, I prefer that forms 1-8, and 36-44 all be derived from a single stem, with the exception of 43, which seems more likely to contain an *-anu* adjectival suffix.

It is also possible that these reflect spelling conventions that vary by region. I do not know enough about cuneiform orthography to judge this for myself and so am trusting the CAD's judgment that these are genuine lexical items and not the artifacts of spelling.

With Semitic derivational mechanisms, substantives can be easily formed from adjectives. This works quite easily with an example such as *kurussu* 'strap' or *kutummu* 'veil', where the form is

transparently a nominalized attributive adjective. The English gloss 'regulation' causes hesitation with 41, but a regulation is 'a thing which causes regulation, i.e. something that regulates'. English makes a theta-role distinction between regulator and regulation, but there is no reason to expect Akkadian to make the same distinction. The case for 37 is the same. 'peaceful' > 'a peaceful one/peacefulness' *bel salammu* 'a lord of peacefulness, i.e. ally'. I'd like to parse *salammu* in the phrase *bel salammu* as 'peaceful', hence, 'peaceful lord, i.e. ally', but that is not clear. What is clear is that *salammu* modifies *bel*, indicating, regardless of precise parsing, an adnominal role.

It is also entirely possible that the form changed in meaning over time in Akkadian before vanishing entirely, perhaps in parallel to the tendency for Sumerian loanwords to have geminate final consonants. Perhaps a *qatallu* came to have the same gravitas as sumerograms even after Sumerian ceased to be spoken.[37] This could account for the numinous connotations of many of these words, in addition to allowing for the later direct derivation of nominal forms.

This leaves only 9 and 10 unaccounted for, since the rootless and nonce forms 11-35 have been discarded as loans, as has 43, as a clear derivation. 2 may also be a derivation via a feminine/abstract suffix *-tu*, and so is removed. As a result, the proposed stem seems to function adjectivally in 16 out of the remaining 18 cases.

It is also worth noting that *da'ummu* is productive and has inceptive value in later texts, a pattern which reoccurs in Ge'ez, see 6.2 below.

5.2 *qatalla'*

parussa:ʔ 'to come to a conclusion'

kušarra:ʔu 'payment', from *k-š-r* 'ingot'

Buccellati suggests that these forms have a semantic value of 'planned actions' and they are attested with

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[37] Cynically, this may well account for the large number of trade goods with geminate final consonants—it exoticized the commodity, similar to the name *Haagen Dazs*, which, despite its European flair is actually from The Bronx and is meaningless.

weak roots:[38]

ʔukulla:ʔ 'food ration'

mudda:ʔ 'knower', though this may be from *w-d-ʔ* 'know', with *w > m*, an attested transformation in Akkadian.

I suspect that these are phonologically-derived final geminates since they all have the suffix *-a:ʔ*. This would attract stress, and thus trigger a long consonant prosodically, parallel to the way that a third consonant in a quadriradical Akkadian word is often long.

5.3 Medial Geminates

Parallel to this, we also have a number of media-geminate adjectives with parallels elsewhere in Semitic:

haššaʔu 'crippled'

marraṣu 'sickly'

ṣallamu 'black'

warraqu 'green'

šammahu 'impetuous'

gubbuḫu 'bald'

gurrudu 'balding, mangy', cf. Heb. 'to scrape'

ḫummuru 'crippled/lame/shriveled'

kabbulu 'lame, cripple', cf. Heb. 'to bind'

kabburu 'obese', from 'much, many', cf. Heb. 'be much, great', perhaps also related to *k-b-d* 'be heavy',

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[38] Buccellati 1996: 98.

later used as 'glory', as in Biblical Hebrew *kavod*

ṣabbutu 'lame, paralyzed', cf. Heb. 'bind', as well as Akk. *ṣabit* 'grasp'

gurruṣu 'leprous(?)'

nurrubu 'skin defects'

qummālu some sort of skin defect, cf. Heb. 'to be decayed'

Many writers have remarked upon the correlation between these forms and those in Hebrew, but formally there is nothing that separates them from other media-geminates that I am aware of.[39]

5.4 Conclusion

Akkadian presents an interesting data point because to a large extent, the F-Stem seems still to be functional in the oldest texts, but with a function unlike what we see elsewhere. Buccellati suggests that it functions as an elative,[40] but in light of my sample, I think it is much more clearly a derivational mechanism for first adjectival values and then nominalized forms. The remaining adjectival forms acquire distinctive traits, such as numinosity and intensity (whence Buccellati's conclusion), but the abundance of adjective-derived nouns in my sample do not suggest that that is a satisfactory explanation; otherwise we would need to posit that 'very flat' became 'flats, plains'. Instead I propose that in an abundance of other related forms (likely G and D), 'flat' > 'flats' and 'still, quiet' became 'deathly still'.

6. Ge'ez and Ethiopic
6.1 The State of the Family

Ethiopic on the whole has been poorly studied. There is some debate as to its precise taxonomy, but the Ethiopic languages are primarily split between Northern and Southern languages. Ge'ez is a Northern

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[39] Fox 2003: 42.

[40] Buccellati 1996: 42.

language, but has the oldest written tradition by far, and is the best studied in the Semiticist tradition. There also exist synchronic studies on other more modern languages, but the historical processes at play in the Ethiopic languages are complex and poorly understood on the whole, compared to the rest of the family.

Ethiopic as a whole makes more widespread use of reduplication, presumably due to contact with other (mostly Afroasiatic languages) in the area. These themselves are poorly studied as well, but include Cushitic and Omotic languages. Ethiopic contains a large number of unique roots not shared elsewhere in Semitic, presumably owing to its contact situation.[41] Further, modern languages have phonemic gemination, clouding the presence of terminal root reduplication. Root shape is far freer here, with *-t-* and *-r-* infixes, as well as quadri- and quintiradical roots attested.

In light of these factors, I have chosen to focus on Ge'ez, as opposed to doing a wider survey. The sample size is smaller, but it is clearer. The same problems are at play (influence from unknown languages), but in contrast with a language like Tigrinya, Ge'ez has been studied from within the same Semiticist tradition as the rest of the classical Semitic languages. Again, some data does exist on Tigrinya and Amharic, but it is far more focused on the synchronic aspects of the languages; nor are these works yet at a point where they focus on more obscure patterns. With this, the surrounding languages are not yet well enough understood to allow us to examine the full scope of the influence they have had on the Ethiopian Semitic languages.

This is not to disregard Leslau's massive contributions to our understanding of Ethiopic, but he is one man, and there is much more data that must be collected. His dictionary of Ge'ez is used extensively in this section.

Thus, Ethiopic is here represented by Ge'ez, and hopefully more work will be done on the rest of the Ethiopic language family to allow for a more complete analysis.

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[41] See any one of numerous articles on the subject, for example Gragg 1991.

6.2 *qatlal*

1. *kæwəlælæ* 'become giddy', alternates with *kolala*; this is a weak root.

2. *ṭæbəlælæ* 'roll up', related to Heb. *ṭəbu:l* 'turban'

3. *ba:ḥəræræ* 'terrified', cf. Ar. *baḥira* 'be startled'

4. *ba:ḥəræræ* 'sink (intransitive)', from *b-ḥ-r* 'body of water'

5. *ḥænəqæqæ*[42] 'be anxious', derivation unclear

6. *ḥænəbæbæ* 'bear fruit', from the *ḥ-b-b,* cf. Ar. *ḥabba* 'berry', Tigre *ḥəbb-it* 'berry', and therefore not a case of a *qatlal*

7. *śa:hbæbæ* 'be moldy', perhaps linked to Ar. *šahuba* 'grey'

8. *ša:ḥlælæ* 'be dry, hard as iron', derivation unclear, perhaps related to the next form

9. *śa:hlælæ* 'to be dried up', derivation unclear, perhaps related to the above

10. *færəzæzæ* 'burst [of a bud], open up, be cheerful, produce fruit', related to *f-z-(z),* cf. Ar. *fazza* 'become excited', Heb. *pzz* 'be agile'; Ethiopic augments with an *-r-*[43]

11. *firəgægæ* 'form (a scar), become inflamed, heal', possibly related to *fargəʿa* 'form pea-shaped lumps on the body', attested only in Ethiopic

12. *ṭæwəlælæ* 'be flabby, hang loose', derivation unclear

13. *za:həlælæ* 'grow weak, soften, be indolent, be sluggish, play the fool', attested both as *z-l-l*, Haruṣiṣi, Syriac, Heb. and *z-h-l*, Ethiopic and Arabic

14. *ḥæbəqæqæ* 'stain, mix, bedaub [oneself]', from *ḥ-b-q*, 'mix'. The attested form is the primary stem in Ge'ez.

15. *ma:həlælæ* 'supplicate, beseech, invocation', perhaps related to *mæhælæ* 'to take an oath'

16. *bæhənænæ* 'vanish, evaporate', also 'rise into the air, wake with a start', from *b-h-n* 'dust', attested only in Ethiopic.

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[42] Here realized, like all emphatics, as an ejective, in this case *k'*.
[43] Leslau 1987: 167.

17. *dæməšæšæ* 'erase, blot out, obliterate, destroy', cf. *dæmæšæ* 'id.' and, in my opinion from the root *d-m-š* 'cover', cf. *dæmæsæ* 'cover, hide' on the logic that the meanings 'obliterate' and 'destroy' are extensions from 'erase, blot out'

18. dængægæ 'delimit, mark boundary', derivation unclear, exclusive to Ethiopic, all forms of which show either reduplicated final segments or geminates.

19. dænzæzæ 'be numb, be dull, be sluggish, become deaf', derivation unclear, exclusive to Ethiopic, all forms of which show either reduplicated final segments or geminates, though Amharic also shows *dænnæzæ* 'be blunt' : *dænæzzæzæ* 'be numb, be slow'

20. *læḥo:šæšæ* 'whisper softly', cf. *læḥæšæ* 'murmur', cf. Hebrew *l-ḥ-š* 'whisper'

21. *kæmo:šæšæ* 'somewhat serious, smile', derivation unclear, perhaps from *k-m-š,* cf. Ar. *kamasa* 'be stern looking'

Some of these forms (1, 6, 10, 13) seem actually to be 1-2-2 roots extended, usually with an infixed -n-, or -r-. This said, they are being treated here as triradical roots and three of the four are adjectival or inceptive in value. They will be disregarded in any event.

The remaining 17 forms seem mostly to be adjectival in meaning, as with 3, 5, 7, 8, 9, 12, and 21. A similar number seem to represent changes in state, as with 2, 4, 11, 14 (become painted), 16, 17, and 19 (become deaf), with some of them being usable for both, 13 and 19. This is a small sample, but the numbers are suggestive of inceptive and adjectival value.

These vowel patterns are typical of triradical verbs, as with *ba:rækæ* 'he blessed', and *dægænæ* 'he followed', and no particular motive for the selection of one over the other was evident.

6.3 *qataltal*

Color terms are attested in *qataltal*, instead of the *qatlal*:

1. *ṣæʕædʕæ:d* 'whitish', from *ṣəʕdəw* 'white'

2. *ḥæmælmæ:l* 'green', from *ḥæml* 'vegetation'

3. *dæmænmæ:n* 'gloomy', from *dæmmænæ* 'be dark, cover with clouds'

4. *qæya:ḥyəḥt* 'reddish', from *q-y-ḥ* 'red'

   Also in this category are character traits and sensory characteristics:[44]

5. *ḥæzænzæ:n* 'mournful', from *ḥæznæ* 'be sad'

6. *ʕæṣæbṣæ:b* 'very hard, time of famine, narrow path', from *ʕæṣæbæ* 'difficult, be harsh', also Hebrew *ʕ-ṣ-b* 'be pained'

7. *mæʕærʕæ:r* 'like honey, i.e. sweet', from *mæʕa:r* 'honey'

These forms seem to be derived from more basic terms, either representing a modification of intensity, as with 1, 2, 3, 5, or a means of generating an adjective from a noun.

6.4 Conclusion

Ge'ez provides us with interesting information. In near every clear triradical root with a reduplicated terminal radical, the form is adjectival or inceptive.[45] 7 of these 17 are inceptive, 7 adjectival, and 2 could be used both ways. Meanwhile, the *qataltal* forms are universally adjectival. Where an adjective already exists, they modify its intensity or range. Otherwise, they make an adjective from a noun. This pattern matches what have seen elsewhere, both in *qatlal* and *qataltal*.

7. Hebrew and Canaanite
7.1 *qatlal*

1. *raʕăna:n* 'luxuriant', derivation unclear

2. *šaʔăna:n* 'quiet, peaceful', from the root *š-ʔ-n* 'be at ease, at peace'

3. *ʔumlal* 'withered, faded', BDB suggest a cognate in Arabic *ʔamal*, 'to hope, to expect'.

4. *kimri:r* 'gloominess', perhaps from *k-m-r* 'warm, tender, hot', possible cognate in Syriac. See

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[44] Dillmann et al. 1907: 232

[45] This is shown by 19/21 surface *qatlal* forms.

below.

5. *sagri:r* 'steady rain', from *s-g-r*, cf. Arabic *sagara* 'to fill with rain'

Note that 1 and 2 may also be the result of *-anu* endings.

7.2 *qatall*

There exist color terms of this form:

1. *ʔădumma:h* 'red f.sg.', from *ʔ-d-m*

2. *śəruqqo:t* 'red, ruddy f.plr.', from *ś-r-q*

3. *šəḥo:ri:m < šaḥurrim* 'black m.plr.', from *š-ḥ-r*

4. *nəquddo:t* 'spotted f.plr.', from *n-q-d*

5. *ʕăquddi:m* 'striped m.plr.', from *ʕ-q-d*

However, there are also words that follow this pattern but are not color terms:

6. *gəmalli:m* 'camel m.plr.', from *g-m-l*

7. *kəlimma:h* 'insult, reproach, ignominy f.sg.', from *k-l-m* 'to insult'

8. *səgulla:h* 'possession, property f.sg.', from *s-g-l*

9. *gədulla:h* 'greatness f.sg.', from *g-d-l*

10. *gədiyyo:t* '[goat] kids f.plr.', from *g-d-y,* though this may also be the result of an *-iyyot* suffix.

Others include gentilics, such as:

11. *ka:libbi:*

7.3 *qataltal*

1. *ʔădamda:m* 'reddish', from *ʔa:dom* 'red'

2. *yəraqraq* 'yellowish, greenish, pale', from *ya:ro:q* 'green, yellow, pale, vegetation'

3. *šəḥarḥo:ret* 'blackish', from *ša:ḥor* 'black'

4. *ḥŏmarmar* 'reddish, blush', since has come to mean 'burnt, scorched', from *ḥ-m-r*, which covers

various dark liquids such as wine and vinegar

5. *ḥăparpa:ra:h* 'mole', from *ḥ-p-r* 'to dig'

6. *ʕăqalqa:l* 'crooked', from *ʕ-q-l* 'to bend'

7. *pətaltol* 'tortuous', from *p-t-l* 'to twist', cf. *pa:ti:l* 'cord', cf. *niptalti:* 'I have wrestled', lit. 'twisted myself'

8. *ḥălaqlaq:o:t* 'slipperyness, smoothness, f.plr.', from *ḥ-l-q* 'to be slippery, smooth'

9. *hăpakpak* 'crooked', from *h-p-k* 'to turn, to overturn'

10. *ʔăsapsup* 'rabble, collection', from *ʔ-s-p* 'to gather, collect'

7.4 Other Canaanite Languages

Of course, Hebrew isn't the only Canaanite language. We also have corpora from neighboring regions. Phoenician, which is easily mutually intelligible with Biblical Hebrew, has the largest corpus, but does not make frequent use of either the *qatlal* or *qatalla* form. These terms are rare and their meanings are unclear and thus have not been included in this work. Ugaritic, several centuries older and spoken at Ras Al-Shamra[46] shows *šḥrr-t* 'blackened'.

7.5 Conclusions

The matter of the theoretical F-Stem in Hebrew is complex. The color words that we would expect to have a doubled final radical do indeed show reflexes in either that form (*qatlal/qatall*) or with a *qataltal*. The problem is that other roots without *qatlal, qatall,* or *qataltal* cognates in other languages show the *qatall* form. The matter of the *qatall* is the easiest to address.

7.5.1 qatall in Hebrew

Given that gentilics such as 7.2.11 show a geminate terminal radical, a prosodic explanation of the form of these words and perhaps all *qatall* words in Hebrew is tempting. Prosodically derived gemination is hardly unknown in the Semitic languages, as in the D-Stem.

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[46] On the Syrian coast, not too distant from the Turkish border.

Paradigmatically, nouns (and color adjectives) sg. *qata:l* : plr. *qatall-* show a shortening of the vowel, which makes sense given the addition of the plural suffix. It has been suggested that such *qatall* forms are relics of the movement of stress in Hebrew from Proto-Canaanite's word-initial stress to Biblical Hebrew's word-final stress. Specifically, it seems that *a:l* alternates with *al:*, as the two syllables have the same prosodic weight.[47] Since the gemination[48] is only triggered when an additional –V(C) segment is appended morphologically, and thus is accompanied by a shift of stress back in the word, from the old penult or ultima to the new penult or ultima, it seems compelling that the gemination is a response to the movement of stress between a penult-stressed form and an ultima-stressed form. In this model, gemination would have been universal for a time.

The gemination, however, is for the most part not preserved in the attested forms, which raises the possibility that these are loans. Certainly the word for camel seems as likely a candidate as any. However, the cognates of *gəmal:i:m* show no long consonants anywhere in their paradigms. This would imply that this development is unique to Hebrew, or at least to the Canaanite dialects. It would also suggest that the introduction of the camel to the region occurred prior to the movement of the stress to the ultima. This is because the trigger for the lengthening of the *l* was the movement of the stress. Had the camel been introduced after the shift, it would not have undergone lengthening in compensation for stress movement.

None of this rules out the 'gemination' in words such as *śəruqqo:t,* where we do have cognates that show a clear F-Stem with a reduplicated final radical. Unfortunately, since these forms have collapsed fully with relic forms showing genuine phonologically-derived gemination, Hebrew can only be used to corroborate data seen elsewhere, at least with the *qatall.*

7.5.2 qatlal in Hebrew

The *qatlal* forms in Hebrew are not particularly useful one way or another. They all work within

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[47] Gray 1934: 26.
[48] And this, I do believe, is gemination in cases such as that of *gəmal:i:m.*

the framework I propose for the F-Stem, but most lack clear cognates. Specifically, the derivation of *raʕăna:n,* and *ʔumlal* are unclear. Despite the fact that BDB suggest a connection between *ʔumlal* 'fade, wither' and Ar. *ʔamal* 'to hope, expect', the semantic values seem discordant. It may be that *ʔumlal* shows a prothetic vowel. In Hebrew, this would usually be an *e,*[49] but an assimilation of rounding from the *m*, thus *e > u,* would hardly be surprising. This would make the root *m-l-(l)*, which is attested in the same semantic value. This root is also shared with 'to say, to speak', 'to scrape', and 'to circumcise'. The latter two do not show cognates, but perhaps they are derivative of the same root as 'to fade', i.e. scraping is a reduction, as is fading, and as is a circumcision. In each case, something is being removed. As for the meaning 'to say, to speak', I have no suggestions. In any event, the fact that it seems to be a biliteral root removes it from consideration as it is irrelevant.

The remaining forms are a bit more useful for our purposes. *šaʔănan* is derived from a root 'to be peaceful' that shows up in both Ethiopic and Syriac. It comes to be used as a noun, i.e. 'one at ease', as in Jb 12:5. Syriac is suspect due to the potential for loans from Biblical Hebrew, but Ethiopic is more secure.

kimri:r 'gloominess', perhaps derived from *k-m-r* 'to be warm, tender, hot' also supports the F-Stem. There is a possible cognate in Syr. *kəmar* 'to be dark, black, gloomy, sad', but this may also be a loan from Hebrew. This said, the form in Syriac does not show a reduplicated final radical, but this does not rule out semantic calquing.

sagri:r 'steady rain' is perhaps the clearest of these forms. We can derive it from a *s-g-r*, cf. Arabic *sagara* 'to fill with rain'. If the root *s-g-r* is 'to rain', then, following the logic of the F-Stem, *sagri:r* would mean 'rainy', i.e. 'characterized by steady rain'.

All in all, the examples from Hebrew, with the exception of *sagri:r* and perhaps *kimri:r,* do not provide strong evidence for either side in the discussion of the F-Stem. The examples can be construed to support the model, but only in the case of the final two examples is that clearly the simplest solution. As

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[49] Moscati et al. 1964: 60.

with the *qatall-*, *qatlal* data in Hebrew will be used only to corroborate patterns observed elsewhere.

7.5.3 qataltal in Hebrew

In later Hebrew, on into Modern Hebrew, the *qataltal* becomes a diminutive, such as *kəlabla:b* 'puppy' from *keleb* 'dog'. This usage is plausible in Biblical Hebrew and certainly explains *ḥəparpa:r* 'mole', i.e. 'little digger' or perhaps more colloquially a 'diglet'.

So too is it with the remaining words (6-10) in Hebrew, each of which stands beside a less highly derived adjectival as an attributive adjective, with the exception of 10, which seems to have been nominalized, 'gather, collect' to 'a gathering, a collection'.[50] Thus, Hebrew suggests an old attributive form that underwent a change to a diminutive/approximative form. This would parallel a change in the English suffix *-ish*, which was initially simply an attributive form, as in *English* or *Swedish*, and later became an approximative form, *coldish*.

8. Mehri and MSA
8.1 The Problem with Mehri

Mehri and the other Modern Southern Arabian (MSA) languages have very small corpora. Much of the information about them currently available has been collected by Johnstone. Unfortunately, parts of his corpus are disorganized and others are unclear.[51]

Most of Rubin's work is a codification of Johnstone's data. Meanwhile, contemporary work on MSA is limited to a few scholars, such as Watson, and is still ongoing and more concerned with matters such as syntax, as opposed to morphology. It also has a synchronic rather than diachronic focus.

With languages like Jibbali, the situation is so bad that lexical data has to be gleaned from works

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[50] The other option is that it was a diminutive of 'collection', certainly plausible if diminutives take on a pejorative value.
[51] Rubin 2010: 42.

on Omani flora.[52] What data does exist outside of Johnstone via Rubin and Watson is mostly written by non-linguists or is not easily accessible, appearing in unpublished Omani Theses.[53] Furthermore, there is no "modern comprehensive grammatical study... of any MSA language other than Mehri." [54]

As a result, there remains much to be learned about these languages. Nonetheless, while the current literature has not noted the forms of interest to this paper as a distinct category, F-Stems have been observed in the data that has been gathered thus far.

8.2 Colors

1. *Ɂəferu:r* 'to become red'
2. *ləbenu:n* 'to become white'
3. *həweru:r* 'to become black'

There is also a set of 'diminutive' adjectives cited in Watson,[55] but their usage is not explained clearly. Given the limited data, it is more likely that 'diminutive' is actually 'diminutive/approximative'. Rubin makes no mention of these, presumably following Johnstone, nor is there a mention of their existence in Jibbali.[56, 57]

Color: approximative ms.: approximative fs.: approximative pl.

1. *ḥo:war: ḥawa:ri:r: ḥwarro:t: ḥwarrawtan* 'black'
2. *hśǫwr: haśa:ri:r: hśarro:t: hśarrawtan* 'green'
3. *albo:n: alba:na:n: albanno:t: albannu:tan* 'white'

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[52] Rubin 2010: 8.

[53] Rubin 2010: 9.

[54] Rubin 2010: 13.

[55] Watson 2012: 42.
[56] Johnstone 1981.
[57] Rubin 2014.

4. *u:bo:n: u:ba:ne:n: u:banno:t: u:bannawtan* 'white'

A sampling from Johnstone's Mehri Lexicon provides the following:

1. *ʔa:fe:ro:r* 'flush, blush, pale with anger', from *ʔ-f-r*, cf. *ʔatfər* 'to paw over, muck up, soil',

    cf. *ʔo:for* 'red'

2. *ʔa:ḳbo:b* 'a tree', derivation unclear

3. *dəġrayr~dəġro:r* 'peak, summit, point', from *d-ġ-r*, cf. *dəġa:r* 'to push st. sharp into st.'

4. *dəġšeš* 'high point, cliff, edge', from *d-ġ-š*, cf. *dəġa:š* 'to prick, to poke', Syriac *dəgaš* 'pierced'

5. *dəḥli:l* 'cave', derivation unclear

6. *dəḳlayl~dəḳlo:l* 'beak, peak', from *d-ḳ-l*, cf. *dəkawl* 'to push with the beak, nose, said of an

    animal'

7. *kərfi:f~kərfo:f*[58] 'lip, face', from *k-r-f*, cf. *kəruf* 'to sniff'

8. *məḳḥayri:r* 'shin bone', derivation unclear (I'm reading it as a *maqtal* with the *ay* as a diphthong)

9. *ḳətəba:b/ḳətəbbu:t* 'doll', derivation unclear

10. *ḳətfi:f* 'wing', derivation unclear, perhaps related to Hebrew *ka:na:p*.

11. *səgdu:d* 'to bow in prayer', from *s-g-d*, cf. *məsgi:d* 'mosque'

8.3 Alternation

There are also some verbs attested as *qatlal*s which alternate with a form in the *qattal* in the perfect and other derived stems:

   mattaḥ < *matḥaḥ 'he oiled the skin' (cf. imperfect *yamtḥūḥ*)[59]

Unfortunately, due to the paucity of data, it is not clear whether these alternating stems also attest a G-stem, nor has a comprehensive list of such forms been gathered. More fieldwork must be done before such a task can be attempted. Unfortunately, there are significant barriers to collecting such data at

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[58] There is also a *kofir:r* with the same meaning. It is unclear whether this is a mistake on Johnstone's part, an accidental metathesis on the part of the informant, or if both words exist in Mehri. Presumably it is the same root.

[59] Watson 2012: 19.

present. It is also worth noting here that Mehri and the other MSA languages do not show D-Stems, instead using an L-Stem[60] for all such functions.

9. Assembling the Data
9.1 The F-Stem Form

The primary form of interest here is the $R_1R_2R_3R_3$ form. $R_1R_2R_3R_2R_3$ forms are also tracked because they appear in similar contexts to the $R_1R_2R_3R_3$ forms in Arabic, which has the clearest pattern, in Hebrew, and in Ge'ez. Finally, anomalous $R_1R_2R_2R_3$ forms were tracked when they appeared in a similar semantic domain as the Class XI and IX forms of Arabic.

This means that I tracked colors and defects across all languages and found them to cluster in form. Forms of $R_1R_2R_2R_3$ are less significant for this study in that they may simply be an extension of the frequentative or habitual meaning, but are still significant in that they are marked. This means that color is marked in all Semitic languages.

Moreover, Mehri shows a linkage between the $R_1R_2R_3R_3$ and $R_1R_2R_2R_3$ forms driven by prosody. Because Mehri does not make use of the D-Stem, there is no analogic motivation for the $R_1R_2R_3R_3$ to alternate with a $R_1R_2R_2R_3$; thus the change must be driven by other factors. We shall return to this later.

In that the $R_1R_2R_2R_3$ form mirrors that of the D-Stem, it is less marked than the $R_1R_2R_3R_3$ or $R_1R_2R_3R_2R_3$ forms. As the sampling has shown, these are rare forms, but they do tend to show similar usages.

I am not worried about vowels for two primary reasons. First, the vowels behave in an ordinary manner for each language. By and large, the theory is that vowels served to mark theta-role assignment in

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[60] *qa:tal.*

early Semitic. In particular, this usage of vowels survives in limited scope into Akkadian.[61] Moscati also analyzes the semantic values associated with these patterns in his comparative grammar.[62] Similarly, Fox's treatment of the Semitic Noun is centered upon vowel patterns and he discusses the role each one plays in the various languages.[63]

Beyond this, the behavior of the consonantal structure seems to be that of a stem. Various vowel patterns can be applied to a stem for different purposes. Thus it is no surprise that there is not a distinctive vowel pattern.

9.2 The F-Stem's Function

Chart 9.1: Functions of forms by Language

	qatlal~qatall(u)	*qataltal*
Hebrew	Adjectives	Adjectives
Aramaic	Unclear	Adjectives
Arabic	Color and defect adjectives, possible inceptive	NA
Akkadian	Numinous adjectives, substantives	NA
Ge'ez	Inceptives, Adjectival forms	Adjectives

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[61] Buccellati 1996: 95.
[62] Moscati et al. 1964: 78, 123.
[63] Fox 2003: 31.

MSA	Adjectives, possible inceptives	Unclear

The indication is that there is indeed a cluster of adjectival and inceptive value in these forms. Furthermore, wherever there is both a *qatlal* and *qataltal* form of a word or a G-Stem color word and a *qataltal* in a single language, the *qataltal* indicates a change in intensity. These forms are thus related as part of a system, one which extends beyond the boundaries of any single language.

10. Explaining the Data
10.1 Is the F-Stem a Valid Linguistic Sign?

It is useful to rule out alternatives to a semantic motivation for the F-Stem:

The pattern is not derived phonologically as some natural class. While many of the examples involve sonorants, the [-continuant] third radical in Ar. *azraqqu* shows that any consonant may be subject to reduplication. Furthermore, were it a phonological accident, we would expect to see more examples and for them to be not so neatly clustered semantically; see below.

Another alternative is unsound-root compensation; but many of the roots involved are sound, such as Ar. *z-r-q*. Further, the attested behavior of these *qatlal*s does not match the behavior outlined in §2.3 for weak roots.

It is also possible that these forms are randomly occurring, i.e. noise due to quadriliteral roots. This was tested by a random sampling by searching dictionaries for forms under b, g, k, and s.

The result is that while there do indeed seem to be a few forms which are 'noise', there is an overall trend of adjectival or inceptive significance for these *qatlal* forms. The matter of the *qataltal* and any relationship it may have to the *qatlal* will be dealt with presently. From the options just outlined, it is

most logical to consider the forms examined in this paper as reflexes of a single stem.

10.2 What is the Oldest Reconstructable Form of the F-Stem?

The question, then, is what the relationship between the *qatlul, qatullu* and *qattul* forms may be. The *qataltal* will be dealt with separately. Because it stands in paradigmatic relation with the *qatlal*, it is less likely to have been derived from it or vice versa.

In theory, the oldest, or at least the underlying form would be a *qatlul*, assuming a disyllabic word. The motivation for this assertion is that *qatlul* is more marked than either *qatallu* or *qattul*. A *qat:ul* or *qatal:u* could be potentially triggered by prosodic shifts producing genuine gemination, whereas for a *qatallu* to produce *qatlul*, we would have to posit that the long consonant was first degeminated and then copied after an intervening vowel.

Conversely, assuming an initial *qatlul* provides a cleaner method of derivation, at least in form, with a shift of stress simply collapsing a *qatla:l* or *qatlal* into a *qatall*, an alternation attested in Arabic and MSA. Data from Mehri also shows that a *qatlal* can alternate with a *qattal.*

Similarly, assuming that a *qattal* yielded a *qatlal* leads to problems. If the *qattal* form came first, then we must assume that a subset of forms fissioned from the overarching D-Stem pattern via dissimilation of the second member of a long or geminate consonant. However, geminates are inseparable. c_3: cannot become c_3vc_3, but a shift of stress can eliminate a vowel, rendering c_3vc_3 c_3c_3v, i.e. c_3:v. In order to derive two identical short consonants, we must assume a shortening and copying; we cannot assume a split. Despite our orthographic convention of rendering them as two phonemes (*qattal)*, they represent a single long consonant and we are thus forced to assume a *qat:at(:)al* between the *qat:al* and *qatlal.* This *qat:atal* would have come about as the result of a reduplication of the second radical for some unknown purpose. The reduplicated second radical could then somehow assimilate to the third radical. We do indeed see very rare variations of *qat:atal* in Akkadian and Ethiopic, both of which attest forms with a reduplicated second radical. Whiting, among others, suggests that it marked a durative,

which is not related to the semantic cluster we observe for the F-Stem.

Akkadian attests a *purrari:s,* which is very rare and seems to parallel the D-Stem. In fact, Whiting[64] considers the attested form as a parallel development to the D-Stem. The Ethiopic form serves a variety of functions, parallel to the D-Stem. Indeed, it seems that a potential *qatatal* may well tell us more about the D-Stem than the F-Stem. This said, we could posit a loss of gemination triggering some sort of overcompensation, but the typical response is lengthening of a vowel; i.e., we would expect **qat:al* to become **qa:tal*.

Either way, assuming primacy of the *qattal* would require us to posit **qat:al >* qat:at(:)al > qatlal > qat:al*, the final step of which, we actually observe. It is certainly possible that a **qatatal* might yield *qatlal,* but to posit this would be to compound improbabilities, and this thesis is concerned with finding a proximal explanation for terminal-root reduplication. The matter of deriving the occurring forms will be dealt with below.

Since the F-Stem is attested across the family with consistent semantics, and the *qatlal* form seems primary, the most logical conclusion is that the F-Stem is an inherited one. If this is the case, then we might be able to identify some sort of parallel in other Afro-Asiatic languages, which could aid in clarifying the F-Stem's function.

10.3 Beyond Semitic

Unfortunately, the situation in Afro-Asiatic mirrors the one in Semitic: there are several very well studied sub-groups and morphological categories, and the rest is unclear.

Berber, for example, though well studied synchronically, has been the subject of very little historical work.[65] Meanwhile Chadic has had less than one third of its languages formally described.

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[64] Whiting 1981: 37-38.
[65] Frajzyngier and Shay 2012: 22.

Furthermore, of these, the majority have only a single description. [66] This means that little can be said about these languages historically, which, in turn, makes statements about Proto-Afroasiatic problematic.

The most important observation for our purposes is that adjectival morphology is rare across the Afroasiatic family.[67] The family also evinces varying degrees of non-concatenative morphology, clearest in Egyptian and Berber, the two groups thought to be most closely related to Semitic.

Berber is less useful for our purposes for a few reasons. First, proto-Berber has not been adequately studied. Secondly, and linked to this, reduplication is largely nonproductive in the Berber languages, with the exception of Tuareg, which seems to have borrowed it from the Chadic languages.[68] This means that in order to derive useful data from Berber, I would need to survey the languages personally, a task beyond the scope of this work.

Conversely, analyses of Egyptian do provide useful data for this work. Egyptian shows a tendency to form adjectives for occupation, sound, and color via forms of the type 12323.[69] 122 and 1233 stems are common, typically in repetitive, continual, or normative value.[70] By the time of Middle Egyptian, it seems that this system of derivation was largely nonproductive; and it plays no role in New Egyptian. By and large, this machinery looks very similar to that seen in Semitic; Gardiner makes numerous comparisons and even suggests that there was middle radical gemination at play in Egyptian.[71]

Reduplication in Egyptian fills several functions. According to Bendjaballah and Reintges,[72] forms of the shape $R_1R_2R_3R_3$, $R_1R_2R_3R_2R_3$, and $R_1R_2R_3R_1R_2R_3$, as well as biradical counterparts are all productive in Old Egyptian. There is even an $R_1R_2R_1$ pattern. Most of these signal what is generally known as "pluriactionality", i.e., they describe habitual or repeated action. However, there is another

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[66] Frajzyngier and Shay 2012: 242.
[67] Frajzyngier and Shay 2012: 525.
[68] Frajzyngier and Shay 2012: 38.
[69] Gardiner 1927: 42.
[70] Allen 2014: 166.
[71] Gardiner 1927: 42.
[72] Bendjaballah and Reintges 2009: 139-40.

category which is very restricted in form. Imperfectives are formed by reduplicating the second radical of a weak root, yielding for example, *prr* 'to be coming' from *prj*[73] 'to come'. Similarly, prospective passives are formed from strong roots by reduplicating their terminal radical. For example, *rxss*[74] 'will be slaughtered' from *rxs* 'to slaughter'. After this form loses productivity, the stem is made into an inceptive for adjectives in Coptic, precisely the behavior we see in Semitic. The degree of parallelism between Old Egyptian and proto-Semitic is questionable. Certainly there is no direct evidence for a prospective passive value in Semitic, nor do such forms act as pluriactionals which mirror the D-Stem. However, it may be that these are parallel developments from earlier forms in a shared ancestral language. What matters for this paper is that in a language with a generally similar structure, an older adjectival form which had lost its meaning was repurposed as an adjectival inceptive or inchoative in a descendent language, which may be very useful in explaining the pattern of usage we see in the Semitic languages. I suggest that as the forms were rarer in Semitic, the refashioning was less consistent, but this does give us a parallel lens.

Further investigation will require additional reconstruction, allowing us to find cognates in the biliteral roots. Regardless, similarities in root-building suggest that the development of these forms dates to the union of Egyptian and Semitic and that root building processes were already in play at the time of Egyptian-Semitic unity.

10.4 Deriving the F-Stem

Deriving the attested forms from a **qatlal* is not a straightforward process. This is because the roots that do or do not attest *qatlal* forms are semantically, rather than phonologically clustered. There is no natural class phonological explanation for the stem form, while the semantic clustering is clear.

Instead of a strictly phonological shift, which should admit of no exceptions and produce results compatible with a tree model, it makes more sense to view this as being in the domain of semantically

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[73] The Egyptian *j* is distinct from the *y*.

[74] Bendjaballah and Reintges use *x*, but the more conventional representation for this sound is *ḫ*.

motivated analogy.

Given the data from Mehri and Arabic, it seems likely that the stem existed in two forms, a *qatlal* and *qatal:*, which alternated based on stress. At some point, there was evidently a phonological shift such that *qatlal* also alternated with *qat:al*. Loss of a final segment, such as the loss of case endings (at least in cases where the form would have been nominal) caused the collapse of *qatal:* with *qatal*. This new set of paradigms would not have been recognized as related by the speaker, producing a case of paradigmatic split. Likely, the newly-generated paradigm merged with those it resembled, G or D stem.

The actual sound shift that triggered the collapse of some phonological manifestations of the F-Stem with another paradigm need only have functioned over a limited semantic domain. Once the altered or fissioned paradigm was established in some cases, other lexical items would have been similarly refashioned, with the changes being based on analogy. This would have occurred at different rates in different speech communities based on the semantic domains which were salient to the speakers. The process could have then been triggered in the proto-Semitic era, but once initiated, would have spread at different rates in different languages, resulting in an uneven distribution.

Instead, I propose a shift based on frame semantics. Rather than a swift and total loss of a form due to a sound shift, as when case endings are lost due to erosion of final syllables, I propose that this change is closer in nature to the erosion of the various classes of strong nouns in Old English, where the more productive *-s* plural marker replaced the internal plurals of English. We still have pairs like *mouse : mice, goose : geese*, but these are rare. So too, then, in Semitic a less productive form was replaced by a more productive one. The distribution of these forms, then, is based on the spread of the newer, more productive forms, since, when a new form is innovated, it replaces the old form, leaving it in specialized functions, just as the older *brethren* is now relegated to religious and ceremonial connotations by the more productive *brothers*. Just as the *-en* plural in English is perfectly viable phonotactically, but was displaced by the *-s* plural, so too could the F-Stem have been pushed out by another stem (probably the D, see below). However, whereas in English, the shift was not mediated by semantic field, the forms in

Semitic do tend to cluster by semantic value, most clearly in the Arabic IX and XI stem's specialization to designate colors and defects, but also in other languages, such as the numinous cluster in Akkadian, the so called 'color diminutives'[75] of MSA, and the marked forms of defects in Hebrew and colors in Aramaic, which appear as a specific subset of media-geminate forms. Unless we posit vanished affixes, phonology alone cannot explain the distribution of the forms. Instead, a frame semantic model is more useful. It seems clear that analogy is a force in this change, spreading a given form to semantically germane words, for example the expansion of the *qataltal* form in Modern Hebrew as a diminutive, e.g. *kəlabla:b* 'puppy' to *keleb* 'dog'. Here the semantic frame is 'small things' and the pattern is applied across the frame. The patterns are extended analogically based on the characteristic gestalt of a particular semantic category.

Nonetheless, if we assume that in Proto-Semitic **qatlal* and **qatall(a)* alternated phonetically, as they do in Arabic and the Hebrew "Geminate Roots", then at some point **qatlal* > **qattal*, as shown in MSA. The geminate collapsed word finally, yielding **qata:l*. This was analogically regularized to *qata:l* or *qat:al*. This process explains the marked vowel patterns seen in some forms, as in Aramaic *quttal*. This is because the syllable structure was different from that of other words, meaning the stress driven shifts of vowel quality did not occur in the same way.

This yields the observed *qatol* in Hebrew quite easily, though without a better understanding of the stress conditions, the vowel quality of the *qattal* is unclear.

11. Conclusions
11.1 Summary

In light of the distribution of $R_1R_2R_3R_3$ forms in the Semitic languages, I believe it is most likely that they are the remains of an old and submerged stem. As strange as it may seem, given the Afro-Asiatic aversion to adjectival morphology, the simplest model is one in which this F-Stem is in fact adjectival.

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[75] Properly, color approximatives.

These seem to have been an open class, as will be suggested below. I propose that it was a means by which adjectives were formed from roots. It likely involved some alternation between $R_1R_2R_3R_3$ and $R_1R_2R_2R_3$ forms. This form had its greatest saliency in the derivation of color terminology. As the template became nonproductive, existing words of this form were repurposed as derived nouns and as inceptives. The specifics of this will be dealt with below.

11.2 Timing

Despite the uncertainties associated with the factors surrounding the attrition of the $R_1R_2R_3R_3$ form, we can gain some idea of when this stem developed. Specifically, the form can have begun to function no earlier than the solidification of the triradical root, as its site of action is on the terminal radical. If the similarity with Ancient Egyptian constructions is a valid one, then this was still a dynamic period in the derivational morphology of the language, given that the role of the F-Stem is filled by a *qataltal* equivalent in Egyptian, with the F-Stem proper having a different semantic value. However, it may just be that the two language families split after the derivational mechanisms that led to the triradical root structure had been initiated but before such forms had been regularized. Certainly, the variation seen in Ethiopic could suggest that it took quite some time for Semitic to develop the archetypical triradical root, and there is a finite number of root consonant formations, so the similarity between Egyptian and Semitic stems may just be coincidence. That is to say, the variation in forms found in Ethiopic may indicate that the primacy of the triradical form is comparatively late in the developmental history of the Semitic languages.

However, Ethiopic has likely been influenced by surrounding languages, many of which productively employ reduplication. The derivational morphology for both root formation and for reduplication (and for new stem forms) is mostly nonproductive by the time Ancient Egyptian is attested and is nearly so in Akkadian, suggesting an archaic date for the end of this period in both families.

More specifically, for Semitic, the loss of the F-Stem as a fully productive form may have

occurred, in principle, at three possible times: before the development of the D-Stem, coincident with the rise of the D-Stem, or at some point after the D-Stem had become regularized.

The data from Modern Southern Arabian would strongly suggest that the F-Stem could not have become nonproductive after the D-Stem had become regularized because it seems that these languages never developed the D-Stem, using instead the L-Stem.[76] [77] The D-Stems that are observed in MSA seem to be loanwords from Arabic,[78] and Watson does not report them as productive. If it turns out that further research reveals that the F-Stem is fully productive in these languages, then that might suggest that the D-Stem's existence played a causal role in initiating the loss of the F-Stem; but given that the grammars have not noted this and the fact that even with no D-Stem, we still observe the *qatlal > qattal* shift, this scenario seems unlikely. Conversely, this same fact indicates that the F-Stem did not directly create the D-Stem because were this the case, MSA would show the D-Stem.

This leaves the first option: the F-Stem became moribund before the D-Stem developed. Analogy with the D-Stem is doubtless responsible for the acceleration of the loss of relic forms later in the history of these languages, but given the D-Stem's absence and the lack of a productive F-Stem in MSA, the two cannot be directly linked unless we can come up with a compelling reason why the wildly successful D-Stem should not catch on in Mehri.

In this model, the F-Stem would already be losing ground, perhaps as part of a paradigmatic shift in the grammatical structure or simply due to the loss of a set of endings, resulting in phonological shifts. At around this time, the *qatlal > qat:al* shift occurred. This would, at some point afterwards, have been reinterpreted as falling into the nascent D-Stem, except in proto-MSA, where the D-Stem never caught on, presumably due to that family's being on the periphery of Proto-Semitic.

From there, the remaining *qatlal* forms were eroded via analogy with the D-Stem in semantic

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[76] Rubin 2010: 42.
[77] Watson 2012: 42.
[78] Rubin 2010: 42.

blocks as the D-Stem took on more semantic frames, until the recent demise of the F-Stem in languages such as Aramaic, where the form for colors is marked, but still has the skeleton of a D-Stem, or in Hebrew, where the *qittel* displays a unique vowel pattern.

In any case, the F-Stem remained somewhat productive in the semantic domain of color words, and, in cases such as Arabic, defects.

11.3 Meaning of the F-Stem

The question of the semantic value of the F-Stem is a complex one. Not all forms attested fall into a clearly delineated semantic field, and in both Southern Arabian and Ethiopic, F-Stems are more common. However, in general, the form seems to be clearly associated with adjectives of sensory properties, be they color or luminosity, or personal characteristics.

As for the other *qatlal*s, it may be that they are quadriliteral roots, nonce formations, or additional relic formations from the original F-stem. Unfortunately, the Modern Southern Arabian languages, where they are most common, are also the least well studied, with research being hampered by a minimal written corpus and political instability in the region. As a result, dictionaries and similar resources required for semantic evaluation are next to non-existent.[79] For these reasons, this investigation will base the assessment of the semantic value for the F-Stem on the clear cases only, with the assumption that any such conclusion will tend to be too narrow.

Given this model, there are several possible options:

1) The F-Stem may have contributed one of the core semantic fields of the D-Stem. This means that it signalled valence change, pluractionality, or frequentative/habitual meaning.

2) The F-Stem modified Aktionsart, performing a role in the tense-mood-aspect (TMA) system, such as marking an inceptive, durative, etc.

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[79] Rubin 2010: 42.

3) The F-Stem is adjectival, marking adjectival value directly and concretely.

4) The F-Stem filled a function with no parallel in the attested Semitic languages, such as indicating an antipassive voice.

Kouwenberg's analysis of the role of gemination and reduplication would suggest that "reduplication iconically reflects and underlines their [the lexemes'] expressive character". "Reduplication... has not been grammaticalized".[80] The argument is that gemination and reduplication both serve as markers of intensity, duration, and number.[81] Additionally they would not be systematic, but spontaneous.

The problem with this is that this is not what reduplication does. It can signal intensification, but this is not inherent to the process. A good example is the Indo-European reduplicated imperfective, e.g. Greek *dídōmi* 'I give' (present), or the Proto-Indo-European stative, often preserved as the perfect, e.g. Greek *léluka* 'I have freed'. In Mandarin *chi yi chi* means 'to eat a little', as opposed to *chi*, 'to eat'. Meanwhile, in Modern Hebrew, the *qataltal* is used to form diminutives.

More importantly, Kouwenberg's analysis does not fit the data. Where *qataltal*s are attested alongside *qatlal*s, as in Hebrew, they signify a reduction in intensity; *ʔa:dom* 'red' : *ʔǎdamda:m* 'reddish'. In Mehri, the *qatlal* form also signals reduction.

Furthermore, if this was a freely iconic phenomenon, it would presumably produce forms randomly as the speaker required them, and we would expect to see forms such as †*bərakrak* or †*bərakak* with a meaning like 'bless greatly'. It seems odd that colors should receive more emphasis than something like 'great' or 'powerful'-- we do not see †*gəbarbar* 'very mighty', †*kəbadbad* 'very weighty/respected', or †*gədaldal* 'very high'. One would imagine such forms to be far more at home in a biblical text exalting a deity than in a poetic text discussing hair or a legal text discussing skin diseases.

Moreover, though there are hard-to-classify forms, particularly in Ethiopic, nothing about these

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[80] Kouwenberg 1997: 43.
[81] Kouwenberg 1997: 16.

seems to represent increased duration or number. If this were the meaning of the reduplication, then we would expect *ya:roq* 'green sg.' : *yəraqraq* 'green pl.'. The fact that these forms stand in organized, parallel relation to the G-Stem means that this is a grammaticalized process, albeit with a perhaps obscure and limited function in the attested languages.

A simple possibility, suggested by Buccellati, among others, is that the form could be an old elative. A term meaning 'rather bent' could certainly come to refer to a hunchback. A problem with this analysis is that there already exist shared syntactic methods for producing such elative values in the Semitic languages and other Afroasiatic languages such as Berber. Unless the form is a relic of Berber, Egyptian, and Semitic unity (as these all show syntactic methods for comparison), if not Proto-Afroasiatic itself, this would require a morphological form to develop alongside the existing syntactic one before being repurposed.

A number of glosses for F-Stems have an inceptive meaning, and it is worth considering this as the primary semantic value of this formation. A drawback of this interpretation is that F-Stem forms show full conjugation in all aspects in languages such as Arabic and Akkadian, meaning that these languages would be able to form perfective and imperfective inceptives, although the notion of an imperfective inceptive is difficult to imagine. While this ability to be combined with aspectual marking may only have arisen following the fossilization of the F-Stem, it is the additions of affixes and the resulting and inevitable shifts in stress based upon these affixes that caused the demise of the F-Stem via the alternation between *qatall, qattal,* and *qatlal*. The fact that the *qatall* and *qattal* forms seem to have served as points of neutralization with other paradigms would suggest that the F-Stem was inflected in an archaic period. If so, we might expect to see inceptive forms at the core of other Afroasiatic TMA systems, because the inceptive value would have been quite ancient.

Another problem with taking the inceptive value as primary is that this makes it difficult to explain many of the lexical items built according to this form, as well as their distribution. The defect words offer no indication of being inceptive and we might reasonably expect an F-Stem 'to become bent'

to assume the meaning 'to bend over' rather than 'permanently hunchbacked'. Why should it be that 'become red' survives while 'become small, i.e. decrease' does not? How do we explain 'terribly bright' from 'become bright'? Simply put, the adjectival clustering seems strange if this was indeed an inceptive, where we would reasonably expect relic forms such as 'lay the foundation' from 'begin to build'.

The opposite possibility, that the inceptive value was derived later on, once the initial motivation for the F-Stem was lost, would account for why there are inceptive color terms in the F-Stem in Ge'ez, Arabic, Akkadian, and possibly MSA (see above), but only in Ge'ez is that a primary function of the form (as a means of providing a contrast with the G-Stem form of a given color). That is to say, when the F-Stem was pushed out, one of the responses was to specialize the form in an inceptive value, but only in Ethiopic did this new use become productive. This will be examined below.

The F-Stem could simply be adjectival. This makes a lot of sense, given that many of the color terms and defect terms have cognates and other forms with nominal or verbal meaning from which the adjectival use can be derived, such as *ʔăda:ma:h*, which can be straightforwardly derived from *ʔa:da:m* 'earth' or *gibbe:n* 'hunchbacked', from a presumed *g-b-n* 'to be bent'. Similarly, the various forms from *ḥ-w-r* are linked to the light contrast before/after dawn, hence its attestation as MSA 'black', Aramaic 'white', and Aramaic 'dawn' across the family. If this was the case, then the G-stem form of the color is likely a back-formation after the F-Stem ceased to be productive.

Table 7: Deriving Adjectives

F-Stem	Corresponding root or cognate	Semantic Derivation
Akk. *gaballu* 'bald'	shave	(perpetually) shaven
Various. *ḥmrr* 'red'	wine	wine-like

Akk. *rapaššu* 'pelvis'	wide	the wide thing
Heb. *gibbe:n* 'hunchbacked'	bend	bent
MSA ḥəweru:r 'black'	dawn	dawn-ish
Aram. *ḥəwwar* 'white'	dawn	dawn-ish
MSA *ləbanu:n* 'white'	moon	moon-ish

From there, the attested G-Stem would be a back-formation. If a G-Stem verb could mean 'to be red', as a back-formation from the F-Stem 'to be red', itself derived from an earlier G-Stem 'to be earthy', then it would be typical for the newly innovated G-Stem formation to fill the role at the center of the system, pushing the F-Stem form aside, which is what we see.

This is supported by the fact that while the Semitic languages share a root such as *ʔ-d-m*, only a subset of them employ it as a color term. To expand on this, my sample shows that core color vocabulary varies greatly between languages. For example, the most widespread basic color word is *waraq* 'green'.[82] Only Southern Semitic does not use it as a primary color term. Given that it's only used for green, we would expect that it was clearly differentiated from black, white, and red. This would place it in a stage III (4 color) language, using Berlin and Kay's color typography.[83] Where, then, did the terms for those other colors go, particularly since the same lexical root is used for both black and white in the family? Clearly these color terms are derived and derived recently, i.e. after the breakup of the proto-language.

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[82] Though note that *waraq* derivatives can also be used to denote plants.
[83] Berlin and Kay 1969.

As strange as the conclusion that all terms for colors in the Semitic languages and Proto-Semitic are derived may sound, there is also precedent for this in the comparative corpus. Several Chadic languages show derived terms in place of basic color terms. Specifically, Mina shows terms for 'red', 'blue-green' and 'white' derived via a suffix. Similarly, Central Giziga shows derived forms for 'red' and 'black'.[84] Again using Berlin and Kay's color typography, we would expect words for 'black', 'white', and 'red' to be the oldest and most stable. It need not have been the case that all color words in Proto-Semitic were derived, but it is plausible, and the data suggests, that some of them were. The variability of color terms suggests that they are an open class in Semitic languages, meaning that they gain members easily. Primary color terms are typically a closed class in Indo-European languages, but open and closed classes vary by language. In Japanese, for example, pronouns are an open class, while they are some of the most conservative words in many other languages.

Ge'ez in particular presents a challenge to the idea of the adjective as the primary value, with the inceptive function of the *qatlal* in that language. In addition, many of the attested forms are unique to the Ethiopic languages. As a result, their form, with infixes and doubling, may be part of a specifically Ethiopic phenomenon. However, the fact that Ethiopic shows a number of inceptives, a pattern replicated throughout the family, is intensely interesting in light of the behavior of Egyptian. There we see a number of adjectival forms being recycled as inceptives of size, quality, and color in the Coptic period.[85]

I propose that the same thing happened in the Semitic languages, with the older adjectival value being replaced with an inceptive one. It neatly accounts for the data and is demonstrated to have happened in a related language family.

Given the parallelism with the Egyptian data, it may be that these forms once had some sort of prospective (i.e. future) passive value as well (though that seems like a secondary function to me), but there is no evidence for this in earlier periods of Egyptian, and thus I err on the side of caution and merely

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[84] Frajzyngier and Shay 2012: 272.
[85] Bendjaballah and Reintger 2009: 150.

ascribe earlier adjectival value to the F-Stem.

It is possible that this usage is a later development from a yet earlier stage. For example, given the frequency of Ergative alignments in surviving Afroasiatic languages (including Cushitic which has a marked nominative case), and some evidence of residual ergative properties in the Semitic languages,[86] it is possible that the F-Stem was once an antipassive in an ergative pre-proto-Semitic era. If the languages were ergative, then typologically, we would expect to see an antipassive, which omits subject instead of object. If ergative morphology ceased to function, such a form would be repurposed, and given the function of an antipassive, it is quite possible that it might well become adjectival. However, given that the existence of ergativity in Proto-Semitic is still contested, this is less a means of explanation than a proviso that if Proto-Semitic was indeed ergative, we would expect residual morphology be repurposed, and that something like an antipassive could indeed explain the F-Stem, rather than proposing that the F-Stem *is* a repurposed antipassive. The proximal explanation for the *qatlal* form that best fits the data is that it represented a means of deriving adjectival value from a noun or verb.

11.4 Color in Semitic

The most recent work on the Proto-Semitic color words has been by Bulakh, who reconstructs a four-member system, white, black, red, yellow-green consisting of **lbn* 'white', **θ'lm* 'black',[87] **ʔdm* 'red', and **wrq* 'green'. These are not unproblematic, however, particularly in light of the distribution of these roots in the attested languages. Nevertheless, Bulakh's reconstructions will serve as the basis of the following discussion:

*lbn

*lbn is lost from the Akkadian lexicon and replaced with *peṣu*. It is then carried into South Semitic,[88] but

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[86] Lipiński includes a section on this in his comparative Semitic grammar (1997: 253-262). At precisely what point alignment shifted is irrelevant; I merely include it as a possibility.
[87] The root is *ϑ'-l-m*, with *ϑ'* designating an emphatic interdental fricative, perhaps realized as an ejective.
[88] Bulakh 2006: 270.

is independently replaced in Ethiopic.[89] It is carried into Central Semitic, only to be replaced in Arabic and Aramaic.

Conversely, outside of South Semitic it serves as a term for (sun baked) bricks and for aromatic trees and resins,[90] attested in Akkadian as *libittu* for the finished product 'brick', and as *laba:nu* 'to make bricks'. The terms for resin are likely loans from the production regions on the Southern Arabian Peninsula, and since Ugaritic and Imperial Aramaic attest *lbnt* brick words, in addition to Arabic and Hebrew, it may be that in its use to describe bricks, this root is a *Wanderwort* as well. However, it is interesting that the term should be used for the products of drying on opposite ends of the family— aromatic resins such as frankincense are harvested in the Southern Arabian Peninsula and the Horn of Africa, i.e. the South Semitic zone. In Qatabatic, i.e. Old Southern Arabian, it serves as a term for the storax tree and its resin, as it does in Ethiopic and elsewhere. However, in Modern Southern Arabian, i.e. South Western Semitic, it serves as the color term.   It is also worth noting that Akkadian *laba:nu* is a G-Stem to the D *lubbunu* 'to thicken, reinforce'. It may be that the word originated for drying, with the meaning white coming from the appearance of sun-dried bricks and powders.

θ'lm

θ'lm appears as 'black' only in Akkadian and Ge'ez,[91] but is replaced independently four times. This distribution would suggest it is a shared archaism, but *θ'l-(l)* appears across the family in the meaning 'shadow', cf. Akkadian *ṣillu*, Ugaritic *θ'l*, Hebrew *ṣe:l*, Arabic *ḍ'ill*, Ge'ez *ṣəla:lot*. Given the similarity between the behavior of this root and other 'geminate roots', I suggest that this form is ultimately a biconsonantal *θ'l*. In light of this, it seems likely that *θ'lm* itself is a derived form. Some Chadic, Cushitic, and Omotic cognates seem to exist, however, all of which take the form *č/c-l-m*, suggesting that the *-m* derivational suffix is quite old. These forms mean variously 'shadow', 'dark', and 'black'. In Hebrew, we have *ṣelem* 'image, likeness', and in Aramaic, a cognate term is used to refer to statues.

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[89] Bulakh 2007: 187.
[90] Bulakh 2006: 271.
[91] Bulakh 2006: 250.

As noted above, *θ'lm is replaced independently four times. Furthermore, the replacement in

MSA, ḥo:war is derived from the same root as the term for 'white' in Aramaic. It may be that these

opposed meanings are pure coincidence, but given that ḥ-w-r is also attested as 'dawn', I believe that the

more likely origin is that the 'dawn' value is older and both the color values are derived from it. This is

supported by a similar phenomenon surrounding the root š-ḥ-r.

Conversely, several other terms are used for black: ḥwr, kwm, and šḥr. *ḥwr has been discussed

above, but šḥr is interesting in that it seems to be similarly derived. Hebrew and Aramaic attest it both as

'black' and 'dawn'. Aramaic also attests it as 'to wake up', evidently an extension of the 'dawn' value.

Arabic also attests saḥara 'the time before dawn', giving us proto-Semitic *šḥr 'dawn'. More

questionably, Bulakh adduces Akkadian šuḥru of unknown meaning,[92] used to describe hides, facial

expressions, and other objects as a cognate. It could plausibly mean 'dark' and would fit the phonological

template. A side consequence of this is that these sky-terms may be quite old. Meanwhile, the Aramaic

kwm ~ ʔkm 'black' looks surprisingly similar to the Ancient Egpytian kmm 'black'.[93] If this is indeed the

case, then this form would have been a term for 'black' alongside *θ'lm.

*ʔdm

*ʔdm appears in Canaanite and Ethiopic as 'red' and always in the company of a qatlal or qataltal; i.e., it

is restricted to the western edge of the family. As before, Aramaic, Arabic, MSA,[94] and Akkadian each

innovate their own replacements. *ʔdm also seems to have cognates across Afroasiatic of the form d-m,

which variously mean 'blood' and 'red'. Given that *dm derivatives are universal in Semitic as 'blood', it

is likely that *ʔdm is a prosodic derivation from *dm and took some functions from the pre-existent root.

Regardless, we are left with the need to explain four replacements for this term.

*wrq

This reconstruction seems to be the most secure of the bunch. It is widely attested in Semitic languages

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[92] Bulakh 2007: 196.
[93] Schenkel 2007: 225.
[94] Bulakh 2004: 274.

(though never without an associated meaning 'vegetation'), and it has cognates in both Egyptian and Berber.[95] However, *wrq is independently replaced on both sides of Southern Semitic. In the case of MSA, Mehri *həḍawr* and Jiballi *šəḍrɔr* may be related to a Central Semitic term for 'grass' cf. Hebrew *ḥa:ṣi:r*.[96] Meanwhile, Ethiopic finds its own replacement as a primary word for 'green', (see above) also working off a root used for plants.[97]

Conclusion

It seems ludicrous to dispute that words such as *wrq , *lbn and *ʔdm were used as color terms in proto-Semitic, and yet, how are we to explain repeated replacement across the family? *wrq, which seems to have roots in a much earlier time, does not survive into South Semitic, and it is independently replaced in East and West Semitic languages. This suggests to me that it is not the case that a new term was simply innovated, but rather that speakers had options. If *kwm* is derived from *km, then we would expect to have several terms for dark hues.

In other words, attempting to model this linearly results in a mess of independent innovations. Instead, I think the high replacement rate across the family and persistence of recognizable secondary meanings suggest that there was a clear and clean means of deriving color terms. Multiple terms existed alongside each other. Some of them, such as *lbn and *wrq may well have been primarily chromatic in value,[98] but all existed in a similar formal and semantic space, as evinced by the fact that both ancient *wrq derivatives and presumably newer forms such as *ḥmrmr* equally show *qatlal* and *qataltal* forms.

In my model, these forms all persisted and were comprehensible to the early speech communities and were selected independently. These divergences could potentially have occurred in proto-Semitic dialects while the F-Stem was still fully functional, as each idiom selected a set of default metaphors, or it

[95] Schenkel 2007: 225.
[96] Bulakh 2004: 276.
[97] Bulakh 2006: 252.
[98] Recall the difficulty in establishing their original semantic values.

could have occurred centuries later, long after the F-Stem had been forgotten and speakers were presented with an overabundance of G-Stem variants. Quite simply, the tree model does not work for Semitic color terms, as it produces the need to explain repeated independent innovations. Instead, waves become the preferred means for visualizing this process. The F-Stem is the agent that allows repeated coining of distinct adjectival terms. This does not preclude the existence of older terms, but such terms as existed were remade in the new pattern and became part of the F-Stem's domain for the speakers. A speaker would be unable to discern whether *wrqq* or *ḥmrr* was "original" and both would have been licit as derived adjectives or as more concrete referents (likely in G). These words seem to have been part of an open class, readily accepting new members the way that verbs do in English. Unlike English, where to make up a new primary color term, one would have to make up a new color, the Proto-Semites were comfortable adding new basic color terms. This, then would explain the situation of common replacement.

11.5 *qataltal*

As mentioned above, the form shows two primary functions: this *qataltal* formation of less intense adjectives such as 'reddish' and 'whitish' from basic color terms, and the formation of adjectives from nouns and verbs, such as 'mournful' from 'to be sad' or 'green' from 'greenery', a semantic role seen in both Ge'ez and Hebrew. It would be simple to declare that the form is an approximative, but that would fail to account for the forms which seem to be straightforwardly derivational in nature. The fact that these forms appear both in NW Semitic and Ethiopic suggests that they are quite old, although their absence in Akkadian is surprising.

Taking these two functions as distinct for the moment, we see that the first function precisely parallels that seen in Hebrew, cf. *ʔădamda:m* 'reddish' from *ʔa:dom* 'red'. Perplexingly, the same form is attested in Aramaic, but with the exact opposite value, *ṣhbyb* 'very yellow'. It may be the case that the

form was originally a comparative, and thus was reinterpreted variously.[99]

This would account for both the function observed with regard to colors and the other more clearly derivational forms; however, without comparative data from Egyptian, it is likely that the precise relationship cannot be untangled.

At present, it is safest simply to assume that both the F-Stem *qatlal* and the *qataltal* have some sort of adjectival significance.

11.6 Conclusion

Based on the assembled data, the most likely model is that the F-Stem existed in Proto-Semitic, perhaps, given Egyptian, at a level yet deeper, as the form of a deverbal or denominal adjective. The form alternated phonetically between a *qatlal* and *qatall(a)*, and at some point *qatlal* became *qat:al,* and the geminate of *qatall* collapsed word-finally, yielding *qatal.* This was analogically regularized to *qata:l* or *qat:al*.

This seems strange, nor can I explain how *qattal* fits into the mix, but remember that in MSA, *qattal* stands alongside *qatlal* in its paradigm, see §8.3, where a *qatlal* surfaces as such in the imperfect, but takes the form *qat:al* in the perfect. Since there is no D-Stem in MSA, this cannot be analogy. I can only offer that there was some sort of change, the nature of which I do not know; *qatlal* or *qatall* became *qattal*, and given the prosody in the MSA forms, I am interpreting it as *qatlal* becoming *qattal.* This means that an initial relationship of *qatlal* to *qatalla* was remade in some cases as *qattal* to *qatalla*. This change was accelerated by the rise of the D-Stem and the *qatall* and *qatlal* forms were folded into it.

The most resistant semantic domains were colors and defects, though often, when a G-Stem form of the color existed, the F-Stem and *qataltal* forms were repurposed as inceptives and came to denote modulations of the intensity of the color. For whatever reason, these frames were salient to speakers, and

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[99] This may explain the analysis of the *qataltal* as an intensive marker in Mishnaic Hebrew.

whenever sound change or levelling occurred, the boundaries of the frame limited its spread. This then resulted in the attested situation of scattered forms.

11.7 Further Research

Clearly, there is much room for further work to be done on the matter of the F-Stem. In particular, additional work on Ethiopic and Modern Southern Arabian would aid historical work greatly by giving us more data to work with. Similarly, a better understanding of the origin of the D-Stem and stress patterns in Semitic languages would aid in our understanding both of the F-Stem and the *qataltal*. Conversely, a better understanding of the F-Stem may also help us understand the origins of the D-Stem.

Furthermore, and perhaps most importantly, comparative research on the 1233 and 12323-stem words in Ancient Egyptian would be instrumental in helping us to understand the relationship between these two forms, given their strong overlap in the Semitic languages.

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