Towards a Morphology of the pre-Semitic Verbal System [MPSVS]

Contents

1 Introduction

1.1 Study *On the Biradical Origins of the Semitic Triradical Root System (BOSTRS)* explores the hypothesis that a substantial proportion of Semitic triradical roots originate in an earlier system based on biconsonantal roots or stems, and concludes that certain grammatical functions and/or expanded lexical senses were at some early time expressed by means of 'augment' morphemes added to a typically biconsonantal root/stem. In extant triradical roots these morphemes are argued to survive as single-consonant phonemes that may occur in position R_1, R_2 or R_3, predominantly the last. The language exhibiting these characteristics will be denoted 'Sigmatic', and is taken provisionally to be the ancestor of

the Semitic, Egyptian and Berber languages. Given the likely dates of the earliest Akkadian and Egyptian data, and taking into account climatic evidence (see Section 2 of *The Afroasiatic Fallacy (TAF)*), Sigmatic as a living language would have flourished considerably before the invention of writing and certainly no later than about 3500 BCE. But there is no reason to suppose that Sigmatic would not have had a reasonably well-developed linguistic structure ; in partucular, it is assumed in what follows that Sigmatic would have possessed a verbal system which at the very least was 'fit for purpose', and in all probability quite complex.

1.2 Verb forms in the extant 'Sigmatic' languages are typically founded on a syntagmatically discontinuous triradical root morpheme from which particular forms are constructed by adding other morphemes which may be prefixed, infixed or suffixed, the verbal systems of individual languages and language groups then displaying particular developments of more restricted application. But if the Sigmatic root system originates in a system substantially biconsonantal in nature, reminiscent perhaps of Sumerian or certain Cushitic languages, it may be that the morphology of the Sigmatic verb was based to a lesser or greater extent on an organising principle different from that of its descendent languages, from which it follows that the characteristically synthetic structure of the Semitic, Egyptian and Berber verbal systems would have evolved in the 'post-biconsonantal' phase.

1.3 This study therefore attempts to answer two questions :

1. If in their systems of triradical roots the Sigmatic languages preserve fossilised biconsonantals and augments, to what extent is it possible to utilise this and other evidence to reconstruct at least part of the verbal system of Sigmatic ;

2. What would be the consequences of this reconstruction be for analysis of the verbal systems of the Sigmatic languages?

1.4 The following discussion is founded on Semitic G-forms displaying prefixed subject pronominal morphemes, as for example Arabic (2ms) *ta-ktub-u*, (G_P) as opposed to suffixing forms such as (2ms) *katab-ta* (G_S). G_P forms are further divided into G_{PA} (apocopate), such as Arabic (2ms) *ta-ktub*, and G_{PE} (extended), as Arabic *ta-ktub-u*.[1] Although the similarities between the Akkadian (permansive) G_S form and the Egyptian old perfective strongly suggest that some kind of G_S form would have formed part of the original Sigmatic verbal system this form will in general not be considered further, not least because its

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[1] **For these terms see §1.6 in *Aspect in Common Semitic and Egyptian (ACSE)*.**

subject pronouns would appear to have a history different from those of the G_P forms.[2]

1.5 In order to exercise a degree of control over the raw data a number of assumptions and simplifications will be necessary. These will in no case go beyond what the evidence permits, but the proposed reconstruction of the original Sigmatic verbal system will nonetheless be at best hypothetical and in some respects rather speculative. The components of postulated Sigmatic G_P verb forms will be considered in the following order:

Roots or stems.

Prefixed and suffixed augment morphemes.

Prefixed and suffixed morphemes of person, number and gender.

To these should be added aspect morphemes, which are discussed in detail in *ACSE*.

1.6 For conciseness, the various morpheme classes proposed below will be expressed using the notation of set theory, whereby a particular Sigmatic verb form is specified as an ordered set of morpheme sets. Suppose for example that there are two sets of morphemes, M_1 and M_2, and that the former comprises the members m_{1a} and m_{1b}, and the latter the members m_{2a} and m_{2b}. These sets would be written:

$$M_1 = \{m_{1a}, m_{1b}\} \text{ and } M_2 = \{m_{2a}, m_{2b}\}$$

where the braces indicate that the members of a set do not occur in any particular order. The morphemes in each unordered set will typically be in paradigmatic distribution, as is the case for example with the prefixed subject morphemes of Semitic G_P verbs. Suppose further that a set of verb strings *VS* can be generated from members of M_1 and M_2. This set can be written:

$$VS = (M_1, M_2)$$

where the brackets indicate that in a particular verb form members of M_1 and M_2 must appear in the order indicated. An individual verb string, say vs_1, would then comprise actual members of M_1 and M_2. Thus for example:

$$vs_1 = (m_{1a}, m_{2b})$$

1.7 Besides being concise this notation in principle facilitates the use of statistical techniques to measure sameness and difference among sets in different language families, and hence provide a formal

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[2] **For the Akkadian permansive (stative) form see W. von Soden, *Grundriss der akkadischen Grammatik [GAG]*, §75a-c, §77. For the equivalent Egyptian forms (old perfective) see Gardiner, *Egyptian Grammar*[3] *(EG)*, §309.**

indication of the degree to which they might be related. In a real verbal system members of the sets will interact with each other in various ways and it would be necessary to write rules defining co-locational restrictions among the various morphemes. This study will be concerned largely with the general nature and membership of sets and only peripherally with specific examples that might require rules of this kind.

2 Stems and Roots

2.1 Theme Vowels in Arabic G_P Forms

2.1.1 Semitic G_{PA} and G_{PE} forms on 'strong' roots are founded in a common Semitic base template $(v_1)R_1R_2(v_2)R_3$, where v_1 has the value *a* or *i* and v_2 the value *u*, *i* or *a* ; the latter are termed 'theme' vowels.[3] At an anecdotal level the theme vowel assigned to an individual root, strong or weak, is in some cases lexically determined and in many others is determined grammatically (e.g. transitive vs intransitive).[4] There are also numerous cases where the value of the theme vowel is phonologically conditioned, particularly when one or both of the adjacent root phonemes is velar, laryngeal or pharyngeal. This section considers the patterning of these vowels from a statistical perspective, with the aim of beginning to understand the way in which vowels may have been assigned to roots/stems in Sigmatic.

2.1.2 Samples were taken of Arabic G_P forms on strong and various types of weak root, 100 examples of each type.[5] The samples utilise only G_P-forms as G_S-forms on weak roots seem in greater or lesser degree to be inflected by analogy with the corresponding forms of 'strong' roots.[6] The following table summarises the results obtained, where geminate roots are defined as triradicals with identical R_2 and R_3. Not unexpectedly, the samples yield a number of roots which may take more than one theme vowel with

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[3] **This definition ignores forms such as the 'passive' of Literary Arabic, where $v_1 = u$. Such forms are taken to be a later innovation in the languages where they occur. The relationship between forms with $v_1 = i$ and $v_1 = a$ is discussed in Section 3. On these vowels see Lipiński, *Outline of a Comparative Grammar of the Semitic Languages*, §40.**

[4] **As an example of lexical determination compare Arabic *yaġuṭṭu* 'he immerses' and *yaġiṭṭu* 'he snores'. On grammatical determination see Lipiński, *Outline*, §37.1 and especially §38.15-18.**

[5] **Forms from Wehr's Arabic dictionary, starting point taken at random, and then followed through alphabetically until 100 forms had been acquired. The samples inevitably include a number of roots postulated in *BOSTRS* as originating in biconsonantals.**

[6] **On the theme vowels of G_S forms see Lipiński, *Outline*, §38.3.**

no difference in meaning. Such roots have been excluded from the data, so that none of the totals for the various root types in fact equals 100.[7]

TABLE 1 THEME VOWELS OF STRONG AND WEAK ROOTS IN LITERARY ARABIC

	Theme vowel			⇔ <F>			⇔ <F̲>		
Type of Root	**= *u***	**= *i***	**= *a***	***u***	***i***	***a***	***u***	***i***	***a***
Geminate	**63**	**25**	**5**	**61**	**11**	**0**	**2**	**16**	**5**
Strong	**31**	**7**	**45**	**23**	**5**	**29**	**8**	**2**	**16**
III-wk	**32**	**27**	**17**	**21**	**26**	**2**	**11**	**1**	**15**
II-wk	**57**	**37**	**3**	**48**	**27**	**0**	**9**	**10**	**3**

2.1.3 Symbol <F> stands for 'fientive' and indicates that the sense of the root is judged to incorporate an implication of 'doing' or 'motion', whereas <F̲> indicates that there is no such implication. Symbol ⇔ indicates the relationship between a functional element and the morpheme(s) by which it is expressed, and is termed an 'association'.[8] The final six columns in the table detail the number of examples of the verb type in question exhibiting the proposed association ; the constructs *u* ⇔ <F>, *i* ⇔ <F̲> etc. can thus be regarded as hypotheses about the original function of the relevant theme vowel. But for these associations to have even provisional validity it is necessary (but not sufficient) to show that the data is statistically significant.[9] Table 2 shows the values used in this calculation (as per footnote 9)

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[7] The results cited for strong roots cannot readily be reconciled with those of Aro, reproduced on page 230 (§127e) of Fleisch, *Traité de philologie arabe*, Vol. II (1979). Aro's work has not been available to this study, but it is clear that his totals represent a sample, how compiled is not stated.

[8] 'Association' used in the sense of C. F. Hockett, *Language, Mathematics and Linguistics* (1967), p25.

[9] The procedure for determining whether this is so is as follows, taking geminate roots as an example: The sample of geminate roots in Table 1 yielded 61 exhibiting the association *u* ⇔ <F> out of a total of 63 roots recorded as having only *u* as their theme vowel. The process of analysing the association between sense and theme vowel of an individual root can be viewed as a 'trial' which can have one of two possible outcomes; either the root supports the hypothesis, by manifesting the association *u* ⇔ <F>, or it does not. As there are 63 examples of geminate roots with theme vowel *u* in the sample, the analysis can be understood as 63 trials of the hypothesis. In statistical terms the possible outcomes range from all 63 trials being 'successes' in the sense of supporting the hypothesis, to 63 'failures', as would be the case if no root supported the hypothesis; in the present case there are 61 successes. The range of possible outcomes takes the form of a 'binomial distribution', the shape of which can be approximated to a 'standard normal curve' with a mean of 0 and a standard deviation of 1. A point *x* on the horizontal axis of a binomial distribution (in this case 61) corresponds to a point z on the standard normal curve. The outcome of any number of trials (*n*) can then be calculated from the formula:

applied to roots with theme vowel *u*.

TABLE 2 CALCULATIONS FOR SIGNIFICANCE OF ARABIC *U* ⇔ <F>

Root Type	*n*	*x*	*z*
Geminate	63	61	+7.43
Strong	31	23	+2.69
III-wk	32	21	+1.77
II-wk	57	48	+5.17

2.1.4 The values *z* = +7.43 and +5.17 for geminate and II-weak roots are exceptionally good and strongly support the hypothesis that the distribution of theme vowel *u* in such verbs reflects the association *u* ⇔ <F> in Sigmatic. For geminate verbs this is not a particularly surprising result, as Ibn Malik long ago observed the strong link in such verbs between theme vowel *u* and 'transitive'.[10]

2.1.5 If value *z* = +5.17 for the II-weak sample is to be viewed as support for the hypothesis that theme vowel *u* had reasonably well-defined grammatical/semantic function in Sigmatic, it would require many Semitic II-weak roots to have originated in biconsonantals, which would in turn imply that second radical *w* in many cases results from secondary lengthening of the original Sigmatic theme vowel. A degree of support for this position of course comes from Semitic G_{PA} forms on II-weak roots where, in Arabic for instance, 3ms G_{PA} forms on such roots are on the pattern *yaqub* or *yaqib*, very occasionally *yaqab*, where strong first and third radicals are separated by a short vowel ; a similar phenomenon is attested in the Masoretic rendering of Biblical Hebrew. The traditional explanation for these forms is that their vowel quantity results from the shortening of an original long vowel in a closed syllable.[11] Fleisch finds the evidence insufficient[12] but R_2 = *w* has significant incidence as an infixed augment reflex in both Arabic and Hebrew, i.e. the associated consonants at positions R_1 and R_3 frequently appear to originate in

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$$z = \frac{x - np}{\sqrt{npq}}$$

where *z* is the number of standard deviations by which a particular outcome varies from the mean (0) of the standard normal curve. It is initially assumed that the distribution of the theme vowels is random, so that the probability *p* of a 'success' is taken to be 0.5, *q* = 1-*p*. Standard deviation being a measure of the statistical significance of a particular result, the value of *z* indicates whether the thematic patterning of the geminate roots is significant or cannot be separated from chance.

[10] **Fleisch, *Traité de Philologie Arabe*, Vol. II, p344.**

[11] **See Moscati et al , *An Introduction to the Comparative Grammar of the Semitic Languages*, §10.3.**

a biconsonantal.[13]

2.1.6 In contrast, the values z = +2.69 for strong verbs and +1.77 for the III-weak group provide support for the commonly held positions that ;

1. Although the patterning of theme vowels in Arabic strong G_P-forms can be predicted up to a point, it does not conform to the pattern in geminate roots.[14]

2. Many III-weak roots derive from worn-down strong roots.

But on the second point, phoneme *w* is one of the most common suffixed augment reflexes yielded by the Arabic data and occurs in statistically significant numbers, as do Hebrew *y* and Egyptian *i* (*BOSTRS* §7.7). It is therefore possible that many III-weak roots originate in a biconsonantal with final *u* or *i*, of type *CvCu* or *CvCi*, but that analogy with the strong roots has so influenced their morphology as to weaken the evidence for their original function as theme vowels.[15] **But of course if this conjecture is valid did the value of vowel *v* in such stems mirror the value of the final vowel?**

.2.1.7 A similar calculation was carried out for Arabic roots with theme vowel *i*, the results of which are shown in Table 3.

TABLE 3 CALCULATIONS FOR SIGNIFICANCE OF ARABIC *I* ⇔<F>

Root Type	*n*	*x*	*z*
Geminate	25	16	+1.40
Strong	7	2	-1.13
III-wk	27	1	-4.81
II-wk	37	10	-2.79

It will be seen that, although only value z = +1.40 for geminate roots is positive, the calculations nonetheless offer a degree of support for some kind of functional distinction between geminate verbs with theme vowels *u* and *i*. The other results are all negative, significantly so in the case of III-weak and II-weak verbs, indicating that the hypothesis *i* ⇔F is not supported for roots of these types. In fact the

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[12] ***Traité*, Vol. II, 402.**

[13] ***BOSTRS*, Section 8.**

[14] **For a discussion of the patterning in Arabic strong roots generally see *Traité*, Vol. II, §127/8.**

[15] **Fleisch (*Traité*, Vol II, §142) prefers to see weak roots as originating in triradicals where *w* or *y* had consonantal value. Although he provides arguments in support of his view (p400 ff) they are in truth no less 'speculative' than those in favour of a biconsonantal origin. However there can be little doubt that at least some Arabic roots with R_3 = *weak* originate in strong roots, roots with R_3 = *labial* in particular.**

association *i* ⇔<F> is much better supported for III-weak and II-weak verbs, rather than *i* ⇔ <F>, as Table 1 shows.[16]

2.1.8 The values of *z* for the association *a* ⇔ <F> for Arabic roots are +2.24 for geminate verbs, +1.94 for strong verbs, +3.15 for III-weak verbs and +1.73 for II-weak verbs. The values for geminate and III-weak roots are statistically significant, but it will be seen from Table 1 that there are many fewer geminate and II-weak examples with theme vowel *a* than strong or III-weak verbs. To an extent the above results reflect the common parallel between Arabic intransitive roots on G_S form *qabira* and G_{PE} form *yaqbaru*, which is here taken to be a post-triradicalisation phenomenon. But an equally important influence on the associations of verbs with theme vowel *a* are roots with a velar, laryngeal or pharyngeal phoneme in position R_2 and/or R_3. The sample of strong roots summarised in Table 1 contains 59 examples of this kind. Of these 36 exclusively manifest theme vowel *a*, of which 26 display the association *a* ⇔ <F>.[17] By comparison, although 48 geminate roots have such consonants as one of their radicals, only five roots have *a* as their theme vowel, as the table shows, and these all have a G_S form on intranstive pattern *qabiba* Thus theme vowel *a* in this environment is very much less common in geminate than in strong roots, and this despite the fact that several geminate roots have R_1R_2 sequences identical to R_2R_3 sequences in strong verbs; for example Arabic *yaḥummu* 'heats' vs *yazḥamu* 'pushes'.

2.1.9 To summarise :

1. The proposed association *u* ⇔ <F> in Sigmatic is well supported for geminate and II-weak roots, and *i* ⇔ <F> finds a degree of support, but only in geminate roots.

2. The evidence for *i* ⇔ <F> in all root types is weakened by the seemingly post-triradicalisation phenomenon of intransitive G_S *qabira* vs G_P *yaqbaru*, which appears to a considerable extent to have supplanted earlier G_P *yaqbiru*.

3. The evidence for *i* ⇔ <F> in strong roots is also weakened by the tendency of roots with a velar, laryngeal or pharyngeal radical in position R_2 and or R_3 to trigger theme vowel *a* in their G_P forms.

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[16] **Hebrew II-weak verbs give values for *u* ⇔ <F> of +5.52 and *i* ⇔ <F> of +1.87 ; the latter value provides considerably better support for hypothesis *i* ⇔ <F>.**

[17] **At +1.94 the association *a* ⇔ F for strong verbs is near significant.**

2.2 Semitic G_P Stems on Geminate Roots

2.2.1 The inflectional patterns of Akkadian G_P forms on geminate roots exactly match those on strong roots with three different radicals. The position in Geʿez is similar except that, alongside the regular 'imperfect' form, for example *yenabbebu* 'they speak/will speak', form *yenabbu* also occurs ; in the latter case the second (theme) vowel is always *a*.[18]

2.2.2 In Ugaritic and Epigraphic South Arabian (ESA) the limitations of the script restrict interpretation of the evidence but, so far as can be judged, the distribution of vowels and consonants in geminate 'imperfect' forms is similar to that of the equivalent Classical Arabic forms. For example in ESA the 3ms form *yġln* is attested, on root *ġll*, the single occurrence of *l* implying a form **y(v)ġ(v)ll(v)n*, where *(v)* represents a short vowel.[19] An example from Ugaritic is *w tql tštqwy* 'she fell down, prostrating herself' where *tql* with a single *l* (root *qll*) also implies a pattern of vocalisation not dissimilar to that of Arabic.

2.2.3 Geminate G_P forms in Hebrew and Aramaic (Syriac) are almost invariably developed along the lines of the equivalent Arabic forms, except that gemination occurs only when the relevant form ends in a vowel. The patterning of theme vowels in the three languages is summarised in the following table (3ms forms), where Hebrew and Syriac *o* and *a* are taken generally - but not invariably - to originate respectively in *u* and *i*, as the Arabic evidence would suggest.[20]

TABLE 4 PATTERNS OF THEME VOWELS : GEMINATE G_{PA} FORMS

Arabic	***yaqubb***	***yaqibb***
Hebrew	***yaqob***	***yeqab***
Syriac	***neqob***	***neqab***

Analysis of the semantic patterning of the Hebrew and Syriac forms yields the data shown in Table 5, where <F> and <F̲> are as defined in §2.1.3.[21]

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[18] **Von Soden, *GAG*, §101; T.O. Lambdin, *Introduction to Classical Ethiopic (Ge'ez)* p144.**

[19] **M. Höfner, *Altsüdarabische Grammatik* p90.**

[20] **For the purposes of this study, only the quantity and approximate quality of Masoretic Biblical Hebrew vowels are represented.**

[21] **These totals represent all the examples in F. Brown, S.R. Driver and C.A. Briggs, *A Hebrew and English Lexicon of the Old Testament* and J.A. Payne-Smith, *A Compendious Syriac Dictionary*, ignoring those judged to have their origin in nominal forms.**

TABLE 5 THEME VOWELS IN HEBREW AND SYRIAC GEMINATE G_P FORMS

	Vowel = *o*	Vowel = *a*	*o* ⇔ <F>	*a* ⇔ <F>
Hebrew	**43**	**6**	**38**	**5**
Syriac	**40**	**26**	**37**	**17**

Applying the procedure used in §2.1 to test the Arabic samples, the values of *z* for Hebrew and Syriac geminate roots with theme vowel *o* are +5.03 and +5.38 respectively, with which compare the value +7.43 for Arabic geminates with vowel *u*. The corresponding values of *z* for Hebrew and Syriac roots with theme vowel *a* are +3.13 and +1.57 respectively, as against the value +1.4 for *i* ⇔ <F> in Arabic geminate roots ; the Hebrew value is statistically significant.

2.2.4 The values of *z* for *u* ⇔ F and *i* ⇔ F in Biblical Hebrew II-weak roots are +5.52 and +1.87 respectively, with which compare the equivalent Arabic values +5.17 and -2.79. Note that Aramaic generally and Syriac in particular have almost entirely dispensed with *i* as a theme vowel in II-weak verbs so that the argument cannot be further explored for this language.

2.3 Towards a Theory of Biconsonantal Stems in Sigmatic

2.3.1 It is suggested in §2.1 and §2.2 that Arabic, Hebrew and Syriac G_P forms on geminate roots with theme vowel *u*, along with the equivalent G_P forms on II-weak roots in Arabic and Hebrew, display a form/function pattern which differs from those of strong and III-weak verbs (Tables 2, 3 and 5). Since there appears to be no phonological reason why geminates (to take the clearest example) should not exhibit the same vowel patterning as strong roots, and statistical evidence supports the hypothesis that many geminate roots originate in biconsonantals (*BOSTRS* §3.2), it may be that the geminate and II-weak patterns of theme vowels represent a trace in the Semitic languages of a feature which was important in Sigmatic but which was largely obliterated by the subsequent process of triradicalisation.

2.3.2 This then invites the conjecture that contrast *u* vs *i* in Arabic geminate and II-weak roots and the equivalent contrasts in Hebrew and Syriac may ultimately be lexical in origin rather than grammatical. Thus the *u* of, say, Arabic *yaquddu* 'cuts off' could be interpreted as originating in a Sigmatic stem morpheme **qud* expressing the sense 'cut', and the *i* of Arabic *yadillu* 'is/will be low' could similarly be analysed as originating in a Sigmatic morpheme **dil* with the general sense 'low'.[22] But if these theme vowels did indeed have semantic value (in the limited sense of §2.1) it might be expected that

[22] **Senses proposed as part of the analysis of triradicals underlying *BOSTRS*.**

there would be at least some geminate and II-weak roots with two (or more) distinct senses differentiated by their theme vowels. However, in Arabic at least, there appear to be rather few of these, although one fairly convincing example is root *ġṭṭ*, mentioned above.[23]

2.3.3 Should this conjecture on the lexical function of theme vowels *u* vs *i* turn out to be correct, it would follow that, to a lesser or greater degree, Sigmatic employed biconsonantal *stems* as the foundation of its grammatical structure, among which would have been pattern *CvC* (two consonants with interposed vowel), rather than biconsonantal *roots*. Thus the consonants expressing the verbal 'idea' in Sigmatic may not have had meaning in isolation from the associated vowel, *u* or *i*. But then, if Sigmatic was indeed founded on a system of stems, remaining essentially unchanged whatever morphological structure they entered into, it would also follow that the largely 'synthetic' structure characteristic of Semitic and Berber, and presumably also of Egyptian, would have been either entirely absent from Sigmatic, or at least not present to anything like the degree evident in the daughter languages. This conclusion then of course entails that, although morphemes could have been prefixed or suffixed to the biradical stem, they could not have been inserted within it. In other words, the Sigmatic verbal system (and presumably Sigmatic morphology in general) may have been agglutinating in character rather than synthetic.

2.3.4 If the Sigmatic verbal system was indeed based on stems rather than roots, consideration must be given, albeit in preliminary fashion, to the possible patternings of stem morphemes. The 'biconsonantal hypothesis', attempting as it does to identify biconsonantal strings in triradical roots and to match them with lexical senses, inevitably promotes a particular form of the 'stem hypothesis' focussing on pattern *CvC*. It is true that this pattern is quite common generally, for example in the Cushitic languages ; for instance, *CiC* is not uncommon with non-fientive senses, as in Beḍawiē *dig* 'be pregnant' and Saho *di'* 'know', although *CaC* is more common in both languages, mostly but not entirely with fientive sense ; pattern *CuC* is almost entirely absent.[24] But these and other Cushitic languages in fact display a range of

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[24] These observations are valid only for a subset of what are termed V_2 (suffixing) verbs in these languages, see *Beḍawie as a Semitic Languge (BdSL)* Section 6, and also takes no account of any tone system which is or may once

stem forms, so that although the Cushitic data is entirely modern and extensive modification of the stem patterns in the various languages must be assumed to have occurred over time, it could be that the range of patterns in these languages gives some hint of the likely range of stem patterns in Sigmatic.[25]

2.3.5 A typological example nearer in time and geography to Sigmatic is Sumerian - although this should not be taken to constitute a claim for a diachronic relationship between Sumerian and Sigmatic (see generally *Sigmatic and Sumerian Verb Forms (SSVF)*). Based on data from Sollberger,[26] the following patterning of Sumerian stems emerges:

TABLE 6 PATTERNING OF STEM MORPHEMES IN SUMERIAN

Pattern	Total	Pattern	Total
CuC	15	Cv	15
CiC	13	vC	6
CaC	17	CvCv	10
CeC	1	CvCvC	3
vCv	4	v	2

Of the 86 stems in Table 6 about half (46) are on pattern *CvC*, followed by *Cv* and *CvCv* with 15 and 10 respectively. Thus this evidence, together with that of Cushitic, suggests that when reconstructing G_P forms of the Sigmatic verb, and attempting to show how attested forms in the daughter languages might have evolved from these reconstructions, hypotheses based only on stem-type *CvC* will not be adequate, for the triradicalisation process would almost certainly have imposed a thoroughgoing rationalisation on the original stem types.[27]

2.3.6 This undoubted difficulty can however be exploited, for there is a very definite practical advantage at this preliminary stage in the reconstruction of Sigmatic in restricting the analysis to forms based on stems of type *CvC*. With this restriction, the set of stems *S* in Sigmatic (S_Σ) can provisionally be

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have been employed.

[25] Although, to take one example, pattern *CvCv* seems not to be prominent in Cushitic. See for instance the proto-Agaw reconstructions in D.L. Appleyard, *A Comparative Dictionary of the Agaw Languages*.

[26] E. Sollberger, *Le système verbal dans les inscriptions 'royales' présargoniques de Lagaš* , §23. Although the total number of stems in the texts investigated by Sollberger is rather small his texts are among the oldest. There appears to be no evidence to suggest that Sumerian might have been a tone language.

[27] There is of course the well-known group of nouns in Semitic having only two consonants or even one (see for example Fleisch, *Traité*, Vol. I, p252 ff). The Semitic systems of demonstrative pronouns are also founded on elements analysable as single consonants combined with various patterns of vowels (see for Arabic, *Traité*, Vol. II, Part 2).

expressed:

$$S_{\Sigma} = \{pur, dil, gum,...ḫum\} \quad ...(1)$$

whose members comprise biconsonantals generally as proposed in *BOSTRS*, supplemented by a vowel whose value, on the basis of the foregoing, is taken generally to be *u* or *i*. Table 7 lists a sample of the relevant biconsonantal sequences, although it will be noted that several pairs of senses share the same consonants. This could be for any of the following reasons:

1. **The relevant network (as discussed in *BOSTRS*) has been incorrectly analysed;**
2. **The relevant biconsonantals were differentiated by differing stem vowels;**
3. **The biconsonantals were differentiated by tone.**

TABLE 7 POSTULATED SIGMATIC STEMS ON PATTERN *CVC*

{ʻl : perceive}	{ḫr : move away}	{nt : pull away}	{rṣ : adhere}
{ʻq : cry out}	{ḫr : be hot}	{nṭ : be moist}	{rṭ : crush}
{ʻr : rise}	{ḫṣ : cut}	{pḏ : force open}	{sk : weave}
{bḫ : make noise}	{kb : pour}	{pq : force apart}	{sḫ : scrape}
{bṣ : pour out}	{km : cover}	{pr : separate}	{sl : slide}
{bṭ : spread}	{km : decay}	{pt : weaken}	{sm : be high}
{dḫ : push}	{kr : penetrate}	{qḏ : pierce}	{ṣb : join}
{dk : crush}	{kṭ : immerse}	{qp : gather}	{ṣd : obstruct}
{dl : be low}	{kz : pierce}	{qp : restrain}	{šá : scatter}
{ḏm : cover}	{lk : hit}	{qr : pull}	{šq : be unhappy}
{gm : gather}	{lk : speak}	{qṣ : shrivel}	{šr : cut}
{hm : pour out [vi]}	{ml : fill}	{qš : take off/gather}	{šṭ : cut off}
{hs : be cheerful}	{ms : touch}	{qṭ : cut}	{ṯl : rise}
{ḫm : be hot}	{ms : absorb}	{rq : be soft}	{zr : scatter}
{ḫn : bend}	{nf : blow}	{rq : move} [vi]	{zr : flow}
{ḫq : scrape}	{nq : pierce}	{rq : shake}	

3 Augment Morphemes

3.1 Introduction

3.1.1 In the previous section it is proposed that the morphology of the Sigmatic verb was founded on stem morphemes which served to express lexical senses and which, in the typical instance, contributed two consonants to triradical roots in Semitic and the other Sigmatic languages. This section utilises the data presented in Sections 6 to 8 of *BOSTRS*[28] to investigate the augment morphemes argued to have been added to Sigmatic stems, and which contributed a third radical to many Semitic and other roots.

3.1.2 For augment morphemes to have become indivisibly associated with their stems it seems

[28] **Although *BOSTRS* is founded largely on data from Arabic, Hebrew and Middle Egyptian, what follows is taken to be generally valid also for those Semitic languages (and Berber) which have not been subject to network analysis.**

inevitable that, in the vast majority if not all cases, stem and augment must have occurred in immediate syntagmatic relationship with each other. For had other morphemes been systematically, as opposed to sporadically, interposed between augment and stem morphemes, this seemingly essential condition for the evolution into a triradical root system could not have been met. Thus two sets of augment morphemes are proposed, a prefixing set whose members immediately preceded their stem morpheme and a suffixing set whose members are taken to have immediately followed the stem.

3.1.3 As will be apparent from *BOSTRS* it is difficult to make convincing suggestions as to the lexical sense and/or grammatical function of the various augments there proposed. One consequence of this is that it is not possible to determine whether prefixed and suffixed augments were in complementary distribution or whether they could occur together. Intuitively it seems preferable to think of sets of prefixed and suffixed morphemes with distinct grammatical or lexical function, each set for the most part deployed independently of the other. But if prefixed and suffixed augments were entirely independent it might be expected that there would be at least some quadriradical roots incorporating both prefixed and suffixed augment reflexes, such that the phonemes at positions R_2 and R_3 would constitute the reflex of (say) an original biconsonantal stem, with R_1 and R_4 being respectively the reflexes of prefixed and suffixed augments. But although the data underlying *BOSTRS* includes a number of quadriradicals analysed as reflecting biconsonantals there are few if any conforming to this particular specification.[29] Thus for the moment at least, the investigation will be restricted to cases where augment morphemes were prefixed or suffixed to their stem, but not both. Moreover, on the evidence of (unaugmented) Semitic geminate and II-weak roots it must also be assumed that there would have been verb strings with no augment. Thus at least the following patterns are taken to have occurred.

(Stem) (Augment - Stem) (Stem - Augment)

3.1.4 It is suggested in Section 2 above that the process of triradicalisation probably resulted in the rationalisation and/or simplification of differing patterns of stem morpheme. This being so, it is also likely that original differences among the morphological forms of the augments were also eliminated ; for

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[29] Egyptian quadriradicals *nšny* 'rage' and *nṣrw* 'grasp' are possible examples, the former analysable as originating in biconsonantal {šn : be angry} and the latter in {sr : steal}. But the fact that these roots share PAR = *n* and SAR = *weak* hints that they could be analysed differently, particularly as there are no similar examples in Arabic or Hebrew. For discussion of Arabic quadriradicals see Fleisch, *Traité*, Vol. II, §145 ff.

example they could originally have comprised a subset of the stem morphemes, with differing functions in different syntagmatic environments. Thus in quadriradical roots where R_1R_2 or R_3R_4 are reflexes of an original biconsonantal stem, it is possible that in some cases the two remaining consonant phonemes reflect an original biconsonantal augment.[30] However, on the evidence currently available augments are initially taken to have been of the general form v_1Av_2, where *A* represents the consonantal component of the morpheme and v_1 or v_2 were vowels, either but not both of which may have had null realisation.

3.2 Prefixed Augments

3.2.1 In Section 6 of *BOSTRS* the following prefixed augment reflexes (PARs) are noted as having 'significant standardised incidence' (SSI), and hence possibly originating in a prefixed augment of some kind:

Arabic	***n***	***w***	
Hebrew	***n***	***y***	***b***
Egyptian	***n***	***w/i***	***p/f***

In addition, although no sibilant PAR has SSI, a number of roots were identified with senses suggesting origin in a biconsonantal prefixed by a sibilant-based deriving morpheme.[31] Analysis of Arabic, Hebrew and Egyptian roots with phonemes *n*, *b* and *s/š* as a putative PAR, along the dimension transitive vs intransitive, yields the pattern shown in Table 8:[32]

TABLE 8 VERB TYPES ASSOCIATED WITH PREFIXED AUGMENT REFLEXES

	Arabic			Hebrew			Egyptian		
PAR	**Total Roots Identified**	**Trans**	**Intrans**	**Total Roots Identified**	**Trans**	**Intrans**	**Total Roots Identified**	**Trans**	**Intrans**
n	**55**	**29**	**26**	**35**	**17**	**18**	**14**	**9**	**5**
b	**9**	**5**	**4**	**10**	**5**	**5**	**7**	**4**	**3**
s/š	**27**	**10**	**17**	**24**	**5**	**19**	**14**	**4**	**10**

[30] A possible Arabic example is *dḥrj* 'roll', where the *–rj* component is analysed as deriving from source {rq : move} and the *dḥ-* component from source {dḥ : push}. But this is probably a relatively late compound rather than stem plus biconsonantal augment.

[31] There is a degree of evidence that the sibilant- and dental-based deriving morphemes are African in origin and were a subsequent introduction into Sigmatic. See §6.1 in *The Afroasiatic Fallacy (TAF)*.

[32] The 7 Egyptian roots with PAR = */labial/* are in fact PAR = *f/p*. No Egyptian roots have been identified wth PAR = /*b*/, but see under §3.2.6 below.

3.2.2 Although a number of the roots with PAR = *sibilant* fit comfortably with the causative/factitive/fientive functions commonly proposed for the Semitic sibilant-based deriving morpheme, it will be seen from Table 8 and the data in §6.2 of *BOSTRS* that the majority of examples identified in fact have intransitive (or stative) sense.[33] Even allowing for subsequent changes in sense and grammatical function, such roots are difficult to accommodate within the causative/factitive framework and may thus have a different origin.

3.2.3 Phoneme *n* has SSI in all three languages and as Table 8 shows, the relevant roots have intransitive or transitive sense, the latter being slightly more common. As with roots with PAR = *sibilant*, an obvious conjecture would be that many of these roots originate in a nasal-based deriving morpheme but, even when allowance is made for subsequent changes in sense this seems a doubtful explanation for all such roots, not least because in Egyptian *n* as a deriving morpheme is confined to quadriconsonantals.[34]

3.2.4 A further argument in favour of a dual origin for the functions associated with *n* and *s/š* relates to the mechanics of the triradicalisation process. As already remarked, for large-scale triradicalisation to have taken place augments and their stems must have come to be considered inseparable. For, although early triradicalisation may well have occurred sporadically without affecting the productivity of the augment system as a whole, for triradicalisation to have taken place to the degree necessary to convert a substantially biconsonantal system into one which was in essence triradical would seem to have necessitated a virtual fossilisation of the augment system. This is difficult to envisage if the proposed prefixed augments were simply the 'Semitic' deriving morphemes, which self-evidently did not become fossilised.[35] That said, if triradicalisation was initially triggered by the permanent association of former augments with biconsonantal stems it is quite possible that a number of stems commonly occurring with sibilant- and nasal-based deriving morphemes may have been 'attracted' into the triradical system by

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[33] See also Lipiński, *Outline*, §41.8 and Moscati et al, *ICGSL* §16.10.

[34] A nasal-based morpheme does not occur in many African languages otherwise exhibiting deriving morphemes.

[35] Although deriving morphemes in the Semitic languages have in a relatively small number of cases become so closely associated with their triradical root as to form a quadriradical, as for example Arabic *sqlb* 'throw down', related to *qlb* 'turn upside down'.

analogy with augments 'proper'.[36]

3.2.5 The roots with PAR = *labial* are of particular interest. As noted above, Hebrew *b* and Egyptian *p/f* have SSI, as do Arabic *b* and *f* taken together, but not individually. As Table 8 shows, there are relatively few roots of this type, almost equally transitive and intransitive, although for what it is worth, no transitive root takes an animate object. It thus seems possible that at least some roots with PAR = *labial* may reflect a further Sigmatic prefixed augment – particularly as there is no labial-based deriving morpheme in the relevant African languages.

3.2.6 With regard to weak phonemes, Arabic *w* is much more common in position R_1 than *y*, whereas *w* at R_1 is almost totally absent from Hebrew, suggesting that in both languages there has been rationalisation in favour of one or other phoneme ; in Egyptian the ratio of triradical roots with R_1 = *w* to R_1 = *i* is 2.33 : 1. There are four principal ways in which these apparent augments may have originated:

1. **As 'regular' augment morphemes with lexical and/or grammatical function;**
2. **As reflexes of an initial *u* or *i* in stems on pattern **vCvC*;**
3. **As filler phonemes, to align the associated biconsonantal stems with the evolving triradical system.**
4. **PAR = *w* originating in a labial phoneme (Arabic and Egyptian).**

3.2.7 Although it cannot be shown that option 1 is wrong it would seem unlikely that a phoneme weak in articulatory terms would be preferred as an augment. Option 2 is supported by Egyptian 'roots', where initial *ì* may reflect stems on pattern *iCvC* and initial *w* may indicate an original pattern *uCvC*.[37] Option 2 is further supported by the 'loss' of *w* and *y* in certain Semitic environments, as for example Arabic 3ms *yalidu* on root *wld*.[38] Option 3 seems the least likely, if only because it is difficult to propose a mechanism through which a weak phoneme would have been selected to 'fill' a triradical, and why *w* should have been chosen rather than *y*, or vice versa, in any given case. Option 4 is supported by (a few) Arabic roots with PAR = *w* which appear to originate in PAR = *b*, and by the fact (for what it is worth)

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[36] See also *BOSTRS* §6.5 where a similar argument is advanced for dental-based deriving morphemes.

[37] In some environments at least, *ì* ≡ *y*, in addition to being a reflex of an original **i* (A. Loprieno, *Ancient Egyptian, A linguistic Introduction*, p31/4). But for present purposes it will also be assumed that *ì* ≡ *i*, at least in root initial position, and that likewise *w* = *u*.

[38] In some Cushitic languages stem pattern *vCvC* is fairly common, although *iCvC* and *uCvC* are relatively uncommon in comparison with *aCvC*. In many cases however, *aCvC* results from erosion of the initial phoneme in an originally Semitic triradical root.

that Arabic and Egyptian roots with PAR = *w* display similar transitive vs intransitive patterns to their *labial* equivalents.

3.2.8 In sum, it is possible that PAR = *b* and *n* reflect original Sigmatic prefixed augments and that *s/š* has dual origin, both as a prefixed augment and also as a reflex of the relevant African deriving morpheme, giving a possible set of prefixed augments:

$$A_P = \{Ba, Na, Sa\} \qquad \text{...(2)}$$

where the capital letters indicate that the consonant phonemes should be viewed as 'superordinate', i.e. incorporating most but not necessarily all the distinctive features of phonemes *n*, *b* and *s/š* ; the vowel value is arbitrary. The precise phonological value of the original augments would generally have been as suggested by the 'cluster indices' referred to at various places in *BOSTRS*.

3.2.9 Finally, although the Sigmatic sibilant- (and dental-) based deriving morphemes are taken to be of African origin, if Sigmatic was indeed an agglutinating language it follows that at least some types of derived stem in the Semitic languages are post-triradicalisation innovations. For these stems are generally constructed by inserting roots into templates characterised not only by their deriving morphemes but also by differences in vowel and syllable patterning. Thus for example Aramaic deriving prefix *t* occurs in both *yitqber* and *yitqabbar*, distinguished by vowel/syllable patterns *-qber* and *-qabbar*. Since such a method of formation cannot be applied to a stem-based verbal system, derived forms of the above type could only have developed in the context of a system of triradical roots.

3.3 Suffixed Augments

3.3.1 In §7.1 of *BOSTRS* the following suffixed augment reflexes (SAR) are proposed, all with 'significant standardised incidence' (SSI) :

Arabic	***r***	***q***	***w***	
Hebrew		***q***	***y***	
Egyptian	***ʀ***	***'***	***i***	***s***

Egyptian *ʀ* and *'* require comment ; both are written *3* and the former is taken to originate in **r*.[39] The consensus appears to be that in older Egyptian the value *'* is exceptional, but close examination of the patterning of Middle Egyptian roots with third radical *3* suggests that value *'* was actually quite common. Thus for present purposes *3* is taken to have had both values, although note that the value of SSI for the

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[39] **Loprieno, *Ancient Egyptian (AE)*, p31.**

two phonemes is inevitably composite.

3.3.2 Weak **SARs *w*, *y* and Egyptian *ỉ* are taken generally to originate in stem pattern *CvCv*, and *r* + *ʀ* is taken to have functioned primarily as a 'filler' (*BOSTRS*, Section 7.4). Possible suffixed augments therefore reduce to those reflected by Arabic and Hebrew *q*, along with Egyptian *s* and *'*, where the prominence of the last of these perhaps results partly from confusion with *ʀ* and partly from the weakening of other consonants in position R_3. The SSIs for Arabic and Hebrew *q* are quite strongly supported by the associated cluster indices so it would appear that, at least, superordinate *Q* (or *aQv*) may have been a suffixed augment.**

3.3.3 As suggested above, the Sigmatic sibilant-based *deriving* morpheme is very likely African in origin. The African morpheme was in all probability suffixed to its stem (*TAF* §6.1), and as Egyptian appears to incorporate a stronger African component than Common Semitic, it may be that Egyptian SAR = *s* originates in the African deriving morpheme.[40] Moreover, although Egyptian *s* is the only sibilant SAR with SSI there are several convincing Arabic and Hebrew roots with SAR = *sibilant* (*BOSTRS* §7.2). These latter then raise the possibility that SARs - phonemically and functionally equivalent to the later Semitic prefixed deriving morphemes - may earlier in the history of Sigmatic have been suffixed to their stem, by analogy with their African equivalents. In effect, there may have been a time when there was a degree of flexibility in the positioning of the Sigmatic deriving morphemes.

3.3.4 The set of suffixed augments (A_S) is thus for the moment taken to have comprised the single member :

$$A_S = \{aQ\} \qquad \ldots(3)$$

3.4 Infixed Augments

3.4.1 A defining characteristic of agglutinating languages is that they do not readily permit the infixation of morphemes within other morphemes, particularly within the stem. This contrasts markedly with the situation in the Sigmatic languages, where the fundamental structural unit is a triradical root which cannot stand alone, but enters into morphological strings only by affixing other morphemes around and within the root ; this of course is the basis for classifying such languages as 'synthetic'.

3.4.2 Thus, if Sigmatic was indeed originally an agglutinating language it is likely that the stems

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[40] The sixteen Egyptian roots with SAR = *sibilant* (i.e. *s*, *š* and *ṯ*) divide equally between transitive and intransitive senses.

forming the basis of its verb forms were inviolable. In consequence, although substantial numbers of triradicals have been identified with an augment in position R_2 (refer to Section 8 of *BOSTRS*) it would seem to follow that most apparent infixed augment reflexes (particularly *r* and *ʀ*) must have originated either in metathesis from triradicals originally incorporating a prefixed or, more probably, a suffixed augment reflex, or that *r* and related phonemes were incorporated into biradical stems simply as fillers. Obviously this could only have occurred as part of or after after the shift from an agglutinating to a synthetic structure.

3.4.3 Also among the phonemes with significant standardised incidence as infixed augment reflexes are *w* in Arabic and Hebrew. Fleisch argues that Semitic II-weak roots originate in triradical roots with R_2 = *w, y*,[41] but his argument is weakened by the fact that a biradical sequence R_1R_3 clearly underlies many II-weak roots (Table 8.2 in *BOSTRS*) and such roots can only originate in one of the following ways:

1. *w* and *y* reflect an original Sigmatic augment;

2. Some other augment phoneme at R_2 attenuated to *w* or *y*, perhaps taking the vowel of the original biradical stem;

3. The long vowel common in II-weak paradigms is original to Sigmatic;

4. These roots result from the lengthening of an original short vowel.

3.4.4 But as with prefixed and suffixed augments it seems unlikely (although not impossible) that the phonemes at position R_2 originate in augments incorporating a weak consonant. The second possibility is perhaps supported by certain Egyptian roots with R_2 = *3* for, aside from the cases where *3* has the value *ʀ* there is no difficulty in viewing phoneme *'* as having originally been strong, and equally no difficulty in seeing how it could eventually have weakened further to become a long vowel.[42] Thus it is more likely that II-weak roots originate in any of the second, third and fourth of the above ways, a position supported by the analysis of theme vowels in §2.1 above, which suggests that the II-weak roots stand between the geminate and strong roots, albeit closer to the former.

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[41] ***Traité*, Vol. II, §142.**

[42] **Compare for example Beḍawiē V_1-type root *rām* 'accompany' which is related to Arabic *r'm* 'keep close to'.**

4 Subject Pronominal and Number Morphemes

4.1 Prefixed Morphemes

4.1.1 For the purposes of what follows, and assuming for the moment that Sigmatic G_P forms did indeed incorporate subject pronominal morphemes, the Semitic and Berber evidence suggests that they would most likely have been positioned immediately before the stem or the prefixed augment - or before a **deriving morpheme when eventually these came to be prefixed to their stem. The Semitic subject pronouns, together with those of Berber (Be) and Cushitic language Beḍawiē (Bd), are summarised in Table 9.**[43]

TABLE 9 PREFIXED PRONOUN MORPHEMES

	Ak	Ug	BHb	BA	LAr	Ge	MSA	Bd	Be
3ms 3fs	i (ta)	y t	yi ti	yi ti	ya ta	yə tə	yə tə	i ti	yə tə
2ms 2fs	ta	t	ti	ti	ta	tə	tə	ti	tə
1s	a	’a/i	’e	’e	’a	’ə	ə	’a	ə
3mp 3fp	i	y/t t	yi ti	yi	ya	yə	yə tə	i	ə
2mp 2fp	ta	t	ti	ti	ta	tə	tə	ti	tə
1p	ni	n	ni	ni	na	nə	nə	ni	nə

4.1.2 In formal terms these morphemes can be expressed as an unordered set of consonants plus vowel *(v)*:

$$P_P = \{yv,\ tv,\ 'v,\ nv\} \qquad \ldots(4)$$

But set $\{P_P\}$ can be generated from two lower order phoneme sets, namely $\{P_{P1}\}$ comprising consonant phonemes and $\{P_{P2}\}$ consisting of vowels, members of the two sets interacting on the basis of language-

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[43] **Semitic data based on Lipińksi, *Outline*, §40.16 ff and Moscati et al, *ICGSL*, p142. Abbreviations : Ak = Akkadian, Ug = Ugaritic, BHb = Biblical Hebrew, BA = Biblical Aramaic, LAr = Literary Arabic, Ge = Geʿez, MSA = Modern South Arabian, Bd = Beḍawiē, Be = Berber. No early Akkadian 3fs form appears to be attested ; see von Soden, *GAG*, Verbalparadigmen, *9. The Geʿez morphemes are those of the ‘subjunctive’ and the Beḍawiē morphemes are those of the G_{PA} (V_1) form (see *BdSL* §2.2.1). The ESA forms, where attested (N. Nebes and P. Stein, ‘Ancient South Arabian’ §4.4.2 in R.D. Woodward (ed), *The Ancient Languages of Syria-Palestine and Arabia*), correspond to the MSA forms (T.M. Johnstone, *Mehri Lexicon*). Dual morphemes are not shown, but where clearly attested (Akkadian, Arabic and MSA), are the same as the equivalent 3s and 2s morphemes. The Berber forms vary slightly according to dialect ; those cited are the ‘jussive’ forms of Lipiński, *Outline*, p388.**

specific rules to generate the required morpheme in any given case. Thus:

$$P_P = (P_{P1}, P_{P2}) \quad \text{…(5)}$$

where:

$$P_{P1} = \{0, y, t, ', n\} \quad \text{…(6)}$$

$$P_{P2} = \{i, a, e, ə\} \quad \text{…(7)}$$

In expression (5) the members of set $\{P_P\}$ are enclosed in brackets to indicate that the selected element in $\{P_{P1}\}$ must always precede that of $\{P_{P2}\}$.

4.1.3 Viewed diachronically, element *y* of set $\{P_{P1}\}$ would appear to be the likliest consonantal marker of the Sigmatic 3rd person masculine, which would seemingly entail that the *y* was subsequently lost from Akkadian, and also from Beḍawiē. While this is almost certainly true of the latter the position in Akkadian is less clear. Von Soden (*GAG*, §75e) indeed assumes an original *y*, ultimately on the ground that other Akkadian forms such as *id* 'hand' originate in *yad*. But while probably true for *yad* it does not necessarily follow that the same must be true of the 3m verbal pronouns.

4.1.4 Element *t* of $\{P_{P1}\}$ is the marker of 3fs and 2nd person in all eight languages and would obviously be included among the prefixed pronominal elements proposed for Sigmatic, albeit that the 3rd and 2nd person pronouns have different histories (see *TAF* §6.2). Phonemes *'* and *n* are also common to all the languages as markers respectively of 1s - except for MSA, Akkadian and Berber - and 1p, and it is possible that MSA, Akkadian and Berber have lost an original *'*. As regards the markers of 3fp, the only significant variation is between languages which have *y* (or *i*) and those with *t*. This might be taken to suggest that analogy has operated such that these morphemes either reflect gender (Hebrew, Ugaritic, MSA) or person (Akkadian, Arabic, Geʿez, Beḍawiē), and also suggests that the evolution of these particular forms had not progressed far before the separation of the various languages.

4.1.5 Although set $\{P_{P2}\}$ comprises four members no language appears to use more than two. This suggests that, when reconstructing the Sigmatic verbal system, set $\{P_{P2}\}$ should be pared down, perhaps to *a* and *i*, the phonemes attested in Akkadian, Biblical Hebrew and Beḍawiē. Whether these variants would have had grammatical function or were merely phonologically-conditioned remains to be explored. But in this context note the possibility that Sigmatic may have been an ergative language (cf. Lipiński, *Outline*, §40.16).

4.1.6 Ignoring for the moment the formal splitting of set $\{P_P\}$ into consonantal and vocalic subsets,

the foregoing analysis would at first sight appear to support the 'scholarly consensus' that prefixing subject pronouns are an Afroasiatic inheritance.[44] A strong version of this hypothesis goes on to claim that, originally, Egyptian likewise displayed prefixed subject pronouns, which were subsequently lost and replaced by the attested suffixed pronouns. A weaker version, confronted by the absence of any evidence for prefixed pronouns in Egyptian, proposes that prefixed subject pronouns were of more restricted application, being confined to the Semitic and Cushitic languages and to Berber.[45] But this weaker hypothesis can only be viewed as a contrivance. For in sum, as the oldest recorded Sigmatic language Egyptian might be expected to offer at least a degree of support for the 'prefixing subject pronoun' conjecture, which it does not.

4.1.7 Moreover, perhaps of equal importance is the fact that there is no evidence for prefixing subject pronouns in the Omotic languages, nor in the Highland East Cushitic and Agaw branches of Cushitic (the latter aside from Awngi). Furthermore, in Beḍawiē and Saho/ʿAfar, the Cushitic languages where such pronouns are most prominent, it is probable that their presence results from the fact that the former almost certainly, and the latter probably, is a composite Semitic-Cushitic language.[46] Thus the so-called 'Afroasiatic' prefixed subject morphemes are probably original only to Semitic and Berber.[47]

4.1.8 But if Semitic, Berber and Egyptian descend in considerable degree from a common original, the absence of prefixing subject pronouns in Egyptian verb forms could better be accounted for by proposing that the non-stative G-form paradigms of Sigmatic (i.e. leaving aside forms such as the Egyptian old perfective and the Akkadian permansive, with their suffixed subject pronouns) did not originally incorporate subject pronouns. For it will be seen from expressions (6) and (7) that the pronominal information is in fact conveyed almost entirely by set $\{P_{P1}\}$, so that $\{P_{P2}\}$ can be regarded either as a mere articulatory device to facilitate the required syllable structure or, more interestingly, can be viewed as a set of 'event markers' which would in effect have been *the* essential indicator of a G_P form,

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[44] See for example A. Zaborski, 'Remarks on the Genetic Classification and Relative Chronology of the Cushitic Languages', in *Current Issues in Linguistics*, (Vol. 28), 132 ff.

[45] A similar clain has also been made for the prefixed pronouns of the Chadic verbal system, but see for example Hayward, R. J. 'Afroasiatic' §4.3.3 in Heine and Nurse, *African Languages an Introduction* (p90).

[46] Section 4 of *BdSL*, where the few verbs with prefixed subject pronouns in the other Cushitic languages are also introduced.

[47] On the status of the latter see *Berber ; a Semitic Language? (BeSL)* Section 2.

as could be argued synchronically for the *i* of Akkadian *iprus*.[48]

4.1.9 Thus on this interpretation Akkadian 3s form *iprus* could be viewed as the reflex of an original pre-pronominal Sigmatic form, in which the pronominal information is signalled by the *absence* of an overt pronominal morpheme ; in other words by the assignment of element *0* of set {P_{P1}}. Furthermore, as the 3ms G_P form is the simplest and perhaps most commonly occurring form in literary texts, and not infrequently is also used to represent other persons of the verb (for example the Akkadian 3fs form) it is possible to envisage a stage in the evolution of Sigmatic when this was in effect a 'default' verb form, varying only in suffixed morphemes of number and gender (see next section). This in turn would require that the other 'persons' were later elaborations of the original, perhaps by prefixing what were originally independent personal pronouns. In this case the strictly pronominal phonemes of set {PP_1} could be understood as an innovation in common Semitic (and Berber) which was not adopted by Egyptian, even though the latter of course utilises at least some of the relevant independent personal pronouns.[49]

4.2 Suffixed Morphemes

4.2.1 The morphemes of number and gender suffixed to Semitic apocopate (G_{PA}) forms are set out in the following table, accompanied as before by the equivalent Beḍawiē and Berber forms ; dual forms are again ignored. [50] The clearest patterns are those of 2fs and 3mp/2mp, where the dominant morphemes are *ī* and *ū* respectively, although note the presumably coincidental similarity between the Berber and MSA plural forms. The 3fp and 2fp forms divide between those having only *ā* (Akkadian, Geʿez) and those

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[48] This analysis would probably require the postulated 2-term membership of set {P_{P2}} (§4.1.5) to have originally comprised only a single term.

[49] For Egyptian see also the discussion of verb forms with prothetic *ì* at §7.1 below.

[50] Abbreviations as Table 9 except that AA refers to Old Aramaic generally (S. Segert, *Altaramäische Grammatik* (Lepizig 1974), §5.7.1.1.9). Based on the sources cited for Table 9 except that the Berber data is Kabyle (K. Naït-Zerrad, *Manual de Conjugaison Kabyle* (Paris 1994), 17), rather than the Tuareg used by Lipiński. In Lipiński and Moscati et al, Ugaritic 2fs and 3p forms are cited with final *n*; such forms are probably G_{PE} (see *ACSE*, §2.3). The Aramaic forms are jussive, although note that 3fp/2fp forms are not attested so that morpheme *nā* is a conjecture. The Berber forms for 2s and 1s probably originate in the morphemes for the equivalent persons in the G_S forms, Berber *ḍ* and *ġ* being equivalent (in this environment) to Akkadian, South Semitic and Egyptian *t* and *k*. See the G_S paradigms in Lipiński, *Outline*, p386/7. The 2fp/3fp ending *–na* is applied both to the Arabic *majzūm* (G_{PA}) and *muḍāri'* (G_{PE}) forms.

having an *n*-based morphemes, typically *–na* or *–nā*.[51] The equivalent Berber forms have *n* (3fp) and *m* (2fp) but also include feminine marker *t*. This general lack of consistency, together with the very limited data on dual forms, where Akkadian (late) and Arabic have dual marker *ā*, could be taken to suggest that the fp forms were in general a later innovation.[52]

TABLE 10 SUFFIXED MORPHEMES OF NUMBER AND GENDER

	Ak	Ug	BHb	AA	LAr	Ge	MSA	Bd	Be
3ms	-	-	-	-	-	-	-	-	-
3fs	(-)	-	-	-	-	-	-	-	-
2ms	-	-	-	-	-	-	-	a	əḍ
2fs	ī	?	ī	ī	ī	ī	i	i	əḍ
1s	-	-	-	-	-	-	-	-	ġ
3mp	ū	?	ū	ū	ū	ū	əm	na	ən
3fp	ā	?	nā	(nā)	na	ā	ən	na	ənt
2mp	ā	?	ū	ū	ū	ū	əm	na	əm
2fp	ā	?	nā	(nā)	na	ā	ən	na	əmt
1p	-	-	-	-	-	-	-	-	-

4.2.2. The Egyptian verbal system provides no evidence for any of these forms. Thus if not also a Semitic innovation, the 'Sigmatic' suffixed morphemes must either have been absorbed into or lost from the Egyptian *śḏm.f* conjugation, when suffixed subject pronouns were added (*ACSE* §6.2).

4.2.3 On the basis of the foregoing the set of morphemes suffixed to Sigmatic G_{PA} forms is provisionally taken to comprise the following, where *ā* is taken to be the dual marker ; feminine plural *ā* and/or *na* are taken to be innovations in those languages where they occur.

$$P_S = \{ū, ī, ā\} \qquad \ldots(8)$$

5 Aspect

5.1 Questions relating to the system of aspect in Semitic and Egyptian G-forms are explored in *ACSE*. The conclusion there drawn (*ACSE* Section §4) is that aspect in prefixing G-forms was essentially a 3-term set comprising the elements <singulative>, marked by a null morpheme, <non-singulative> marked by final *–un* and <iterative> marked originally by stem reduplication and ultimately by gemination of the second radical.[53] Thus :

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[51] Moscati et al, *Introduction*, §16.61, propose that the latter forms originate in *–āna*. Although Beḍawiē *–na* matches the Hebrew and Arabic 3fp morphemes it follows the Cushitic language pattern where gender is not distinguished in 3p and 2p forms ; compare the Mehri 2/3mp morphemes *-əm* and 2/3/fp *-ən*.

[52] With apologies to any female reader.

[53] To which should be added <stative> aspect, taken to have originally been expressed by a G_S form displaying only

$$AM = \{0, un, |SS|\} \quad \ldots(9)$$

6 Summary

6.1 Based on the foregoing, it is proposed that Sigmatic prefixing G-form verbs were generated from an ordered set :

$$G_{P\Sigma} = (\{P_{P2}\}, \{A_P\}, \{S\}, \{A_S\}, \{P_S\}, \{AM\}) \quad \ldots(10)$$

where sets $\{P_{P2}\}$ and $\{P_S\}$ of pronominal and number morphemes are as in expressions 7 and 8, sets $\{A_P\}$ and $\{A_S\}$ of augment morphemes as in expressions 2 and 3, aspect morphemes $\{AM\}$ as expression 9, and the set $\{S\}$ of stems as in expression 1.Thus in terms of the form ⇔ function patterns proposed in §4.3 of *ACSE* expression 10 would yield something like the following Sigmatic G_P forms (utilising prefixed augmant *Na*):

$$G_{PA} = *i.na.pur$$

$$G_{PE} = *i.na.pur.un$$

$$G_{PR} = *i.na.pur.pur$$

7 Evidence for a Prefixed Event Marker in Egyptian Verb Forms

7.1 Forms with Prothetic ì

7.1.1 Fairly common among verbs in the Pyramid Texts, but almost entirely absent from Middle Kingdom, is what Gardiner terms 'prothetic' *ì-*, typically prefixed to biconsonantal *śḏm.f* verb stems, as for example *ì.dp.k* 'may you taste' (Pyramid Texts [PT] 26b)[54] and also, albeit much less commonly, to *śḏm.n.f* stems, as for example *ì.mr.n.k* 'I will love you' (PT 67b) on III-weak root *mrì*. The list in Thacker's Appendix A makes plain that prothetic *ì-* is mostly prefixed to biconsonantals, less commonly to III-weak roots but almost never to strong triradical roots.[55] The data is complex, not least because prothetic *ì-* does not occur in all instances where it might be expected, and indeed there are cases where a

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suffixed subject pronouns, e.g. the Akkadian 'permansive' or the Egyptian 'old perfective'.

[54] *EG*, §272. Translating these forms is a major problem (Thacker, *The Relationship of the Semitic and Egyptian Verbal Systems (RSEVS)*, p197). The position taken here is that most forms with prothetic *i* can be read as jussive, optative (*RSEVS*, p198) or cohortative (Thacker's 'prospective' *śḏm.f* - *RSEVS*, p213). Faulkner however (*Ancient Egyptian Pyramid Texts*) translates this and other forms as imperatives.

[55] *RSEVS*, p336. Appendix A includes one strong root, *km* ' 'grasp' witrh $R_3 =$ ' and two with $R_3 =$ ', namely *'b'* 'offer' and *dw'* 'adore', where the final ' may approximate to */R/.*

verb occurs with and without *i-* in parallel versions of the same text.[56]

7.1.2 Thacker discusses these forms at length and accounts for the predominance of biconsonantals (his 'hollow' verbs) by proposing that they are in reality II-weak triradicals where the middle radical (*y*) has been transposed to precede the original first consonant (R_1) of the root.[57] Apart from being inherently unlikely this explanation cannot account for prothetic *i-* prefixed to III-weak roots, of which there are admittedly fewer examples. Thacker attempts to resolve this difficulty by proposing that, as almost all III-weak roots with prothetic *i-* have at R_2 a radical which tends to weakness, this radical has been transposed to position R_1 by analogy with the putative middle radical of the 'hollow' verbs.[58] However this can at best be an incomplete explanation since, for example, in *i.q'* 'be raised up' from root *q'y* (PT 126a) the 'weak' second radical *'* is preserved. Moreover, prothetic *i-* also occurs with a number of stems incorporating causative morpheme *s*, as for example *i.s.mn.n.k* 'I fasten for you' (PT 30a). If Thacker's explanation be rejected an alternative would appear to be Sethe's proposal that *i-* marks an auxiliary vowel added to avoid an initial consonant cluster.[59] But as Thacker points out, Sethe's hypothesis has its own problems, not least that prothetic *i-* occurs only with verbs and it is most unlikely that initial consonant clusters would not have occurred elsewhere.

7.1.3 However, a relatively simple alternative explanation for these forms is offered by the proposal in §4.1.8 that the vocalic element of the Semitic prefixed subject pronouns can be analysed as an 'event marker' and that this may be a relic of the original (pronoun free) Sigmatic prefixing verb. For it then becomes possible to explain Egyptian prothetic *i-* as a semi-fossilised remnant of the Sigmatic event marker, preserved only under the special conditions relating to the stress and syllable patterns in certain types of root and stem.

7.1.4 Inevitably there are problems. For instance, Thacker argues that prothetic *i-* rarely if ever occurs with biconsonantal *śdm.f* verbs expressing a completed action, but is generally confined to jussive, optative or subjunctive contexts, or in clauses of purpose/result.[60] This may be evidence for differing

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[56] Compare for example *i.rś* in the N version of PT 126 b with *rś* in the W, T and M versions.

[57] *RSEVS*, p55-67 and 197/8.

[58] Among his 'weak' consonants at R_2 are *r* and *'*. From a Semitic perspective the latter seems rather unlikely.

[59] *RSEVS*, p56/7.

[60] *RSEVS*, p198/9, 207. But see the parallel texts at PT 1597c, where *i.q'* appears to refer to a completed action.

stress patterns in declarative and non-declarative verbs, as also occurs in the Semitic languages (see for Hebrew at §2.2 above). Moreover there are also occasional examples of the old perfective with prothetic *i*, for example *i.ḥ''.ti* (*RSEVS* p58), which would appear at first sight to refute the hypothesis under consideration, although of course it is not impossible that such forms may have arisen by analogy with *śḏm.f* forms.

7.2 Event Markers in the śḏm.f *and* śḏm.n.f *Forms*

7.2.1 If prothetic *i-* were indeed a fossilised event marker it would follow that the *śḏm.f* form may have originated in a pre-pronominal **i.śḏm* which subsequently lost its *i-*, most likely when suffixed subject pronouns were added, and similarly that *śḏm.n.f* may derive from pre-pronominal **i.śḏm.n*. Thus if *śḏm.f* did indeed originally express aspect element <singulative> and *śḏm.n.f* element <non-singulative>, as suggested in *ACSE* §6.3, the latter could then be related both morphologically and functionally to the proposed Sigmatic G_{PE} form **i.na.pur.un* (Section 6 above). If this was so it would then follow that, at some point, when subject pronominal morphemes were incorporated into the relevant verb forms (i.e. leaving aside the permansive/old perfective forms) Egyptian 'opted for' suffixed morphemes and Common Semitic for prefixed morphemes[61]

7.2.2 A further feature of Egyptian *śḏm.f* and *śḏm.n.f* forms that can be adduced in support of this hypothesis is that when the subject of a 3ms or 3mp verb is an independent noun the subject pronoun is not written, as for example: *śḏm.n ntr hrw* 'the god heard the voice'. Of course this could be understood either as the fossil of a period in the language when subject pronouns did not form part of the verb, as suggested here, or as the subsequent loss of a pronoun in a particular environment ; this omission of subject pronouns is partly paralleled in Semitic, particularly in Akkadian.

7.2.3 Not the least attractive feature of the foregoing is that it offers a simple explanation for the absence of G_P forms in Egyptian. On the other hand, assuming that the Semitic suffixed morphemes of person/number are Sigmatic in origin (§4.2 above), and making due allowance for defective orthography, Egyptian verb paradigms offer no evidence for morphemes of this type. The 'fossilisation principle' requires that there should in general be at least some trace of former structures, however slight, in

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[61] It is possible that 'pronominalisation' was also a trigger for 'triradicalisation'. See Section 8 below. Note that this hypothesis does not permit the conjecture that prefixing subject pronouns were a feature of 'Common Afroasiatic'.

attested forms, but in Egyptian only 3p *ū* occurs unambiguously (written *w*) and then only with nouns.[62] Thus if the present proposal for the evolution of Egyptian verb forms is anywhere near correct it would have to be concluded that, if suffixed morphemes of person and number are indeed pre-Semitic and were thus originally a feature of Egyptian, they must first have been abbreviated and then eliminated when suffixed subject pronouns were introduced.

7.3 Imperfective Forms

7.3.1 The imperfective *śdm.f* form (refer to §6.2.1 of *ACSE*) is argued to have doubled either the second radical or the third.[63] Thus, should it turn out that the 'perfective' *śdm.f* form originates in pre-pronominal **ì.śdm*, it would then follow that the pre-pronominal imperfective would have ben either **ì. śddm* or **ì. śdmm.*[64] Gardiner (*EG*, §365) distinguishes the functions of these two *śdm.f* forms thus: '...the imperfectives ... originally conveyed a notion of continuity or repetition, while the perfectives expressed the verbal action quite simply and without implication either of such a notion or its reverse'. Thus Gardiner's definition, taken with his proposed doubling the second radical in the imperfect form, yields two pre-pronominal verb forms functionally reminiscent of Akkadian *iprus* and *iparras*, in which case form **i. śddm* would offer further support for Hypothesis B discussed in Section 3 of *ACSE*.

7.3.2 Loprieno on the other hand (*AE*, p79) terms this form the 'emphatic or nominal *śdm.f*' on account of its 'syntactic function as topicalized or nominalized VP' [verb phrase]. 'Emphatic' being one of the possible connotations of the Semitic D form is it possible that **ì. śddm* is in effect a D form, at least in some contexts? Proposed event marker *ì*, rather than *w (u)*, would suggest not, although the relevant Egyptian S forms also have *ì* as their event marker (see §7.1.3), where the analogy of Semitic might predict *u*.

8 On the Evolution of Semitic G_P and Egyptian *śdm.f/śdm.n.f* Forms

8.1 Introduction

8.1.1 This section is concerned with what became the Semitic G_P and Egyptian ***śdm.f/śdm.n.f*** forms but not the Akkadian permansive and Egyptian old perfective forms, and their equivalents in other

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[62] ***EG*, §72.**

[63] ***EG*, §438 and *RSEVS*, p218 respectively.**

[64] **The Pyramid Texts (in particular) also exhibit what is without question a quite different *śdmm.f* form. See *EG*, §425/6.**

languages, whose suffixed subject pronouns are taken to have a diferent **history.**

8.1.2 If subject pronouns, as opposed to suffixed markers of number, were an innovation in the Semitic and Egyptian verbal systems, and were absent from the earlier Sigmatic G_P forms, the primary effects of introducing subject pronouns ('pronominalisation') would probably have been two ;

1. To shift the balance of stress in the various forms towards the 'new' pronominal morpheme, leftward therefore in the case of the Semitic forms, with their prefixed pronouns, and rightward in the Egyptian forms.

2. To create a triradical stem, and eventually root, from the original biradical plus augment.

8.1.3 In what follows, certain of these shifts are investigated in a preliminary way, founded on a hypothetical reconstruction of the stress and syllable patterns applied to the verb strings postulated for Sigmatic. The investigation also attempts to identify, again in preliminary fashion, certain of the rules which may have been applied to Sigmatic verb strings to yield the stress patterns of Semitic G_P-forms and those of the *śdm.f* and *śdm.n.f* forms in Egyptian.

8.1.4 Given a 'target' verb form it is relatively easy, exercising imagination and ingenuity, to propose rules by which a non-pronominal Sigmatic verb form could have evolved into a Semitic or Egyptian form with subject pronoun. But at least a degree of legitimacy would be conferred on these rules if it could be shown that the same rules directed the evolution of at least the initial post-pronominalised stress and syllable patterns in both Semitic and Egyptian verb forms, and that these rules were relatively few in number. But it must be conceded at the outset that what follows is conjecture, not least because the vocalisation of the Egyptian forms, let alone their stress patterns, remains obscure.[65]

8.2 Rules for Stress/Syllable Patterning and Modification

8.2.1 As a basis for the investigation, suppose that Sigmatic applied the following three qualities or levels of stress:[66]

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[65] Stress in Egyptian is discussed briefly by Thacker, *RSEVS* p39,40 and more extenisvely for the *śdm.f* form on p217-223. For Semitic, Lipiński, *Outline*, p187 ff, discusses the patterns in the various languages but refrains from drawing conclusions about stress in Common Semitic.

[66] The relationship between accent and vowel length is elusive in that the latter seems not infrequently, but by no means universally, to be a consequence of the former ; moreover an intrinsically long vowel seems to attract the accent. (see for example the discussion of Mehri forms in §2.8.4 of *ACSE*).

Primary stress (accented syllable)

Secondary stress (unaccented syllable)

Unstressed syllable (*shewa mobile*)

Suppose further that these levels have matching 'weight' such that primary stress is assigned a value of 3 'units' and is therefore equal in weight to level 2 (secondary stress) plus level 1 (unstressed). Part of the process of modifying a stress pattern could then be understood as shifting one (or more) units of stress from one syllable to another, as the main stress moves along a morpheme string undergoing modification. Thus, using Arabic G_{PE} form (3ms) *yáqburu* as an example, syllable [yaq] would have primary stress, syllable [ru] would have secondary stress, and syllable [bu] would be unstressed. If these syllables, with their stress levels, are denoted [yaq_3], [bu_1] and [ru_2] the whole string can be represented : [yaq_3-bu_1-ru_2].

8.2.2 A preliminary set of rules is proposed which are conjectured to have determined the stress patterns and syllable structures of Sigmatic verb strings, and which are taken also to have been valid during the pronominalisation process, although not necessarily much beyond. These rules have been developed empirically and again assume that Sigmatic was not a tone language;

1. Whatever modifications are applied to a verb string, the main stress tends to fall on the penultimate syllable unless the final syllable is closed and has a long vowel, i.e. is of form CVC;[67]

2. A final syllable, long or short, normally carries level 2 stress, except when closed and with a long vowel;

3. If two adjacent syllables come to be assigned the same stress level, the first syllable generally drops to the next lowest level. Thus hypothetical string Cv_2-Cv_2 would become Cv_1-Cv_2, and Cv_1-Cv_1 would become C-Cv_1 and hence CCv_1;

4. An open syllable with level 1 stress which is enclosed by syllables with higher level stress may lose its vowel. Thus Cv_3-Cv_1-Cv_2 may become CvC_3-Cv_2. Consonant phonemes forming a closed syllable with level 1 stress may in this environment either be assigned to adjacent syllables or may be preserved.

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[67] This rule conflicts with that proposed by Moscati et al for Semitic (*Introduction*, §10.6), namely that the stress moves towards the beginning of a word until it meets a long syllable (CvC or CV) or, in the absence of a long syllable, falls on the first short syllable (Cv). This is in fact a 'rule' for Arabic, and does not necessarily apply when CvC is final, for example *yáktub* rather than *yaktúb*. See also Lipiński, *Outline,* §25.4 and Thacker, *RSEVS,* p39.

5. In any group of three successive syllables the same stress level cannot occur twice. Thus, say, Cv_2-Cv_3-Cv_2 would normally be inadmissible. Exceptions are:

a. When the resulting form would contain a cluster of three consonants (see rule 6).

b. If two non-contiguous syllables have level 1 stress and one is closed.

6. A cluster of three consonants being inadmissible, if the first consonant is identical to the third, the second is normally lost; thus $C_AC_BC_A$ would typically become C_AC_A.

7. A Semitic or Egyptian form resulting from the application of the above rules may contain fewer but will not contain more units of stress than the Sigmatic original.

8.3 Semitic G_{PA} and Egyptian ś<u>d</u>m.f *Forms from Sigmatic Forms with Prefixed Augment*

8.3.1 It is conjectured that the stress pattern of a Sigmatic G_{PA} form with prefixed augment and stem type CvC would have been [i_1-na_3-pur_2], the final syllable being stressed according to rule 2, [na] according to rule 1 and [i] according to rule 5. For Semitic, it is assumed that the stress pattern of the target form would have been that of attested Arabic and Akkadian G_{PA} forms, with primary stress on the initial syllable. In the absence of contemporary information for the vocalisation and stress patterns of the Egyptian ś*<u>d</u>m.f* form, the evolution proposed in Figure 1 is strictly rule based and the target form does not conform to pattern *śé<u>d</u>mef* or similar, as reconstructed by Thacker.[68] Forms intermediate between the source and target forms may actually have existed but, being unstable, would at best have been transitory.[69]

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[68] *RSEVS* p221. Thacker's analysis is also difficult to reconcile with *ś<u>d</u>m.f* forms with prothetic *i* (see §7.4).

[69] In this and the other tables in this section Semitic 3fs and Egyptian 3ms forms are utilised.

FIGURE 1

Step	Semitic		Egyptian
Sigmatic		i_1-na_3-pur_2	
	<==========		==========>
1	ti_3-na_1-pur_2 (1)		na_1-pu_3-raf_2 (3)
2	tin_3-pur_2 (2)		

Notes:

(1) Final syllable *pur* remains at level 2 (rule 2). The proximity of pronoun morpheme *t-* to syllable *na* causes the main stress to move leftward on to the pronominal syllable by means of a 2-element shift.

(2) Unstressed syllable [na_1] is lost by rule 4. Form [tin_3-pur_2] conforms to rule 1 and reflects the probable stress pattern in Common Semitic.

(3) Level 2 stress shifts from *pur* to pronominal suffix *–af* in accordance with rule 2. Syllable *pur* then takes three elements from *na* in accordance with rule 1 and the latter takes a single element from initial *i.*

8.4 Egyptian **śḏm.f** *Forms with Prothetic* **ì**

8.4.1 If, as proposed in Section 7, Egyptian prothetic *ì* is a fossilised remnant of a Sigmatic event marker, it may be that most verbs with this feature evolved from a non-augmented Sigmatic G_{PA} biconsonantal form **i.pur*. Then, if main stress was originally applied to the penultimate syllable as required by rule 1 ([i_3]), and the final syllable had level 2 stress in accordance with rule 2 ([pur_2]), something like the following evolution may have occurred on pronominalisation:

FIGURE 2

Step	Egyptian
Sigmatic	i_3-pur_2
1	i_1-pur_3-af_2
2	pu_3-raf_2

8.4.2 Step 1 involves a two-element rightward shift (rule 2), an analysis implying a resulting phonologically weak first syllable, and supported by instances in the Pyramid Texts where biconsonantal stems/roots otherwise displaying prothetic *ì* also occur without, as for example *ì.ḏd.f* versus *ḏd.f* ; the loss of [i_1] to give target form [pu_3-raf_2] is predictable by rule 7. From the distribution of the relevant forms Thacker concludes that, in general, forms with prothetic *ì* represent either a 'prospective' or an 'imperfective' *śḏm.f*, and forms such as *ḏd.f* a 'perfective'. But it is clear from his discussion that the latter

type not infrequently occurs where *i.dd.f* might be expected, although apparently not vice versa.[70] Moreover, the alternative forms also occur in parallel versions of the same text, which self-evidently cannot admit of differing grammatical functions.

8.5 Forms from Sigmatic G_{PE} Forms

8.5.1 In Figure 3 Sigmatic G_{PE} form **i.na.pur.un*, with prefixed augment (§6.1 above) is developed similarly to G_{PA} form **i.na.pur* to give daughter forms in Semitic and Egyptian. For Semitic it is assumed that the initial stress pattern would have been generally as the Arabic 3ms G_{PE} form, i.e. *yánpuru*.

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[70] See *RSEVS* p198, the table on p209 and the preceding discussion.

FIGURE 3

Step	Semitic	Egyptian
Sigmatic	i_1-na_3-pur_1-un_2 (1)	
	<==========	==========>
1	ti_3-na_1-pur_1-un_2 (2)	i_1-nap_1-ru_3-naf_2 (4)
2	tin_3-pu_1-run_2 (3)	nap_1-ru_3-naf_2 (5)

Notes:

(1) Conforms to rule 5b.

(2) Two-element leftward shift onto pronominal morpheme *ti-* (compare note (1) to Figure 1),

(3) [na_1-pur_1] becomes [$npur_1$] by rule 3. Regrouping of consonant phonemes.

(4) Final syllable *-af* acquires level 2 stress (rule 2) and *ru* acquires level 3 stress (rule 1). Syllable *nap* drops to level 1 (rule 5).

(5) Initial syllable is lost (rule 3). Steps 4 and 5 yield a form equivalent to *śedménef* rather than the *šedémnef* proposed by Thacker.[71]

8.5.2 Thacker (*RSEVS* p58) draws attention to a number of *śdm.n.f* forms on III-weak root *mry* which have prothetic *i-*. If such roots evolved from Sigmatic stems on pattern CvCv, the relevant forms could be derived as follows:

[i_1-mu_2-$rūn_3$] ⇒ [im_1-$rū_3$-naf_2] ⇒ [i_1-mur_3-naf_2] ⇒ [mur_3-naf_2]

In the first form the second vowel of the CvCv stem has coalesced with the vowel of aspect marker *-un* to give a final syllable with long vowel (stressed according to rule 1). The second form incorporates a 2-element rightward shift from [pu_2] to accommodate the subject pronoun. The third form incorporates repositioning and shortening of vowel *–ū* ; albeit not rule based, this shift is necessary to give the target form. The third and fourth forms represent respectively forms with and without prothetic *i.*

8.6 Semitic G_{PR} Forms and Egyptian Imperfective śdm.f *Forms from Sigmatic G_{PR} Forms*

8.6.1 In accordance with rules 1 and 4 the stress pattern on Sigmatic unaugmented reduplicated form **i.pur.pur* is likely to have been [i_1-pur_3-pur_2], but what would have been the pattern on a form with prefixed augment i.e.i.na.pur.pur*?. Rule 1 would require main stress to fall on the penultimate syllable, but this would yield [i_1-na_2-pur_3-pur_2] which violates rule 5 (same stress in two of three successive syllables). However, in information terms **i.na.pur.pur* could be viewed as having a more specific sense**

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[71] *RSEVS*, 58.

than **i.pur.pur* and thus main stress might be conjectured to fall on the augment, i.e. [i_1-na_3-pur_1-pur_2]. The consequent violation of rule 1 can be resolved by applying rule 4, so that [pur_1] reduces to [pr_0] to yield the syllable and stress pattern [i_1-nap_3-pur_2]. If this is the correct analysis it will be seen that the stress pattern on the source Sigmatic form already matches that of possible Akkadian daughter form *iparras*. The (3fs) Semitic form yielded by the proposed Sigmatic original would be **tinappur*, whose theme vowel *u* is reminiscent of the theme vowels of certain Akkadian *iparras* forms, although whether the latter are original or secondary seems impossible to decide. But a problem for this analysis is that pronominalisation cannot initiate the usual leftward stress shift postulated for Semitic forms.

8.6.2 The stages in the proposed evolution of the equivalent Egyptian form are shown in Figure 4.

FIGURE 4

Step	Egyptian
Sigmatic	i_1-nap_3-pur_2
1	i_1-nap_1-pur_3-af_2
2	nap_1-pu_3-raf_2

As usual, pronominal suffix *–af* takes level 2 stress (rule 2) and penultimate syllable *pur* assumes level 3 (rule 1). This results in two initial syllables with level 1 (rule 7), which contravenes rule 3 and is resolved by losing the event marker, giving the final form **nappuraf*[72]

8.7 Semitic and Egyptian Forms from Sigmatic Forms with Suffixed Augment

8.7.1 The stress patterns and syllable structures of forms originating in Sigmatic strings with suffixed augment can be developed similarly to those with prefixed augments. The point of departure for each of the G_{PA}, G_{PE} and G_{PG} forms is the assumption that, in the typical case, the main stress would have fallen on the penultimate syllable, giving the following base forms.[73]

[i_1-pur_3-uq_2] (G_{PA})

[ip_1-ruq_3-un_2] (G_{PE})

[i_2-pur_1-pur_3-uq_2] (G_{PR})

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[72] **Thacker (*RSEVS* p219) proposes that the syllable structure of the imperfective *śdm.f* form was along the lines **śedemm.ef*, with doubling of the third radical rather than the second. However, this pattern cannot be derived from the Sigmatic form as it stands nor, it would appear, from any other plausible source form. The attested Egyptian imperfective forms appear to offer no evidence for a theme vowel.**

[73] **Utilising suffixed augment *–(a)q* from set {A_s} of §3.3.**

These all assume that the augment consonant was preceded by a vowel and that vowel harmony of some kind would have occurred, typically giving an augment vowel matching that of the stem.[74] These would then develop as shown in Figures 5 to 7.

FIGURE 5 G_{PA} Form as Base

Step	Semitic	Egyptian
Sigmatic		i_1-pur_3-uq_2
	<==========	==========>
1	ti_3-pur_1-uq_2 (1)	i_1-pu_1-ruq_3-af_2 (3)
2	tip_3-ruq_2 (2)	pu_1-ruq_3 af_2 (4)

Notes:

(1) Two-element leftward shift moves main stress to first syllable. Final syllable remains at level 2 (rule 2).

(2) Weak penultimate syllable violates rule 4 and is lost.

(3) Two-element rightward shift to new morpheme *af* (rule 2). Main stress shifts to new penultimate syllable by rule 1 (compare Figure 1, G_{PA} form with prefixed augment).

(4) Loss of initial morpheme (rule 3)

8.7.2 Semitic and Egyptian forms originating in a Sigmatic G_{PE}-form with suffixed augment can be derived as shown in Figure 6 ; compare G_{PE} forms with prefixed augment (Figure 3).

FIGURE 6 G_{PE} Form as Base

Step	Semitic	Egyptian
Sigmatic		i_1-pur_3-qun_2
	<==========	==========>
1	ti_3-pur_1-qun_2 (1)	i_1-pur_1-qu_3-naf_2 (3)
2	tip_3-ru_1-qun_2 (2)	pur_1-qu_3-naf_2

Notes:

(1) Two-element leftward shift from penultimate syllable.

(2) Rationalisation of closed penultimate syllable as per note 3 of §7.5.

(3) Two-element rightward shift assigns level 2 stress to final syllable (rule 2). Development otherwise as per G_{PE} form with prefixed augment (§8.5, Figure 3).

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[74] In terms of an argument from information theory, as outlined in §8.6.1, the main stress in these forms might be expected to fall on the final syllable. But this would contravene rule 2 and this (perhaps arbitrarily) is assumed to take precedence, if only because it permits Semitic and Egyptian verb forms with uniform stress patterns, irrespective of the position of the original augment.

8.7.3 Original reduplicated forms with suffixed augment are analysed similarly to those with a prefixed augment (§8.6 above). Thus, adding a suffixed augment to unaugmented stress-notated form [i_1-pur_3-pur_2] could have yielded an initial form [i_1-pur_3-pr_0-uq_2], where the main stress remains on the original syllable and the penultimate syllable is reduced.[75] Rule 6 then requires that sequence [r-pr] further reduces to [rr], giving a 'working' Sigmatic form [i_1-pur_3-ruq_2], with which should be compared [i_1-nap_3-pur_2] incorporating a prefixed augment (§8.6.1). Like the latter, [i_1-pur_3-ruq_2] already exhibits the syllable and structure and stress patterning of the Akkadian *iparras* form and therefore requires no further development, other than rationalisation of the vowel qualities. The stages in the evolution of the Eqyptian form are set out in Figure 7, with which compare Figure 4.

FIGURE 7 G_{PR} Form as Base

Step	Egyptian
Sigmatic	i_1-pur_3-ruq_2
2	i_1-pur_1-ru_3-qaf_2
3	pur_1-ru_3-qaf_2

8.8 Summary

8.8.1 In general, the proposed reconstructions are encouraging in that it is possible in many cases to arrive at apparently correct syllable structures in a reasonably elegant way. It is also encouraging that at any given stage in a reconstruction there is usually only one rule which can be applied to acquire the next stage. Although in the context of an ill-defined system it would be unreasonable to expect reconstructions to exhibit mathematical rigour, the fact that it is possible to a considerable degree to eliminate the element of subjectivity lends the technique a degree of credibility which merits further investigation. The next step would of course be to carry out a rigorous computer-based analysis, which I leave to others.

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[75] The argument from information theory in §8.6 might suggest that the main stress should fall on the final syllable. But this would violate rule 1 and result in a Sigmatic string [i_1-pur_2-pur_1-uq_3] or similar, which would not yield a target form paralleling that of §8.6.

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Bibliographical Abbreviations

ACSE	**Aspect in Common Semitic and Egyptian**
AE	**LOPRIENO, A., Anicent Egyptian : A Linguistic Introduction**
BdSL	**Beḍawiē ; a Semitic Language?**
BeSL	**Berber a Semitic Language?**
BOSTRS	**On the Biradical Origins of the Semitic Trirdical Root System**
EG	**GARDINER, A., Egyptian Grammar**

GAG	**SODEN, W. VON, Grundriss der akkadischen Grammatik**
ICGSL	**MOSCATI, S., An Introduction to the Comparative Grammar of the Semitic Languages**
RSEVS	**THACKER, T.W., The Relationship of the Semitic and Egyptian Verbal Systems**
SSVF	**Sigmatic and Sumerian Verb Forms**
TAF	**The Afroasiatic Fallacy**