Description of Thesis

Kirsty Rowan

Meroitic – A Phonological Investigation

This dissertation is an investigation into aspects of the phonology of Meroitic. The Meroitic language was spoken in an area that encompasses modern day Nubia (southern Egypt to northern Sudan). Evidence for the Meroitic language is only known through the survival of its inscriptions, whereby two forms are used to write these: hieroglyphic and cursive, both heavily borrowed from the Ancient Egyptian writing system.

The Meroitic language has only been partially deciphered; Griffith (1911) established approximations for the signs' sound values, along with a handful of lexical items. Progress into the decipherment of the language has been seriously hampered by the lack of any bilingual texts, and more importantly, a lack of evidence for a genetic affiliation with an existing language or language family.

This thesis concentrates on investigating the traditional representations given for the phonemic values of the Meroitic signs. The methods used for investigating this are: firstly, through analysing the correlative phonemic values of signs taken from transcriptions from languages such as Ancient Egyptian, Coptic and Greek, where equivalent forms with Meroitic ones are evidenced. The comparative data used as evidence for the initial proposals for the Meroitic signs' sound values is also updated. The investigation also analyses the co-occurrence and distribution of individual Meroitic signs with others. Proposed revisions are shown to correspond with typological and empirical phonological processes.

Through this investigation, I not only challenge the traditional representations of certain signs but also present revisions to them. I highlight that research into the Meroitic script has to take into account the level at which the script is encoding the Meroitic language, whether this is the phonetic or phonemic level.

This thesis also presents a phonological theoretical account in the framework of Government Phonology for some of the major proposals put forward. The theoretical account supports the proposals put forward in this study.

It is hoped that the thesis will give a certain transparency to the field of Meroitic phonology for linguists, Egyptologists and Meroiticists alike.

Meroitic – a phonological investigation

Kirsty Rowan

School of Oriental and African Studies

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ABSTRACT

This thesis is a study into certain areas of Meroitic phonology. The Meroitic language was spoken in an area that encompasses modern day Nubia (southern Egypt to northern Sudan). Evidence for the Meroitic language is only known through the survival of its inscriptions, whereby two forms are used to write these: hieroglyphic and cursive, both heavily borrowed from the Ancient Egyptian writing system.

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This thesis concentrates on investigating the traditional representations given for the phonemic values of the Meroitic signs. The methods used for investigating this are: firstly, through analysing the correlative phonemic values of signs taken from transcriptions from languages such as Ancient Egyptian, Coptic and Greek, where equivalent forms with Meroitic ones are evidenced. These transcriptions from other languages are given with their sources. Secondly, empirical and typological phonological evidence is used to support the proposed revisions to the phonemic values of certain Meroitic signs, and thirdly the investigation also analyses these proposals within a theoretical framework, principally Government Phonology.

Through this investigation, I not only challenge the traditional representations of certain signs but also present revisions to them. I highlight that research into the Meroitic script has to take into account the level at which the script is encoding the Meroitic language, whether this is the phonetic or phonemic level.

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This thesis has benefited greatly from the generosity of Claude Rilly in forwarding me his research, answering my queries and fundamentally bringing to the fore linguistic research into the Meroitic language once again, and as such, I owe him many thanks.

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CONTENTS

FIGURES

Chapter 1

Introduction

1 General remarks

The Meroitic language of the Kushite Empire is one of the last few ancient written languages that still remain to be fully deciphered. This sub-Saharan kingdom adapted signs borrowed from the Ancient Egyptians' writing system for a script in which to write their own distinct language. In spite of the fact that the approximate values of the Meroitic signs had been brilliantly deduced by the Egyptologist F. Ll. Griffith nearly one hundred years ago, the language overall is still unknown. Without the archaeological discovery of a bilingual inscription in which to discern the language of this important African civilisation, scholars have directed their research in trying to establish a connection, based upon various comparative linguistic criteria, with a cognate language. However, as of yet, this has still not produced any definitive results in a breakthrough for the complete understanding of the Meroitic language, as only a small number of lexical and grammatical items have been semantically identified.

The impetus for this thesis was through assessing that a basic phonological investigation into this documented language was much needed. This was not only necessitated in order to have a more detailed understanding of the Meroitic phonological inventory and certain phonological processes, but also as a contribution to the search for its classification. It is hoped that the research conducted in this thesis, which must be looked upon as preliminary to a certain extent, will contribute to the field of Meroitic studies and will go some way towards benefiting the discovery of a cognate language.

The focus of linguistic research into the Meroitic language has been more directed towards analyses and investigations into the semantics and morphology of known and/or unknown grammatical particles and lexical items. Overall, these investigations represent the majority of research conducted, of which, the phonological investigation into Meroitic has been relegated to a very small research area, and one that came to a complete halt in the 1970s. It was not until nearly a quarter of a century later that Rilly (1999a, 1999b, 2007) revived the importance of its study with new insights and proposals.

This thesis was prepared from September 2002 to September 2006. During this time, Claude Rilly (CNRS) was also preparing for publication his book '*La Langue du royaume de Méroé*'. I was very grateful to have been given access in 2005 to the camera-ready copies of two chapters '*L'écriture méroïtique*' and '*Phonologie et phénomènes phonétiques*' from his forthcoming publication. The book duly appeared in 2007 after this thesis was submitted for examination and therefore there are other areas of Dr Rilly's research that I was not able to cite if pertinent to the topic under investigation.

This thesis reviews the literature on Meroitic phonology within each separate stage of the investigation, the main studies conducted on Meroitic phonology are: Griffith (1911, 1916b, 1917b, 1929); Meinhof (1921/22); Zyhlarz (1930); Hintze (1973a, 1973b, 1974a, 1987); Zawadowski (1972a, 1977); Vycichl (1958a, 1973b); Millet (1973a); Hofmann (1980, 1981a); Böhm (1987), and Rilly (1999a, 1999b, 2007).

1.1 Further research into the Meroitic language

For further works on Meroitic grammatical investigations and discussions, see Griffith (1911, 1917a, 1922, 1925); Schuchardt (1913); Hintze (1955, 1963, 1974a, 1974b, 1976, 1977, 1979, 1999); Zyhlarz (1930, 1949/50, 1956, 1960); Vycichl (1958a, 1973a); Priese (1968, 1977); Heyler (1967); Heyler & Leclant (1974); Hainsworth (1975, 1979); Zawadowski (1981); Böhm (1988b); Trigger (1964, 1967, 1968, 1970); Hofmann (1975, 1977, 1978, 1980, 1981a, 1981b, 1981c, 1981d, 1982, 1986, 1989, 1989/90); Yoyotte (1957); Millet (1973b, 1974b, 1977, 1982, 1991, 1998, 1999, 2003); Millet & Heyler (1969); Abdalla (1979, 1986, 1988, 1999); Peust (2000, 2003); Rilly

(1999a, 1999b, 2000, 2001a, 2002, 2004c, 2007); Schenkel (1972, 1973a, 1973b, 1973c), and Monneret de Villard (1959, 1960).

Overviews of the Meroitic language are given in Haycock (1978); Millet (1974a); Trigger (1973a, 1973b, 1979); Robinson (2002); Welsby (1996); Abdalla (2003), and Rilly (2007).

The context of the Meroitic language within African history, see Haycock (1974), and Thelwall (1984, 1988).

Works on the association of Meroitic with the Nubian/Nilo-Saharan languages are in Griffith (1911); Zyhlarz (1930, 1949/50); Greenberg (1971); Trigger (1964, 1966, 1977); Zawadowski (1981); Bender (1981a, 1981b); Hintze (1989); Peust (1999a); Aubin (2003); Hofmann (1979), and Rilly (2003a, 2003b, 2004a, 2007).

For investigations and discussions into the affiliation of the Meroitic language with Afroasiatic, see Meinhof (1921/22); Zyhlarz (1930, 1960); Hainsworth (1975); Hofmann (1979); Böhm (1986, 1988a), and Orlando (1999).

Discussions and proposals on the palaeography of the Meroitic script are given in Griffith (1911); Priese (1973); Zawadowski (1971, 1972b); Aubin (2003), and Rilly (2001b, 2004b, 2007).

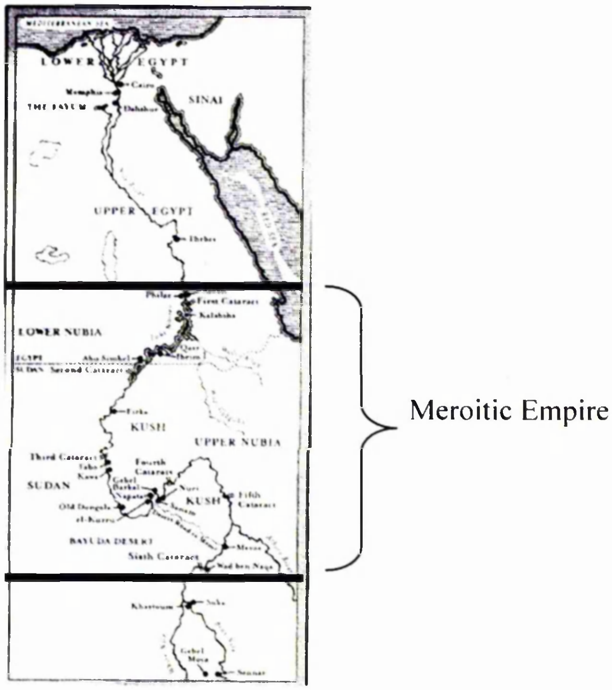
2 Meroitic historical overview

The Kingdom of Kush 900BCE – CE 350, was one of the most important early civilisations in sub-Saharan Africa. The civilisation, also known as the Kingdom of Napata and Meroe, stretched from the first cataract of the river Nile in southern Egypt to the sixth in central Sudan:

Fig. 1.1

Map showing the coverage of the Kushite (Meroitic) Empire

(adapted from Robinson 2002:142)



The importance of the Ancient Egyptian civilisation influencing the Kushite state cannot be over-emphasised. This is foremost seen in the adoption of the Egyptian language and script by the Kushites for their religious, diplomatic and administrative language. The use of Ancient Egyptian as the official written language of the Kushite Empire was usurped by the indigenous language of the Kushites, traditionally termed Meroitic, during the last few centuries of the first millennium BCE (circa early 2nd century BCE). This coincides with the Kushite state emerging with a shift in the location of power focused around Meroe (Edwards 2004).[1]

Whatever reasons instigated the decline and fall of the Kingdom of Kush (circa 350 CE),[2] the transitional period (350 – 550 CE) saw the disappearance of the Meroitic

[1] Edwards specifies that, 'the beginning of the Meroitic period is usually linked with the move of the royal cemetery from the Napata region to Meroe sometime after 300 BC' (2004:143).

[2] See Török (1997), Welsby (1996) and Edwards (2004) for overviews and considerations of the various proposals.

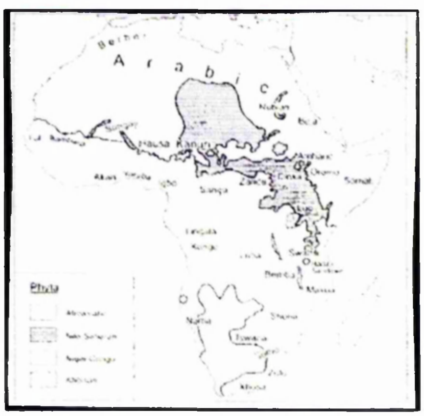
language as the state language, and subsequently the Meroitic script. By the sixth century CE, the new regional power that emerged belonged to the Nobadia or Nubians. The language of the Nubians is classified as a member of the Nilo-Saharan language family.[3] This language would use a different script written in a modified form of the Greek alphabet, with a few extra signs borrowed from Coptic and possibly Meroitic.[4]

2.1 African languages' classification

The Meroitic language was spoken in a region of Africa where two of the four major African language phyla, namely Nilo-Saharan and Afro-Asiatic, are found. A geographical positioning of these phyla is given in fig. 1.2. The Kingdom of Kush encompassed an area stretching north of Khartoum to the border with Egypt in present day Sudan. The Meroitic civilisation existed in an area where the Nilo-Saharan Nubian language is found which is presently surrounded by predominately Afro-Asiatic languages.

Fig. 1.2

African language phyla (Heine & Nurse 2000:2)



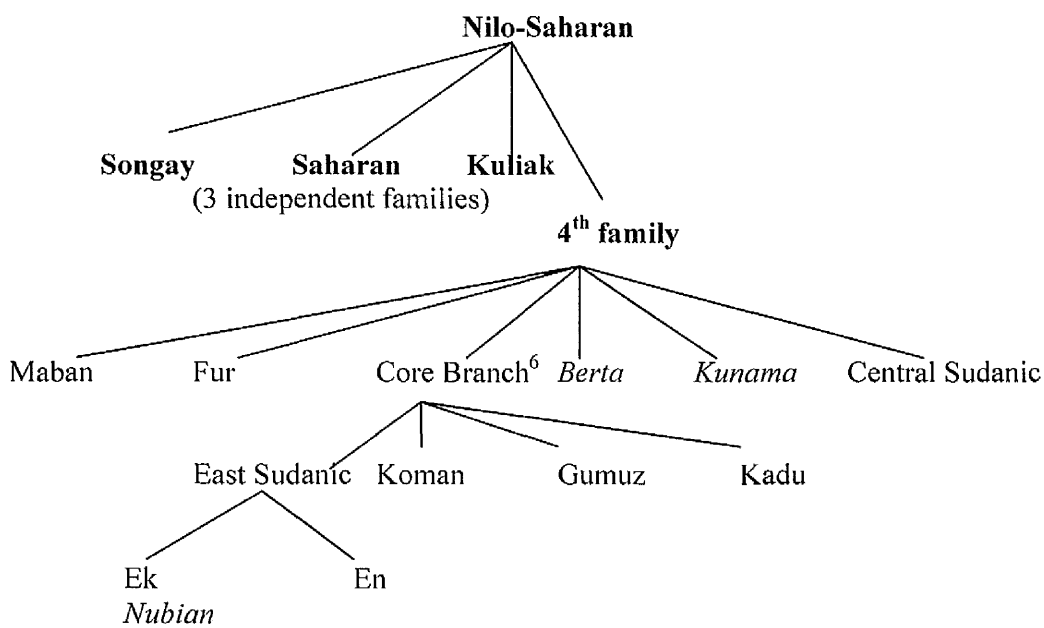
[3] Cf. Greenberg (1966a) for this genetic classification, and Bender (1996) and Ehret (2001) for more investigations into the relatedness of languages in this phylum and Blench (2000) for a critical review of these works. Also, see Mukarovsky (1996), for evidence towards a query to this classification based on shared Nubian and Afro-Asiatic vocabulary.

[4] See Chapter 2, §4 for more on this borrowing of a Meroitic sign.

The Afro-Asiatic phylum is divided into six major branches 'families' following Hayward's (2000:75) 'neutral' positioning: Berber, Semitic, Egyptian, Chadic, Cushitic and Omotic.[5]

The Nilo-Saharan language phylum is extremely diverse and one of the least widely accepted. The following outline of this phylum is adapted from Bender (2000):

Fig. 1.3 Partial Nilo-Saharan Phylum



2.2 The classification of the Meroitic language

Griffith, who determined the values of the Meroitic signs, believed that if a closely related language to Meroitic could be found, the progress of decipherment and the understanding of the language would be greatly enhanced. Griffith's initial assessment for the classification of Meroitic with African language families was that it was possible

[5] The internal structures of this phylum are very much contested and the discussion of this is beyond the scope of this thesis. See Fleming (1983) for one of the initial proposals using a lexicostatistical method for internal sub-grouping. See also Diakonoff (1988) and Bender (1997a) for updated proposals.
[6] Greenberg's (1966a) Chari-Nile family.

that Meroitic could be related to the Nilo-Saharan[7] language Nubian, and further that 'Meroitic may belong to the Hamitic [Cushitic] or to the negro group of languages, or even to the Semitic' (1909:54). In a later study (1911), once Griffith's research into the values of the signs had been roughly determined, he advocated the theory that Meroitic might be an older form of the Nubian language.[8] He found 'analogies to Nubian both in structure and vocabulary' (1911:22) which he believed were worth mentioning. Griffith further stated that 'The [Meroitic] language appears to be agglutinative, without gender, the place of inflextions [sic] taken by post-positions and suffixes.' Nevertheless, he was 'disconcerted' to find that the few 'native' (Meroitic) words, which were then known, did not resemble Nubian equivalents.[9] Griffith then made a further assertion that would have an implication into the association of Meroitic within a language family, and would revise his initial suggestion of 1909 when he stated that '[the] Absence of the peculiarly Semitic consonants and a general simplicity in the sounds of the language seem certain' (1911:22).

However, Griffith writing further in this same publication remarks that the association of the Meroitic language with Nubian is 'very slight' based on the evidence of the inscriptions that were known at that time (1911:83). Furthermore, Griffith outlines that the scanty lexical items that seem to share equivalences in Meroitic and Nubian could be a case of lexical borrowing (especially as the given example *Mash* is a religious deity) or that 'while Meroitic was the official language for writing, Nubian was the

[7] For recent research into the classification of the Nilo-Saharan family, see Ehret (1989, 2001) and Bender (1997b) with an overview of both theories given in Blench (2000).
[8] The Nubian language has a known written tradition stretching back to roughly the 8th century CE (Browne 2002). Its orthography uses a form based on Coptic, which is itself heavily borrowed from the Greek script. The language is spoken in the Nile Valley and beyond, from Upper Egypt through to northern Sudan. Under Greenberg's classification (1966a) Nubian is a member of Eastern Sudanic – sub-group of Chari-Nile a member of the Nilo-Saharan language phylum. In geographical terms, Nubian and Meroitic are in close proximity. The nineteenth century scholar Lepsius initially thought Meroitic might also be closely related to Nubian but revised this view to Beja. Lepsius's views were based on historical association rather than linguistic exactitude (1880), as it was not until Griffith's (1911) breakthrough into the phonemic representation of the Meroitic signs that there was any real understanding of the language of the script.
[9] Griffith saw a comparison with the Meroitic and the Nubian word for 'water' although he could not see any similarity with the word for 'beget/bear' in these two languages (1911:22-23).

mother-tongue of Lower Nubia, so that *Mash* would not be truly Meroitic, but the local Nubian name of the Sun-god retained in official documents' (1911:83). Later on, the case of lexical borrowing became a stronger argument for Griffith, 'borrowing of individual words may therefore have gone on freely between Nubians ... and Meroites, but so far the language of the Meroitic inscriptions does not appear to have been the ancestor of the Nubian dialects' (1916b:123). Subsequently, Griffith did not pursue this line of investigation further in any other of his later works.

Since Griffith had left open the investigation into the linguistic affinities of Meroitic with other African languages and moreover that he had abandoned the Nubian link hypothesis, other scholars took up the issue. Zyhlarz, who, through his academic expertise in Nubian, concluded that Meroitic and Nubian were unrelated (1930). However, certain scholars have raised objections to Zyhlarz's investigation, as they believe it was fundamentally biased in that he propounded a theory put forward by Meinhof (1921/22) (in a publication that predates Zyhlarz's investigation). Meinhof (1921/22) claimed that Meroitic was a primitive 'Hamitic' (Cushitic branch of Afro-Asiatic) language. Zyhlarz (1930, 1956), following Meinhof, pushed his investigation into promoting the association of Meroitic with the Cushitic group of languages, such as Beja, Saho, Afar etc. Furthermore, Zyhlarz's argument (1930) was left unchallenged for nearly quarter of a century until the publication of Hintze's article (1955) where Hintze thoroughly dismissed Zyhlarz's research.

Hintze argued that the similarities given by Zyhlarz between Meroitic and these Cushitic languages were based on manipulations of the content of the texts and that most of his assumptions were speculative. Hintze (1955:372) concluded this article by claiming Meroitic therefore, was not a Hamitic (Cushitic) language. In addition, Hintze reasserted Greenberg's statement from an early paper into African language classification that 'the [Meroitic] language does not appear to be related to any existing language of Africa' (Greenberg 1950a:391).

Greenberg's (1966a) major study into the proposals for the classification of African languages positioned the Meroitic language as unclassified.[10] Greenberg gave further reasons into the Meroitic language's unclassified status in a later publication, 'In the absence of bilingual inscriptions of any significant extent, our knowledge of the Meroitic language, lexically and grammatically, remains very limited and uncertain to a degree' (1971:438). The dearth of assured knowledge of Meroitic lexical and grammatical items cautioned Greenberg's inclusion of Meroitic within any African language family. However, Meroitic scholars have been far from cautious in trying to ascertain the language family of Meroitic as it is believed that the discovery of a cognate language would enhance the understanding of the language of the Meroites.

A publication by the Meroitic archaeologist Trigger (1964) would take up this classification issue once again.[11] In this paper, Trigger argues that as there are advances in African linguistic classification it 'would be profitable to see if a genetic relationship could be discovered between Meroitic and some known African language or group of languages' (1964:188). Trigger, after analysing a few lexical items, goes on to assert that 'while Nile Nubian is not a descendant of Meroitic or even a particularly closely related language, the two may belong to a common larger linguistic unit' (1964:191).[12] Trigger's hypothesis was that Meroitic is a member of the Eastern Sudanic branch of Nilo-Saharan, which was based on a comparison with certain morphological items. This led him to propose that 'the scanty data presently suggests that Meroitic is a member of Greenberg's Eastern Sudanic family' (1964:192). Unfortunately, Trigger's data on which he based his assertion was flawed from the beginning, as he used Zyhlarz's data, which had already been discredited by Hintze (1955). Hintze (1955), in his critique of

[10] See also Tucker and Bryan (1966).

[11] Vycichl's (1958a) proposal that Meroitic is a 'negro' language is built upon converting the negative conclusion of Hintze's (1955) paper that Meroitic is not a Hamitic language into a positive assertion. His proposal would be that Meroitic is a non-Afro-Asiatic language.

[12] During the 19th century, the main method of classifying languages was through morphological typology, see Comrie (1988:146), for a criticism of reliance on morphological typology as a basis of language classification as 'morphological distinctions are not correlated with any other aspect of the language; they stand alone as an arbitrary classification criterion.' See also Peust (1999b:25), who remarks on how 'spoken Egyptian was a highly inflectional language, whereas written Egyptian can be described as a basically agglutinative system.'

Zyhlarz's paper, argued that most of the words in this data could not be proven to have the associated meanings.[13]

In another publication, Hintze (1974a) critically remarked on the associations drawn and the conclusion made in Trigger's paper (1964). In summary Hintze's remarks include the following points; (i) 'the meaning of only a few Meroitic words is well enough established to be used as a basis for lexical comparison' (1974a:75), (ii) A comparison with Nubian 'is made even more difficult because of the known existence of Meroitic loan words in Nubian' (1974a:75), (iii) There are no established sound change rules to show regular equivalents in the different languages, and (iv) The grammatical elements should be concentrated on more than lexical comparisons as these are 'partially much better known than the meaning of words' (1974a:76). Finally, Hintze showed that by Trigger's method, one could also erroneously propose that if Meroitic is a member of the Eastern Sudanic family and therefore related to Nubian, with more linguistic data it could be shown that Nubian, and subsequently Meroitic, is a member of the Ural-Altaic languages (1974a:76-78).[14]

Hintze's conclusion to his paper states that he is in doubt whether 'a kind of comparative method, which compares isolated elements from different languages without considering their inner history, will help us very much in the better understanding of the Meroitic language and texts' (1974a:78).

However, in response to Hintze's criticisms, Trigger (1977) outlines that the aim of his paper (1964) was meant as an encouragement to 'professional linguists' to investigate the connection between Meroitic and the Eastern Sudanic languages more, and that this paper 'did not pretend to prove that such a relationship existed' (1977:422). Within his

[13] See Haycock (1978:61-62) for a succinct refutation of the word list used by Trigger. Cf. Priese (1971) and Schenkel (1972), for further investigations into this association.

[14] Unfortunately, some scholars did not notice the point of Hintze's (1974a) comparison of Meroitic with Ural-Altaic languages to show that scanty data could be used to evidence erroneous proposals and saw this association as a valid line of research, thereby proposals have been put forward asserting that Meroitic is a Ural-Altaic language (Hummel 1992, 1993, 1995).

discussion, Trigger does raise certain important issues in regard to the classification of Meroitic. He points to the recent splitting of the Cushitic branch of Afro-Asiatic into Cushitic and Omotic[15] and outlines that this indicates 'greater complexity among these languages than was formerly recognised.' Trigger also importantly states that 'It is therefore more prudent to conclude that Hintze proved the inadequacy of any existing arguments that Meroitic is an Afro-Asiatic language rather than that Meroitic is not Afro-Asiatic' (1977:422). In concluding this paper, however, Trigger (1977:433) still pursues his original proposal, although now he bases it upon geographical grounds, that Meroitic may be related (in descending order) to Eastern Sudanic, Nilo-Saharan and Afro-Asiatic.

A paper put forward by Bender (1981a) also worked with the same data as Trigger's paper (1964), although there is no reference to Hintze's criticisms (1955, 1974a). From his analysis, Bender puts forward a cautious assertion that 'Meroitic was probably an East Sudanic language' (1981a:22), although, unfortunately, Bender had used the transliteration method implemented for the REM system in his data comparison (as used by Meeks 1973), where the transliteration is not representative of the signs' sound values. This mistaken dependency on a transliteration method would lead him to revise this assertion in a publication of the same year (1981b), which again looked at lexical correspondences with sample languages, and then stated that 'one cannot conclude that Meroitic was Nilo-Saharan, much less East Sudanic' (1981b:28).[16]

The Russian scholar Militariev (1984) put forward the hypothesis that Meroitic may be a member of the Afro-Asiatic language family. He remarked that his hypothesis was designed in order to understand more about African linguistic studies in a historical context. Later on, Böhm (1986) discussed several semantically identified Meroitic words that he associated with equivalents from languages in the Omotic branch of Afro-

[15] Referring to Flemming (1969).
[16] Cf. Bechhaus-Gerst (1984:94) for a few words of possible Nubian origin in Meroitic, although she states that this is not sufficient evidence to claim a link between these languages.

Asiatic. However, within the field of Meroitic research, Militariev and Böhm's research was not followed, as the line of inquiry was stubbornly focused upon the Nilo-Saharan connection with Hintze (1989) reviving the issue of a relationship between Meroitic and (Old) Nubian once more. In this paper, Hintze demonstrated some structural similarities between the two languages, such as:

(i)	Meroitic:	SOV/Post/N + Gen/N + Adj
(ii)	Old Nubian:	SOV/Post/Gen + N/N + Adj

Nevertheless, Hintze concluded that these similarities could be nothing more than coincidence and therefore did not concretely prove a genetic relationship.[17] Hintze's 'coincidence' could be a case of areal diffusion and he was correct in concluding that this did not support a genetic relationship. If this structural similarity is a case of areal diffusion it does not point to evidence of a genetic relationship between Meroitic and Old Nubian, in fact this type of evidence is usually used erroneously as evidence of relatedness in languages where classification is circumspect and/or unknown. Consequently, the investigation into an affiliation of Meroitic with any other African language had drawn no unanimity amongst scholars.[18]

Nevertheless, more recent research into the language family of Meroitic has again proposed the Nilo-Saharan phylum as being the likeliest candidate.[19] Peust (1999a) believes that with further research Nubian and Meroitic might indeed turn out to be

[17] It is the syntactic structural similarities between Meroitic and Old Nubian that most scholars who support the Nubian link hypothesis base their associations upon. However, word order is not the most reliable guide to classification as it is very easily influenced by the word ordering of neighbouring languages. For example, Akkadian, a Semitic language, has SOV word order because of its contact with Sumerian, and further the Ethio-Semitic languages are SOV due to their contact with Cushitic languages. In fact the SOV word order of Meroitic and its use of postpositions (which should not be taken as two separate structural similarities as this ordering occurs cross-linguistically with this word ordering) are also seen across Afro-Asiatic languages: Cushitic, Ethio-Semitic and Omotic.

[18] Various other proposals have been put forward cf. Hummel (1992) for Meroitic belonging to the Altaic family, Sharman for a Sumerian connection (1974) and Böhm (1988) for a hypothesis of an "Indo-nilotischen" proto-language connection. Orlando (1999) also puts forward the hypothesis that Meroitic is a member of the Afro-Asiatic language family.

[19] See Aubin (2003) for this same proposal, but now based on epigraphic considerations.

related languages. Rilly also advances the Nilo-Saharan phylum as the likeliest related language family to Meroitic. Rilly (2003a, 2003b, 2004a) uses a 'multicontextual' approach in order to suggest translations for new words.[20] These words are then subjected to a 'lexicostatistical' analysis and to the 'classical comparative method' with other Nilo-Saharan languages. This language family was analysed following Rilly's initial premise 'to reconsider the relation of Meroitic with Nilo-Saharan and possibly spot inside this phylum a specific family where Meroitic could belong' (2004a:2). He asserts that a link with the other major African phyla is 'unlikely' (2004a:2) and so his analysis is not extended to any non-Nilo-Saharan language.

Fundamentally, the assertion that Meroitic is not an Afro-Asiatic language is based upon Hintze's refutation of the Meroitic data put forward by Zyhlarz. In discrediting Zyhlarz's paper, Hintze and subsequent Meroitic scholars have, in turn, discounted the overall premise that the investigation of Meroitic within the Afro-Asiatic language phylum is a valid line of research. Consequently, even though that evidence is abandoned it should not mean that the investigation of an affiliation or non-affiliation of Meroitic with an Afro-Asiatic language should also be abandoned. Again, as Trigger correctly stated, 'Hintze proved the inadequacy of any existing arguments that Meroitic is an Afro-Asiatic language rather than that Meroitic is not Afro-Asiatic' (1977:422). As these investigations into the linguistic affinities of Meroitic have always focused on lexical and grammatical relatedness with other languages (where these elements are assumed and/or known), this thesis hopes to contribute to the search for a related language with a re-evaluation of the most fundamentally understood aspect of the script, namely the sound values of the signs.

[20] Unfortunately, this approach is not specifically detailed in these papers (2003a, 2003b 2004a), although Rilly states that 'The archaeological and iconographical context can be very helpful, since very often, the short texts are the description with words of a painted or engraved image' (2004a:2). The reader is referred to Rilly (2007) where more discussion is given on this approach.

2.3 Background to the Meroitic script

Knowledge of the indigenous language of the Kushites - Meroitic comes from the archaeological discovery of the execution of its script on monuments, stele, ostraca and papyri. Two scripts were found to be in use, one pictorial or hieroglyphic form used mainly for monumental texts, and the other a cursive form of writing, which was extensively used on numerous media.

The decipherment of the approximate sound values of the signs contained in the Meroitic script was importantly discovered by the pioneering work of the British Egyptologist F. Ll. Griffith (1911). This resulted in a major breakthrough in the understanding that the Meroitic script is composed of 23 phonographic signs and a further sign that denotes a word boundary. Griffith was also able to correspond, through a textual analysis, the hieroglyphic forms with their cursive equivalents and therefore his seminal work initiated the field of studies into the Meroitic language.

The origin of the Meroitic signs is generally seen as being derived from the Ancient Egyptian hieroglyphic and Demotic signs.[21] The Meroitic signs showing their hieroglyphic and cursive forms are given in Fig. 1.4 and the Egyptian origins of the Meroitic signs are outlined in Chapter 2, Fig. 2.1.

The principles by which Griffith (1911) deduced the Meroitic signs through equivalences with Egyptian cannot be detailed here, for a thorough treatment, see Griffith (1911), Haycock (1978) and Rilly (2007).

2.4 The Meroitic system of transliteration

As Griffith (1911) deciphered the approximate sound values of the Meroitic signs, he implemented the first system for the transliteration of Meroitic into Latin-based

[21] For a full overview of the literature and on the specific chronological period of the borrowed Egyptian signs, see Rilly (2007:241-244), and for a full investigation, see Priese (1973).

letters.[22] Various other systems of transliteration have also been used: some of these have been done due to alternative claims on the sound values of the Meroitic signs (Zyhlarz 1930) and others for typographical reasons (former REM system, Meeks 1973). However, the majority of scholars working on the Meroitic script followed Griffith's system, although Macadam's (1949) modification of the transliteration of *z* to *d* would also be followed. In the 1970s, Hintze (1973a, 1974a) revised the transliteration of certain signs in Griffith's system, in light of remarks already made by Griffith (1911, 1916b) and not through new discoveries in the phonology of Meroitic. It is pointed out that the mark of division sign, whether the hieroglyphic form - ⁝ or the cursive form - :, was not specifically ascribed a transliteration symbol by Griffith or Hintze, other than a space between transliterated forms. Furthermore, transliteration of the Meroitic signs is usually italicised:[23]

[22] Further, see Abdalla (1992) for a system proposed for the transliteration of Meroitic into Arabic.
[23] However, the mark of division has been given a specific transliteration symbol in certain works e.g. Eide *et al* (1994, 1996, 1998).

Fig. 1.4
Transliteration systems of Griffith and Hintze

Meroitic		Griffith	Hintze
Hiero.	Cursive		
𐦈	𐦧	*p*	*p*
𐦆	𐦦	*b*	*b*
𐦉	𐦨	*m*	*m*
𐦝	𐦶	z^{1911}/ $^{r}d^{1929}$	*d*
𐦘	𐦳	*t*	*t*
𐦚	𐦴	*te*	*te*
𐦜	𐦵	*tê*	*to*
𐦓	𐦯	*š*	*s*
𐦕	𐦰	*s*	*se*
𐦊	𐦩	*n*	*n*
𐦌	𐦪	*ñ*	*ne*
𐦎	𐦫	*r*	*r*
𐦐	𐦬	*l*	*l*
𐦖	𐦱	*k*	*k*
𐦗	𐦲	*q*	*q*
𐦑	𐦭	*ḫ*	*ḫ*
𐦒	𐦮	*ẖ*	*ẖ*
𐦅	𐦥	*w*	*w*
𐦄	𐦤	*y*	*y*
𐦀	𐦠	*a*	*a*
𐦂	𐦢	*i*	*i*
𐦁	𐦡	*e*	*e*
𐦃	𐦣	*ê*	*o*
⁝	:		

However, not every work on the Meroitic script or Meroitic scholar has followed Hintze's revised system, and even Hintze himself would adopt a different transliteration system for a few signs in his later works (1989, 1999).[24]

Hintze's Meroitic transliteration system (1973a, 1974a) is the system that is used throughout this thesis along with these transliterations being italicised.

2.5 The principles of the Meroitic script

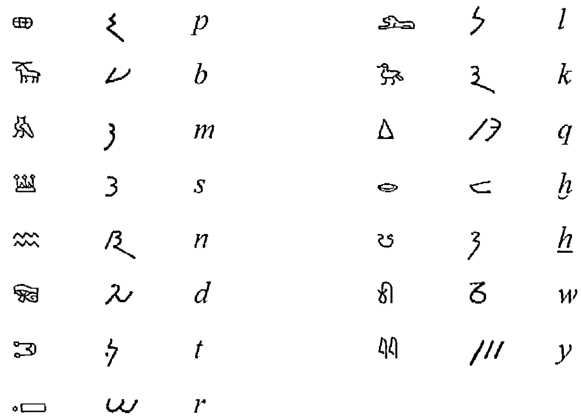
The transliteration system of Meroitic does not in itself indicate a direct mapping between what is written in the orthography and what is converted into Latin letters. Further, there is not always a direct correspondence between what is thought to have been present in pronunciation and what is written in the script. Hintze (1973a:322) specified that the system of transliteration is not identical to the transcription, but only a transformation of the Meroitic signs into Latin letters. He explicitly expressed that the system of Meroitic writing must be understood for any linguistic research into the language. He outlined the following principles:

> Every consonant, which is written without a vowel sign, signifies a consonant + vowel 'a'. Hence *t* is /ta/, *b* is /ba/, etc.
> Therefore all Meroitic letters denote syllables ... This means that doubling of consonants is not expressed in writing; e.g. *-li* may be /-li/ or /-lli/, but *rr* is never /rr/ but /rar(a)/.
> Consonant + vowel, if this vowel is not /a/, [it] is written with consonant + vowel sign *e*, *i* or *o*. So *li* is /li/, not /lai/... For /te/, /to/, /se/ and /ne/ the special letters *te*, *to*, *se* and *ne* are used.
> Consonant + *e* has a double value: /Ce/ or /C/ (consonant without vowel).

These principles need further explanation and discussion in order to understand the method of transliteration and the principles that underlie the Meroitic script. Foremost, the direction of the Meroitic signs are to be read from right to left, and this same direction is implemented throughout this thesis when I notate sequences of the Meroitic signs. Further, the Meroitic signs can be divided into distinct sets:

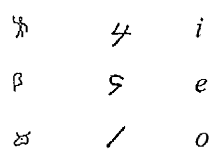
[24] For a full discussion into the various systems of transliteration, see Rilly (2007:253-240).

(1) The 'consonant' inherent unmarked 'a' signs:



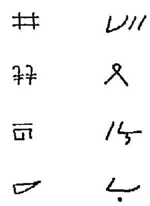
I term this set as 'consonant' signs as they appear in transliteration to represent a single consonant, although in actual fact these 'consonant' signs represent an inherent unmarked 'a' vowel. They denote a CV sequence where they contain an inherent /a/ vowel which is not traditionally transliterated i.e. *p* /pa/. Where there is to be a change in quality of the vowel that follows these 'consonant' signs, one of the separate vowel signs then follows:

(2) The separate vowel signs:



The separate vowel signs are transliterated i.e. *pi* /pi/, and accordingly mark the change in quality from the inherent 'a' /a/ vowel to the corresponding vowel. The vowel sign *e* has been considered to function ambiguously as indicating a vowel and also the absence of a vowel (zero-vowel), whereby, when it follows a 'consonant' sign it represents either the 'consonant' sign is a CV sequence or a consonant with no following vowel. This vowel sign *e* is transliterated even when it is believed to function as a zero-vowel indicator. Moreover, sequences of more than one separate vowel sign are not found in the script without an intervening 'consonant' sign.

(3) The 'syllable' signs:



se
ne
te
to

The 'syllable' signs are termed as such in order to differentiate them from the 'consonant' inherent unmarked 'a' signs, as the 'syllable' signs are thought to contain different inherent vowels to the unmarked 'a' vowel. Traditionally, these 'syllable' signs are assigned as containing an inherent *e* 'e' vowel in three of them, and an inherent *o* 'o' vowel in the fourth. No separate vowel signs follow the 'syllable' signs and so no change can be made on their intrinsic vowel. These 'syllable' signs are transliterated with their inherent vowel, unlike the 'consonant' signs containing the inherent unmarked 'a' vowel. The inherent *e* 'e' vowel of the three 'syllable' signs is also thought to function ambiguously as a vowel and as a zero-vowel indicator, as in the separate vowel sign ϛ *e*.

(4) The 'initial a' sign:

a

This sign is only ever positioned word-initially and no separate vowel signs follow it. This sign is transliterated as *a*, although it is traditionally thought of as representing a word-initial vowel of varying quality.

(5) The written omission of a nasal segment

There is a further practice of the Meroitic script that needs to be understood, which is the written omission of a nasal segment when it is directly followed by a consonant (where this consonant is notated with a 'consonant' or 'syllable' sign). This nasal segment is not notated in the Meroitic script or in transliteration but is adduced from equivalent forms from other languages where it is seen to have been phonetically present. This nasal, when evidence is found for its presence, is only usually transcribed in phonemic/phonetic representation.

2.6 The classification of the Meroitic script

It was not specifically until Hintze's revised transliteration system (1973a, 1974a) and his remarks on the principles of the script (1987) that the understanding of the Meroitic script as being essentially syllabic (CV) was understood. Up until then, the script was usually termed as alphabetic, although unfortunately this mistaken classification is still currently to be found.[25]

In particular, the inclusion of a distinct set of separate vowel signs in the Meroitic script, and the small number of signs has probably caused the most confusion in its classification, as these give the 'alphabetic' appearance of the script and mask its syllabic based principle. Typologically, the Meroitic script is quite rare in its system of organisation, where the Old Persian Cuneiform script is perhaps its most typologically closest equivalent.[26]

Script typologists, such as Saloman (2000:95), have remarked on the uniqueness of the Meroitic script, '[it] is an unusual system which superficially looks like an alphabet, but which on closer examination proves to have an unusual combination of syllabic, alphasyllabic, and alphabetic characteristics.'

[25] Robinson (2002:149) is vague in his script typology definition for Meroitic when he refers to it as 'not a simple alphabet.' See also Abdalla (2003) and Millet (1996:85) for the classification of the Meroitic script as alphabetic.

[26] For more on Old Persian Cuneiform, see Testen (1996).

Rilly (2007:278-284) defines the script as a syllabary and discusses its typology. He further remarks on the possible evolution of the Meroitic script from a syllabic system of Egyptian ("group writing" or "syllabic orthography") that was used to transcribe proper nouns from other languages.

The discussion and investigation into the classification of the Meroitic script is beyond the scope of this thesis, and I follow Hintze (1973a, 1974a) and Rilly (2007) that it is in essence a syllabic script. For more on scripts and script typology, see Gelb (1952, 1963); Jensen (1970); DeFrancis (1989); Sampson (1985); Harris (1986, 1995); Daniels & Bright (1996); Coulmas (1989, 2003); Kavanagh & Mattingly (1972); Rogers (2005); Daniels (1990, 2000); Bright (2000); Diringer (1968), and Miller (1994).

2.7 The ordering of the Meroitic signs

In the works of Griffith, the way that the Meroitic signs were ordered was based on the traditional sequence of Egyptian signs with the Meroitic vowel signs appended. For Rilly (2007), this ordering is cumbersome and so he revises it to run in line with the same sequence as the Latin alphabet i.e. *a*, *b*, *c*, *d* etc.

These sequences are artificially constructed in order to give a systematic reference to the Meroitic signs, as there is no evidence that the Meroites specified any alphabetical-like ordering of their signs.

In Chapter 2 of this thesis, I adopt an ordering for the consonant values of the Meroitic signs, which is based upon grouping these signs into their respective articulatory classes.

3 Ancient Egyptian historical overview

The Ancient Egyptian language, in its various phases including Coptic, is classified as being an autonomous branch of the Afro-Asiatic phylum.[27] The chronological stages of the Egyptian language and the development of its writing system are highly pertinent for any investigation into the Meroitic language.

Loprieno (1995:5-8) divides the history of the Egyptian language into two main stages: *Earlier Egyptian* and *Later Egyptian*. These stages are then subdivided into three different phases which he states primarily reflect changes in the graphemic system. He outlines that the *Earlier Egyptian* stage is the stage of the language of all written texts from 3000 – 1300 BCE, but which survives in formal religious texts until the 3rd century CE. He divides this stage into *Old Egyptian* (3000-2000 BCE), *Middle Egyptian* (2000-1300 BCE) and *Late Middle Egyptian* which coexisted with *Later Egyptian* (1300 BCE – 1300 CE). *Late Middle Egyptian* being the language of religious texts from the New Kingdom up until the end of the Egyptian civilisation. This phase of the *Earlier Egyptian* language stage existed alongside the *Later Egyptian* stage in a situation of diglossia (1995:6). It is this *Later Egyptian* stage that specifically concerns the investigation into Meroitic.

Within the *Later Egyptian* stage (1300 BCE – CE 1300), Loprieno (1995:6-8) outlines three main phases:

(i) Late Egyptian (1300-700 BCE).
(ii) Demotic (seventh century BCE – fifth century CE).
(iii) Coptic (fourth to fourteenth century CE).

The roughly four millennia of Egyptian history are typically divided into nine periods, with the New Kingdom covering the 18th – 20th Dynasties (1550 – 1069 BCE). It is

[27] For an overview of the classification of Ancient Egyptian, see Loprieno (1995:1-5); also see Greenberg (1950b) for a separate criterion detailing its inclusion into this language phylum.

during the 19th Dynasty of the New Kingdom period that sees the emergence of the *Later Egyptian* stage of the Egyptian language.

Texts from the Late Egyptian phase (the language of written records from the second half of the New Kingdom) display various degrees of interference from classical Egyptian (Middle) in older or more formal records and literature which are gradually much rarer in later or administrative texts (Loprieno 1995:7).

The Demotic phase (seventh century BCE – fifth century CE) of Egyptian is heralded by a radical change in the writing convention, where a shorthand simplification of Hieratic sign-groups is introduced (Loprieno 1995:18).[28] The Demotic phase also coincides with the Late Period of Egyptian history (747 – 332 BCE), which in turn gives way to the Ptolemaic period (third century BCE – first century BCE).[29]

The final stage of the Egyptian language – Coptic (fourth to fourteenth century CE) not only sees the introduction of a new script written as a modification of the Greek alphabet, with additional Demotic signs for Coptic phonemes not present in this borrowed script, but also a dramatic change from the older pharaonic religion to the adoption of Christianity.[30]

3.1 The Ancient Egyptian scripts

By far the most important and well-known 'graphic system' of the Egyptian language is known as hieroglyphic writing. There were also two further varieties of writing in use for cursive texts: Hieratic and Demotic. The Hieratic script (2600 BCE – third century CE) is a direct cursive rendering of hieroglyphic writing, whereas the Demotic script

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[28] Hieratic script is used for cursive purposes where it is documented as being used from the Old Kingdom to the 3rd century CE (Loprieno 1995:11).
[29] These chronological periods are roughly given.
[30] Davies (1990:98) asserts that 'The Coptic script was not, however, initially devised for Christian purposes. The earliest recognisable form of Coptic (datable to the end of the first century AD) was used to write native magical texts, where the motive for the use of the Greek letters probably lay, it is thought, in the desire to render as accurately as possible the correct pronunciation of the magical 'words of power.''

(seventh century BCE – fifth century CE) 'modifies radically the writing conventions by introducing a shorthand-like simplification of Hieratic sign-groups' (Loprieno 1995:18). These systems gradually give way to the introduction of a Greek-derived script – Coptic, which thus heralds the final stage of the Egyptian language.

Since the hieroglyphic writing system and its cursive derivatives did not notate the vowels of the Egyptian language, the discernment of its vocalisation comes from evidence attained from the Coptic script, which introduced signs representing vowels, and corresponding forms written in Akkadian cuneiform.

3.2 The Ancient Egyptian hieroglyphic script

A brief overview of the nature of the hieroglyphic script is needed in order to understand not only the origins of the Meroitic signs, but also for the understanding of equivalent forms between Egyptian and Meroitic, which are extensively referred to in this thesis. The Egyptian writing system is exceedingly complex; therefore, I will outline only its major features.[31]

The Egyptian writing system signs can be separated into three broad categories:

(i) Phonograms – the signs that represent the consonantal phonemes of the language.

(ii) Determinatives – the signs that are used to indicate the semantic category of the word.

(iii) Logograms – the signs that represent a complete lexical item.

The phonographic signs are further subdivided into the following categories; uniconsonantal signs are those that represent a single consonant, biconsonantal signs represent pairs of successive consonants, and triconsonantal signs, which represent

[31] For a preliminary description of how the Egyptian writing system functions, see Davies (1990).

groups of three successive consonants. The uniconsonantal signs are the most extensively used signs and total 26 in number:

Fig. 1.5

The Egyptian hieroglyphic uniconsonantal signs.

Hieroglyph	Translit.	Gardiner's Sign list	Hieroglyph	Translit.	Gardiner's Sign list
𓄿	*ꜣ*	G1	𓎛	*ḥ*	V28
𓇋	*i*	M17	𓐍	*ḫ*	Aa1
𓇌 ~ 𓏭	*y* ~ *j*	M17 ~ Z4	𓄡	*ẖ*	F32
𓂝	*ꜥ*	D36	𓋴 ~ 𓊃	*s*	S29 ~ O34
𓅱	*w*	G43	𓈙	*š*	N37
𓃀	*b*	D58	𓈎	*q* ~ *ḳ*	N29
𓊪	*p*	Q3	𓎡	*k*	V31
𓆑	*f*	I9	𓎼	*g*	W11
𓅓	*m*	G17	𓏏	*t*	X1
𓈖	*n*	N35	𓍿	*ṯ*	V13
𓂋	*r*	D21	𓂧	*d*	D46
𓉔	*h*	O4	𓆓	*ḏ*	I10

The Egyptian script contains many further distinct signs other than the uniconsonantal ones, which notate more than one consonant. Examples of biconsonantal signs, which are transcribed with two consonants are: 𓂓 = *kꜣ*, 𓉐 = *pr*, 𓆼 = *ḫꜣ*, and 𓁹 = *ir* ~ *jr*, and triconsonantal signs, which are transcribed with three consonants are those such as: 𓋹 = *ꜥnḫ*, 𓄔 = *jdn*, 𓄊 = *wsr*, and 𓏴 = *zwꜣ*.

The determinative signs are added at the end of a word to indicate its general meaning, e.g. 𓉐𓂋𓂻 *pr* "ascend", the determinative 𓂻 functions here to indicate that the general meaning of the word has to do with motion.[32] Determinatives also function in indicating that the word they are suffixed to should be read phonographically rather than ideographically (logogrammatically). In this sense, they also function as word dividers,

[32] The uniconsonantal sign 𓂋 <*r*> is added here as a 'phonetic complement' i.e. in order to assist in the reading of the biconsonantal sign; the uniconsonantal signs commonly function in the capacity of phonetic complements.

since hieroglyphs do not have a specific sign that demarks a word boundary. When signs are used as determinatives, they do not have any phonographic quality, but are in essence just semantic indicators. It must be mentioned how the majority of Egyptian signs can be polyvalent i.e. they can function with either a phonographic reference, or a determinative indication and even as a logogram. For logograms, the sign of the object they want to represent is used to write the word for the object. They are usually inferred by an additional stroke sign, e.g. 𓉐𓏤 *pr* "house". In this example, the house sign 𓉐 is a logogram which is transcribed *pr* and translated as "house". This house sign can also function as a pure phonogram indicating the sequence *pr*.

The Egyptian hieroglyphic script made variable use of the direction in which it could be read, this was usually, but not always from right to left horizontally, although always from top to bottom vertically.

4 Methods of transcription and transliteration

Throughout this thesis, certain systems of transcription and transliteration are used in order to represent data from various languages. This section outlines the main systems used throughout this thesis.

4.1 The transcription system of Ancient Egyptian

The method of transcribing the Egyptian scripts into Latin letters also uses additional points or diacritics in order to differentiate certain signs from others. The transcription system is a convention, and one that is not fully standardised. The transcription system also does not take into account whether a word is written with phonograms, logograms or both, as Peust (1999b:46) remarks, 'The huge graphical variability of Egyptian is therefore concealed as soon as words are put into transcription.' Conventionally, the transcription is always given in italics, and this practice is maintained in this thesis. There is a further transcription practice of separating certain morphemes from their lexical stems with the use of punctuation marks, such as the nominal feminine suffix 𓏏

t with (.). Where a sign has been omitted in the script, but which can be reconstructed, transcriptions usually mark this omission with the transcription of the sign in parenthesis.

Due to the complexity of the Egyptian writing system, only the Egyptian transcription practice is used for the Egyptian data and this data is not given in its original hieroglyphic or Demotic representations. However, sometimes the discussion of a particular Egyptian sign is necessary therefore the hieroglyphic sign is shown. For the transcription, if the data is a lexical item, the transcription is given in italics e.g. *imn* and if I refer to a specific Egyptian transcribed sign, this is given in pointed brackets i.e. <*i͗*>. As there is no rigid transcription system for Egyptian, I have chosen to use the transcription, within pointed brackets, of the common ones that vary:

(6) <*i͗*> (*j*), <*y*> (*jj*), <*q*> (*ḳ*), <*ṯ*> (*č*), <*d*> (*ṭ*), <*ḏ*> (*ğ*).

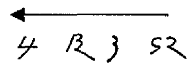
4.2 Coptic

Since Coptic, as the latest stage of the Egyptian language, departed from using the hieroglyphic and Demotic forms of the writing system, and introduced a new script, modified from Greek, I give the Coptic forms in their original 'alphabetic' script. This script is to be read from left to right. I do not give transliterations for the Coptic data, but will specify the phonemic value of the sign that is being discussed when relevant to the discussion. The Coptic language consists of regional dialects, the main ones being Sahidic and Bohairic. The Sahidic dialect is known as the classical dialect of Coptic Egyptian. The Coptic transcriptions exampled throughout this thesis will be identified for the dialect to which they belong if and when the dialect is able to be identified. Many of the original examples in Meroitic studies unfortunately did not specify the exact dialect.

4.3 Meroitic transliteration

The majority of Meroitic data is given in cursive form, and I use the late period cursive form throughout this thesis for consistency (the differences between the more archaic signs and their later equivalents are shown in fig. 2.1).[33] The direction in which this Meroitic data is to be read throughout this thesis is in line with how the Meroites executed it and that is from right to left. The transliteration of the Meroitic data is given following Hintze's (1973a, 1974a) revised version, the transliterations read from left to right and are italicised:

(7) Meroitic



i n m a

Transliteration → *amni*

The Meroitic hieroglyphic forms of the signs are used when necessary for particular discussions, and again for consistency, the later versions of these signs are selected throughout. The system for reading the hieroglyphic forms and their transliterations is the same as that detailed above for the cursive forms.

4.4 Methods for other languages

This thesis also refers to data from languages such as Greek, Nubian and Latin. These data are transcribed throughout this thesis in their original scripts, although when a relevant or particular sign is being discussed its phonemic/phonetic value is given. However, the data from Akkadian and certain other Semitic languages (Ugaritic, Hebrew, Ethiopic, Arabic etc) are represented using their respective conventionalised transliteration system. Again, I specify the exact phonemic representation of the transliterated forms when relevant.

[33] The Meroitic fonts were generously made available to me by the Group d'Etudes Meroïtiques de Paris, Académie des Inscriptions et Belles-Lettres.

4.5 Further symbols

Throughout this thesis, the representations of phonological forms are given in slash brackets e.g. //, and the phonetic representations use square brackets e.g. []. I also indicate diachronic processes with the use of the pointed brackets e.g. > or <. I indicate synchronic processes with the arrow sign: →. This sign is also used to signal that a lexical item is 'written as' something else in another language, but this is specified when used as such.

This thesis also indicates the direction of lexical borrowing by underscoring the given language from where an item originates (e.g. <u>Egyptian</u>) when comparative data are given.

5 Methodological issues

There are a number of reasons as to why any linguistic analysis of the Meroitic language is fraught with difficulties. Firstly, the corpus of known Meroitic inscriptions is very small and the material is limited; the number of inscriptions that are catalogued and published only number to approximately 1,300 (Répetoire d'Épigraphie Méroïtique). A large majority of these inscriptions only consist of a few lines in length, being writings of graffiti, and on fragments of pottery (ostraca) and papyrus. Texts that are more extensive are evidenced on royal and funerary inscriptions and offering tables, although as these follow a standard format they subsequently contain a very limited range of grammar and vocabulary. Only a few texts are known that contain lengthy inscriptions such as the inscription of Kharamadoye at Kalabsha (REM 0094), but still this text only reaches to approximately 34 lines in length. As a result, the known and surmised lexical and grammatical items of the Meroitic language are indeed very small. In addition to the associated problems of a small corpus hindering a linguistic analysis of Meroitic, there are also problems with the written language; many inscriptions are poorly executed and there is ambiguity in interpreting signs that are similar stylistically.[34] On a deeper language level, the language, even though not interpretable overall is understood to be agglutinative thereby making the discovery of grammatical and lexical morphological boundaries at times tenuous and problematic.[35] Consequently, these limitations result in a statistically lower frequency of data in which to analyse, as opposed to thoroughly described languages such as Arabic and Ancient Egyptian.

Further limitations of the data are due to the Meroitic script exhibiting, sometimes considerable, variability in its spellings. These inconsistencies pose serious difficulties in the ability to discern dialectal variations, diachronic changes, morphophonemic alternations, or simply orthographic errors from one another. However, these variant forms should also give indications into the nature or class of sounds they are representing. This is particularly true for the consonantal signs. If it is found that a particular sign often varies with another then it can be inferred that they most probably belong to the same natural class whether this is for place or manner of articulation. This in itself gives additional evidence for the reaffirmation of the sound value (whether phonological or phonetic) of a sign, or a revised proposal.

A basic study of a language's phonology seeks to determine the sounds of the language and how these pattern. In particular, phonology aims to explain exceptions to generalised patterns (when these are not lexical). Nevertheless, throughout this thesis, I take into consideration the importance of patterns as a starting point in which to gain a more detailed understanding of Meroitic phonology. The analysis of signs in positional distributions or restrictions is conducted, along with an investigation into restrictions on co-occurrences. These investigations lead me to make new claims of Meroitic phonology.

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[34] E.g. 𐦴 *t* and 𐦬 *l*, 𐦨 *m*, 𐦮 *h̲* and 𐦯 *s*.

[35] This point refers directly to the encoding of the language in the script – in that the morphological boundaries are harder to discern if there is morpho-phonological assimilation. Meroitic grammatical morphemes are more understood than lexical items. For a main overview, cf. Griffith (1911, 1916b), Hintze (1963, 1974a, 1979), Hofmann (1981a) and Meeks (1973).

The investigation into Meroitic phonology benefits from equivalences of lexical items borrowed from or into other languages, generally Egyptian, even though these equivalences can be problematic. In the case of Egyptian equivalences these are mainly due to the nature of the Egyptian writing system, i.e. the non-representation of vowels; the complexities of its script; the plethora of Egyptian signs used; and the various sound changes that took place during the four millennia of its documented history. Furthermore, these equivalences can also be problematic because of differences between these languages' phonological inventories and syllabification principles. Therefore, an awareness of loan-word phonology is also necessary in proposing claims based on these data.

6 Phonological representations and phonetic realisations

The investigations conducted in this thesis specifically differentiate between phonological or underlying representations and phonetic or surface realisations. I make claims that the Meroitic script encodes either phonologically a phoneme or phonetically an allophone (or phonetic realisation). A phoneme is traditionally understood as being the smallest unit of sound capable of contrasting word meaning. As it is an abstract unit, stored in the lexicon, a phoneme is never pronounced in phonetic realisation. A phoneme can be defined according to its allophones (or phones),[36] whereby we expect sounds that are phonetically similar to occur as allophones of a phoneme, therefore it is the allophones of a phoneme that are pronounced at phonetic realisation. It is often believed by native speakers of a language that certain sounds are identical even though they are phonetically distinct. Katamba summarises this as 'Sounds are grouped together as member of the same phoneme when the very real physical differences between them happen to be functionally immaterial with respect to the language being described' (1989:19).

[36] In Generative Phonology, it is defined by a set of distinctive features.

To use a basic example from English, most native speakers are not aware that the phonetic realisation of a sound such as ‘p’ is variable depending upon its positioning within a word; word-initially or at the beginning of a stressed syllable, this sound is produced with aspiration, although in other positions such as intervocalically and word or syllable final this aspiration is not produced. Therefore, these two predictable occurrences are termed as the allophones [p^h] and [p] or the phonetic realisations of the phoneme /p/ in English. Since the phoneme is usually represented by the sound or allophone that has the broadest distribution in a language, the allophone [p] has the broadest distribution in the English example and so this is the representation of the phoneme /p/. Traditionally, the phoneme and allophone are differentiated by the use of slash and square brackets respectively, and this notation is used throughout this thesis.

Furthermore, phonological processes such as assimilation also condition the phonetic realisation or allophone of a phoneme. That is, the realisation of an allophone is also dependent upon other sounds that are adjacent to it. The English phoneme /p/ is phonetically realised as the labialised allophone [p^w] when followed by a rounded vowel [u].

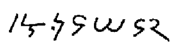
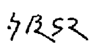
Throughout this thesis, I indicate the phonetic realisations of certain Meroitic phonemes when evidence can be shown that they are conditioned either by their distribution or through their adjacency to other sounds. At times, the phonetic realisation of certain phonemes can be inferred from transcriptions from other languages.

7 Sources for correspondent forms

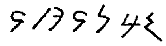
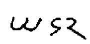
This section gives the correspondent forms from Meroitic, Egyptian and other languages along with their sources. These forms are used throughout the thesis to discuss and evaluate the sound correspondences between Meroitic and other languages that are used to determine the Meroitic signs’ sound values. The Meroitic borrowings combine ancient loans from Egyptian (particularly theonyms) which Rilly (2007:359-

60) asserts may go back to borrowings from the Middle Kingdom period with more recent loans (such as certain titles) which are mostly derived from Demotic.

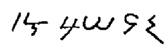
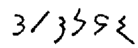
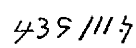
7.1 Sources for Ancient Egyptian forms transcribed into Meroitic

1.	<u>Egyptian</u>	*ḥr-nd-ḥr-ỉt=f*[37]	"Harendotes"	theonym
	Egyptian	*ḥrw-nḏ-jtj.f*[38]		
	Meroitic		*arette*	
	Greek	Ἀρενδωτης[39]		
2.	Late Eg.	*ḥm-ntr*[40]	"Prophet/Priest"	title
	<u>Old Eg.</u>	*ḥm-nṯr*[41]		
	Demotic	*ḥm-nṯr*[42]		
	Coptic	Boh ϩⲟⲛⲧ[43], Sah ϩⲟⲛⲧ[44]		
	Meroitic		*ant*	

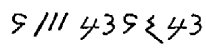
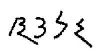
[37] Eide et al (1994:436).
[38] Osing (1976:596).
[39] Rilly (2007:367), Osing (1976:596).
[40] Lesko (2001:310), Rilly (2007:368).
[41] Thesaurus Linguae Aegyptiae (TLA), lemma 104940.
[42] Erman and Grapow (1926-31; Vol. III:88-90), TLA, lemma 4069.
[43] Erman and Grapow (1926-31; Vol. III:88-90), Westendorf (1977:380), Černy (1976:288), Vycichl (1983:306).
[44] Westendorf (1977:380), Černy (1976:288), Vycichl (1983:306).

3.	<u>Egyptian</u>	*pꜣ-ỉw-rḳ*[45]	"Philae"	toponym
	Demotic	*p-ỉlḳ*[46] *pꜣ-ỉj-lḳ, p(r)-ꜣlq,* (^{det}*pr*)(^{det}*ỉꜣt*)*rq.t,*[47] (^{det}*ỉꜣt*)*rkꜣ.t,*(^{det}*ỉꜣt*)*lkꜣ.t*[48]		
	Coptic	^{Sah}**ⲡⲓⲗⲁⲕ,**[49] **ⲡⲓⲗⲁⲭ, ⲡⲩⲗⲁⲕ,**[50] ^{Boh}**ⲡⲓⲗⲁⲕϩ**[51] ^{Sah}**ⲗⲁⲕϩ**[52]		
	Meroitic		*pileqe*	
	Greek	φιλαί, φιλή[53] πιλάχ[54] πιλάκ[55]		
4.	<u>Old Eg.</u>	*ḥrw*[56]	"Horus"	theonym
	Late Eg.	*ḥr*[57]		
	Demotic	*ḥr*[58]		
	Coptic	^{Sah}**ϩⲱⲣ,**[59] ^{Old}**ϩⲱⲗ,** ^{Old}**ϩⲁⲣ,** ^{Old}**ϩⲣ,**[60] ^{Old}**ϩⲁⲣ-ⲡϣⲱⲧ**[61]		
	Meroitic		*ar*	

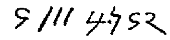
[45] Černy (1976:348).
[46] Černy (1976:348).
[47] Gauthier (1925-31; Vol. II:52). Glossed as 'island of Raq/Laq' being a periphrastic expression for the Island of Philae. The hieroglyphic form given by Gauthier shows *ỉꜣt* which LeFebvre (1940) identifies as an ideogram or determiner *monticule de terre* 'mound'.
[48] Gauthier (1925-31; Vol. I:30).
[49] Černy (1976:348), Gauthier (1925-31; Vol. II:52).
[50] Gauthier (1925-31; Vol. II:52).
[51] Černy (1976:348), Gauthier (1925-31; Vol. I:30).
[52] Reintges (p.c.).
[53] Gauthier (1925-31; Vol. II:52).
[54] Gauthier (1925-31; Vol. I:30).
[55] Černy (1976:348).
[56] Osing (1976:185), TLA, lemma 107500.
[57] Erman and Grapow (1926-31; Vol. III:122).
[58] TLA, lemma 1352.
[59] Osing (1976:185), Crum (1939:703).
[60] Reintges (p.c.).
[61] Crum (1939:703), the final Coptic form is the idiomatic name of Jupiter – *Horus the Secret.*

5.	<u>Egyptian</u>	*pꜣ-rt*,[62] *rdw*[63]	"the agent"	title
	Demotic	*pʿ-rj.t*,[64] *p-rṱ, rt*,[65] *pꜣ-rt/tꜣ-rt*,[66] *pꜣ-rṱ*,[67] *rṱ*[68]		
	Coptic	Sahⲣⲏⲧ,[69] Sahⲡⲣⲏⲧ[70]		
	Meroitic		*perite*	
	Greek	παριτ, πρατις, πρητ, παρατις, παρητ, παρειτις, παρατ, παρατης[71]		
6.	<u>Egyptian</u>	*pꜣ-mr-mšʿ*,[72] *imy-r mšʿ*,[73] *mr-mšʿ*[74]		title
	Demotic	*r-mšʿ*,[75] *mr-mšʿ, pꜣ-mr-mšʿ*[76]		
	Coptic	Sahⲗⲉⲙⲏⲏϣⲉ,[77] Sahⲙⲏⲏϣⲉ, Bohⲙⲏϣ,[78] Akⲗⲉⲙⲏⲥⲉ,[79] Lⲗⲉⲙⲏϣⲉ[80]		
	Meroitic		*pelmos*	
	Greek	λεμεισα[81]		
7.	<u>Egyptian</u>	*tꜣ-ist*[82]		anthroponym
	Demotic	*tʿ-ꜣs.t*,[83] *ty-ist*[84]		
	Meroitic		*tyesi*	

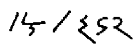
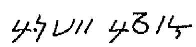
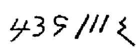
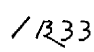
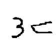
[62] Rilly (2007:363).
[63] Vycichl (1983:179).
[64] TLA, lemma 5121.
[65] Vycichl (1983:179).
[66] Osing (1976:683-4).
[67] Eide et al (1998:1016).
[68] Eide et al (1996:730).
[69] Vycichl (1983:98), Osing (1976:176) from New Kingdom Egyptian **rwḏ-w*.
[70] Rilly (2007:363).
[71] Osing (1976:683-4).
[72] Erman and Grapow (1926-31; Vol. II:94, 155, 388).
[73] Černy (1976:73), Lesko (2001; Vol. I. 28, 208).
[74] Old Egyptian form, TLA, lemma 72290.
[75] Černy (1976:73), Lesko (2001; Vol. I. 28, 208).
[76] TLA, lemma 2517, 80.
[77] Crum (1939:143), Erman and Grapow (1926-31; Vol. II: 94, 155, 388), Vycichl (1983:98).
[78] Erman and Grapow (1926-31; Vol. II: 94, 155, 388).
[79] Vycichl (1983:98).
[80] Vycichl (1983:98).
[81] Erman and Grapow (1926-31; Vol. II: 94, 155, 388).
[82] Lüddeckens et al (1997:1166-7), Erman and Grapow (1926-31; Vol. I: 128)
[83] TLA, lemma 4886.
[84] Eide et al (1998:992).

8.	<u>Old Eg.</u>	*(bꜣ)šps-j*, *ꜥ.t šbs.t*,[85] *šps.t*[86]	"the noble"	anthroponym
	Late Eg.	*pꜣ-šps(j)*, *tꜣ-šps.t*[87]		
	Demotic	*tꜣ-špš*,[88] *tꜣ-špšj.t*,[89] *tꜣ-špšjꜣ.t*[90]		
	Coptic	Old ϭⲁⲡϭⲓ,[91] Old ϣⲁⲡϣⲓ[92]		
	Meroitic		*sipesiye*	
9.	<u>Egyptian</u>	*pꜣ-mr-šn*[93]		title
	Coptic	Sah ⲗⲁϣⲁⲛⲉ[94]		
	Meroitic		*plsn*	
10.	<u>Egyptian</u>	*pꜣ-b(j)k*,[95] *bjk*[96]	"falcon"	anthroponym
	Demotic	*b(j)k*[97]		
	Coptic	Sah ⲃⲏϭ, Sah ⲃ(ⲉ)ϭ, Boh ⲃⲏϫ,[98] Boh ⲃⲉϫⲓ, Fa ⲃⲏϭ, Fa ⲃⲓϭ[99]		
	Meroitic		*beke*	
	Greek	βηκις[100]		

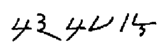
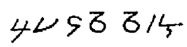
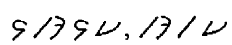
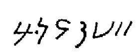
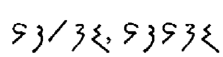
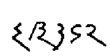
[85] Osing (1976:651).
[86] Old Kingdom forms, Osing (1976:150).
[87] New Kingdom forms, Osing (1976:651).
[88] TLA, lemma 4628.
[89] Lüddeckens et al (1997:1086), Crum (1939:582).
[90] Philae Graffiti 417.
[91] Osing (1976:150).
[92] Old Coptic idiomatic feminine form, Crum (1939:582).
[93] Erman and Grapow (1926-31; Vol. IV:496, 498).
[94] Erman and Grapow (1926-31; Vol. IV:496, 498).
[95] Erman and Grapow (1926-31; Vol. I:84).
[96] Erman and Grapow (1926-31; Vol. I:444), Late Egyptian form, Lesko (2001:131).
[97] TLA, lemma 500418.
[98] Erman and Grapow (1926-31; Vol. I:444), Crum (1939:48).
[99] Crum (1939:48)
[100] Erman and Grapow (1926-31; Vol. I:444).

11.	<u>Egyptian</u>	*pꜣ-nbz*(*t*), (*pr*)*nbs*[101]	"Pnoubs"	toponym
	Demotic	*pꜣ-nbse*[102]		
	Meroitic		*nbse*	
	Greek	πνόυφ[103]		
	Latin	Nups[104] ~ Nupsia[105]		
12.	<u>Egyptian</u>	*ḫ*(*w*).*t-tiye*, *jttyt*[106]	"Sedeinga"	toponym
	Meroitic		*atiye*	
	Latin	Ataea/Noa[107]		
13.	<u>Egyptian</u>	*kꜣš, kꜣs, kšj, kwš, kꜣšj, kšwj,*[108] *ks, kš, ks*(*t*),[109] *kꜣš*[110]	"Kush"	toponym
	Demotic	*kšt,*[111] *kš*[112]		
	Coptic	[Sah, Ak]ⲉϭⲱϣ,[113] [Boh]ⲉⲑⲱϣ[114]		
	Meroitic		*qes*	
	Greek	χυς, χυσι[115]		
	Hebrew	[116]כוש		
	Babylonian	*kasi,*[117] *kaši*[118]		
	Assyrian	*kusi,*[119] *kusu*[120]		

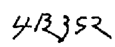
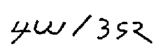
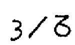
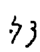
[101] Gauthier (1925-31; Vol. II:38, 92).
[102] Eide et al (1998:967).
[103] Ptolemaic form, Gauthier (1925; Vol. II:38).
[104] Form given by Pliny, Gauthier (1925; Vol. II:38).
[105] Form given by Juba, Gauthier (1925; Vol. II:38).
[106] Zibelius (1972:97).
[107] Bion's form, Eide et al (1998:808).
[108] Zibelius (1972:165).
[109] Gauthier (1925-31; Vol. V:193-4).
[110] Erman and Grapow (1926-31; Vol V:109).
[111] Eide et al (1998:983).
[112] Eide et al (1998:970).
[113] Osing (1976:311), Erman and Grapow (1926-31; Vol. V:109), Gauthier (1925-31; Vol. V:193-4).
[114] Osing (1976:776), Erman and Grapow (1926-31; Vol. V:109).
[115] Gauthier (1925-31; Vol. V:193-4).
[116] Gauthier (1925-31; Vol. V:193-4), Erman and Grapow (1926-31; Vol. V:109).
[117] Gauthier (1925-31; Vol. V:193-4).
[118] Erman and Grapow (1926-31; Vol. V:109).
[119] Gauthier (1925-31; Vol. V:193-4), Erman and Grapow (1926-31; Vol. V:109).

14. Egyptian	*jp(w).t(j)*,[121] *ipwty*,[122] *wpwtj*[123]	"messenger"	title
Meroitic		*apote*	
15. Egyptian	*t(ꜣ)-wš.t*	"the adoration"	noun
Demotic	*tꜣ wšte*[124]		
Coptic	[Sah]**Ⲧ-ⲞⲨⲀϢⲦⲈ**		
Meroitic		*tewiseti*	
16. Egyptian	*pa-ist*[125]		anthroponym
Demotic	*pꜥ-ꜣs.t*,[126] *pa-ist*[127]		
Meroitic		*pyesi*	
17. Demotic	*ssn*,[128] *ssꜥn*[129]		anthroponym
Meroitic		*ssno*	
18. Egyptian	*ẖns.w*,[130] *ẖns.w*, *ẖ(n)s.w*[131]	"Khonsou"	theonym
Demotic	*ẖnsw*[132]		
Meroitic		*ẖs*(?)	
Greek	χόνς		

[120] Gauthier (1925-31; Vol. V:193-4).
[121] Old Egyptian form, TLA, lemma 45760, Osing (1976:532-3).
[122] Late Egyptian form, Lesko (2001; Vol. VI:25).
[123] Osing (1976:532-3).
[124] Demotic Graffiti of Paese, Eide et al (1998:944).
[125] Lüddeckens et al (1985:354, 1086).
[126] TLA, lemma 1916.
[127] Eide et al (1998:944).
[128] Eide et al (1998:946).
[129] TLA, lemma 1917.
[130] Middle Egyptian form, TLA, lemma 4532.
[131] Late Egyptian forms, TLA, lemma 119720.
[132] TLA, lemma 118720.

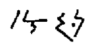
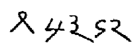
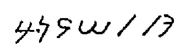
19. <u>Egyptian</u>	*tꜣ-b(j)k(.t)*[133]	"the female falcon"	anthroponym
Meroitic		*tebiki*	
Greek	τβηχις		
20. <u>Egyptian</u>	*ḏw-wꜥb, (pꜣ)tꜣ-wꜥb*[134]	"holy mountain"	toponym
Coptic	$^{\text{Sah}}$ⲧⲟⲟⲩ, $^{\text{Boh}}$ⲧⲱⲟⲩ[135]		
Meroitic		*tew webi*	
21. <u>Egyptian</u>	*bꜣqi, bꜣki*[136]		toponym
Meroitic		*boq-, beqe*	
Greek	Ἀβουγκις[137]		
Latin	Aboccis[138]		
22. <u>Demotic</u>	*is-mt*		anthroponym
Meroitic		*semeti*	
23. <u>Egyptian</u>	*p(ꜣ)-ꜥẖm*	"the sacred falcon"	anthroponym
Coptic	$^{\text{Sah}}$ⲡⲁϩⲱⲙ[139]		
Meroitic		*pẖome, pẖeme*	
24. <u>Egyptian</u>	*imn(-m-)ip.t*[140]	"Amun of Luxor"	theonym
Meroitic		*amnp*	
Greek	ἀμενῶφις		

[133] Erman and Grapow (1926-31; Vol. I:85).
[134] Gauthier (1925-31; Vol. VI:9).
[135] Coptic forms for *ḏw*, Erman and Grapow (1926-31; Vol. V:541).
[136] Gauthier (1925-31; Vol. II:7).
[137] Zibelius (1972:76), Ptolemaic Greek form, Gauthier (1925-31; Vol. II:38, 92).
[138] Pliny's form, Gauthier (1925-31; Vol. II:38, 92).
[139] Eide et al (1998:1167).
[140] Erman and Grapow (1926-31; Vol. I:84).

25. Egyptian	*imn*	"Amun"	theonym
Coptic	[Boh]ⲁⲙⲟⲩⲛ[141]		
Meroitic		*amni*	
Greek	ἁμουν[142]		
Babylonian	*amâna, amunu*[143]		
26. Egyptian	*ḥw.t-ḥr.w*[144]	"Hathor"	theonym
Demotic	*ḥwt-ḥr*,[145] *ḥ.t-ḥr*[146]		
Meroitic		*atri*	
27. Egyptian	*ws-jr*[147]	"Osiris"	theonym
Demotic	*ws-ir*[148]		
Coptic	ⲟⲩⲥⲓⲣⲉ		
Meroitic		*asori*	
28. Egyptian	*ꜣs.t*[149]	"Isis"	theonym
Demotic	*ꜣs.t*[150]		
Coptic	ⲏⲥⲉ		
Meroitic		*wos*	
29. Egyptian	*mw.t*	"Mout"	theonym
Meroitic		*mt*	
Greek	μουθ[151]		

[141] Erman and Grapow (1926-31; Vol. I:84).
[142] Erman and Grapow (1926-31; Vol. I:84).
[143] Erman and Grapow (1926-31; Vol. I:84).
[144] TLA, lemma 99960.
[145] Eide et al (1998:979).
[146] TLA, lemma 3916.
[147] TLA, lemma 49460.
[148] TLA, lemma 1502.
[149] TLA, lemma 271.
[150] TLA, lemma 209.
[151] Rilly (2007:367).

7.2 Sources for forms transcribed from Meroitic

30. Meroitic		*npte*	"Napata"
Egyptian	*mr-z-nip*(^{det}*ḏw*),[152] *npt*,[153] (*ỉmn*)-*npjj*,[154] *npỉ*, *np*, *np.t*,[155] *npꜣ*,[156] *npyt*,[157]		
Greek	(Τα)Νάπατα,[158] Τα-ναπη[159]		
31. Meroitic		*akine*	"lower Nubia"
Egyptian	*jqn*,[160] *ꜥqnꜣ.t*,[161] *ỉqn*, *ỉkn*, *ỉkinꜣ*[162]		
Demotic	*ꜣkjny*		
Greek	Ἀχίνη[163]		
Latin	Acina[164]		
32. Meroitic		*qoreti*	"Qurta"
Egyptian	*kꜣrtỉ(t)*,[165] *kꜣrtꜣ*, *kꜣrwt-tꜣ*[166]		
Demotic	*kꜣltỉ(t)*[167]		
Greek	κόρτι[168]		

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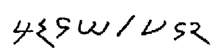
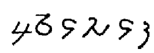
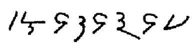
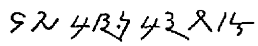
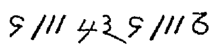
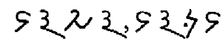
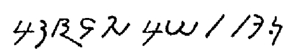
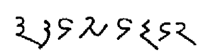
[152] Ranke (1935:158). The form is given with *ḏw* functioning as an ideogram 'mountain'. Gardiner (1957:489, fn 1) gives the Coptic form of 'mountain' as 'toou'. Reintges (2004:558) glossed as ^{Sah}ⲧⲟⲟⲩ.
[153] Zibelius (1972:137).
[154] Zibelius (1972:138).
[155] Gauthier (1925-31; Vol. III:86-87).
[156] Erman and Grapow (1926-31; Vol. II:247).
[157] Middle Egyptian form, TLA, lemma 850127.
[158] Erman and Grapow (1926-31; Vol. II:247), which Peust (1999b:216) determines as a plural form.
[159] Reintges (p.c.) Greek singular form.
[160] Zibelius (1972:94).
[161] Ancient form, Gauthier (1925-31; Vol. I:158).
[162] Gauthier (1925-31; Vol. I:158).
[163] Gauthier (1925-31; Vol. I:158).
[164] Rilly (2007:375).
[165] Gauthier (1925-31; Vol. V:191).
[166] Zibelius (1972:163).
[167] Gauthier (1925-31; Vol. V:191).
[168] Gauthier (1925-31; Vol. V:191).

33. <u>Meroitic</u>		*sye*	"Saï"
Egyptian	*šꜣʿ.t*,[169] *zꜣw*,[170] *šꜣw*[171]		
Demotic	*sj*,[172] *sꜣw*[173]		
Coptic	**ⲍⲁⲏ**,[174] Boh**ⲥⲁⲓ**[175]		
Old Nubian	**ⲥⲁⲉⲓ, ⲥⲁⲏ**[176]		
Assyrian	*sy*[177]		
Greek	Σαΐς[178]		
34. <u>Meroitic</u>		*aborepi*	"Musawwaret"
Egyptian	*jpbrp, jpbrpt, jbbrʿnḫt*,[179]		
35. <u>Meroitic</u>		*medewi*	"Meroe"
Egyptian	*mriw*,[180] *brw.t*[181]		
Demotic	*mrw*,[182] *mlwꜣ*,[183] *mrwꜣ*[184]		
Coptic	**ⲡⲉⲣⲟⲩⲉ**[185]		
Greek	μερόη,[186] *mi-r-wꜣ-i*[187]		

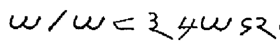
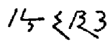
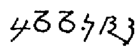
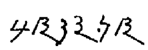
[169] Middle Egyptian form, Zibelius (1972:154, 157).
[170] Old Egyptian form, TLA, lemma 126380.
[171] Middle Egyptian form, TLA lemma 126380.
[172] TLA, lemma 5020.
[173] Erman and Grapow (1926-31; Vol. I:408).
[174] Zibelius (1972:154, 157), dialect unspecified.
[175] Černy (1976:352).
[176] Rilly (p. c.).
[177] Černy (1976:352).
[178] Černy (1976:352).
[179] Zibelius (1972:77).
[180] Gauthier (1925-31; Vol. III:46).
[181] Zibelius (1972:106), TLA, lemma 850069.
[182] Erichsen (1954:169).
[183] TLA, lemma 1362.
[184] TLA, lemma 2546.
[185] Zibelius (1972:76), dialect unspecified.
[186] Zibelius (1972:106-7).
[187] Ptolemaic Greek form, Rilly (2007:388).

36. Meroitic		*pedeme*	"Primis"
Egyptian	*prmt*[188]		
Demotic	*prm*(*t*), *p*(*r*)*my*[189]		
Greek	πρίμις, πρῆμ(ν)ις[190]		
Latin	Pindimis[191]		
37. Meroitic		*tolkte*	"Naga"
Egyptian	*twrkt*(*t*)[192]		
38. Meroitic		*bekemete*	anthroponym
Demotic	*bk-mṯj*[193]		
39. Meroitic		*tenekitnide*	anthroponym
Demotic	*ꜣtngyṯnryꜣ*[194]		
40. Meroitic		*brtoye*	anthroponym
Demotic	*ꜣbrṯy*[195]		
41. Meroitic		*wyekiye*	title
Demotic	*wjngjꜣ*, *wjgꜥjꜣ*, *wꜥyḳy*[196]		
42. Meroitic		*qorene*	title
Demotic	*qrnj*(*ꜣ*),[197] *ḳrnyꜣ*,[198] *ḳrny*[199]		

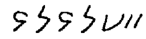
[188] TLA, lemma 854016.
[189] Černy (1976:349).
[190] Černy (1976:349).
[191] Eide et al (1998:931).
[192] Zibelius (1972:172).
[193] Eide et al (1998:1011, 1014).
[194] Eide et al (1998:990).
[195] Eide et al (1998:1020), TLA, lemma 1918.
[196] Rilly (2007:130, 375), Eide et al (1998:968).
[197] TLA, lemma 6401.
[198] Eide et al (1998:1016).
[199] Eide et al (1998:944).

43. <u>Meroitic</u>		*akroro*	title
Demotic	*ꜣkrr(e)*[200]		
44. <u>Meroitic</u>		*kdke, ktke*	title
Egyptian	*kntiky*[201]		
Greek	κανδάκη		
Ethiopic	*ẖəndake*[202]		
45. <u>Meroitic</u>		*arebetke*	title
Demotic	*ꜣrbtgꜥjꜣ, ꜣrbtngꜥj*[203]		
46. <u>Meroitic</u>		*qore*	title
Demotic	*kwr*[204]		
47. <u>Meroitic</u>		*tqoridemni*	anthroponym
Demotic	*tḳrrmn*[205]		
48. <u>Meroitic</u>		*ẖoẖonete*	title
Demotic	*ẖẖnꜣti*[206]		
49. <u>Meroitic</u>		*apedemk*	theonym
Demotic	*ỉprmk*[207]		

[200] TLA, lemma 520, Eide et al (1998:1011).
[201] Eide et al (1998:902).
[202] Dillmann (1907:48), Dr Antonio Orlando (p.c.).
[203] Eide et al (1998:1014).
[204] TLA, lemma 6544.
[205] Eide et al (1998:1007), TLA, lemma 532.
[206] Eide et al (1996:733).
[207] Eide et al (1996:584-5).

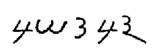
50.	Meroitic		*arikẖror*	anthroponym
	Egyptian	*irk-nḫr*[208]		
51.	Meroitic		*snpte(li)*	anthroponym
	Demotic	*snptj*[209]		
52.	Meroitic		*mnitore*	anthroponym
	Egyptian	*imn-tꜣ{.wy}ry(.t), imn-dr(.t)-y(.t),*[210] *imn-ʿ-r(yt), imn-ʿ-r*[211]		
53.	Meroitic		*mntwwi*	anthroponym
	Demotic	*mnṯwi*[212]		
54.	Meroitic		*ntkmni*	anthroponym
	Egyptian	*ntk-imn, ntg-imn, ndkꜣmn*[213]		
55.	Meroitic		*peseto*	title
	Demotic	*p(ꜣ)sy-nsy*[214]		
	Greek	ψεντης[215]		
56.	Meroitic		*pẖrse*	"Faras"
	Coptic	**ⲡⲁⲭⲱⲣⲁⲥ**		
	Greek	παχωρας		

[208] Eide et al (1998:905).
[209] Dakka 30 graffiti, Rilly (2007:363).
[210] Rilly (2007:367).
[211] Eide et al (1998:902).
[212] Eide et al (1998:973, 978-80).
[213] Rilly (2007:367).
[214] Development of Egyptian *pꜣ sꜣ-nswt,* Eide et al (1998:1005-10).
[215] Eide et al (1998:1009, 1021-2).

57. Meroitic		*selele*	"Shellal"
Greek	τεληλις[216]		

7.3 Sources for forms from other languages transcribed into Meroitic

58. Latin	*roma*		"Rome"
Meroitic		*arome*	
Egyptian	*jrm, jrmj, jrmjw, jrmy,*[217] *hꜣlmꜥ(t)*[218]		
Demotic	*hrme*[219]		
Coptic	ϩρωмн[220]		

59. Latin	Cesar		"Caesar"
Meroitic		*kisri*	
Egyptian	*gꜣjsrj, qjsr(ꜣ), qꜣjsrj,*[221]		
Demotic	*gsrs,*[222] *gjsrs*		
Greek	καῖσαρ		

8 Organisation of the thesis

This thesis is an investigation into certain areas of Meroitic phonology, and is organised as follows; Chapter 2 investigates the phonemic and phonetic value of the consonants of Meroitic and relevant phonological processes that affect their phonetic realisation. This is followed by Chapter 3 which specifically explores the phonemic and phonetic value of the Meroitic 'initial a' sign, and further its participation in phonological processes with evidence used from equivalent forms from other languages. The investigation into Meroitic vowels and their transcriptions into other languages is the study conducted in

[216] Eide et al (1998:1147-1151).
[217] Zibelius (1972:84-5).
[218] Gauthier (1925-31; Vol. IV:2).
[219] Eide et al (1998:1006).
[220] Gauthier (1925-31; Vol. IV:2).
[221] Reintges (p.c.).
[222] Eide et al (1998:1006).

Chapter 4. I examine the traditional representation of two 'syllable' signs and as a consequence of this examination I put forward a revised proposal to one of the Meroitic vowel signs in Chapter 5. Chapter 6 details the major claims of this thesis with a theoretical phonological analysis and finally, Chapter 7 of this thesis summarises the main claims made throughout with a general conclusion.

Chapter 2

A Phonological Investigation into Meroitic Consonants

This chapter investigates the phonemic representation and phonetic realisation of the Meroitic consonants. Furthermore, discussions are given on apparent phonological processes that affect certain consonants. I put forward claims for the revision of the phonemic/phonetic value of some of the consonants. This chapter also discusses the transcription of the Meroitic consonants from other languages. Firstly, an overview of the origins of both the Meroitic hieroglyphic and cursive forms of these signs that have been proposed is given in Fig. 2.1. The literature on proposals for these signs' sound values is summarised in Fig. 2.2. Correspondences between the Meroitic signs with Ancient Egyptian and other languages is summarised in Fig. 2.3.

Major references are made to Egyptian phonology, as I believe that this is needed not only because Meroitic heavily borrowed signs from Egyptian but also because a thorough understanding of sound changes affecting the Egyptian phonemic values of their signs is crucial to enhance the understanding of the Meroitic sound values and equivalent forms.

This chapter also addresses and puts forward explanations for ambiguities that have been observed by previous scholars concerning the representations of certain Meroitic consonants in equivalent forms from other languages. I primarily draw upon typological evidence for proposed revisions to certain signs' phonemic/phonetic sound values, and emphasise that a detailed understanding of differences between the phonemic and phonetic levels of representation that are encoded in the Meroitic orthography is vital for any investigation into the script.

The organisation of this chapter is as follows: firstly, a brief overview on the origins of the hieroglyphic and cursive forms of each sign is given, and the literature is reviewed for each (sub) group of consonant signs. Sections that evaluate proposals for their representation follow this, and my proposals, when relevant, are put forward. This chapter divides the Meroitic consonants into specific sections where they are primarily grouped into their place of articulation and further subdivided into manner of articulation for the coronal and dorsal consonant signs. This chapter also gives updated correspondent forms, where found, to the ones used traditionally. The following figures (2.1, 2.2 and 2.3) summarise the discussions given in this chapter.

Fig. 2.1
Origins of Meroitic hieroglyphic and cursive signs borrowed from Ancient Egyptian

Meroitic hieroglyph	**Meroitic translit.**	**Egyptian hieroglyph**	**Egyptian transcription**	**Gardiner's sign list no.**
	p		<*p*>	Q3
	b		<*bꜣ*>	E10
	m		<*m*>	G17
	s		<*šꜣ*>	M8
	se		<*s*> ~ <*z*>	O34
	n		<*n*>	N35
	ne		<*nn*> ~ <*nsw*>	M(22)
	d		<*jr*> ~ <*ir*>	D4
	t		<*ṯ*>	V13
	te		<*tꜣ*> + <*h*>	N16[1] + O4
	to		determinative	N21
	r		<*r*>	D21
	l		<*rw*> ~ <*ḻ*>	E23
	k		<*gb*>	G38
	q		<*q*> ~ <*ḳ*>	N29
	ḫ		<*ḫ*> ~ <*ẖ*>	Aa1 ~ F32
	ẖ		determinative ~ <*n(w)*>	W22 ~ W24
	w		<*wꜣ*>	V4
	y		<*y*>	M17 reduplicated
	a		<*ꞽ*>	A1
	i		<*ꞽ*>	A26
	e		<*šw*> ~ <*ꞽ*>	H6 ~ M17
	o		<*ˁḥ*> ~ <*ḥr*>	F1 ~ D2

[1] Gardiner (1957:487) points to this sign being rare in group writing.

Meroitic cursive		Trans.	Egyptian Demotic		
early form	**late form**		**Griffith** (1909, 1911)	**Priese** (1973)	**Rilly** (2007)
		p	-	(<*p*> Q3)	Confirmed
		b	-	(<*b*> D58)	Confirmed
		m	(<*m*> G17)	Confirmed	Confirmed
		s	(<*š*> M8)	Confirmed	Confirmed
		se	(<*s*> Aa18)	Confirmed	Confirmed
		n	-	(abnormal hieratic <*m*(*ȝ*)>)	Possibly also (<*n*>)
		ne	-	(<*n*>)	Remains to be discovered.[2]
		d	Stylisation of Meroitic hieroglyph (<*wḏȝt*> D10)	(<*rh*> D21 + O4)	Refutes both Griffith's and Priese's proposals
		t	-	(~ <*ti*> U33 + M17)	Confirmed
		te	-	(<*dj*> ~ <*tj*>)	Confirmed
		to	-	(<*dy*> D46 + Z4 ~ <*ty*> X1 + Z4)	Queries
		r	(<*r*> D21)	(<*ry*> D21 + Z4)	Confirms Griffith but refutes Priese

[2] Cf. the proposal put forward in this thesis Chapter 2, §4.2.1.

		l	-	(<*mr*> G17 + D21)	(<*rw*> ~ <*l*> E23) But still yet to be clarified
		k	Stylisation of Meroitic hieroglyph	(<*g*> W12)	(<*q*> ~ <*k*> N29)
		q	-	(<*k3*> D28)	Confirmed. And cites the Ptolemaic form
		ḫ	-	1. (<*ḫ*> Aa1) 2. (<*nḫ*> Aa1)	Agrees with Priese's proposal 1.
		ẖ	-	(<(*w*)*ḥ3*> Z7 + M12)	Cites Macadam's (1966:49) proposal, but these are still to be confirmed
		w	Stylisation of Meroitic hieroglyph	Agrees with Griffith	Advances M. Chauveau's proposal of (<*w*> G43)
		y	(<*j*> ~ <*y*> M17 + Z7)	Confirmed	Confirmed
		a	Stylisation of Meroitic hieroglyph	(<*ỉ*> A1)	Advances a Ptolemaic form
		i	Could not see a link with Eg. Demotic form of (A26) at time of writing.	(<*ỉ*> M17)	Cites El-Aguizy (1998) Demotic palaeography of Ptolemaic letters (<*ỉ*> A26)
		e	Stylisation of Meroitic hieroglyph [3]	(<*ỉ*> M17)	Maintains that the origin remains uncertain
		o	Stylisation of Meroitic hieroglyph	(<*w3*> V4)	Confirms Priese's proposal

[3] See also the proposal put forward by Macadam (1949:110).

Fig. 2.2
Proposed sound values for the Meroitic signs

The following table outlines the main proposals by scholars on the sound values of the Meroitic signs. It is pointed out that in some of the earlier works there was no real understanding, at that time, of the difference between phonological and phonetic representation, therefore, I give these proposals in inverted commas where the phonological or phonetic difference is unclear, and when the sound value is indistinct I give the IPA value in parenthesis. Further, this chart does not give the inherent unmarked ‘a’ /a/ vowel *in combination with the ‘consonant’ signs*, but details just their consonantal value. Moreover, proposals for the inherent vowel of the ‘syllable’ signs are given (when put forward).
My claims for the phonemic representations, when stipulated more than once, does not mean that I consider them to be separate phonemes, but the same phoneme that has differing phonetic realisations depending upon the sign that is being used to represent it. For example, I claim that there is only one phoneme /p/ but it is realised either as [p] or [b].

Meroitic	Griffith	Meinhof	Zyhlarz[1]	Zawadowski	Hintze	Böhm	Rilly	Rowan
p	‘p’	‘p’	‘p’	/p/	‘p’	‘p’	/p/[2] [p]	/p/ [p]
b	‘b’	‘b’	‘b’	/β/	‘b’	‘ʼb’ (ɓ)	/b/ [b]	/p/ [b]
m	‘m’	‘m’	‘m’	/m/	‘m’	‘m’	/m/ [m]	/m/ [m]
d	‘dj’(ɟ)~‘tch’(c),[3] ‘ʳd’ (ɖ)[4]	‘dʼ’ (ɟ)	‘ḍ’(ɖ)	/dʲ/ (ɟ)	‘ḍ’	‘ḍ’ (ɖ)	/d/ [d̪]	/d/ [d] ~ [ɾ]
t	‘t’	‘t’	‘t’	/t/	‘t’	‘t’ (tʲ ~ tsʲ)	/t/ [t̪]	/t/ [t] ~ [d]
te	‘te’	‘tʼ’ (tʲ)	‘đ’ (?)	/tə/	‘tə’ ~ ‘t’	‘t’ (t͡l)	/te/ ~ /tə/, /t/ [t̪]	/t/ [t], /tə/?

Meroitic	Griffith	Meinhof	Zyhlarz	Zawadowski	Hintze	Böhm	Rilly	Rowan
to	‘tê’(te:)	‘ṭ’ (tʷ~ ṭ)	‘ḍ’ (?)	/tu/	‘tu’	‘ṭ’[5]	/tu/ [ṭu]	/t/ [t], /tu/?
s	‘š’(ʃ)[6] ‘s’[7]	‘š’(ʃ)	‘š’(ʃ)	/sʲ/ (ʃ)	‘s’	‘sʲ’ (sʲ)	/s/ [s̪]	/s/ [s] ~ [sʲ]/[ʃ]
se	‘s’[8] ‘se’[9]	‘s’	‘s’	/s/	‘sə’ ~ ‘s’	‘s’	/se/ ~ /sə/, /s/ [s̪]	/s/ [s] ~ [sʲ]/[ʃ]
n	‘n’	‘n’	‘n’	/n/	‘n’	‘n’	/n/ [ŋ]	/n/ [n]
ne	‘ñ’ (ɲ)[10] ‘ne’[11]	‘ñ’ (ɲ)	‘ñ’ (ɲ)	/nʲ/ (ɲ)	‘nə’/ ‘n’~‘ɲ’	‘ń’ (nʲ)	/ne/ ~ /nə/, /n/ [ŋ]	/n/ [n] ~ [ɲ]/[nʲ], [ŋ]
r	‘r’	‘r’	‘r’	/r/	‘r’	‘r’	/r/ [ɽ]	/r/ [r]
l	‘l’	‘l’	‘l’	/l/	‘l’	‘l’	/l/ [ḷ]	/l/ [l] ~ [ɫ]?
k	‘k’	‘k’	‘k’ (?)	/k/	‘k’	‘k’	/k/ [k]	/k/ [k], [g]
q	‘g’	‘q’ (ḳ)	‘q’ (?)	/q/	‘k’	‘kʷ’[12], ‘qʷ’[13]	/kʷ/ [kʷ]	/q/ [q]
ḫ	‘ḫ’[14]	‘χ’	?	/χ/ ~ /ʁ/[15]	‘χ’, ‘ɣ’, ‘ŋ’, ‘g’	‘ḫ’[16]	/ḫ/ [x]	/x/ [x]
h̠	‘h̠’[17]	‘ɣ’	?	/x/ ~ /ɣ/[18]	‘h̠’	‘h̠’	/h̠/ [xʷ]	/χ/ [χ]
w	‘w’	‘w’	‘w’	/w/	‘w’	‘w’	/w/ [w]	/w/ [w]
y	‘y’	‘y’	‘y’ (?)	/y/	‘y’	‘y’	/y/ [j]	/y/ [j]
a	‘a’ ~ ‘u’ (CV)[19]	‘a’	‘ ‘ ’[20]	/ʔ/	/a/	?[21]	/a/ ~ /u/	/ʔ/ [ʔa]
i	‘i’	‘i’	‘i’	/i/	/i/	?	/i/	/i/ [i]
e	‘e’	‘e’	‘e’	/ə/	/ə/ ~ zero[22]	?	/e/, /ə/ ~ zero	/e/ and /ə/ [e] ~ [ə]
o	‘ê’ (e:) ~ ‘o’	‘u ~ o’	‘u ~ o’	/u/	/o/ - [o]~[u]	?	/u/ [u] ~ [o]	/u/ [u] ~ [o]
unwritten nasal					‘n’		/n/ [ŋ], [ŋ]	/n/ [n], [ŋ],

[1] Zyhlarz's proposals are, at times, terminologically erroneous and confused. His representations are given here, although some are circumspect.
[2] Rilly (in press) believes that this phoneme was borrowed from Egyptian, and not that it was phonologically opposed to *b* for voicing.
[3] Griffith (1911).
[4] Griffith (1929).
[5] Böhm (1987:12) defines this consonant as 'emphatic'.
[6] Griffith (1911).
[7] Griffith (1916b).
[8] Griffith (1911).
[9] Griffith (1916b).
[10] Griffith (1911).
[11] Griffith (1916b).
[12] Böhm (1987).
[13] Böhm (1988a).
[14] Griffith (1911) does not specifically state what he thought to be the actual value of this sign; he only lists it as a 'guttural spirant' (1911:22).
[15] Zawadowski (1972a:28) does not specifically indicate whether this sign was voiced or voiceless.
[16] Böhm (1987:6) terms these signs (*ḫ* and *ẖ*) as 'gutturals' but does not exactly specify their value, as he keeps to the transliteration method.
[17] Griffith (1911) does not definitively state what he thought to be the actual value of this sign; he only lists it as a 'guttural spirant' (1911:22).
[18] Zawadowski (1972a:28) does not specify whether he proposes that this sign is voiced or voiceless.
[19] Griffith (1916b:118) gave a further view on this sign as being 'a kind of consonant, a breathing followed by a vowel.'
[20] Zyhlarz (1930:421-422) terms this sign as a 'laryngale explosiv'.
[21] Böhm does not put forward proposals on the sound values of the 'vowel' signs.
[22] Hintze (1973a:322) proposes this sign as being realised as /ə/ or zero.

Fig. 2.3
Sound correspondences from equivalent forms

Meroitic	Late Egyptian	Egyptian Demotic	Greek	Coptic	Latin
p	<*p*> /p/	<*p*> /p/	π /p/, β /b/~ /v/, φ /p^h/, ψ /ps/	ⲡ /p/	-
b	<*b*> /b/ > /β/	<*b*> /b/ > /β/	β /b/ ~ /v/, ψ /ps/	-	*b* /b/, *p* /p/
m	<*m*> /m/	<*m*> /m/	μ /m/	ⲙ /m/	*m* /m/
d	<*r*> /r/	<*r*> /r/	ρ /r/	-	*d* /d/
t	<*t*> /t/, <*ḏ*> /ɟ/ > /d/	<*t*> /t/, <*ṯ*> /c/ > /t/	τ /t/, δ /d/, Θ ~ θ /t^h/	ⲧ /t/	*t* /t/
te	<*t*> /t/, <*ṯ*> /c/ > /t/, <*ḏ*> /ɟ/ > /d/	<*t*> /t/, <*ṯ*> /c/ > /t/	τ /t/	ⲧ /t/	-
to	<*t*> /t/, <*ḏ*> /ɟ/ > /d/	<*ṯ*> /c/ > /t/	τ /t/	-	-
s	<*s*> /s/, <*š*> /ʃ/	<*s*> /s/, <*š*>/ʃ/	Σ ~ σ ~ ς /s/, ψ /ps/	ⲥ /s/, ⲍ /z/	*s* /s/
se	<*s*> /s/, <*š*> /ʃ/	<*s*> /s/	Σ ~ ς /s/, ψ /ps/, T /t/[1]	ⲥ /s/, ϣ /ʃ/	*x* /ks/, *s* /s/
n	<*n*> /n/	<*n*> /n/	N ~ ν /n/	ⲛ /n/	*n* /n/
ne	-	<*n*> /n/	-	-	*n* /n/
r	<*r*> /r/ ~ /l/	<*r*> /r/	ρ /r/	ⲣ /r/	*r* /r/
l	<*l*> /r/ ~ /l/[2]	<*l*> /l/	λ /l/	-	-
k	<*k*> /k/, <g> /g/ > /k/[3]	<*k*> /k/, <g> /k/	κ /k/, χ /k^h/ ~ /x/	-	*c* /k/, *x* /ks/
q	<*k*> /k/, <*q*> /q/[4]	<*k*> /k/, <*q*> /q/[5]	κ /k/, χ /k^h/ ~ /x/[6]	-	*c* /k/, *ch* /k^h/

Meroitic	Late Egyptian	Egyptian Demotic	Greek	Coptic	Latin
ḫ	<*ḫ*> /χ/[7] ~ /x/[8]	-	χ /kʰ/ ~ /x/	-	-
ẖ	<*ẖ*> /ç/[9] > /x/[10]	<*ẖ*> /ç/ > /x/[11]	χ /kʰ/ ~ /x/	ϩ /h/, ⲭ /kh/[12]	-
w	<*w*> /w/[13]	<*w*> /w/	ό /o/[14]	ⲟⲩ /w/ ~ /u/	-
y	<*y*> /j/	<*y*> ~ <*j*> /j/	ει [ẹ̄] > [iː], ι [i][15]	-	-
a	<*ỉ*> ~ <*ꜣ*> /j/ > /ʔ/,[16] <*ḥ*> /ħ/,[17]	*ꜣ* /ʔ/[18]	Ά /a/	ⲁ /a/~/ʔ/,[19] ϩ /h/, ⲟⲩ/w/~/u/	*a* /a/
i	-[20]	-	ι /i/, η /ɛː/[21]	ⲉ /ɛ/, ⲏ /e/[22]	*i* /i/
e	-	-	ι /i/, η /ɛː/	ⲉ /ɛ/	*e* /e/, *i* /i/
o	-	-	ο /o/, ω /ɔ/	ⲟⲩ /u/, ⲟ /o/, ⲱ /oː/	*u* /u/, *o* /o/
inherent 'a'	-	-	α /a/, ο /o/, ω /ɔ/	ⲁ /a/, ⲱ /oː/	*a* /a/

[1] The Greek form Τεληλις is suggested (Eide *et al* 1998:1151) as being the equivalent of the Meroitic toponym *selele* whereby Greek T /t/ is cognate with Meroitic *sel* /sl/. However, this is the only form where Greek T /t/ is equivalent to Meroitic *se/s* /s/. Rilly (2007:379) poses the question that could this be a form of 'Griffith's Law' where Meroitic *se* + *l* → *t*. For more on this see Chapter 2, §3.4.

[2] Rilly (2007:383) gives two further Egyptian equivalent forms: Eg. *pꜣ-mr-šn* – Mer. *plsn,* Eg. *pꜣ-mr-mšꜥ* – Mer. *pelmos,* whereby Eg. <*mr*> = /l/. However, Peust (1999b:127) asserts that in Late Egyptian it is the sequence <*nr*> = /l/, consequently as this equivalence is unclear, I leave this assignment out.

[3] Loprieno (1995:41) points out that this Egyptian phoneme /g/ during the first millennium BCE was neutralised to /k/. Therefore Egyptian correspondences of /g/ with Meroitic *k* could be due to sonorisation or intervocalic voicing, see Chapter 2, §6.1.

[4] Peust (1999b:114) also gives the Egyptian sign <*q*> the phonemic representations of /k/, /kʷ/ and /q/ although Loprieno (1995:33) proposes the uvular stop /q/.

[5] Ibid.

[6] Rilly (2007:372) lists that Greek γ /g/ is also found to transcribe Meroitic *q* in one form.

[7] Loprieno's (1995:33) phonemic assignment of this Egyptian sign is a voiceless uvular fricative.

[8] Peust's (1999b:115) phonemic assignment of this Egyptian sign is a voiceless velar fricative.

[9] Loprieno's (1995:33) phonemic assignment of this sign which is a palatal fricative - IPA /ʃ/ at a synchronic stage of Egyptian, whereby Peust (1999b:117) believes this is the representation of a velar fricative /x/ that became palatalised diachronically.

[10] Peust (1999b:117) proposes that the Egyptian sign *ẖ* had two phonemic representations of /ʃ/ and /x/. The former phoneme was due to velar palatalisation and the latter phoneme is the non-palatalised velar fricative, see Chapter 2, §7 for more on this.

[11] Ibid.

[12] Loprieno (1995:248) outlines that 'Greek *aspiratae* generally represent in Coptic the combination of the corresponding voiceless phoneme followed by the glottal fricative: ... ϫ = /kh/ (rather than /k^h/).'

[13] Rilly (2007:385) cites another Egyptian equivalence i.e. <*wꜣ*> from the Ptolemaic era (4th century BCE – 1st century BCE).

[14] Rilly (2007:385) equates Meroitc *w* with Greek ό from the following equivalent form: Mer. *medewi* – Greek μερόη. It is shown that Meroitic consonantal /w/ is interpreted as vocalic ό in Greek.

[15] Rilly (2007:384) equates Greek ει and ι with Meroitic *y* from the following equivalent forms: Mer. *brtoye* – Greek 'Αβρατοεις, Mer. *sipesiye* – Greek Τσεφις ~ Σεφις. Allen (1968:66) states that 'The development of ει to [ī] is revealed by occasional confusion between ει and ι from the late 4 c. B.C., becoming common in the 3 c.' I have shown in this fig., the development of ει from a front mid vowel (with Allen's phonetic transcription [ẹ̄]) to a long high front vowel [i:]. Again, the consonantal *y* of Meroitic in interpreted as the Greek vocalic ει and ι.

[16] Loprieno (1995:33) asserts that the diachronic process of /j/ > /ʔ/ evolved during the Middle Kingdom (2000-1750 BCE), between two vowels in post-tonic position and before an unstressed vowel in initial position. See Chapter 3, for more on this in the analysis of the Meroitic 'initial a' sign 𐦠 *a*.

[17] Loprieno (1995:33) and Peust (1999b:98).

[18] Vergote (1945:76, 109-114; 1948:66). However, Peust (1999b:127-129) believes that in Earlier Egyptian this sign <ꜣ> was a liquid rather than a glottal stop, but he states that in later times 'Most instances of the phoneme written as <ꜣ> merged with /j/ after the Middle Kingdom ... and it thus lost its liquid character.' Loprieno (1995:33) claims that this sign <ꜣ> was an earlier phoneme /ʀ/ (uvular trill) but which diachronically evolved to a glottal stop /ʔ/ by the New Kingdom (1550-1050 BCE). Peust (1999b:129) describes the development of the sign <ꜣ> from the New Kingdom in that it had already merged with <*j*> /j/ by this period. Orthographically, 'From this time on, the sign <ꜣ> was employed very inconsistently and became interchangeable with <*j*> in many words.' Loprieno (1995:38) further points out that 'in the syllabic writing of the New Kingdom <ꜣ> has come to indicate the a-vowel.'

[19] Loprieno (1995:25, 40-42) proposes that Coptic contained the phoneme /ʔ/ in its inventory and that the Coptic vowel sign ⲁ can stand for /a/ or /ʔ/. Cf. Peust (1999b:96-97) who argues against this hypothesis.

[20] The Egyptian scripts (including Demotic) do not specifically notate vowels therefore representations between Meroitic and Egyptian vowels cannot be fully evidenced (although in Late Egyptian certain signs are used as *matres lectionis* in transcriptions of foreign names). However, the Egyptian glide signs <*i*>, <*j*> /j/ and <*w*> /w/ are used consonantally, in certain forms, for Meroitic *i* /i/ and *o* /u/ respectively.

[21] Two Greek transcriptions of Meroitic toponyms are evidenced transcribing Meroitic *i* /i/ with Greek η /ε:/: Mer. *qoreti* – Gr. κορτη; Mer. *medewi* – Gr. μερόη. The two Greek transcriptions both show η positioned word-finally, whether the vocalic positioning affects the vowel quality is discussed in Chapter 4, §2.2, however Allen (1968:71) remarks that 'Confusion between η and ι in Attic inscriptions begins around 150 A.D.'

[22] This is Peust's (1999b:202) proposal on the representation of these Coptic vowels. For the alternative representation of them being distinguished by quantity rather than quality see Loprieno (1995:15).

1 The Labial Signs

This section discusses the three Meroitic signs 𐦨 *p*, 𐦦 *b* and 𐦩 *m* that are representative of labial stops.

1.1 Meroitic *p* 𐦨 𐦈

Griffith (1911:8-14) found that the Meroitic hieroglyphic form of this sign 𐦈 is derived from the Ancient Egyptian hieroglyph 𓊪 <*p*>. He posited the sound value of this Meroitic sign as 'p' and implemented its transliteration as *p*. He did not remark on the derivation of the corresponding Meroitic cursive sign 𐦨, although Priese (1973:286-287) put forth the proposal that it originated from an Egyptian Demotic sign.[1]

Griffith (1911:8-14) also gave evidence for the representation 'p' for 𐦈 𐦨 from equivalent forms where we find Egyptian and Egyptian Demotic <*p*> /p/, Coptic ⲡ /p/ and Greek π /p/, φ /pʰ/ correspond to the Meroitic sign 𐦨:

(1)

a.	<u>Egyptian</u>	*pꜣ-iw-rḳ*	"Philae"	toponym
	Demotic	*p-ilḳ, pꜣ-ij-lḳ, p(r)-ꜣlq, (^{det}pr)(^{det}iꜣt)rq.t, (^{det}iꜣt)rkꜣ.t,(^{det}iꜣt)lkꜣ.t*		
	Coptic	^{Sah}ⲡⲓⲗⲁⲕ, ⲡⲓⲗⲁϫ, ⲡⲩⲗⲁⲕ, ^{Boh}ⲡⲓⲗⲁⲕϩ ^{Sah}ⲗⲁⲕϩ		
	Meroitic	𐦨𐦢𐦭𐦡𐦴𐦡	*pileqe*	
	Greek	φιλαί, φιλή πιλάχ πιλάκ		
b.	<u>Egyptian</u>	*pꜣ-mr-mšꜥ, imy-r mš, mr-mšꜥ*		title
	Demotic	*r-mšꜥ, mr-mšꜥ, pꜣ-mr-mšꜥ*		
	(Coptic	^{Sah}ⲗⲉⲙⲏⲏϣⲉ, ^{Sah}ⲙⲏⲏϣⲉ, ^{Boh}ⲙⲏϣ, ^{Ak}ⲗⲉⲙⲏⲥⲉ, ^Lⲗⲉⲙⲏϣⲉ)		
	Meroitic	𐦨𐦡𐦭𐦩𐦣𐦰	*pelmos*	
	(Greek	λεμεισα)		

[1] See Fig. 2.1.

c.	<u>Egyptian</u>	*p3-rt, rdw*	"the agent"	title
	Demotic	*p^{c}-rj.t, p-rṯ, rt, p3-rt/t3-rt, p3-rṯ, rṯ*		
	Coptic	^{Sah}**ⲣⲏⲧ**, ^{Sah}**ⲡⲣⲏⲧ**		
	Meroitic		*perite*	
d.	<u>Meroitic</u>		*p<u>h</u>rse*	"Faras"
	Coptic	**ⲡⲁⲭⲱⲣⲁⲥ**		
	Greek	παχωρας		
e.	<u>Meroitic</u>		*npte*	"Napata"
	Egyptian	*mr-z-nip(^{det}ḏw), npt, (imn)-npjj, npi, np, np.t, np3, npyt*		
	Greek	(Τα)Νάπατα, Τα-ναπη		

These equivalences with Egyptian and Greek that show a correspondence of Meroitic *p* with <*p*> /p/ in Egyptian forms and π /p/, β /b/, φ /pʰ/ ~ /f/[2] in Greek forms (also see Rilly 2007:360). These equivalences indicate a labial value for this Meroitic sign. Rilly (2007:361) discusses how the Greek forms of the Meroitic toponym *napate,* which he assumes must come directly from Meroitic, are transcribed as Νάπατα and Νάβατη. The Greek transcriptions show π /p/ and β /b/ for Meroitic. Furthermore, Rilly (2007:361) cites evidence from Pliny, who gives the same toponym transcribed in Latin as *Napata, Nabata* and *Nabatta.* These parallels in equivalent forms all point to a labial place of articulation for the Meroitic sign and therefore the value of 'p' can be confirmed, particularly through the correspondences where Meroitic is word-initial (1a, b, c, d). However, the value of /b/ in the Greek and Latin forms (1e), where this sound is found in an intervocalic position, is discussed in §1.3.1. Since the phonological/phonetic realisation of this sign rests upon the discussion of another labial

[2] See Allen (1968:20-24) for a discussion on the representation of this sign being an aspirated plosive /pʰ/ that developed into the labial fricative /f/ circa 2nd century BCE.

sign *b* 𐦦 𐦆, which now follows in §1.2, both of these signs are further discussed together in §1.3.

1.2 Meroitic *b* 𐦦 𐦆

Griffith did not specifically discuss the origins of the hieroglyphic form of this sign 𐦆, or the origins of the cursive form 𐦦. In his discussion of this sign, Rilly (2007:261-262) refers to evidence found in an archaic Meroitic text (REM 0401) that a Meroitic hieroglyphic sign 𐦇, derived from the Egyptian hieroglyphic sign 𓃀 <*b*>, is implemented rather than the later usual Meroitic sign 𐦆, which he suggests shows the Meroites' hesitation in the choice of which hieroglyph to use. The use of the hieroglyphic sign 𐦇, derived from the uniconsonantal Egyptian hieroglyphic sign 𓃀 <*b*>, was replaced by the Meroites' stylisation of an Egyptian hieroglyph 𓃝 <*bꜣ*>, which was used in syllabic Egyptian for the syllable /bi/ (Albright 1934:39-40).[3] This replacement of the hieroglyphic sign 𐦇 (from the Egyptian uniconsonantal sign 𓃀 <*b*>) for the Egyptian syllabic sign 𐦆 <*bꜣ*> could be indicative that the Egyptian syllabic sign was more representative of the syllabic structure of the Meroites' script (and language?). Allen (2000:428) gives the representation of 𓃝 used in Ancient Egyptian as an ideogram for <*bꜣ*> 'ram' which perhaps points to the syllabic principle of the Meroitic script motivating the replacement of this Egyptian uniconsonantal sign (see also Gardiner (1957) for this).

The cursive form of this sign 𐦦 was found through Priese's investigation (1973:286) to have its origins in the Demotic correspondence of the Egyptian uniconsonantal hieroglyph 𓃀 <*b*> (Fig. 2.1). Therefore, the Meroites borrowed the syllabic Egyptian sign 𓃝 (Mer. 𐦆) for their hieroglyphic form of this sound, and the Demotic form of the uniconsonantal sign 𓃀 <*b*> for their cursive form 𐦦 of this same sound.

[3] Syllabic Egyptian is also commonly referred to as "group-writing". Peust (1999b:218-222) discusses syllabic Egyptian and defines it as, 'In the New Kingdom, specialised graphemes are used for representing words of foreign, primarily Semitic, origin.' He goes on to claim that 'Some scholars have argued that these graphemes may also indicate vowels, but this theory remains doubtful' (1999b:218).

For the sound value of this Meroitic sign (in its hieroglyphic and cursive forms), Griffith (1911:13) had difficulty in giving this sign a direct equivalent representation; as he outlined: 'The equivalence of the hieroglyphic and Demotic signs rests on little proof beyond the process of elimination.' Further, he stated 'As *b* occurs in Ethiopian [Kushite] and Meroitic names … and there is no other sign in the alphabet that can well have this value, it seems likely that this is the value of the Meroitic letter.' Since Griffith saw that the sign replaces *p* and *m* in the funerary formulas, this led him to propose that its value must therefore be 'b'.

Borrowings between Egyptian and Meroitic show a correspondence between Egyptian and Demotic <*b*> and Meroitic *b*:

(2)

a.	<u>Egyptian</u>	*pꜣ-b(j)k, bjk*	"falcon"	anthroponym
	Demotic	*b(j)k*		
	Coptic	$^{\text{Sah}}$ⲃⲏϭ, $^{\text{Sah}}$ⲃ(ⲉ)ϭ, $^{\text{Boh}}$ⲃⲏϫ, $^{\text{Boh}}$ⲃⲉϫⲓ, $^{\text{Fa}}$ⲃⲏϭ, $^{\text{Fa}}$ⲃⲓϭ		
	Meroitic		*beke*	
	Greek	βηκις		
b.	<u>Meroitic</u>		*aborepi*	"Musawwaret"
	Egyptian	*jpbrp, jpbrpt, jbbrꜥnḫt*		
c.	<u>Meroitic</u>		*bekemete*	anthroponym
	Demotic	*bk-mṯj*		
d.	<u>Meroitic</u>		*brtoye*	anthroponym
	Demotic	*ꜣbrṯy*		
e.	<u>Meroitic</u>		*arebetke*	title
	Demotic	*ꜣrbtgꜥjꜣ, ꜣrbtngꜥj*		

f.	<u>Egyptian</u>	*t3-b(j)k(.t)*	"the female falcon"	anthroponym
	Meroitic		*tebiki*	
	Greek	τβηχις		

g.	<u>Egyptian</u>	*ḏw-wʿb, (p3)t3-wʿb*	"holy mountain"	toponym
	(Coptic	^{Sah}**тоογ**, ^{Boh}**тωογ**)		
	Meroitic		*tew webi*	

h.	<u>Egyptian</u>	*b3qi, b3ki*		toponym
	Meroitic		*boq-, beqe*	
	Greek	Ἀβουγκις		
	Latin	Aboccis		

i.	<u>Egyptian</u>	*p3-nbz(t), (pr)nbs*	"Pnoubs"	toponym
	Demotic	*p3-nbse*		
	Meroitic		*nbse*	
	Greek	πνόυφ		
	Latin	Nups ~ Nupsia		

1.3 Discussion of *p* and *b*

Griffith (1911), Meinhof (1921/22:3) and Zyhlarz (1930:421) believed that there was a phonological opposition of voicing for the Meroitic labial signs *p* and *b*. Nonetheless, further investigations into the phonemic representations of these signs advocated that even though these signs are evidenced as showing alternation with one another in certain forms, it does not prove that they were phonologically contrastive for voicing.

Rilly (2007:361) discusses how the phoneme /b/ of earlier Egyptian came to be phonetically realised as a bilabial fricative [β] in Late Egyptian (the contemporary language with Meroitic) and Coptic. This was noted by Vycichl (1958a:75) who states that 'Egyptian *b* was a voiced fricative sound' and this is confirmed by Loprieno (1995:41), in discussing the phonological inventory of Coptic, who states that 'the voiced phoneme /b/, … by this time was probably articulated as a fricative [β].' The spirantisation of Egyptian /b/, if not allophonically distributed, means that phonemically there is a diachronic sound change of /b/ > /β/ from earlier Egyptian to Late Egyptian and Coptic. I remark that therefore the Egyptian phoneme for signs transcribed with <*b*> should be considered to be /β/ in its synchronic form of Late Egyptian (and Coptic /v/).[4]

Zawadowski's (1972a:28) proposed consonantal system for Meroitic, advances the Meroitic labial sign *b* as a bilabial fricative (/β/), through considerations based on the phonetic/phonemic realisation of the Late Egyptian equivalent (as discussed above). However, what can be surmised as to the manner of articulation of the Meroitic labial sign *b* borrowed from the Egyptian sign representing a bilabial fricative? For one, it is very rare for a script to be borrowed, and then to change the original sound values of the signs (Sampson 1985:72),[5] although if there is a change in the sound value of this sign, it is only in its manner of articulation and not in its place or voicing features.[6] It cannot be concluded, as Zawadowski proposed, that because the Late Egyptian phonemic inventory contained a bilabial fricative then the Meroitic inventory did so as well.[7] It is more likely that the Meroites borrowed the Egyptian sign that was the closest phonetically to the Meroitic sound they were trying to represent, and not that these two labial sounds were completely identical in Meroitic and Egyptian.[8] Furthermore, it

[4] E.g. /β/ and /βi/.

[5] Sampson (1985:72) states that 'it is common for people who borrow a script from speakers of another language to avoid tampering with the values of its graphs even when these are relatively unsuitable for their own language.'

[6] The difference between [β] and [b], within Generative Phonology, is a change in the feature value [± continuant] as all other features are shared.

[7] The Late Egyptian phoneme <*b*> /β/ diachronically spirantised from /b/ resulting in /v/ in Coptic.

[8] Furthermore, this is a case of grapheme adaptation or substitution; the Egyptian bilabial fricative sign was the closest phonetically to the Meroitic bilabial stop.

could also be proposed that Meroitic borrowed this sign with its sound value before it diachronically spirantised in Egyptian.

1.3.1 The signs *p* 𐦨 𐦈 and *b* 𐦦 𐦆 as allophones

Rilly (2007:362) discusses clues that seem to show that voicing was not originally a phonological contrastive criterion for bilabials in Meroitic, and that it is not certain that the signs 𐦦 *b* and 𐦨 *p* were always transcribed as distinct phonemes for Meroitic speakers.[9] His conclusion as to the phonetic realisation of these signs is that the Meroitic script inherited two signs for a single phoneme.[10] Rilly (2007:362) compares this use to the Greek *sigma* signs σ and ς which both represent the single phoneme /s/, although which sign is used is dependent upon the differing positions of the phoneme /s/ within a word (Rilly does state that this hypothesis is not as systematic as in the Greek example, where σ is used word-initially and medially and ς word-finally). The evidence that Rilly presents for this conclusion is that in the oldest traces of Meroitic,[11] the sign 𐦨 *p* is only ever found word-initially.

Furthermore, passages in a foreign dialect from the Egyptian text *The Book of the Dead*, which Rilly supposes are most probably Proto-Meroitic, show several uses of the sign 𐦦 *b* but never 𐦨 *p*. Rilly conducts a search in his database of Meroitic words i.e. his 'lexicon'[12] for Meroitic words that include the sign 𐦨 *p* and finds only 61 occurrences out of 560 lexemes and morphemes, where 35 of these are recognisable borrowings from Egyptian, but states that there must be more of these borrowings which are less obvious. Where the sign 𐦨 *p* is found in words that are of Meroitic origin, it is seen to alternate with the sign 𐦦 *b*. Such is the case with the verbal prefix -𐦱𐦨 ***ps***-, which is found written as -𐦱𐦦 ***bs***-, and the forms 𐦳𐦣𐦬𐦨𐦱 ~ 𐦳𐦣𐦬𐦦𐦱 *qorpse* ~ *qorbse* (Hofmann 1981a:34).[13] Rilly follows Hofmann's (1981a:34) suggestion that

[9] Rilly asserts that there is a possibility that an opposition of voicing was adopted in certain regions or social groups, but this distinction of the phonemes did not affect the whole population.
[10] See Rilly's chart (2007:377, 392).
[11] The word list from Crocodilopolis.
[12] See Rilly (1999b) for more on this 'lexicon'.
[13] Cf. Zach (1994:104), who evidences the variation between Meroitic 𐦨 *p* and 𐦦 *b* in anthroponyms.

there was an influence of Egyptian borrowings that began with the masculine article <*p*(*ȝ*)> which led to this Egyptian phoneme being written with the sign *p* in the Meroitic forms word-initially. For Rilly, this explains why it is also seen that the Meroitic sign *b* is found much more frequently than *p*, but *b* is much less common word-initially.[14]

Rilly's hypothesis is that *p* and *b* are two signs for a single phoneme. I believe that this hypothesis is certainly the most plausible considering the discussion above. To define this more specifically, I add to Rilly's hypothesis that this means that there are two signs for the two allophonic variants of a single phoneme where this phoneme is unspecified for voicing (plain voiceless):

(3)

/p/

[p] [b]

This analysis is able to explain why the sign *p* is found positioned so frequently word-initially whereas the same placement of *b* is quite rare in comparison. It leads to the indication that the Meroitic phoneme /p/ is realised as [p] word-initially and so is written in Meroitic with *p*, as it is less likely to take on any voicing quality in this position. Intervocalically (word-internally) the phoneme /p/ is realised as [b] and written with *b* because it assimilates voicing from having an intervocalic placement, and therefore directly adjacent to vowels, which are inherently voiced.[15] The positioning of

[14] An interesting case shows the late Meroitic toponym "Meroe" as *bedewi* with word-initial [b], whereas this is transcribed in Old Coptic as **ⲡⲉⲣⲟⲩⲉ** with word-initial [p] (Griffith 1917b:170 fn. 1). This correspondence could be indicative for the case that Meroitic [b] was not fully voiced and as such was accordingly interpreted by the Coptic Egyptians as [p]. However, it is perhaps more likely that as voiced stops spirantised by the Coptic stage of Egyptian, the notation of Meroitic [b] with Coptic **ⲃ** [β]/[v] would not have been exact enough in representation with the Meroitic sound and thus the sound [p] (ⲡ) was used as a closer representation.

[15] Vowels are inherently voiced and so a voiceless segment positioned intervocalically (V_V) is cross-linguistically evidenced to assimilate the feature [+voice]. Cf. Harris & Urua (2001) for more details on the phonetic effects of this sonorisation.

stops within a word is known to phonetically affect the degrees of voicing that they take.

However, the occurrences of intervocalic (word-internal) *p* could weaken the allophonic hypothesis, as Kenstowicz (1994:66) states: 'Such variants (*allophones*) of the same underlying sound (*phoneme*) are the product of systematic rules that modify the segment depending on the context in which it finds itself.' This means that as *p* does occur occasionally where *b* should be positioned, it could indicate that we are dealing with two separate phonemes. Moreover, if the Meroitic signs *p* and *b* are allophones of the same underlying phoneme, then we should not find contrastive instances of them. However, in response to the above point, I still support and maintain the allophonic hypothesis, taking into account the following remarks. The major point to make is that the distribution of *p* and *b* is too predictable and not down to chance occurrence.

Generalisations can be made (as per Rilly) on the contexts in which each sign occurs, thereby evidencing an overall patterning. It is this patterning that is most important in conducting an analysis through which to make claims and proposals on a language only known through its script. We should not expect to find complete consistency in representation due to the very nature of our data. In fact, what these instances also highlight is that there is variation between the level of the script that is being encoded, where some scribes are closely encoding the phonetic level by executing the sign *b* intervocalically (word-internally as we expect), and others who are encoding the phonemic level by utilising the sign *p* in this position instead.

Furthermore, it cannot be overlooked that these instances of intervocalic (word-internal) *p* could be mistakenly identified as being word-internal when in fact they are due to the creation of morphologically complex items. A case in point is the variant form ~ *qorpse* ~ *qorbse*. A reanalysis of this form shows that *p*, when it seems to be occurring word-internally, is actually because it is morpheme initial. The word (title?) is composed of the noun *qor*(*e*) "ruler" and a suffixed morpheme.[16] This suffixed morpheme *-pse* begins with the sign *p*. This is not inconsistent with the generalised observation already discussed that it occurs mainly as word-initial, but we can be more specific in stating that it also occurs morpheme-initially. Therefore, when this sign does occur word-internally it does so because it is also morpheme-initial.

In consideration of the above remarks, the hypothesis that the signs *p* and *b* are allophonic variants of a single phoneme is upheld.

1.4 Transcriptions from other languages

Transcriptions from languages other than Egyptian can also give an indication into the phonetic realisation of this phoneme. It is pointed out by Rilly that the Greek and Latin transcriptions of the Meroitic toponym *npte* "Napata" must come directly from Meroitic (rather than through Egyptian as with so many other equivalent forms).[17] In Greek, we find this toponym transcribed as Νάπατα and Νάβατη, where in Latin it is variously transcribed as *Napata, Nabata* and *Nabatta.* The realisation of *p* of the Meroitic form is transcribed in Greek and Latin as either the voiceless labial *π*/*p* /p/ or the voiced labial β/*b* /b/. Tthe erring between /p/ and /b/ in the Greek and Latin forms could indicate that there is an assimilated phonetic voicing of this labial sound due to its intervocalic positioning. Allen (1968:27-29), in his book on Classical Greek pronunciation, discusses the realisation of the Greek stops and states that 'There is no doubt that the sounds represented by β, δ, γ were *voiced.* … and are regularly rendered by voiced sounds in other languages – e.g. Latin *barbarus, draco, grammatical.*' He goes on to verify that 'There seems no reason to doubt that in classical times the value

[16] Hofmann (1981a:34) refers to this form as a title. Further, I have to leave the issue open at this stage of whether *-pse* and *-bse* are composed of more than one morpheme, as *-se* on its own is traditionally thought to be representative of a genitive morpheme (Griffith 1911).

[17] It is at the beginning of the Ptolemaic era that Greek scholars met with the rulers of Kush (Meroe), (Rilly p.c.). Ptolemaic era is approximately circa 4th century BCE – 1st century BCE.

of β, δ, γ was that of voiced plosives, much as the English *b*, *d* and 'hard' *g*, with places of articulation as for the corresponding voiceless sounds.'[18]

The Latin transcription of the Meroitic toponym *napate* is taken from Pliny's *Natural History*, where it is transcribed as *Nabata* and this is dated circa 1st century CE.[19] These Greek and Latin examples highlight that there is a definite ambiguity in the phonetic representation of the Meroitic phoneme /p/ in intervocalic position. Many Meroitic forms show an alternation with the signs representing the voiced and voiceless labial allophones, where this ambiguity is also evidenced from Greek and Latin transcriptions.

To summarise, the Meroitic signs *p* and *b* has the following realisations with Egyptian:

(4)

a.	Egyptian	<*p*> [p]	Meroitic	*p*	[p]
b.	Egyptian	<*bꜣ*> [β?]	Meroitic	*b*	[b]

This is contra Zawadowski (1972a:28), who suggested that the Meroitic *b* was a biliabial fricative [β] because the Egyptian sign borrowed into Meroitic notated a bilabial fricative in the Egyptian language (at this Late Egyptian stage). It is claimed here that Meroitic *b* is phonemically /p/ but phonetically surfaces in one of its allophonic forms as [b] when it assimilates a voicing quality from adjacent vowels, specifically in intervocalic position.

Indications against this sign representing a bilabial fricative [β] come through considerations of the Greek and Latin transcriptions. It is known that Greek words

[18] Allen goes on to point out that in Modern Greek, these sounds have become fricatives (spirantised), but believes that this development did not take place until a much later period than Classical Greek (circa 5th century CE).
[19] Eide *et al* (1998:804).

containing the letter *beta* β /b/ were transcribed into Latin using the letter *b*, if the Greek phonetic value of beta β was a fricative, then Latin would have used the letter *u* (in consonantal form) which signified the labio-dental fricative [v] instead.[20] This also points to Meroitic *b* not being phonetically realised as a bilabial fricative *[β], since Latin would then have transcribed the Meroitic toponym as *"*nauata*". Further, there would not have been ambiguity in the Latin alternate forms *Nabata/Napata* with the voiceless labial stop *p* /p/ as we would expect to see the alternate form as *"*Nafata*" written with the voiceless labio-dental *f* /f/ instead. Subsequently, the following correspondences are verified:

(5)

a.	Meroitic *p* /p/ [p]	Greek π *p* /p/ [p]	Latin *p* /p/ [p]
b.	Meroitic *b* /p/ [b]	Greek β *b* /b/ [b]	Latin *b* /b/ [b]

Furthermore, if the Meroitic phonetic value for the sign *b* was a bilabial fricative [β] (as in the later Egyptian value for their sign), then why did the Meroite script devisors not borrow the Egyptian sign <*f*> /f/ (labial fricative) instead, rather than <*p*> /p/, for its equivalent seen in alternate forms, if indeed the manner of articulation of the sound they were trying to represent was a fricative rather than a plosive? To clarify this point, the Meroite script devisors adopted the Egyptian sign <*bȝ*> [b] > [β] as it represented the closest phonetically equivalent consonantal sound to the Meroitic voiced allophone [b] (*b*) of the phoneme /p/. The Meroitic voiceless allophone [p] (*p*) of the phoneme /p/ was adopted from the Egyptian <*p*> [p] without any alteration to its phonetic value.

Conclusively, it is put forward that it is highly possible that there existed two signs that represented two allophones of a single phoneme in Meroitic:

[20] Allen (1968:29).

(6)

a. Meroitic *p* /p/ [p] b. Meroitic *b* /p/ [b]

I propose that the phoneme is the plain voiceless /p/, as the allophonic variant [b] is found more frequently word-internally and therefore intervocalically where it is expected to assimilate a voicing quality.

1.5 Further remarks

It is briefly discussed in this section how my representation of this sign differs from Rilly's. Rilly states in his passage on the representation of these signs that they are two signs for a single phoneme, and he summarises his discussion with two charts (2007:377; 392) for his proposal of the Meroitic stop signs:

(7) Rilly's outline of Meroitic stops (2007:377) in the order of signs' transliteration/phoneme/phonetic realisation:

	bilabials	retroflexes	velars	labialised velars
voiced	*b* /b/ [b]	*d* /d/ [ɖ]	-	-
voiceless	*p* /p/ [p] (?) (borrowed from Egyptian)	*t* /t/ [ʈ]	*k* /k/ [k]	*q* /q/ [k^w]

In Rilly's outline chart above, the Meroitic signs *p* and *b* appear to be phonologically opposed for voicing, although he rightly claimed in his discussion that they were not, and he shows how Meroitic *p* is 'borrowed from Egyptian.' This chart could still give the indication that there are two phonemes /p/ and /b/, which are part of the Meroitic phonological inventory and as such there are two phonemes for two labial stops signs in Meroitic, which are in opposition for voicing. Rilly's chart could indicate that Meroitic imported the phoneme /p/ from Egyptian (phonemic adoption) into its phonemic inventory, whereby Meroitic then has the phonemes /p/ and /b/. Hence, this could indicate that there are two signs in Meroitic for two distinct phonemes, contra to his earlier discussion (2007:362), although he does query this assignation. Therefore, I contend that the phonemic representation of these two Meroitic signs should show a single phonemic value /p/, which is then phonetically realised as [p] and [b].

1.6 Meroitic *m* 𓅓

This sign is transliterated as *m* in Meroitic, due to Griffith's (1911:14) assignation of the sound value 'm' through his verification of its parallels with the Egyptian hieroglyphic uniconsonantal sign 𓅓 <*m*>, phonologically /m/ (Loprieno 1995:15). It was Griffith who first noticed (1909:50) that the Meroitic cursive form was adopted from an Egyptian Demotic sign that had the value /m/;[21] later on, Priese (1973:287) verified this association and Zawadowski (1972a:28) followed Griffith's proposal of this sign's sound value as 'm'.

The correlative value of this Meroitic sign *m* can be seen through the following equivalences where Egyptian and Egyptian Demotic <*m*> /m/, Greek μ /m/, Coptic ⲙ /m/, Babylonian /m/ and Latin *m* /m/:

(8)

a.	Meroitic		*bekemete*	anthroponym
	Demotic	*bk-mṯj*		
b.	Egyptian	*ỉmn*	"Amun"	theonym
	Coptic	[Boh]ⲁⲙⲟⲩⲛ		
	Meroitic		*amni*	
	Greek	άμουν		
	Babylonian	*amâna, amunu*		

[21] See Fig. 2.1.

c.	<u>Meroitic</u>		*amod*	toponym
	Latin	*amoda*		
d.	<u>Latin</u>	*roma*		"Rome"
	Meroitic		*arome*	
	Egyptian	*jrm, jrmj, jrmjw, jrmy, h3lmʿ(t)*		
	Demotic	*hrme*		
	Coptic	ϩⲣⲱⲙⲏ		
e.	<u>Meroitic</u>		*apedemk*	theonym
	Egyptian	*iprmk*		

From the evidence that these equivalent forms verify, it can be confirmed that Meroitic *m* is phonemically /m/ and phonetically realised as the labial nasal stop [m]:

(9)	Meroitic		*m*	/m/	[m]
	Greek	μ	*m*	/m/	[m]
	Egyptian		<*m*>	/m/	[m]
	Eg. Demotic[22]		<*m*>	/m/	[m]
	Latin	m	*m*	/m/	[m]
	Coptic	ⲙ		/m/	[m]

1.7 Alternation of *m* with *b*

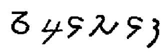
Griffith also saw that the Meroitic sign *m* could replace *b* in certain funerary formulas such as *ẖblol* ~ *ẖmlol* (1911:14). Zyhlarz (1930:420) refers to this alternation as being either a historical sound change or a local variation (dialectal). This view is also discussed in Grzymski (1982), although he does not come to a firm conclusion for the sound change.[23] However, Rilly (2007:387) gives further

[22] See Fig. 2.1 for the actual Demotic sign.
[23] Cf. Böhm (1988a) for an alternative proposal.

examples of the written variation of these two signs, but proposes that this variation is due to a diachronic phonological process, as shown in the following early and late Meroitic forms:

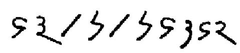
(10)

a. Late Meroitic  ***bedewi*** toponym

b. Middle Meroitic  ***medewi***

(11)

a. Late Meroitic  ***beloloke*** title

b. Middle Meroitic  *ameloloke*

Rilly's claim for this alternation of *b* > *m* is caused by the syncope of the schwa sign *e* /ə/, which then triggers a process of epenthesis of [b], which in turn triggers the loss of [m] (2007:388), as summarised below:[24]

(12)

a. *medewi* [məɖ] → [mɖ] → [mbɖ] → [bɖ] – written *bed-* in *bedewi*

b. *amelołoke* [məl] → [ml] → [mbl] → [bl] – written *bel-* in *beloloke*

The diachronic alternation of written forms with *m* resulting in *b* can be given an alternative explanation and one that is more in line with evidence from languages that are areally closer to Meroitic.[25] I propose that this alternation is better analysed as the loss of the feature [nasal] resulting in [m] > [b].[26]

[24] See Chapter 5 for the refutation of this vocalic sign being a zero-vowel indicator.

[25] The epenthesis of [b] is phonologically very circumspect and highly marked, although Rilly (2007:388) states in a footnote that this same change is attested in various languages and cites an example from Greek. The example from Greek, which I am not dismissing as an example of this process, is, however morphologically complex and further deals with a grammatical change from aorist to perfective, whereas the Meroitic forms are nominal, and there is no morphological boundary where this alternation takes place.

[26] Ullendorff (1955:101-102) points out that the loss of this nasal feature could be due to a process of dissimilation in these languages, as dissimilation is a highly productive phonological process in Afro-Asiatic, see Chapter 5 for more on dissimilation. However, Ullendorff notes many forms that do not

It is found that this same alternation is widely attested in Afro-Asiatic languages and is further typologically common across the world's languages. Ullendorff (1955:91) examples this process in Afro-Asiatic and describes this alternation as being attested in South Arabian ***bn*** for ******mn*** 'from', and in Ethiopic, the forms ***nmr*** and ***nbr*** 'tiger' are also found with this same alternation. Ge'ez shows *zämän* 'time' with *zäbän* in Tña, and ***zbn*** in Syriac. Ullendorff (1955:91) asserts that this alternation is 'well known also in other Semitic languages.' He lists further examples from Ge'ez, *'ə**m**ni* ~ *'ə**b**ən* 'stone', *zəna**b*** ~ *zəna**m*** 'rain' and *dä**b**äna* ~ *dä**m**äna* 'cloud'. These same examples of this alternation are found in Tigre, ***b**älsä* ~ ***m**älsä* 'return, reply' and in Amharic, ***m**əsrat* for Ge'ez ***b**əsrat* 'good news',[27] Amharic ***b**ärä**b**ärä* for ***m**ärä**m**ärä* 'examine' (1955:96). Hebrew has the root ***btr*** "to cut" and this is found in Arabic as ***btr*** ~ ***mtr*** where this form is found as ***mtr*** in Gə'əz (1955:102). Furthermore, Grzymski (1982:27) cites Egyptian transcriptions of this Meroitic toponym revealing that the Egyptians also interchanged <*m*> and <*b*> e.g. *mrwt* ~ *brwt* "Meroe".

This alternation is not only found in the Semitic branch of Afro-Asiatic, but also within Cushitic.[28] Ullendorff (1955:107-109) gives the following example from Bedauye (Beja) where ***bluk*** alternates with ***mluk*** 'date'; he concludes that this alternation is prominent in Semitic and Cushitic and therefore 'This labial "debility" may, perhaps, be considered a common feature of primitive Hamito-Semitic [Afro-Asiatic]' (1955:109). This typological process is also found in Nilo-Saharan Nubian languages whereby initial /m/ in Dongolawi Nubian corresponds to /b/ in Kordofan Nubian (Rilly p.c.). Consequently, the case for the substitution of 𐦨 *m* with 𐦦 *b* in Meroitic can be concluded as being strong evidence for the typological process of alternation in line with the examples given from Afro-Asiatic languages.

contain another segment, which are similar in place of articulation, such as *btr*, where there is an alternation to *mtr*, thereby discounting dissimilation as the motivating factor.

[27] In Arabic the form is *bišra*.

[28] Cf. Dolgopolsky (1967) who instances this same alternation in Cushitic (Afro-Asiatic) languages.

In fact, as it is evidenced that there is a diachronic change from Middle Meroitic forms 𐦩 *m* /m/ > Neo-Meroitic 𐦦 *b* /p/ this is further evidence for the proposal put forward in §1.3.1 (and following Rilly) that the labial stops 𐦨 *p* and 𐦦 *b* are not in opposition for voicing in Meroitic but allophones of a single phoneme. If the direction of the change was from 𐦦 *b* > 𐦩 *m* then this would be evidence for 𐦦 *b* being fully voiced and therefore not acquiring voicing through an intervocalic placement but from being a phoneme rather than an allophone. Further evidence for this comes from the Old Coptic form for "Meroe" where the initial /m/ is transcribed with /p/: **ⲡⲉⲣⲟⲩⲉ**.[29]

2 The Coronal Stop Signs

There are four signs in Meroitic that are thought to each be representative of coronal stops. This section discusses and investigates each of these signs.

2.1 Meroitic *d* 𐦸 𐦘

The attributed sound value for this particular Meroitic sign has been the subject of a number of investigations. In deducing the origin of the Meroitic hieroglyphic form 𐦘, Griffith (1911:15) discussed how the sign 𐦘 is used as a 'very common amulet, but a rare hieroglyph in Egyptian, and then only represents its own name … and has no Demotic form.'[30] Griffith tentatively assigned the Meroitic transliteration of this sign as *z* and stated that 'there is little to fix its value as a consonant' (1911:15), although he did further see that it could replace the Meroitic sign 𐦵 *t* in certain forms. This led him to postulate that 'It could be a dental of some kind.' In a later work, Griffith (1916b:117) specifically outlined his deduction on his proposed value for this sign:

> The only consonantal sign in the Meroitic alphabet for which no equation could be found to prove its value was 𐦘 𐦸. The others, however, having been sufficiently settled, it seemed by their elimination that 𐦸 must be the equivalent of Eg. 𓍿 or 𓆓, and there

[29] Zibelius (1972:76), dialect unspecified.

[30] However, Griffith (1909:50) alludes to the view that the Meroitic cursive form 𐦸 was probably a stylised form of the hieroglyphic form 𐦘, but he does not investigate the origins of the cursive form of this sign further. Cf. Rilly (2007:246) for a refutation of Griffith's hypothesis, and the summary of proposals in Fig. 2.1.

were some arguments besides making it a dental … The value *z* was therefore assigned to it, a sound which is also a prominent element in the Eg. word *wz'.t,* the name of the sacred eye … The transliteration *z* is of course only an approximation for a sound more like the Coptic ϫ, ϭ, i.e. *ğ* (dj), *č* (tch).

In this discussion, Griffith refers to the Egyptian signs and ; these Egyptian signs are transcribed as <*ṯ*> and <*ḏ*> representing voiceless and voiced palatal affricates; /tʃ/ and /dʒ/ respectively. The value of these Egyptian signs was subject to a sound change. Peust (1999b:123) affirms that the sounds represented by these Egyptian signs, transcribed as <*ṯ*> /tʃ/ and <*ḏ*> /dʒ/, came to merge with the dentals <*t*> /t/ and <*d*> /d/ by the end of the Old Kingdom, he terms this as a process of 'palatal fronting.' Certainly by the time the Meroites were devising their script, these palatals <*ṯ*> and <*ḏ*> had fronted to merge with the dental sounds in Egyptian resulting in /t/ and /d/. Therefore, this would result in the Egyptian script with two signs for one identical phonemic value, i.e. <*ṯ*> and <*t*> = /t/, and <*ḏ*> and <*d*> = /d/.

Priese (1973:280) investigated the origins of the Meroitic hieroglyphic form and proposed that this hieroglyph was a later version of the hieroglyph ~ which is found in archaic Meroitic texts. In Egyptian, the hieroglyph ~ , is a biliteral sign transcribed as <*ỉr*>[31] and represents the consonant sequence /ʔr/. Rilly (2007:262) believes that the Meroites transformed the archaic sign into due to the influence from the corresponding Meroitic archaic cursive form .[32]

As to the sound value of this Meroitic sign, Griffith (1917b:169-170) had difficulty in exacting its representation in light of an alternation in spelling of a Demotic and Greek equivalent form discovered by Sayce (cited in Griffith). The Meroitic form *medewi* is transcribed into Egyptian Demotic as <*mrw.t*> and in Greek as Μερόη, where Meroitic in Egyptian Demotic and Greek is represented by the phoneme /r/. Since

[31] Also variously transcribed as <*jr*>, see Chapter 1, §4.1 for more on Egyptian transcription practice.
[32] The further discussions into the origins of the cursive form are beyond the scope of this thesis. See Priese (1973:294-296) for a proposal on the origins of the cursive form and Rilly (2007:246) for a discussion on the improbability of Priese's hypothesis.

Griffith had already positioned the Meroitic sign ω as *r* /r/,[33] he thought that 'to imagine a special variety of *r* to represent λ is not easy in this region of Africa. There are no likely variants of λ with ω so far as I am aware … There is nothing in the pictorial form to suggest a value *r*.' Griffith goes on to state that 'It is true that direct evidence for the value of λ alone among the alphabetic signs, is very scanty. On the other hand, if λ is read as *r* then there is no equivalent left for *z* which however is found in Meroitic or Nubian names written in Egyptian.' Consequently, Griffith did not accept the value of 'r' for the sign λ even though this sign was transcribed with <*r*> /r/ and ρ /r/ in the Egyptian Demotic and Greek equivalent forms.

It was not until much later that Griffith (1929) revised his sound value for λ and accepted Sayce's suggestion. In this paper, Griffith admits that the Meroitic sign λ was the only one for which he 'could find no equation either from Greek or Egyptian transcripts of Meroitic words or from Meroitic transcripts of Greek and Egyptian words' (1929:70). Conclusively, from the equivalences that Sayce suggested and a further form, Griffith remarked that 'it is seen that the Greeks and Romans agreed with or accepted the Egyptian rendering of [Meroitic] λ by *r*. There were two Meroitic signs ω and λ, representing distinct sounds, but both represented by *r*.' Griffith speculates that 'the sound of λ was foreign to Egyptian, but to the Egyptian ear at least resembled an *r*' (1929:71). Griffith goes on to discuss the representation of this Meroitic sign in Greek and concludes overall that 'λ is nearly *d, (n)d,* but not identical with it', and that 'We must now find some symbol to represent the rather evasive sound of , λ in transcription. A combination of *d* and *r*, thus ^{r}d would be appropriate to the evidence' (1929:71). Subsequently, Griffith revised his transliteration of this sign from *z* to ^{r}d although later Meroiticists would not adopt his revision.

Zyhlarz (1930:416-417) took up Griffith's discussion and corroborates the Meroitic sign λ with the retroflex [ɖ], which he correlated as found in the inventories of languages

[33] See §5.1 for more on this sign.

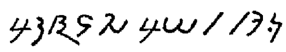
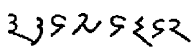
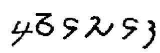
such as Beja (Cushitic language). The retroflex proposal was also taken up by Macadam (1966:52), who wrote more specifically on the phonetic realisation of the Meroitic sign '… appears to be a consonant partaking of the sounds of both R and D, probably a retroflex letter [sound] in which the tip of the tongue is turned behind the teeth-ridge and flaps forward over it.' Macadam (1949) had previously transliterated *z* as *d*, which then came to be used as the standard transliteration for this sign.[34] Most Meroitic scholars agreed with this phonetic realisation, such as Hintze (1973a:328), who stated that, '*d* is not [d], it is most probably something like [ɖ]', although Zawadowski (1972a:23-24) proposed instead, through a highly tenuous comparison between Meroitic and Sudanese Arabic, a palatalised coronal [d^j].[35] Rilly (2007:365-366) is in agreement with the proposal that this Meroitic sign represents a retroflex consonant [ɖ].[36] He explains why the Egyptians and Greeks transcribed Meroitic with <*r*> /r/ and ρ /r/ through a mixed articulatory and auditory phonetic description: he states that the curling back of the tip of the tongue in a voiced environment leads to the emission of vibrations which, to a foreign ear is unaccustomed to this type of consonant which seems to be a variety of /r/.[37]

Meroitic, Egyptian and Greek equivalent forms showing Meroitic *d* transcribed into Egyptian and Egyptian Demotic <*r*> /r/ and Greek ρ /r/:

(13)

a.	<u>Meroitic</u>	*tenekitnide*		anthroponym
	Demotic	*ꜣtngyṯnryꜣ*		

[34] For more on the transliteration methods, see Chapter 1, §2.4, 2.5.
[35] Cf. Vycichl (1973b:65-66) for a critique of Zawadowski (1972a).
[36] Rilly (2007:366 fn. 3) points out that this sound value is currently accepted by everyone, although I hasten to add that no thorough phonological analysis has ever been made into this sign by these scholars, bar Rilly's investigation, although Abdalla (1992:23) hypothesises that this sign represents a sound between the range of /t/ and the Semitic emphatic coronal /ḍ/.
[37] *'Le retournement de la pointe de la langue en contexte voisé est propice à l'émission de vibrations qui, pour une oreille étrangère à ce genre de consonne, la font considérer comme une variété de /r/, ce qui explique les transcriptions égyptiennes par r, grecques par ρ'* (Rilly, 2007:366).

b.	Meroitic		*tqoridemni*	anthroponym
	Demotic	*tḳrrmn*		
c.	Meroitic		*apedemk*	theonym
	Demotic	*iprmk*		
d.	Meroitic		*medewi*	"Meroe"
	Egyptian	*mriw, brw.t*		
	Demotic	*mrw, mlwꜣ, mrwꜣ*		
	Coptic	**пероүе**		
	Greek	μερόη		
e.	Meroitic		*pedeme*	"Primis"
	Egyptian	*prm.t*		
	Demotic	*prm(t), p(r)my*		
	Greek	πρῖμις, πρῆμ(ν)ις		

However, the Meroitic toponym in (13e) is also found transcribed into Latin from two different sources.[38] In the Latin equivalences, Meroitic  *d* is not transcribed using Latin *r* /r/ but *d* /d/ (Rilly 2007:363):

(14)	Meroitic		*pedeme*	toponym
	Latin (Bion)	*pind[em]is*		
	Latin (Juba)	*pidema*		

What is the difference between the Romans who interpret Meroitic  *d* as *d* /d/ and the Egyptians and Greeks who interpret it as /r/ if indeed Meroitic  *d* is a retroflex consonant? Rilly's (2007:366-367) answer to this is that it may be due to the use of

[38] See sources in Eide *et al* (1996:549-57, 1998:804-9).

guides from particular ethnic groups or regions that produced the Meroitic retroflex in an alveolar fashion. The following sections outline my argument against the proposal of this sign being a retroflex consonant.

2.1.1 No retroflex *d*

I advance here an alternative proposal to the generally accepted view that Meroitic *d* is a retroflex coronal [ɖ]. That is, Meroitic *d* is more likely to be [d]. The reasons for this proposal are as follows: (i) it is highly marked for a language to have retroflex consonants with no 'plain' counterparts. In her study on the phonology of retroflexes, Hamann (2003:3) outlines this, 'typically only large segment inventories have a retroflex class i.e. at least another coronal segment (apical or laminal) is present, as for instance in Sanskrit, Hindi, Norwegian, Swedish and numerous Australian languages.' She quotes Maddieson's (1984) database of 317 languages, which mentions only one exception to this and that is the Dravidian language Kota, which has a retroflex consonant as its only coronal consonant. Even if we look areally closer to Meroitic, the Cushitic language Beja has retroflex /ɖ/ [ɖ] and /ʈ/ [ʈ] which phonologically contrast with plain /d/ [d] and /t/ [t] (Hudson 1974:112). Therefore, it is expected that Meroitic would have had a phonologically contrastive plain /d/ [d], if it did contain a retroflex /ɖ/ [ɖ], and as such would have represented this opposition with a further independent sign.[39]

Further (ii) retroflex consonants are known to commonly pattern with back vowels, and further, very rarely occur in a front vowel context (de-retroflexion) (Hamaan 2003:90-102). However, it is seen that Meroitic *d* (and *t*, *s*, *n*, *l*, and *r* which Rilly (2007) also proposes to be articulated as retroflexes) do occur in the context of the front vowel *i* /i/. And finally (iii), Hamann (2003:83-89) discusses how it is diachronically attested in

[39] Further, see also Trubetzkoy (1969:128-9), who states, when discussing distinctive oppositions among retroflexes and plain consonants, that 'Many languages that have the phonological opposition between retroflex and plain apicals, or between alveolar and interdental apicals, also have a palatal series. Considering the ambiguous character of the palatals, it is not impossible that the three series (retroflex, plain, and palatal, or alveolar, interdental and palatal respectively) may be interpreted as three different degrees of rising or lowering the tip of the tongue.'

some languages that contain retroflex consonants, that they arise through merging with a rhotic consonant /r/. She cites Bhat's example of the Nilo-Saharan language Lugbara, which has retroflexion of the voiced coronal stop /d/ → [ɖ] (2003:86). This is partly triggered by a following /r/. It is evidenced that retroflexion in Meroitic cannot arise through this rhotic context of adjacency with 𐦬 *r* /r/, as forms where the sequences of coronal consonant + /r/ (and the reverse) are unattested.[40] Subsequently, the empirical and typological evidence is against the representation of Meroitic 𐦸 *d* realised as a retroflex consonant.

2.1.2 Intervocalic flapping of *d* 𐦸 𐦟

Nevertheless, it still has to be explained why the Egyptian and Greek forms of Meroitic 𐦸 *d* were transcribed with /r/. Primarily and most importantly, the instances where occurrences of Egyptian and Greek /r/ transcribe Meroitic 𐦸 *d* /d/ are found where Meroitic 𐦸 *d* /d/ is positioned intervocalically (V_V):

(15)		Meroitic V**d**V	→	Egyptian/Demotic/Greek/Coptic - /r/	
	a.	*tenekitnide*	→	Eg. Demotic	*ꜣtngyṯnryꜣ*
	b.	*tqoridemni*	→	Eg. Demotic	*tqrrmn*
	c.	*apedemk*	→	Egyptian	*ỉprmk*
	d.	*medewi*	→	Eg. Demotic	*mrw.t*
			→	Old Coptic	ⲡⲉⲣⲟⲩⲉ
			→	Greek	Μερόη
	e.	*pedeme*	→	Egyptian	*prm.t*
			→	Greek	Πρῖμις, Πρῆμις

The prosodic environment of V_V (intervocalic) is well known to condition the change of a coronal stop /t/ or /d/ to a flap [ɾ], whereby this is a typologically common process

[40] Principally, this point refers to the syllable basis of Meroitic where every consonant is followed by a vowel, apart from the three word-final consonants represented by the signs *te*, *se* and *ne*; for more on this see Chapter 5.

of lenition (Harris 2003, Harris and Kaye 1990, Kenstowicz 1994, de Jong 1998, Lavoie 2001, Kirchner 2004). In considering data from Ibibio, Bantu and English that illustrate not only the flapping of a coronal stop but also other lenition examples, Harris asserts that 'The wide distribution of this phenomenon across different languages suggests that it is phonetically natural' (2003:283).

The production of intervocalic voiced coronal stops 'are very similar to flaps' as de Jong (1998:296) specifies. I propose therefore that the Egyptian and Greek transcribed forms of <*r*>/ρ /r/ for Meroitic *d* /d/ can be explained as approximations for a voiced coronal stop /d/ → [ɾ], which lenites to a flap when positioned intervocalically. Proposals on the approximate sound value for Egyptian and Greek /r/ back up this claim: For Egyptian, Allen (2000:16) postulates that Egyptian <*r*> /r/ was articulated 'Probably as a "flapped" *r* ... To English speakers, this often sounds like *d*,' and Loprieno (1995:33) also positions Egyptian <*r*> as the flap [ɾ]. With Greek ρ /r/, Allen (1968:40-21) describes it as being 'a trilled alveolar sound,' and Sturtevant (1940:60) states that the ancient descriptions of Greek ρ leave no doubt that it was a 'trilled tongue-tip *r*.' Lastly, the Latin equivalents are faithful to the representation of /d/ for Meroitic *d*.

Further evidence for this proposal of Meroitic *d* /d/ being realised as a flap intervocalically i.e. *d* /d/ → [ɾ]/V_V, can be shown in that when Meroitic *d* /d/ is not in an intervocalic placement its phonetic realisation is [d]. The following equivalent forms elucidate this point:

(16)	<u>Meroitic</u>	([41])	*kdke* (*ktke*)	title
	Egyptian	*kntiky*		
	Greek	κανδακη	*kandake*	
	Ethiopic	*ḫəndake*[42]		

[41] The variant spelling is also given here.
[42] My thanks are due to Dr. Antonio Orlando for giving the transcription of this form.

There is an orthographic practice in Meroitic whereby a nasal segment in coda position followed by a consonant is unwritten (Griffith 1911:22; Rilly 2007:389).[43] Therefore the Meroitic form *kdke* is phonemically /ka**nd**ake/, where evidence of this nasal segment in adduced from equivalent forms. What we see in the Greek and Egyptian equivalences in (16) above, is that Meroitic *d* /d/ is not, in this instance, transcribed with Egyptian or Greek /r/ but with the coronal stop /t/ ~ /d/.[44] This is due to the Meroitic *d* /d/ not being conditioned by an intervocalic placement and consequently does not surface as the flap [ɾ]. In this position, Meroitic *d* /d/ surfaces as [d], and therefore is transcribed with /t/ ~ /d/ in the Egyptian and Greek forms.

In fact, Meroitic is not the only language where its phoneme /d/ (*d*) is transcribed into Egyptian as <*r*> /r/, as evidence is found where Semitic /d/ was occasionally transcribed in Egyptian with <*r*> /r/; e.g. Late Egyptian *ꜥršn* "lentils" from Semitic *ʕdš* (Peust 1999b:88). Fundamentally, it has never been proposed that Semitic /d/ is a retroflex [ɖ] because it is transcribed occasionally in Egyptian with <*r*>. Whether these transcriptions are due to intervocalic flapping of Semitic /d/ is open to investigation. Indicatively, this says more about the Egyptian representation of <*r*> than it does about the Meroitic *d* /d/ in that this discussion lends more evidence to Loprieno's (1995:33) phonetic realisation of Egyptian <*r*> as the flap [ɾ].

Lastly, there are no forms found in Meroitic where there is variation between the signs *d* /d/ [d] → [ɾ] and *r* /r/ [r], which shows that these two phonemes /d/ and /r/ were distinct in Meroitic.

This section has contributed strong evidence towards refuting the hypothesis that Meroitic *d* is a retroflex coronal consonant */ɖ/, as has been traditionally accepted

[43] See §4.2.2.1, and Chapter 5, §4.4 for more on this.

[44] This is firm evidence that there is an unwritten nasal segment in coda position in Meroitic as it prohibits the flapping of Meroitic *d* /d/, as seen in the Greek, Egyptian, and now the Ethiopic forms.

amongst Meroitic scholars. This traditional hypothesis was followed only based on Egyptian and Greek equivalences which transcribe this Meroitic sound with their rhotic /r/. The Egyptian and Greek transcriptions are now accounted for as being the interpretation of a flapped (lenited) coronal stop in an intervocalic position: /d/ → [ɾ]/V_V. In conclusion, it is therefore proposed that Meroitic *d* is a voiced coronal stop - /d/ which is realised as [d], but when positioned intervocalically /d/ → [ɾ], and that it is this flapped coronal stop that is transcribed (through being interpreted) as a rhotic /r/ in Greek and Egyptian as this is their sound with the closest approximation to a flap.

2.2 The Voiceless Coronal Stop Signs

It is a peculiarity of the Meroitic script that it contains three separate signs, which are all traditionally thought to have the consonantal value of a voiceless coronal stop 't'. These signs are *t*, *te* and *to* (following Hintze's revised transliteration 1973a, 1974a). What distinguishes these signs from one another is that they are thought to be distinct in their vocalic representations.[45] The analysis and investigation into the inherent vowels of these signs is beyond the scope of this thesis. The argument put forward in §2.1 that rejects the traditional hypothesis of Meroitic *d* as a retroflex, consequently applies to this same proposal asserted by Rilly (2007:368) for the voiceless coronal stop /t/ as phonetically realised as a retroflex [ʈ].

The arguments Rilly puts forward for this same retroflex realisation of the Meroitic signs transliterated with *t* are: (1) because it contrasts in voicing with Meroitic *d*, and therefore it is unlikely that *d* would be the only consonant belonging to this retroflex class, and (2) written variations are found between *d* and *t* e.g. *kdke* ~ *ktke, sdemdese* ~ *stmdese*.[46] Following the arguments put forward in §2.1, that refutes the hypothesis of

[45] See Chapter 1, §2.4 for more on this.
[46] Rilly (2007:368) advances a further remark on this hypothesis in trying to explain why it was that the Meroitic [ʈ] was never transcribed into Egyptian and Greek with their /r/. Rilly's explanation is that this is because the voiceless quality of this sound [ʈ] reduced the audible vibrations of the apex in comparison with the corresponding voiced consonant [ɖ], which made this voiced consonant sound like an /r/.

retroflexion in Meroitic, I claim here that the Meroitic voiceless coronal stop /t/ is phonetically realised as [t]. The three distinct signs representing this consonant are discussed in the following sections.

2.3 Meroitic *t*

Griffith (1911:16) confirmed that the origin of the Meroitic hieroglyph was the Egyptian uniconsonantal hieroglyph 𓍿.[47] This Egyptian hieroglyph is transcribed as <*ṯ*>, and which Griffith states that it 'often stands for *t* in and after the New Kingdom' (1911:16).[48] Peust (1999b:123) outlines that 'Around the end of the Old Kingdom, <*ṯ*> and <*ḏ*> frequently merged with <*t*> and <*d*>, a process which I call palatal fronting.' He goes on to discuss that this 'palatal fronting' is reflected in the Egyptian writing by the signs <*ṯ*> and <*ḏ*> being written as dentals <*t*> and <*d*> from the Middle Kingdom onwards. The Egyptian sign 𓍿 would have been palatally fronted by the time in which the Meroites would have been exposed to its sound value, and so for the Meroites, the Egyptian hieroglyph 𓍿 <*ṯ*> represented Egyptian /t/.

Griffith offered no analysis on the origin of the cursive form of this sign. However, Priese (1973:293) suggested that the cursive form is derived from the Egyptian hieroglyphs 𓍘 ~ 𓇋𓍘. The Egyptian hieroglyph 'pestle' sign 𓍘 is used as a phonogram <*tj*> ~ <*t*> (Allen 2000:444). Peust (1999b:222) presents an interesting description of this Demotic sign when he writes that:

> Many Demoticists employ a specific symbol <*ṱ*> for transcribing a Demotic phonogram which developed from the Late Egyptian group writing grapheme 𓇋𓍘 <*t*(*i*)>. This is a familiar rendering of /t(ʰ)/ in Demotic whereas the Demotic successor of Egyptian <*t*> (𓏏) no longer has a definite sound value in most words.

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[47] Rilly (2007:270) points out that the Meroites interpreted the Egyptian hieroglyph not as a hobble but as a pair of tongs, shown by the inclusion of a central 'spring' piece in the Meroitic version of this sign. See Fig. 2.1 for the comparison of these two signs.
[48] See discussion in §2.1.

Rilly (2007:254) presents a discussion on the Egyptian Demotic form of this hieroglyph and proposes that the use of the dot on the Meroitic cursive form was implemented in order to distinguish it from another Meroitic cursive sign *l*.[49]

For the sound value of this sign, Griffith (1911:9-10) gave equivalent forms where Meroitic *t* is correlated with Egyptian <*t*> /t/, Egyptian Demotic <*ṯ*> /t/ and Greek τ /t/, a summary of which is given below:

(17)

a.	Meroitic		*atiye*	toponym
	<u>Egyptian</u>	*ḥ(w).t-tiy, jttyt*		
b.	Meroitic		*tewiseti*	noun
	<u>Egyptian</u>	*t(ꜣ)-wšt.t*		
c.	<u>Meroitic</u>		*mnitwwi*	anthroponym
	Demotic	*mnṯwj*		

The co-occurrence of specific vowels following the sign was observed by Griffith (1911:16) in that this Meroitic sign is often followed by the vowel sign *i* but not by the vowel signs *o* or *e*. Therefore, this sign *t*, when not followed by a distinct vowel sign, contains the inherent unmarked 'a' /a/ vowel representing the sequence /ta/, and when followed by the vowel sign *ti* represents the sequence /ti/.

2.4 Meroitic *te*

For the origin of the Meroitic hieroglyphic form of this sign, Griffith found that it corresponded to a 'combination found in the Egyptian spelling of older Ethiopian names

[49] See Fig. 2.1 for the similarity of these signs.

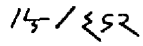
for $t + h$' (1911:16), namely the combination of the Egyptian hieroglyphs and .[50] Rilly (2007:270) agrees that the derivation proposed by Griffith is close enough to be the origin of the Meroitic hieroglyph.[51] Griffith did not discuss the origin of the cursive form , but Priese (1973:293) attributes its origin to an Egyptian Demotic sign.[52]

The sound value of this Meroitic sign was proposed by Griffith to be 'te' (1911:16), and so he recommended that it be transliterated accordingly. Griffith adduced the consonantal value as 't' through the following equations (1911:9-10):

(18)

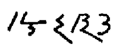
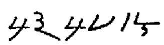
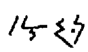
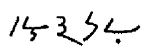
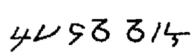
a.	Meroitic		*tewiseti*	noun
	Demotic	*t(ꜣ)wšṯ*		
	Coptic	[Sah]**т-оуаϣтє**		
b.	Meroitic		*perite*	title
	Demotic	*pꜣ-ıṯ*		
	Coptic	[Sah]**ⲣⲏⲧ**		
	Greek	παριτ		
c.	Meroitic		*bekemete*	anthroponym
	Egyptian	*bkmṯy, bjk-mṯj*		

[50] Additonally, Griffith also thought that it was possible that the Meroitic hieroglyph was derived from an alternative combination of and <*ty*> which occur 'as syllabic in Egyptian-Ethiopian [Kushite] writing' (1911:16). Cf. Priese (1973:293), who proposes an alternative origin for this Meroitic hieroglyph as being derived from Egyptian Demotic, although Rilly (2007:270-271) is unconvinced by Priese's proposal.
[51] See Chapter 5 for a discussion into the possibility that this sign was borrowed with its determinative function from Egyptian.
[52] See Fig. 2.1.

d.	Meroitic		*apote*	title	
	Egyptian	*wpwtj* [53](*jpwtj*)			

Rilly (2007:364-365) draws together further correspondences which indicate that the consonantal value of this Meroitic sign is /t/, updated forms are also given:[54]

(19)

a.	Meroitic		*snpte*	anthroponym
	Demotic	*snptj*		
b.	Egyptian	*tȝ-b(j)k(.t)*	"the female falcon"	anthroponym
	Meroitic		*tebiki*	
	Greek	τβηχις		
c.	Meroitic		*npte*	"Napata"
	Egyptian	*mr-z-nip(^{det}ḏw), npt, (imn)-npjj, npi, np, np.t, npȝ, npyt,*		
	Greek	(Τα)Νάπατα, Τα-ναπη		
d.	Meroitic		*tolkte*	"Naga"
	Egyptian	*twrkt(t*		
e.	Egyptian	*ḏw-wʿb, (pȝ)tȝ-wʿb*	"holy mountain"	toponym
	Coptic	^{Sah}**ⲧⲟⲟⲩ**, ^{Boh}**ⲧⲱⲟⲩ**		
	Meroitic		*tew webi*	

[53] Griffith's transcription of this Egyptian title is given as *wpte* although this is using an older Egyptian transcription style that could give the mistaken belief that the Egyptian script represents vowels. I follow here the Egyptian transcription of this form as given by Rilly (2007:365), where the consonantal glide <j> is word final.
[54] Rilly proposes that the Meroitic coronal stop is phonetically realised as a retroflex [ʈ] in line with his proposal for the other coronal signs.

f.	Meroitic		*h̲oh̲onete*	title
	Demotic	*h̲h̲n3ti*		

It is a highly pertinent point that the Meroitic sign *te* occurs, in the vast majority of cases, word-finally and occasionally word-initially. It is evidenced that this seemingly positional restriction is not the case for the previously discussed sign (in §2.3 above) *t*, which has the same consonantal phonemic value /t/. However, *t* is not positionally restricted as it occurs not only word-initially or word-finally but also word-internally. The positional distribution of these signs is interesting and could be indicative of a further value, not necessarily a phonetic one of the 'syllable' sign, although at present, I agree that the majority of the evidence suggests that the 'syllable' sign *te* does consonantally represent the voiceless coronal stop /t/, and its positional restriction must be the subject of a future investigation.

2.5 Meroitic *to*

The origins of the hieroglyphic form of the 'syllable' sign, Griffith (1911:16) followed a suggestion by Maspero (cited in Griffith) that 'The origin of as a *t*-symbol may perhaps be sought in, the Egyptian determinative of land, used here to represent *t*.' Griffith also observed that this is also found in Coptic as ⲧⲟ "land". Priese (1973:293) is in agreement with Griffith that this is the origin of the Meroitic hieroglyphic form.

Griffith (1911) did not speculate on the origin of the Meroitic cursive form, but Priese (1973:293) puts forward the proposal that it was a development from a Demotic form.[55] Griffith (1911:16) implemented the initial transliteration of this sign as *tê* to indicate its consonantal value as 't', where it is now commonly transliterated as *to* (following Hintze 1973a, 1974a).[56] Griffith's evidence for this was mainly from the

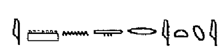
[55] See the discussion in Rilly (2007:255), who questions Priese's proposal.
[56] See Chapter 1, §2.4, 2.5 for the discussion on the transliteration of Meroitic signs.

Meroitic hieroglyphic form borrowed from the Egyptian determinative hieroglyph for "land". However, I believe that this association should be clarified more specifically.

There are several Egyptian hieroglyphic signs that work in a determinative sense indicating "land". One of these is the 'strip of land with sand' hieroglyph , this is a polyvalent sign which functions as an ideogram of the words for "land, earth, world" <*tꜣ*>, and phonographically for the sequence <*tꜣ*>. The other Egyptian sign is the 'tongue of land' hieroglyph borrowed by the Meroites for their hieroglyph . This 'tongue of land' hieroglyph in Egyptian functions only as a determinative for "land" and as an ideogram for the word "bank" <*jdb*>, and as such does not have any phonographic reference (Allen 2000:436). When Griffith referred to the Coptic form of "land" as **ⲧⲟ** this must have been derived from the 'strip of land with sand' hieroglyph , as it ideogrammatically represents "land" as <*tꜣ*> /tʔ/, therefore Egyptian <*tꜣ*> /tʔ/ > Coptic **ⲧⲟ** /to/, and not the 'tongue of land' hieroglyph . From this, the specific claim that Meroitic has a 't' value based on Coptic **ⲧⲟ** "land" is untenable. Hence, the Meroites borrowed the Egyptian hieroglyph which has no phonographic reference, but only functions ideogrammatically and as a determinative, for their hieroglyphic form .

In fact, this point is highlighted further when looking at the equivalence that Griffith used to establish the 'phonetic values' of this Meroitic sign (1911:8):

(20) <u>Meroitic</u>  *mnitore* anthroponym

Egyptian  *ỉmn-tꜣ-rỉ.t*

The equivalent form in (20) above confirms that Egyptian transcribed this Meroitic anthroponym not with the 'tongue of land' hieroglyph but with the 'strip of land with sand' hieroglyph , which functions phonographically as <*tꜣ*>.[57] This indicates that the

[57] This hieroglyph is a variant form of . I have not aesthetically doubled this sign in the form given above as per Griffith's example.

Egyptian 'tongue of land' hieroglyph has no phonographic reference in order to be used to transcribe the Meroitic form.

Moreover, the Egyptian 'strip of land with sand' hieroglyph was borrowed by the Meroites for their hieroglyphic form as already discussed in §2.4.

Even though the above discussion has questioned the phonographic reference of the Egyptian 'tongue of land' hieroglyph borrowed into Meroitic, it is still evidenced that between the equivalent forms, Egyptian transcribes Meroitic with <*tꜣ*> which indicates the consonantal value /t/ for Meroitic .[58]

Furthermore, Griffith (1911:16) outlined that 'In a few instances replaces and .' This is seen in a few examples Griffith gives (1911:45), where Meroitic *pso<u>h</u>ete* ~ *pso<u>h</u>eto* and *psi<u>h</u>ete* ~ *bsi<u>h</u>eto*.[59] Whether or not this is a grammatical change, as Griffith believes, or a semantic change, as it could be the case that signs could function polyvalently in Meroitic, is open to debate.

Only three further equivalent forms are found where this sign is transcribed into other languages that correspond with the sound value of /t/ in Egyptian and Egyptian Demotic <*t*>/<*<u>t</u>*>, and Greek τ:

(21)

a.	<u>Meroitic</u>		*peseto*	title
	Demotic	*p(ꜣ)sy-nsy*		
	Greek	ψεντης		

[58] However, it is a query as to why the Meroites borrowed an Egyptian hieroglyph that had no phonographic reference – could it be an indication that this Meroitic sign is polyvalent? The polyvalent issue is further discussed in Chapter 5, §4.6.1.

[59] The alternation of *p* and *b* can also be seen in the second example. See §1.3.1 for more on this.

b.	<u>Meroitic</u>		*tolkte*	"Naga"
	Egyptian	*twrkt(t)*		
c.	<u>Meroitic</u>		*brtoye*	anthroponym
	Demotic	*ꜣbrṯj, ꜣbrṯj*		
	Greek	Ἀβρατοεις		

Various proposals have been put forward into the consonantal sound values for these three signs *t*, *te* and *to*. The discussion of these now follows.

2.6 Discussion of *t*, *te* and *to* consonantal sound values

It was specified by Griffith (1911:16, 22) that the consonantal value of these three signs was 't'. He explained that the reason why there were three distinct signs representing the sound value 't' was because these signs differed in their vocalic values. Meinhof (1921/22:3) would go on to propose, contra Griffith, that in fact these signs did differ in their consonantal sound value. For Meinhof, the sign *t* represented 't' (/t/), the 'syllable' sign *te* a palatalised coronal 't´' (/t^j/), and the other 'syllable' sign *to* an emphatic or labialised coronal 'ṭ ' (/ṭ/ ~ /t^w/).[60]

Essentially, Meinhof did not give any satisfactory phonological analysis to explain this proposal, which has been rejected within the field of research by most scholars, specifically by Rilly.[61] One scholar who did not reject Meinhof's claim was Böhm (1987:10-12), who also believed the distinction between these three signs rested upon their consonantal value.[62] Böhm (1987:10-12) posits alternative consonantal values to

[60] The term 'emphatic' denotes uvularisation or glottalisation and is commonly seen in Semitic voicing triads.
[61] I agree with the arguments Rilly (2007:367 fn. 3) presents against Meinhof's proposal, but they are beyond the scope of this discussion.
[62] Further works that have remarked on or made proposals on Meroitic phonology such as Zyhlarz (1930:421), Zawadowski (1972a:31), Hofmann (1981a:38-39), Hintze (1973a:322; 1979) and Rilly (2007) do not consider that these signs differ in their consonantal values.

Meinhof, although again there is no real in-depth phonological analysis of these values. Rilly (2007:367 fn. 3) also critiques Böhm's proposals and suggests that these were motivated because Böhm strived to link Meroitic with Afro-Asiatic, and thus he was fitting the facts around this hypothesis, which allows him to account for a three way contrast in the stop series, as is evidenced in Semitic languages (Dolgopolsky 1977). For Rilly (2007:367 fn. 3), it is not a phonetic subtlety that motivated the Meroites to instigate distinct signs with the same consonantal sound value, but because of the frequency of the syllable sequences *ne, se, te,* and *to* in Meroitic and, further, because it is believed that they are recurrent (common) morphemes.

In concluding this section, I agree that these three separate signs 𐦴 *t*, 𐦵 *te* and 𐦶 *to* do not differ as to their consonantal value, as the data from equivalent forms is too strong to be argued against, whereby these indicate that their consonantal value is /t/ [t]. However, I claim that we have not learnt all there is to know about the 'syllable' signs 𐦵 *te* and 𐦶 *to*, although the investigation into these particular 'syllable' signs is the subject of future research. Nevertheless, I speculate in Chapter 5 that the 'syllable' sign 𐦵 *te* could also function as a plain consonant sign with no inherent vowel.

3 The Coronal Fricative Signs

There are two signs in the Meroitic script that represent coronal fricatives 𐦰 *s* and 𐦱 *se*. The phonemic representation of these signs is inextricably linked to each other. The sign 𐦰 *s* is a 'consonantal' sign including the unmarked inherent 'a' /a/ vowel (when not preceding the separate vowel signs), and 𐦱 *se* is termed a 'syllable' sign which is traditionally thought of as having a fixed inherent vowel 'e' *e*; It should be noted that the vocalic status of this 'syllable' sign is presented later in Chapter 5. The discussion into the consonantal value of these signs is given in two parts here as follows.

3.1 Meroitic *s* 3 𓆷

Griffith (1911:15) correlated the Meroitic hieroglyphic sign 𓆷 with the Ancient Egyptian biconsonantal hieroglyph 𓆷 <*šꜣ*>. This hieroglyph in Ancient Egyptian is realised as the phonogram /ʃʔ/ (Allen 2000:434). Griffith (1911:11) initially attributed the value 'š' (a palatal fricative /ʃ/) to this Meroitic sign, in correspondence with the Egyptian value /ʃ/. He also saw the connection of the Meroitic cursive form 3 with an Egyptian Demotic form which again had the same value /ʃ/ (1909:50, 1911:15). Priese's (1973:291) later investigation into the origins of the Meroitic signs agreed with Griffith's association.[63] Griffith (1911:22) went on to propose that there were two coronal fricatives in Meroitic, these being the 'consonant' sign 3 (transliterated initially as *š* by Griffith) representing a palatal fricative 'ʃ', and an alveolar fricative denoted by the 'syllable' sign ɩ⁄// 's' (transliterated as *s* by Griffith). Griffith (1911:9) gives two forms that show his original proposals for their sound value; the original transliteration method of Griffith is given in these examples where Meroitic 3 *š* = Egyptian and Egyptian Demotic <*š*> /ʃ/ (and Coptic ϫ /z/):[64]

(22)

a.	Meroitic	3/359ʞ	*pelmoš*	title
	<u>Demotic</u>	*p-mr-mšꜥ*		
	Coptic	ⲡ-ⲗⲉⲙⲏⲏϣⲉ		
b.	<u>Meroitic</u>	9///3	*šye*	toponym
	Egyptian	*šꜣꜥ.t*		
	Coptic	ϫⲁⲏ		

Later on, Griffith claimed that the value of this sign 3 being a palatal fricative /ʃ/ was wrong as, 'There is no clear case of *š* occurring in Egyptian transcripts of Meroitic

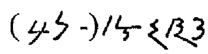
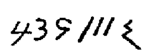
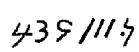
[63] See Fig. 2.1.

[64] For more on the revised transliteration of these signs, see Chapter 5, §1. Those who follow Hintze's system now generally transliterate the Meroitic cursive sign 3, which Griffith transliterated as *š*, as *s*.

names in either hieroglyphic or Demotic. It would therefore seem probable that Meroitic made no distinction between *s* [/s/] and *š* [/ʃ/], at least in writing' (1916b:117). He later stated his position more firmly on the value of this sign 3 being an alveolar fricative 's'; 'The Meroitic letter 3 transcribed *š* often corresponds to *s* and seems to be nothing more than *s*' i.e. the voiceless coronal fricative /s/ (Griffith 1929:69).

In his re-evaluation of this sign's value, Griffith (1916b:113-114) gave new equations of Meroitic forms with Egyptian hieroglyphic and Egyptian Demotic where Meroitic 3 *š* is equated with Egyptian <*s*> /s/ in the equivalent forms. The following is a summary of these new equivalences, although for clarity, I use Griffith's original transliteration:

(23)

a.	Meroitic		*šsno*	anthroponym
	<u>Demotic</u>	*ssn*		
b.	<u>Meroitic</u>		*šnpte(-li)*	anthroponym
	Demotic	*snptj*		
c.	Meroitic		*pyeši*	anthroponym
	<u>Demotic</u>	*pa-is.t*		
d.	Meroitic		*tyeši*	anthroponym
	<u>Demotic</u>	*ta-is.t*		

With these new equivalences, Griffith re-analysed the value of the sign 3 from the voiceless palatal fricative 'š' /ʃ/ to the voiceless coronal fricative 's' /s/, although the transliteration of this sign was confusingly kept as *š* until Hintze's (1973a) revision to the methods of transliteration, since when it has been mostly transliterated as *s*.

Subsequently, Meroitic scholars generally agree that there is no phonological contrast in Meroitic between /s/ and /ʃ/ and that the sign 3 *s* is phonemically /s/.

3.2 Meroitic *se* 𐦰 𐦕

This sign has traditionally been termed a 'syllable' sign through Griffith's (1916b:117) assumption that it contained an inherent vowel 'e' *e*, which Hintze (1973a:321) later tried to substantiate. This 'syllable' value has been followed by later Meroiticists.[65] Leaving aside the issue of the vocalic representation of this sign, Griffith (1911:11) gave its consonantal value as 's' (/s/) and so used *s* for its transliteration. When looking for the origins of the Meroitic hieroglyphic form 𐦕, Griffith proposed that it was a borrowing of the uniconsonantal Egyptian hieroglyph 𓊃, transcribed as <*z*>, which was then reduplicated by the Meroite script devisors.[66] The transliteration of this Egyptian sign as <*z*> belies its phonemic representation, since during the Late Egyptian period, when it would have been borrowed by the Meroite script devisors, its phonemic realisation was /s/. Loprieno (1995:34) points out that 'the phonological opposition between /z/ and /s/ was neutralized at the beginning of the Middle Kingdom,[67] at which time <z> and <s> had become graphic variants of the same phoneme /s/.'[68] Therefore, the Meroites borrowed the Egyptian hieroglyph 𓊃 <*z*> /s/, with its neutralised phonemic value of /s/, to represent their second voiceless coronal fricative sign.[69]

For the Meroitic cursive form of this sign 𐦰, Griffith (1911:15) saw that it resembled the Egyptian Demotic form of the hieroglyph, which as a phonogram is transcribed <*s3*> /ʃʔ/.[70] These correspondences confirmed Griffith's proposal that the consonantal value of this sign was 's'; and this was further substantiated by the following equivalent

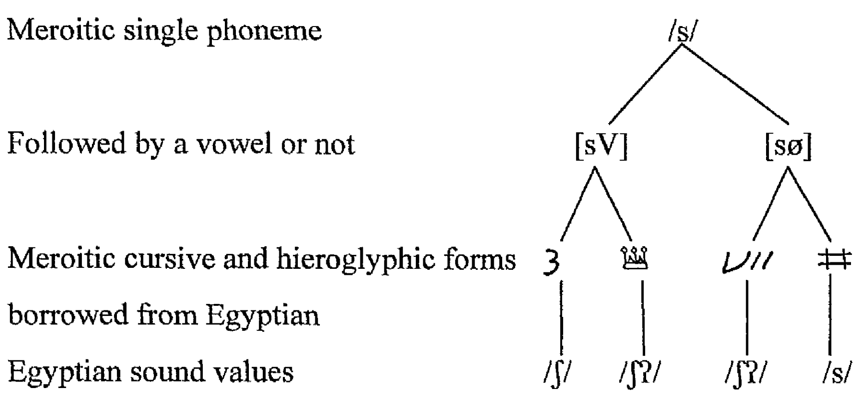
[65] I argue against this representation in Chapter 5.
[66] Griffith (1911:14) hypothesises that the reduplication of this sign was for aesthetic reasons.
[67] The Egyptian Middle Kingdom existed circa 2050-1750 BCE (Loprieno 1995:21).
[68] See Priese (1973:280) for an alternative proposal of the origins of the Meroitic sign and cf. Rilly's (2007:269-270) argument against Priese's proposal. See Fig. 2.1 for Priese's proposal.
[69] See Peust (1999b:125-126) for an overview of the assumptions put forward in the analysis of Egyptian <*s*> and <*z*>.
[70] Cf. Priese (1973:291) for a further palaeographical analysis of the cursive form.

forms (1911:9, 1916b:114), where Greek ς /s/, Coptic **ⲥ** /s/ and Egyptian and Egyptian Demotic <*s*> /s/:

(24)

a.	<u>Meroitic</u>		*p<u>h</u>rse*	toponym
	Greek	παχωρας		
	Coptic	**ⲡⲁⲭⲱⲣⲁⲥ**		
b.	Meroitic		*šseno*	anthroponym
	<u>Demotic</u>	*ssn*		

Further, Griffith also saw that the two Meroitic signs and 3 were found to interchange in various forms, although he kept to his original transliteration of as *s* and 3 as *š*. Hintze (1973a) revised the transliteration of this sign from *s* to *se*, as he followed Griffith's assumption that it contained an inherent vowel 'e' *e*. It can therefore be concluded that the Meroite script devisors borrowed two signs from Egyptian, where these both had the consonantal value /s/, into the Meroitic script in order to notate a single phoneme with two signs:[71]



[71] For evidence against the proposal that this sign contains an inherent 'e' *e* vowel and reasons into why the Meroites borrowed two signs for one phoneme, see Chapter 5.

3.3 Later proposals for *s* ʒ and *se* ν// ⧺

Further researchers working on the values of these signs have proposed alternative theories.[72] Vycichl (1958a:75) proposed that 'Most probably *s* was originally *ts* or a similar sound.' Vycichl is following Griffith's original transliteration method and so Vycichl's *s* is the sign ν//, now transliterated as *se*. He goes on to reiterate Griffith's statement (1916b:117), saying 'Many equations show that *s* and *š* are hopelessly intermingled' (1958a:75). Vycichl's proposal for the value of this sign is very vague and it essentially rests upon his attempt at explaining a process of assimilation evident in Meroitic where *s* + *l* > *t*.[73] Vycichl (1973b:64) later stated that the Meroitic *s* was difficult to describe: '*Ce son* s *du méroïtique est difficile à décrire: il correspond, en égyptien, à la fois, à* s *et à* š, *et il forme, avec un* l *suivant, la consonne (probablement géminée)* t *(tt).*' Again, Vycichl was querying the value of this sign because he was trying to account for its participation in this particular assimilation process.

Zawadowski (1972a:28, 1977:9) proposed that the two Meroitic coronal fricative signs represented a '*dentale*' (dental) fricative /s/ and a palatal or palatalised fricative /s^j/, as he followed Griffith's (1911:15) initial claim that these two signs had two distinct values.[74]

Hintze (1973a:322) tied up Griffith's later proposal that these two signs had the same consonantal value /s/ and so revised the method of transliteration to signify this, thus *s* for ʒ and *se* for ν// ⧺, showing their consonantal correlation.[75]

Rilly (2007:378) specifically states that Meroitic has one '*fricative apicale*', namely '*la sifflante*' /s/. He gives equivalent forms where this phonemic value is evidenced, especially in the Greek equivalents, as Greek σ, Σ and ς = /s/ (2007:379):

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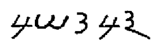
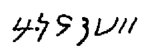
[72] However, Meinhof (1921/22:3) and Zyhlarz (1930:421, 1956:22) followed Griffith's original proposal that there were two different values for these signs.
[73] For more on this process traditionally referred to as 'Hesterman's Law', see §3.4.
[74] See Rilly (2007:378), for his query of Zawadowski's claim of palatalisation.
[75] See Chapter 1.

(25)

a.	Meroitic		*asori*	theonym
	Egyptian	*ws-ir*[76]		
	Greek	Ὄσιρις		
b.	Meroitic		*kisri*	title
	Greek	Καῖσαρ		
	Latin	Caesar		
	Demotic	*gysr(s)*		
c.	Meroitic		*semeti*	anthroponym
	Demotic	*is-mt*		
	Greek	Σμιθις		

The difference between these two Meroitic signs, is outlined by Rilly (2007:378), who contends that the difference is due to the Meroitic graphical system and not that they represent an unspecified phonological contrast. He points out that there does not seem to be any coherent rule in Egyptian for transcribing Meroitic /s/, as the Egyptians used either <*s*> or <*š*>. He also believes that the phonetic realisation of the Meroitic coronal fricative phoneme is to be found between these two values of the Egyptian alveolar and palatal fricatives, and is therefore realised as a retroflex [ʂ].[77] He cites (2007:379) a description given by Martinet of retroflex fricatives as being quite similar to palato-alveolar fricatives and so they are often confused with one another. He goes on to state (2007:380) that he believes this acoustic ambiguity causes the Egyptian scribes' hesitation in transcribing Meroitic /s/ with <*s*> or <*š*>. He then refers to the observed

[76] The Egyptological transcription of this theonym is discussed in detail in Chapter 3.

[77] Rilly's retroflex proposal rests upon his proposal for the phonetic realisation of the coronal stop signs as retroflex (see §2.1.1 for the argument against this). He gives this correspondence of /s/ being [ʂ] because fricatives often use the same place of articulation as their corresponding stops (2007:379).

assimilation process of *s* + *l* > *t* in Meroitic, as being explained more satisfactorily if Meroitic /s/ is assumed to have a retroflex articulation i.e. [ʂ].[78]

3.3.1 Palatalisation of Meroitic *s* ~ *se*

I propose an alternative theory to Rilly's proposal in accounting for the Egyptian palatal fricative <*š*> /ʃ/ variously used to transcribe Meroitic *s* ~ *se*. In looking at the equivalent forms where Egyptian <*š*> /ʃ/ is Meroitic *s* ~ *se* /s/, it can be observed that Meroitic *s* ~ *se* /s/ is adjacent to a 'palatal' segment i.e. the high front vowel *i* /i/ or the palatal glide *y* /j/.[79]

The Meroitic sequence *si* /si/ transcribes <*š*> /ʃ/ of the Egyptian Demotic form below:

(26)	<u>Old Eg.</u>	*(bꜣ)šps-j, ꜥ.t šbs.t, šps.t*	"the noble"	anthroponym
	Late Eg.	*pꜣ-šps(j), tꜣ-šps.t*		
	Demotic	*tꜣ-špš, tꜣ-špšj.t, tꜣ-špšjꜣ.t*		
	Coptic	$^{\text{Old}}$**ϭⲁⲡϭⲓ**, $^{\text{Old}}$**ϣⲁⲡϣⲓ**		
	Meroitic		*sipesiye*	

Again, in (27), the Meroitic high vowel *i* /i/ is adjacent to (precedes) *se* /s/, which transcribes Egyptian <*š*> /ʃ/ (and Coptic ϣ /ʃ/):

(27)	<u>Egyptian</u>	*t(ꜣ)-wš.t*	"the adoration"	noun
	Demotic	*tꜣ wšte*		
	Coptic	$^{\text{Sah}}$**ⲧ-ⲟⲩⲁϣⲧⲉ**		
	Meroitic		*tewiseti*	

[78] See also the discussion into this assimilation in §3.4.
[79] For more on the Meroitic palatal glide, see §8.2.

The Egyptian transcribed form in (28) uses <*š*> /ʃ/ for the Meroitic sequence ///3 *sy* /saj/, where there is adjacency to the palatal glide /j/:

(28) Meroitic ϟ///3 *sye* toponym
Middle Egyptian *šꜣꜥ.t*

It is claimed here that there is better evidence for the reason why Meroitic 3 *s* ~ ㄩ// *se* /s/ is transcribed occasionally as <*š*> /ʃ/ in Egyptian; this is due to the coronal fricative /s/ neighbouring a palatal segment ㄐ *i* /i/ ~ /// *y* /j/. Further evidence for a palatal segment comes from transcriptions of this toponym in Assyrian *saja*, Greek Σαΐς and Coptic ⲥⲁⲓ (ⲥⲁ).[80] The palatal segment can also give a secondary articulation of palatalisation to /s/ resulting in /s^j/. As Kenstowicz (1994:42) discusses, 'In many cases, however, dental, velar and sometimes labial consonants change their primary place of articulation to alveopalatal when palatalised by a front vocalic segment, especially the high vowels [i, ü] and the corresponding glides [y, ɥ].'[81] It is therefore a stronger case that there was palatalisation of Meroitic alveolar /s/, due to assimilation of neighbouring /i/ and /j/ which resulted in either secondary palatal articulation – [s^j], or total palatalisation to [ʃ]. This analysis then explains the seemingly ambiguous Egyptian forms where <*s*> /s/ and <*š*> /ʃ/ are used for Meroitic /s/.

From this therefore, and in agreement with Rilly, I claim that Meroitic possessed only one coronal fricative phoneme /s/ that was represented by two signs: 3 *s* and ㄩ// *se*. In light of the discussion on palatalisation, and the evidence from the data given, the assumed ambiguous transcriptions of Egyptian <*s*> and <*š*> can be explained, and this thus leads me to claim that in Meroitic there was a palatalised allophone [s^j] ~ [ʃ] of the

[80] Forms taken from Zibelius (1978:195) also see the New Egyptian form *sꜣw* (ibid.), where the earlier palatal fricative is attested later as the coronal fricative. This Egyptian diachronic sound change can account for the Coptic forms transcribing this toponym with ⲥ /s/ and not ϣ /ʃ/ (also see Coptic ⲍⲁⲏ and Old Nubian ⲥⲁⲉⲓ, ⲥⲁⲏ. I am grateful to Claude Rilly and Chris Reintges (p.c.) for bringing these last forms to my attention).
[81] For Kenstowicz's '[ü]' read IPA [y] – high front rounded vowel – and for his glide '[y]' read IPA [j]. [ɥ] is a labial-palatal approximant.

alveolar fricative phoneme /s/ when in the vicinity of a high front vowel /i/ or its corresponding glide /j/:[82]

(29) /s/ - ȝ *s*, ⅃/// *se*

[s] [s^j] ~ [ʃ]

Furthermore, in Rilly's section on the origins of the Meroitic signs (2007:254), he states that the Meroitic borrowing of ȝ *s* from the Egyptian hieroglyph <*šȝ*> /ʃʔ/ and its corresponding Demotic form, representing a fricative, can be explained by the slightly hushing nature of the Meroitic retroflex *s* /s/ (=[ʂ]).[83] However, I do not follow Rilly's claim that the Meroitic phoneme /s/ was phonetically realised as a retroflex [ʂ] as the motivations for this proposal are from systemising all the coronal signs as retroflexes.[84] I put forward that it was more the case that the Egyptian hieroglyph <*šȝ*> /ʃʔ/ was utilised by the Meroites, as it corresponded more closely to the sequence /sa/.

There is a question asked by Rilly in his discussion on the origins of the other Meroitic coronal fricative sign ⅃/// *se* (2007:253-254) that needs to be addressed. Here, he states that a phonetic problem remains, in that why did the Meroites choose an Egyptian hissing sibilant <*z*> /s/ for the origin of their ⌗ *se*, and not a hushing sibilant as was the case for the previous sign (ȝ *s* /s/ from Egyptian <*š*> /ʃ/).[85] I do not consider that there is any 'phonetic problem' here; as /s/ and /ʃ/ are both sibilants. Rilly concludes that the Meroitic sound did not correspond to either the Egyptian <*s*> /s/ or <*š*> /ʃ/ and hence proposes that it must be because the Meroitic consonantal sound value for ȝ ~ ⅃/// *s* ~ *se* was the retroflex [ʂ] (2007:254). The reasons why the Meroites

[82] Whether this palatalised allophonic variant split to create a new phoneme in the Meroitic language is open to debate when looking for correlations for cognate languages. Bender and Fulass (1978:15) point out that for Ethiopic languages, 'it is quite clear that the palatal series arose from contact of consonants with neighbouring palatal vowels.'

[83] '*L'utilisation par les Méroïtes d'un signe égyptien représentant une chuitante /š/ pour les* s *s'explique par le caractère légèrement chuinté du /s/ rétroflexe méroïtique (=[ʂ]).*' (2007:253).

[84] See §2.1.1 for the argument against retroflexes in Meroitic.

[85] '*Une problème subsiste, d'ordre phonétique: pourquoi les Méroïtes ont-ils pour ce signe choisi une sifflante égyptienne et non une chuitante comme pour le précédent?*' (2007:254).

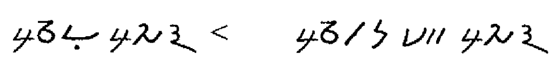
borrowed these signs from Egyptian are discussed in Chapter 5. This discussion points out that the specific borrowings of the Egyptian signs into Meroitic were not just initiated through purely segmental reasons but also through syllabic motivations.

To conclude, Griffith's (1929:69) revised assumption that both these signs represent the coronal fricative 's', as supported by Rilly (2007) is also the interpretation followed here. Furthermore, it is highly probable that Meroitic had a process of palatalisation, as could be indicated by the Egyptian data, and therefore the phoneme /s/ would have the allophonic variants [s] and [sʲ] ~ [ʃ].

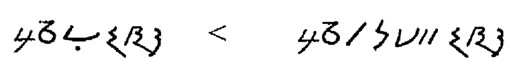
3.4 Griffith's Law

Meroitic scholars have variously commented on a unique assimilation or contraction process evident in the texts, whereby when the sign *se* /s/ precedes a form with an initial *l* /l/ they assimilate or contract, resulting in *t* /t/. This process has traditionally been referred to as 'Hestermann's law', although Rilly (2007:413) argues that this law was erroneously applied to Hestermann, when it should be attributed to Griffith instead.[86] The process is exampled in the data below:

(30)

a. Meroitic 

kditowi < *kdise-lowi*

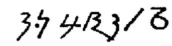
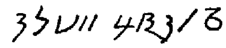
b. Meroitic 

mnptowi < *mnpse-lowi*

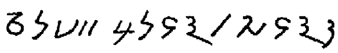
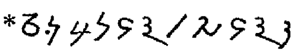
c. Meroitic 

adblito < *adblise-lo*

[86] Rilly (2007:413) asserts that Hestermann developed an entirely different rule than the one that is constantly attributed to him and that it was Griffith (1911:38) who first noticed this alternation.

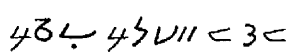
d. Meroitic  < 

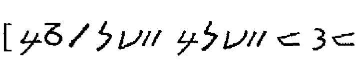
womnith̲ < *womniselh̲*

Rilly (2007:413) dates this process as taking place circa 1st century CE. His analysis of palaeographically dated texts from this time into the late period shows that this process is not consistently respected. He finds that texts are found where the series *se* + *l* does appear where it is not transformed to *t*. For example, the late period Kharamandoye Inscription (REM 0094) shows that this transformation is not always respected:  *mkedokeliselw* *  **mkedokelitw*. These instances do not allow Rilly to see whether they are examples of a more archaic spelling or simply transcriptions of a conservative pronunciation. With respect to the non-transformation found in REM 0094, Rilly states this is astonishing, as nearly four centuries have passed since the first occurrences of Griffith's Law are found in the texts.[87] He explains that this is due to this inscription being modelled on ancient steles, and refers to an irregularity of spelling due to the use of two differing orthographical standards – one being phonetic and the other being morpho-phonological (2007:414).[88]

Rilly (2007:411) remarks on the juxtaposition of different spellings within the same text, where assimilated written forms are found alongside non-assimilated ones. However, the juxtaposition of different spellings is also seen within the same word, and therefore how are the phonetic or morpho-phonological orthographical standards able to explain this? In one late period text (REM 1183), Griffith's law is only respected once within the same item (31a) when we expect it to apply to both occurrences of *se* + *l* (31b):

(31)

a.  *h̲sh̲selitowi*

[ *h̲sh̲seliselowi*]

[87] REM 0094 is dated circa early 5th century CE (Eide *et al* 1998).

[88] For the proposal into differing orthographical standards, see Rilly (1999a).

b. * **ẖsẖtitowi*

[*ẖsẖseliselowi*]

Does this indicate that there is a restriction on how many times within a word Griffith's Law can take place? Or is it that Griffith's Law is a non-standardised practice? In fact, the restriction hypothesis must be discounted through evidence from the late period texts REM 1088 and 0247, where within the same word there are two written forms of the transformation:

(32) Meroitic

pedemeyotito

(*pedemeyoseliselo*)

Unfortunately, more questions are being generated here than answered with respect to these instances, and I leave aside the issue of the juxtaposition of assimilated or non-assimilated forms.

Turning back to the reasons for this process, Rilly disputes that Griffith's Law is a morphological phenomena in the way that the transformation of the genitive *se* + *l* > *t* is not just restricted to the determiner and its derivatives (*-l, -leb, -li, -lw, -lowi, -lebkwi*), but it is also seen when the adjective 'great' *lẖ* follows the genitive *se*:[89]

(33) Meroitic

womnitẖ < *womni-se-lẖ*

Noun Gen. Adj.[90]

[89] Griffith (1916b:124) thought that the *l* on the adjective *lẖ* was a connective element.

[90] Rilly (2007:413 fn. 1) gives the translation as "great prophet of Amun".

According to Rilly (2007:414), this process is a phonetic law that is triggered when the phonemes /s/ and /l/ are adjacent which then become simplified into a realisation corresponding to the phoneme /t/, which is possibly also geminated. Rilly's explanation for this is from an articulatory phonetics proposal based on his hypothesis for retroflextion of the coronal consonants. His proposal is that due to /s/ and /l/ having retroflex realisations, when [ʂ] and [ɭ] are articulated sequentially it results in a total closure thereby [ʈ] is produced.

Even though many Meroitic researchers have commented on this process, only three previous proposals to Rilly's have been made in trying to account for Griffith's Law. Vycichl (1958a:75) advances that probably Meroitic /s/ was originally an affricate /ts/ or a similar sound, therefore the sequence /ts/ + /l/ was simplified to 'one long occlusion.'[91] Alternatively, Vycichl suggests that /l/ 'may go back to an old *d or *t.' Millet's paper dealing with a phonetic alternation in Meroitic (1973a) combines a grammatical change on nominal forms with instances of Griffith's Law.[92] In this paper, Millet essentially only indicates the process by which Griffith's Law is manifested: '/-sl-/ > (by this hypothesis) /-tl-/ > (by assimilation) [-tt-] (written *t*)' (1973a:314), although this is without furthering our understanding of this law. Furthermore, he also proposes that /s/ became [t], not only when adjacent to /l/, but when adjacent to the vowels /e/, /u/ and /i/, but not /a/ (1973a:316). Rilly (2007:415) is critical of Millet's paper and outlines that his theory cannot be substantiated in light of the syllable-based principle that typifies the script.[93]

That Griffith's Law could be explained by a phonetic proposal, albeit an alternative one to Vycichl and Millet, was also Böhm's (1987:11) contribution to the investigation. His

[91] See Rilly (2007:414-415) for a critique of Vycichl's proposal.
[92] Millet's analysis, which should perhaps be considered as a grammatical change, is that a few forms with word-final *se* seem to vary with forms with word-final *te*. Millet understands this, strangely, as being due to the vowel *e*, in that when it follows *s* (i.e. contained in the 'syllable' sign) the *s* becomes *t* and is so written (1973a:308). He further believes that these two morphemes are the same.
[93] This further proposal of Millet's is outside the scope of this discussion as it rests upon an alternative theory to Hintze's generally accepted proposal for the syllabic nature of the script. For more on this, see Rilly (2007:415).

proposal is that the phoneme /s/ could be a voiceless dental fricative [θ], thus when adjacent to /l/ results in a lateral stop [t͡ɬ] and he refers to the lateral fricatives [ɬ] that are argued to be present in Afro-Asiatic.[94] He cites a near parallel sound law that is well known in Akkadian where there is a merger of *š* with *l* before apical stops e.g. *ilti* < *išti* 'with' (Steiner 1977:144). Böhm's theory that the merger of /s/ and /l/ resulted in [ɬ] which was then interpreted to be an allophone of /t/ is implausible for Rilly (2007:416).

At present, I cannot add to these studies with a strong proposal for the phonetic reasons into Griffith's Law, however in Chapter 6, I present a phonological theoretical account which is able to capture this process but there are certain issues and points that I believe should be raised here. Primarily, this sound law appears to be morpho-phonological, rather than phonetic. The great majority of cases take place at morpheme boundaries, and there is no evidence of its appearance word or morpheme internally.[95] It is not a systematic sound law as there is juxtaposition of texts from the late period where it is notated and others where it is not, sometimes this juxtaposition is found in the same text and sometimes in a single written form. A thorough, systematic investigation is needed, particularly in consideration of Millet's observation that 'in late Meroitic, the syllable -*tê* [𐦷 *to*] in final position when it does *not* represent *s* + *l* is exceedingly rare' (1973a:311).

As I have argued in §2.1.1 against the case for a series of retroflex consonants in Meroitic, I cannot support the hypothesis that the answer lies there. I speculate a tentative possibility in that perhaps Griffith's Law is a dissimilatory process. If it is possible that the Meroitic phoneme 𐦭 *l* /l/ is actually a coronal lateral fricative /ɬ/,[96] then when it is in immediate contact with another fricative i.e. the coronal fricative /s/ it

[94] For an extensive investigation into fricative laterals in Semitic (Afro-Asiatic), see Steiner (1977).
[95] I imply here that there is no evidence of it applying word or morpheme internally from the Meroitic script, as with the word/morpheme final forms. However, there is a particular Meroitic toponym where its transcription into Greek could be evidence for Griffith's Law applying word-internally. See the correspondent form in (34).
[96] Steiner (1977:9) notes that the lateral fricative phoneme /ɬ/ is found in a large number of languages of Africa, particularly the Chadic languages.

could dissimilate to /t/. The following investigation into the lateral sign 𐦬 *l* /l/ (§5.3), discusses how, unlike approximants in many other languages, there are no known alternations with the coronal lateral approximant sign 𐦬 *l* /l/ and the coronal approximant 𐦫 *r* /r/ in Meroitic.

The following point is discussed as length in §5, that when the Meroites transcribed a loan-word that contained a word-initial approximant /r/, in order not to violate their phonotactic constraint of 𐦫 *r* /r/ being in this word-initial position, they epenthesised a segment preceding 𐦫 *r* /r/ e.g. Latin *roma;* Meroitic 𐦠𐦫𐦣𐦨𐦡 *arome*. It is therefore a query as to why the Meroites chose to epenthesise a segment rather than implement 𐦬 *l* /l/, which has no phonotactic restriction on occurring word-initially, if indeed these two phonemes are approximants. However, if Meroitic 𐦬 *l* was a lateral fricative phoneme /ɬ/, this would make this phoneme's manner dissimilar enough not to be confused with or used as a variant of the approximant 𐦫 *r* /r/.

Due to the nature of the script being essentially syllabic, and following my proposal (Chapter 5) that the Meroitic sign 𐦰 *se* is not a 'syllable' sign but in actual fact a consonant only sign /s/ that denotes no vowel follows,[97] it will always be the case that it is this sign that is involved in Griffith's Law. Possible evidence for this could come from a Meroitic toponym "Shellal" and its tentative identified transcription into Greek:

(34)	<u>Meroitic</u>	𐦰𐦬𐦡𐦬𐦡	***selele***	toponym
	Greek	Τελῃλις (?)		

It is indicated in this form that the Meroitic fricative 'syllable' sign 𐦰 *se* is directly adjacent to the lateral 𐦬 *l*, as per my analysis of there being no inherent vowel contained within the 'syllable' sign - /slele/. If this Meroitic lateral is a fricative this would then trigger a dissimilation of /sɬ/ → [t], which corresponds to the Greek representation of

[97] See Chapter 5 for the full discussion.

this toponym with word-initial T /t/. Rilly (2007:379 fn. 2) notes that the possible Greek transcription with /t/ is strange and does ask whether it could be in effect an instance of Griffith's Law.

Nevertheless, whether Griffith's Law indicates a grammatical nuance that we are overlooking is another matter, and I leave this investigation for future research.

4 The Coronal Nasal Signs

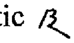
As with the coronal fricative signs discussed in §3, the Meroitic script implemented the use of two independent signs *n* and *ne* to represent, consonantally, a coronal nasal /n/. The consonantal value of these signs is discussed in two parts in this section, and since the vocalic representation of the 'syllable' sign *ne* also rests upon a further analysis and discussion, this is presented in Chapter 5.

4.1 Meroitic *n*

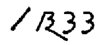
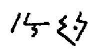
For the origin of the Meroitic hieroglyphic form, Griffith adduced that 'In Egyptian is *n*, and *n* is the value of [Meroitic],' and further, that the borrowed Egyptian hieroglyph was doubled in the Meroitic script for 'aesthetic reasons' (1911:14).[98] In summary, the Egyptian hieroglyph <*n*> represents /n/ [n].

For the origins of the Meroitic cursive sign, Griffith stated that ' has no resemblance to the hieratic or Demotic forms.' (1911:14). Proposals for the origin of this Meroitic cursive sign are discussed in Priese (1973:287) and Rilly (2007:251), but as they rest upon in-depth discussions of palaeography, it will not concern this present discussion.

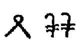
[98] Priese (1973:280) disagreed with Griffith's doubling of this sign due to 'aesthetic reasons' and put forward an alternative analysis, however, Rilly (2007:266) gives palaeographic evidence to disagree with Priese's hypothesis. This discussion is essentially outside the scope of this thesis, although see the above references for more on this and Fig. 2.1.

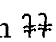
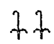
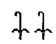
Griffith assigned the sound value of 'n' to the Meroitic hieroglyphic sign  due to correspondences with Egyptian hieroglyphic equivalent forms (1911:8). Rilly (2007:388-389) lists further equivalences between Meroitic  and Egyptian, Egyptian Demotic <*n*> /n/, Coptic ⲛ /n/ and Greek N ~ ν /n/:

(35)

a.	<u>Demotic</u>	*ssn, ssʿn*		anthroponym
	Meroitic		*ssno*	
b.	<u>Meroitic</u>		*npte*	"Napata"
	Egyptian	*mr-z-nip(*^{det}*ḏw), npt, (imn)-npjj, npi, np, np.t, npꜣ, npyt*		
	Greek	(Τα)Νάπατα, Τα-ναπη		
c.	Late Eg.	*ḥm-ntr*	"Prophet/Priest"	title
	<u>Old Eg.</u>	*ḥm-nṯr*		
	Demotic	*ḥm-nṯr*		
	Coptic	^{Boh}ϩⲟⲛⲧ, ^{Sah}ϩⲟⲛⲧ		
	Meroitic		*ant*	

The representation of this Meroitic sign in equivalent forms therefore shows a direct correspondence and therefore the phonemic and phonetic values can be confirmed as /n/ and [n].

4.2 Meroitic *ne* 

Griffith (1911:14) saw a correlation between the Meroitic hieroglyphic form  and the Egyptian hieroglyph 'rush' sign , transcribed as <*nn*> (when doubled).[99] Griffith quotes Schäfer's (1885:133) observation that the Egyptian  <*nn*> sign was used in Napatan inscriptions to represent /n/ of "Ethiopian" (Kushite) names. Priese (1973:288)

[99] When this sign is not doubled i.e.  it has the phonographic reference of <*nḫb*> Allen (2000:435).

proposed an alternative adoption by the Meroites that came from the use of 𓇒 as a demonstrative.[100] However, I put forward a query as to the origin of this Meoritic hieroglyphic sign, which is discussed in the next sextion.

4.2.1 Proposal for the origins of the Meroitic cursive sign 𐦪 *ne*

There is another hieroglyph in Egyptian that has an exact parallel with the Meroitic hieroglyph 𐦌, this is the 'sedge' sign – 𓇓; it functions in Egyptian as a phonogram <*sw*> and as an ideogram for both "king" <*nswt*> and "sedge" <*swt*>. The Egyptian 'sedge' sign 𓇓 is often used as the abbreviated form of the word 𓇓𓏏𓈖 <*nswt*> meaning "king" (Allen 2000:31). It is possible, by acrophony, that the Meroites adopted the 'sedge' sign in its abbreviated form for "king", taking the initial sound <*n*> /n/ for its phonemic value in Meroitic and then doubling (for aesthetic reasons) the graphic representation to 𐦌.[101] However, it could remain to be the case that the doubled 'rush' sign 𓇒 is the origin of the Meroitic hieroglyph if Peust's (1999a) study into the Napataen Egyptian dialect is taken into consideration. In this study, Peust mentions that the the 'rush' sign 𓇒 <*nn*> can also be related to the term for "king" <*nswt*>.

It is quite indicative that for the origin of the cursive form 𐦪, Griffith could not find its parallel form from the Egyptian hieratic or Demotic version of 𓇒, and consequently he concluded that 'It [𓇒] does not occur in Egyptian Demotic, and the known hieratic forms do not explain the [Meroitic] form 𐦪' (1911:14).[102] Rilly (2007:251) states that the source of this Meroitic cursive sign 𐦪 still remains to be discovered. This is a point that was investigated in light of the proposal put forward above that queries the traditional view of the origin of the Meroitic hieroglyph sign (and due to the discussion given in Chapter 5, §4.6.2).

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[100] For more on Priese's proposal, see the discussion in Rilly (2007:267).

[101] It could also be the case that the Meroite script devisors confused these two Egyptian hieroglyphs (as they could be confused in Egyptian).

[102] Priese (1973:278-288) also looked at the palaeography of this sign and gave further proposals but could come up with no definite link.

It is interesting that the Meroitic hieroglyphic form 𐦌 is closer in execution to the Egyptian 'sedge' sign hieroglyph 𓇓 rather than the 'rush' sign 𓇒, this led me to investigate the Egyptian Demotic form of 𓇓 to see if the Demotic form is similar to the Meroitic cursive form 𐦪. The comparison is found in Betrò (1996:143) who gives a Demotic form of this Egyptian hieroglyph as ___. The Egyptian Demotic scholar Prof John Tait verified that ___ is a Demotic representation of the Egyptian hieroglyph 𓇓 (p.c.).[103] It is quite distinctive that the Meroitic cursive form 𐦪 shows such a strong resemblance to the Egyptian Demotic form of 𓇓, therefore the possibility that this is the origin of the Meroitic cursive form should be investigated fully.[104] Furthermore, this could also support my initial query of the origin of the Meroitic hieroglyph 𐦌 correspondingly being the Egyptian hieroglyph 'sedge' sign 𓇓 rather than the traditionally proposed Egyptian 'rush' hieroglyph sign 𓇒𓇒.[105]

4.2.2 The consonantal value of *ne* 𐦪 𐦌

For the sound value of this Meroitic sign, Griffith instanced the following equivalent form, which led him to assume the consonantal value of this sign as 'ny' (1911:9):

(36)	<u>Meroitic</u>		*qorene*	title
	Demotic	*qrny*		

Griffith initially believed that due to the Egyptian Demotic transcription giving the sequence <*ny*> this indicated that 'Probably, therefore, 𐦪 represents that particular Nubian *n* which most closely resembles *ni* and may be represented by *n̄*' (1911:14).[106] Griffith is referring to the palatal nasal consonant /ɲ/ [ɲ] of Nubian (Browne 2002:8, 17)

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[103] See also Pestman (1977:110), for this sign used in Egyptian Demotic for the suffix pronoun.

[104] As this investigation would rest upon palaeographic analysis, it is beyond the field of this thesis, not to mention the author's specialism.

[105] Cf. Macadam (1949:46) states that the Egyptian title *sꜣ nsw* was, 'conferred in ancient times on the Egyptian viceroy of Nubia as a special mark of favour … pronounced, as can be fairly established from cuneiform transcriptions of these words separately in other contexts, *psiinsi* or *psiensi*.' The cuneiform pronunciation is indicative for the Egyptian hieroglyph 𓇓 articulated with the nasal <*n*> /n/ (<*nswt*>).

[106] It can be seen that there is variation in Egyptological transcription of <*y*> and <*j*> as Rilly (2007:389) gives one of the transcriptions of this Demotic form as <*qrnj*>. Allen (2000:15) remarks that 'In some words, however, *j* seems to have had the same sound as *y*.'

and so used the transliteration *ñ* to represent this Meroitic sign.[107] This analysis led to Griffith's preliminary claim that there were two distinct coronal nasals in Meroitic: 'n' and 'ñ'. In a later study (1916b:117), Griffith revised the sound value of the sign 'ñ' to 'ne' (therefore a 'syllable' sign), although Griffith kept to his original transliteration of *ñ*. Griffith's evidence for revising this association lay in his observation that no separate vowels signs ever followed , whereas they could all follow the other coronal nasal sign *n*, apart from the vowel sign *e*.[108] It is the consonantal value of this sign that is discussed here, as per the coronal fricative signs in §3, I put forward that the motivations for having two distinct signs to represent one phonemic value is due to syllabification principles, as discussed in Chapter 5.

Meinhof (1921/22:3, 5) followed Griffith's initial analysis (1911:14) of a palatal/alveolar distinction between the signs and without taking into account Griffith's later paper of 1916b. It could be inferred that Meinhof either ignored Griffith's revision (or was unaware of it) or thought that the transliteration of these signs had a direct correspondence with their sound values.[109] Vycichl (1958a:75) believed that the sound value for was 'difficult to establish.' However, he goes on to agree with Griffith's original proposal that it is possible that it was pronounced as '*n mouillé* as in French (*champagne*) or Italian (*agnello*) and, as a matter of fact, this sound is common in African Negro languages,' although Vycichl does not elucidate on which languages these are. He queries Griffith's initial equivalence of the Meroitic title *qorene* with Egyptian Demotic *qrny* for the palatal sound value '*ny*' and states that 'this proves nothing as there was no particular sign for *n mouillé* in Demotic.' Zawadowski (1972a:27-28) propounds the palatal hypothesis for this sign as well. When referring to the palatalisation of /n/, he states that 'Both in Meroitic and African phonetics we have the same phenomenon because the sign – N renders the sound /n^y/

[107] Griffith first indicated that the Old Nubian script adopted the Meroitic sign and used it to represent their palatal nasal consonant [ɲ] (Browne 2002:7), furthermore, his initial assumption that Old Nubian was perhaps the descendent language of Meroitic led him to propose this initial sound value for this sign.
[108] For the analysis of this sign, see Chapter 5.
[109] See also Zyhlarz (1930:417-418).

or /nyi/, which is not the same as /n/.' Zawadowski concludes that 'the sign corresponds to /n/ plus a palatal semi-vowel or a palatalised phoneme /n^y/.'

Papers presented at the Berlin conference 1971 and published by Priese (1973:287-288) and Hintze (1973a:321-322) brought the consonantal values of the signs and in line with one another to represent a plain coronal nasal /n/. Hintze's (1973a) proposal also called for a revision to the transliteration of these signs in order to represent their correlation as now being *n* and *ne*, and this was substantiated by a 'resumption of remarks' which Hintze affirms were already made by Griffith.[110] Hintze (1987:44) published a further paper where he put forward a hypothesis concerning the Old Nubian borrowing of Meroitic sign to represent their palatal nasal phoneme /ɲ/, namely that this borrowing could be explained by the exceedingly frequent Meroitic sequence of - *neye*, which would be phonetically realised as [-nj-].[111] The Nubians accordingly would have then borrowed this sign to transcribe their palatal nasal /ɲ/.

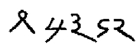
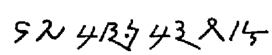
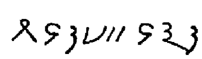
Rilly (2007:390) discusses Hintze's proposal but advances an alternative explanation, which rests on his proposal for the sound value of this sign as a retroflex, in line with his retroflex hypothesis for the other coronals. He gives an articulatory phonetic explanation for how this Nubian borrowing can be explained, as the retroflex [ɳ] is realised through an occlusion by the tip of the tongue against the top of the palate and this articulation is similar to the nasal palatal [ɲ] whose articulation occurs at the same point but with the dorsal part of the tongue. Consequently, for Rilly, it is therefore not astonishing that the first script writers of Old Nubian have recycled the Meroitic sign transcribing a retroflex to transcribe their palatal.[112] However, I believe that this

[110] For more on this, see Chapter 5.
[111] The specific reasons for Hintze's assertion is that for him (and most Meroitic scholars) the 'syllable' sign *ne* encodes the vowel 'e' *e* which has the ambiguous realisation of being vocalised or not. Therefore, when this vowel is unvocalised this results in the nasal consonant being adjacent to the glide. See Chapter 5 for my investigation and the proposal that this is not a 'syllable' sign but functions only as a consonant with no inherent vowel.
[112] '*Or le [ɳ] rétroflexe, qui se réalise par une occlusion par la pointe de la langue contre le haut de la voûte du palais, s'approche acoustiquement de la nasale palatale [ɲ], dont l'articulation se produit au même point, mais avec la partie dorsale de la langue. Il n'est donc pas étonnant que les premiers*

proposal of the borrowing of the Meroitic retroflex for the Nubians' palatal should really be looked at from an acoustic phonetic viewpoint rather than an articulatory one, as essentially it is more salient as to what the Nubians perceived this sound to be rather than how the Meroites articulated it.

Only a few equivalent forms are found that show a correspondence with this Meroitic coronal nasal sign , where Egyptian Demotic <*n*> /n/, Greek ν /n/ Latin *n* /n/ = Meroitic  *ne*:

(37)

a.	Meroitic		*akine*	toponym
	Demotic	*3kjny, jqn, ʿqn3.t, iqn, ikn, ikin3*		
	Greek	Ἀχίνη		
	Latin	*acina*		
b.	Meroitic		*ẖoẖonete*	title
	Demotic	*ẖẖn3tj*		
c.	Meroitic		*tenekitnide*	anthroponym
	Demotic	*3tngyṯnry3*		
d.	Meroitic		*mkesemene*	anthroponym
	Latin	*maximinus*		

There is no indication in these equivalent forms of this Meroitic sign  representing anything other than a coronal nasal /n/ [n] for its consonantal value.[113] I follow Griffith's revised assumption (1916b), Priese (1973) and Hintze (1973a) who conclude

scripteurs du vieux-nubien aient recyclé le signe méroïtique transcrivant une rétroflexe pour transcrire leur palatale.'

[113] However, as the languages where equivalences are found do not contain retroflexes in their inventories we would not expect to see evidence of this correlation.

that the sign ⅄ represents the same consonantal sound value as ʒ *n* /n/ [n], namely the coronal nasal stop, contra to Rilly's proposal that both these signs ʒ and ⅄ are realised purely as retroflexes [ɳ]. I consider that in the case of the Old Nubian borrowing of this Meroitic sign ⅄ for their palatal nasal, Hintze's (1987:44) assimilatory analysis is strong. It is a well-documented assimilation process that a palatal segment can cause neighbouring segments to palatalise or have a secondary palatalisation. Hintze discusses the high proportion of ϛ /// ⅄- *neye* sequences that are found in the Meroitic texts (particularly in anthroponyms), and which have the realisation [-nj-]. The nasal sign is directly adjacent to the palatal glide /// *y* [j] and so in support of Hintze's proposal that, consequently, the nasal has a very high chance of becoming a palatal i.e. [ɲ] or having secondary palatalisation [nʲ]. This palatal quality, in the majority of cases, is what the Old Nubian script devisors would have heard (acoustically) and subsequently, the Meroitic sign ⅄ is borrowed to notate the Nubians' palatal nasal phoneme /ɲ/.

Moreover, Rilly (2007:390) claims that the Old Nubians, who used an alphabetical system, borrowed the sign ⅄ as it represented a simple consonant /n/ ([ɳ]), whereas the other coronal nasal sign ʒ represented a properly syllabic sign which reads as /na/ ([ɳa]). However, I put forward that the choice of the Old Nubian script devisors of which nasal sign to borrow is better explained in that the sign ⅄ is the one that was directly adjacent to the palatal segment /// *y* /j/ [j] because ⅄ was realised as a simple consonant sign (with no inherent vowel),[114] unlike ʒ which is always followed by a vowel sign (including its inherent 'a' /a/ vowel) and therefore is not directly adjacent to the palatal /// *y* /j/ [j] and as such is perhaps not so strongly prone to palatalisation.[115]

To conclude, I put forward in line with Griffith, Priese and Hintze, that Meroitic possessed two signs ʒ *n* and ⅄ *ne* with the same consonantal phonemic value /n/. It can also be proposed that phonetically this phoneme was realised in two ways for the

[114] The investigation into the 'syllable' properties of this sign is given in Chapter 5.
[115] However, we would also expect this sign ʒ to be palatalised when adjacent to the palatal vowel sign ϕ *i* /i/ [i].

sign *ne* where one of these i.e. [ɲ] ~ [nʲ] is the realisation when followed by the palatal glide sign:[116]

(38)

a.	*n* /n/ | [n]	b.	*ne* /n/ / \\ [n] [ɲ] ~ [nʲ]

In (38), it is shown that there are two signs for the same phoneme /n/ which is either realised as a plain coronal nasal [n], or a palatal nasal [ɲ] or a palatalised coronal nasal [nʲ] when adjacent to the palatal sign *y* /j/ [j].

Furthermore, Griffith (1911:13) noted a revealing variation in that the 'syllable' sign *ne* is found to alternate with the sequence *ni*. It could be the case that the 'syllable' sign *ne*, due to its common realisation as a palatal nasal [ɲ], was progressively considered to represent this value, independently of whether it was in contact with a palatal segment. This would explain the variations between the sequence *ni* [nʲi], which is adjacent to the palatal vowel, and *ne* in one of its phonetic realisations as [ɲ].

4.2.2.1 Meroitic velar nasal

There is a Meroitic orthographic practice of not notating nasal segments in coda position i.e. when the nasal is adjacent to a following consonant (*NC clusters).[117] Evidence for the realisation of a nasal, even though unwritten, comes through equivalent forms from Egyptian, Greek etc. An example is the Meroitic female title ~

[116] This is not to say that I promote the view that there are two separate phonemes of /n/, but in (38a) and (38b) it is the same phoneme, but for clarity the representation is given in (38b) to show the allophonic variant for as it is this sign that is more prone to palatalisation. This is due to my proposal that it represents the nasal consonant which never has a vowel sign following (see Chapter 5).

[117] See Chapter 5, §4.4 for more evidence of the unwritten nasal in coda position. See the discussion in Rilly (2007:368-372) on an evaluation of the various other proposals put forth for this written omission. In this thesis, I follow Rilly in that the nasal segment in coda position is unwritten in the Meroitic script, although it is pronounced. I have added evidence to support this claim with an Ethiopian transcription of the Meroitic title *kdke* ~ *ktke* which is found in Ethiopic with a written nasal segment in coda position.

ktke ~ *kdke*, transcribed into Greek as κανδάκη *kandake*. Further evidence for the Meroitic unwritten nasal segment in this form comes from the Ethiopic transcription of this Meroitic title *ḫᵊndekiė* (Dillmann 1907:48).[118] Subsequently, it is expected that the enunciation of a nasal segment in coda position, where the following consonant is velar or uvular (dorsal) for place of articulation, will regressively assimilate this same place of articulation.[119] Thereby, the Meroitic nasal phoneme /n/ also has the phonetic realisations [ŋ] and possibly [ɴ], as, for example, in the anthroponym form (39) below:

(39) <u>Meroitic</u> *wyekiye* /wayenkiye/ → [wayeŋkiye]

Demotic *wyngy3*

The theory that Meroitic had a phonological velar nasal /ŋ/ was propounded by Priese (1973:289) and Hintze (1973a:328), but this suggestion only rested upon what was considered a parallel between the Old Nubian sign for their velar nasal and the Meroitic sign *ḫ*, thereby indicating, for them, that this Meroitic sign was highly likely to be representative of a velar nasal phoneme /ŋ/ as well. I agree with Rilly (2007:391) that the velar nasal is only phonetically realised i.e. [ŋ] through assimilation of the following consonants' place features, and not that it was an independent phoneme */ŋ/.

5 The Coronal Liquid Signs

The two Meroitic signs *r* and *l* are thought to be representative of coronal liquids. These signs are discussed in this section in two parts along with a further discussion of their correlation.

5.1 Meroitic *r*

The origin of the Meroitic hieroglyphic form caused problems for Griffith (1911:15), as he claimed that 'It is difficult to suggest any Egyptian origin.' However,

[118] My thanks are due to Alex Bellem (p.c.) for bringing this form to my attention.

[119] For the proposal of velar and uvular consonants in Meroitic, see §6 and §7.

in analysing the origin of the Meroitic cursive sign Griffith stated that it 'may be compared to the Eg. Demotic equivalent of .' Priese (1973:280) claims that the Meroitic hieroglyph has its origins in the Egyptian hieroglyph . Rilly (2007:269) believes that Priese's claim is correct and that the dot found to the left of the Meroitic hieroglyph is a trace of the line to the left of the Egyptian one . Further, he proposes that the rectangular form of the Meroitic hieroglyph is motivated through graphic reasons in order to distinguish it from another Meroitic hieroglyphic sign *ḫ*. The Egyptian hieroglyph form is transcribed as <*r*>, a uniconsonantal sign, and is phonemically thought to represent /r/. This, of course, would bring it in line with the Meroitic borrowed form for their sign transliterated as *r* (through equivalent forms).

For the origins of the Meroitic cursive sign , Griffith believed that it could be explained as the Egyptian Demotic equivalent of <*r*>, as already noted. Priese (1973:288-289) disagreed with Griffith's assignation and he suggested that Meroitic as having its origins in the Demotic equivalent of a different Egyptian hieroglyph. Rilly (2007:253) believes that Priese's hypothesis is somewhat complicated and uncertain. Rilly goes on to state that there is a link between the Ptolemaic Demotic form of from Upper Egypt which seems very close to the Meroitic cursive form , and hence this is the most likely origin for the Meroitic borrowing of this sign.[120]

Griffith (1911:8-9) lists equivalent forms where the Meroitic phonemic value 'r' is assigned; some of his examples are given below:

(40)

a.	<u>Old Eg.</u>	*ḥrw*	"Horus"	theonym
	Late Eg.	*ḥr*		
	Demotic	*ḥr*		
	Coptic	$^{\text{Sah}}$ϩⲱⲣ, $^{\text{Old}}$ϩⲱⲗ, $^{\text{Old}}$ϩⲁⲣ, $^{\text{Old}}$ϩⲣ, $^{\text{Old}}$ϩⲁⲣ-ⲡⲓϣⲱⲧ		
	Meroitic		*ar*	

[120] See Fig. 2.1.

b.	Egyptian	*pꜣ-rt, rdw*	"the agent"	title
	Demotic	*pꜥ-rj.t, p-rṱ, rt, pꜣ-rt/tꜣ-rt, pꜣ-rṱ, rṱ*		
	Coptic	Sah**ⲣⲏⲧ**, Sah**ⲡⲣⲏⲧ**		
	Meroitic		*perite*	

c.	Meroitic		*qorene*	title
	Demotic	*qrnj(ꜣ), ḳrnyꜣ, ḳrny*		

Rilly (2007:386) assumes that it is quite possible that Meroitic *r* was articulated as a retroflex [ɽ], in line with his proposal for the other coronal signs (see §2.1.1 my evidence against this), although he does state that this retroflex proposal for *r* is impossible to prove. Hence, in his table for the system of Meroitic consonants, Rilly gives two possible phonetic realisations for *r* /r/ as [r] or [ɽ] (2007:392).[121] Rilly (2007:386) lists further equivalent forms where Meroitic *r* is equated to Egyptian <*r*> /r/, Coptic **ⲣ** /r/, Greek ρ /r/ and Latin *r* /r/, which are given below along with some updated forms:

(41)

a.	Meroitic	*arikẖror*		anthroponym
	Egyptian	*ỉrk-nḫrr*		

b.	Meroitic		*pẖrse*	toponym
	Greek	παχωρας		
	Coptic	**ⲡⲁⲭⲱⲣⲁⲥ**		

c.	Meroitic		*arome*	toponym
	Latin	*roma*		

[121] Cf. Rilly (1999a) for an investigation into the assimilation of the Meroitic signs *r* and *l*.

Greek	ʽρώμη
Demotic	*hrwmj, jrm, jrmj, jrmjw, jrmy, h3lmʿ(t)*
Coptic	ϩⲣⲱⲙⲏ

The phoneme /r/ across these languages is phonetically variable, as Rilly (2007:386) correctly states, and therefore the phonetic realisation of which is different from one language to the other. For instance, the Egyptian phonetic realisation is given in Loprieno (1995:33) that the phoneme /r/ in earlier Egyptian was realised as [ɾ] – an alveolar flap, although he does not give a proposal of the phonetic realisation of /r/ by the Late Egyptian stage of the language (1995:40). Allen (1968:39) cites descriptions of Greek ρ /r/ by Plato and Dionysius of Halicarnassus and specifies that 'What is being described is clearly a trilled, alveolar [r] sound, as e.g. in Italian or some Scottish pronunciations, and not as in southern English, where it is more retracted and less strongly articulated (with single tap, friction, or neither).'[122]

That the Meroitic sign 𐦬 *r* never shows alternate forms with another sign is outlined by Rilly (2007:385), who states that 𐦬 *r* therefore is very singular amongst the Meroitic consonants. He goes on to claim that 𐦬 *r* never alternates with 𐦭 *l* /l/, even though the alternation of /r/ and /l/ is seen across many languages including Old Nubian.[123] This point is discussed in §5.3.

Griffith (1911:15) observed that 'Like ⲣ [r] in old Nubian, and *r* in modern Nubian, [Meroitic] 𐦬 [*r*] is exceedingly rarely, if ever initial'. He reiterated this statement further on in the same publication when he noted the apparent resemblances between Meroitic and Nubian (1911:22), 'As in modern and Christian Nubian [Meroitic] *r* is never initial.' In a later study, and after further research into Meroitic (1917b:165), Griffith could find no instances in Meroitic 'of an independent word beginning with *r*.'

[122] However, note that although it is phonetically variable across Egyptian, Greek and Latin, it is only a trill vs a tap (flap), which is not as variable as being realised as a retroflex. See also the discussion on Meroitic 𐦸 *d* §2.1.1.

[123] For more on the disassociation of Meroitic and Nubian as proposed in this thesis, see Chapter 6.

Rilly (2007:386) claims that when foreign words where /r/ is word-initial are borrowed into Meroitic, they are transcribed with the sign  *a* epenthesised word-initially which is then followed by  *r* (although there is only one example of this given), note that the Egyptian and Coptic forms in (41c) are not /r/ initial also:[124]

(42)	Meroitic		*arome*	toponym
	<u>Latin</u>	*roma*		

Interestingly, Amharic (Ethio-Semitic) in some cases also epenthesises a prosthetic (')ə before initial /r/ e.g. (')ərgəb/rəgəb 'pigeon', (')ərab/rab 'hunger' (Ullendorff 1955:200). The phonotactic constraint, moreover, that prohibits /r/ from appearing in word-initial position is not particular to Meroitic or Nubian. Wurm's (1972) survey of Australian languages evidences that the large majority of Australian languages also have this positional restriction on rhotics from occurring word-initially.[125] Ullendorff (1955:126) summarises how in Ethio-Semitic languages the phonemes /r/, /l/ and /n/ generally surface as [n] when word initial e.g. *nakkabam* "find" (*rkb*).[126] Consequently, because this positional restriction is typologically common it cannot be taken as evidence towards the genetic association between Meroitic and Nubian.

Before the phonemic value of this sign, as I claim, is put forward, the discussion needs to be given of the second Meroitic coronal liquid sign -  *l*.

[124] Griffith (1917b:165) discusses the writing of *renas* in REM 0092. He finds this form 'extraordinary' as he finds no other instances in Meroitic of an independent word starting with *r*. He doubts that it can be explained as an abbreviated writing for *(a)renas* as initial *a* is written in these inscriptions. He proposes then that it is best explained either as an abbreviation or a mistake for *amanirenas*.

[125] Peust (1999b:128) discusses Egyptian <ȝ> and supports the representation of its phonemic value as being /r/. One supporting piece of evidence Peust puts forward for this is that in Egyptian <ȝ> is 'comparatively rare in word anlaut [initial] … which is a typologically well-known characteristic of /r/.' He states that in Ancient Greek, Armenian, Basque, Mongolian and Turkish, /r/ is also unknown or restricted in loan words to word-initial position. However, see Chapter 3, for the alternative representation of Egyptian <ȝ> as /ʔ/.

[126] David Appleyard (p.c.) points out that the word-initial change of r > n is not a universal feature in Ethio-Semitic but is restricted to some Gurage languages such as Chäha.

5.2 Meroitic *l*

For the origin of the Meroitic hieroglyphic form of this sign, Griffith saw a direct correspondence with the Egyptian hieroglyph <*l*> (1911:15), but he does not explain the origins of the corresponding Meroitic cursive sign.[127]

For the sound value of this sign, Griffith (1911:15) proposed that it had the value 'l' through the following equivalences (1911:8-9). These can be added to with the updated correspondences indicating the value /l/, although note that the earlier Egyptian forms instance <*r*>:

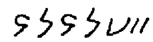
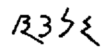
(43)

a.	<u>Egyptian</u>	*p3-iw-rḳ*	"Philae"	toponym
	Demotic	*p-ilḳ p3-ij-lk, p(r)-3lq, (*^{det}*pr)(*^{det}*i3t)rq.t, (*^{det}*i3t)rk3.t, (*^{det}*i3t)lk3.t*		
	Coptic	Sah πιλακ, πιλαχ, πγλακ, Boh πιλακϩ, Sah λακϩ		
	Meroitic		*pileqe*	
	Greek	φιλαί, φιλή, πιλάχ, πιλάκ		
b.	<u>Egyptian</u>	*p3-mr-mšʿ, imy-r mšʿ, mr-mšʿ*		title
	Demotic	*r-mšʿ, mr-mšʿ, p3-mr-mšʿ*		
	Coptic	Sah λεμηηϣε, Sah μηηϣε, Boh μηϣ, Ak λεμηcε, L λεμηϣε		
	Meroitic		*pelmos*	
	Greek	λεμεισα		

Rilly (2007:383) cites three more forms where Meroitic *l* shows a correspondence with Egyptian <*l*> /l/ and Greek λ /l/. He points out that these equivalences with other languages are rare, as there are only five known examples, with two already given by Griffith (1911:8-9) as above. Updated correspondences are also given:

[127] Later proposals for the origin of the cursive form are discussed in Rilly (2007:250) and Priese (1973:278), see also Fig. 2.1.

(44)

a.	<u>Meroitic</u>		*tolkte*	"Naga"
	Egyptian	*twrkt*(*t*)		
b.	<u>Meroitic</u>		*selele*	toponym
	Greek	τεληλις (?)		
c.	<u>Egyptian</u>	*p3-mr-šn*		title
	Coptic	Sahⲗⲁϣⲁⲛⲉ		
	Meroitic		*plsn*	
	Greek	[π]λεσωνις		

Rilly (2007:383) explains that the individualisation of the /l/ phoneme in Egyptian is not always obvious and he cites Loprieno's discussion on Egyptian phonology (1995:31) who states that 'nor is Eg. */l/ indicated by an independent grapheme, in spite of its almost-presence in the phonological inventory of the language.'[128] Loprieno goes on to say that 'in the New Kingdom, when Later Egyptian became the written form of the language for the domain of administration and literature, a specific grapheme <n>+<r> was created in order to express the phoneme /l/. In Demotic, /l/ is autonomously indicated by a grapheme <l>, a diacritic variety of <r> = /r/.' Peust's study into Egyptian phonology (1999b:128-130) proposes that 'Earlier [Egyptian] <r> corresponds to ⲣ /r/ in most Coptic words, but in quite a number of cases it appears as ⲗ /l/. Since no phonetic condition for a split development is evident, I suggest that the grapheme <r> represented two distinct phonemes /r/ and /l/ in Earlier Egyptian.' Peust then asserts that, evidently, the Egyptian phonemes /r/ and /l/ were not distinguished in writing until the Demotic stage of the script.

[128] Loprieno's evidence is taken from Afro-Asiatic etymological examples.

I make a query here as to why the Egyptian equivalent form (44c) shows the transcription <*mr*>, which for Rilly represents /l/ in Egyptian (2007:250), but Loprieno specifies that it is the Egyptian sequence <*nr*> that indicates /l/. This needs further corroboration, although the Greek forms are evidenced as using λ /l/ to notate this Meroitic sign *l*.

In line with his proposal for a retroflex articulation for the other coronal signs, Rilly (2007:384) posits Meroitic *l* as being realised as [ɭ] but does say there is no proof for this proposal and so gives an ambiguous realisation to this sign as either [l] or [ɭ] (2007:392).[129]

5.3 Discussion of Meroitic *r* and *l*

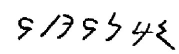
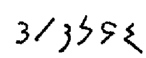
The discussions put forward here investigate two possibilities for the value of these two signs; (i) these signs represent two distinct phonemes i.e. /r/ and /l/; and (ii) that it could be the case that the Meroitic signs *r* and *l* are written allophonic variants of a single phoneme (as in the case of languages such as Ewe and Korean). The possibility for the second proposal rests on the highly conspicuous positioning of *l* occurring word-initially where *r* is prohibited; this positional distribution of liquids is seen across languages as being indicative of allophonic distribution.

Rilly (2007:384) observes that the distribution of Meroitic *l* occurring word-initially is unlike Old Nubian (where it can only occur in rare loans), and gives the well-known Meroitic adjective *lẖ* 'big, large' as an example, although he does state that most of the cases of word-initial *l* in Meroitic involve proper nouns. He goes on to point out that several types of determiners in Meroitic also have *l* as initial. As already discussed in §5.1, the Meroitic sign *r* is never found word-initially. Rilly (2007:386) reiterates Griffith's (1911:15, 1917b:165) observation that there is a restriction on this sign occurring word-initially and brings our attention to how this distribution is also

[129] See the discussion in §2, for the argument against retroflexion in Meroitic.

reminiscent of Old Nubian and Modern Nubian.[130] He states that there are no known alternations of 𐦬 *r* and 𐦭 *l*, which is contrary to what is found in many languages, particularly Old Nubian (2007:385).[131] Rilly (2007:385, fn. 2) refers the reader to the work of Creissels for the complementary distribution of *r* and *l* ([r] and [l]) in African languages, but otherwise he maintains that the signs 𐦬 *r* and 𐦭 *l* represent two distinct phonemes in the Meroitic language. This is clearly evidenced in the chart given by him (2007:392) where the Meroitic sign 𐦭 *l* is represented phonemically as /l/ and with 𐦬 *r* representing the phoneme /r/; these signs are grouped under his category '*apicales/rétroflexes vibrantes*'. Unfortunately, he notes that there is a major paucity of equivalent forms for the Meroitic sign 𐦭 *l*. Three of the five equivalent forms with Meroitic are Egyptian/Egyptian Demotic nouns transcribed into Meroitic (as given in §5.2):

(45)

a.	<u>Egyptian</u>	*p3-iw-rḳ*	"Philae"	toponym
	Demotic	*p-ilḳ p3-ij-lk, p(r)-3lq, (^{det}pr)(^{det}i3t)rq.t, (^{det}i3t)rk3.t, (^{det}i3t)lk3.t*		
	Coptic	Sah**ⲡⲓⲗⲁⲕ, ⲡⲓⲗⲁϫ, ⲡⲩⲗⲁⲕ,** Boh**ⲡⲓⲗⲁⲕϩ** Sah**ⲗⲁⲕϩ**		
	Meroitic		*pileqe*	
	Greek	φιλαί, φιλή, πιλάχ, πιλάκ		
b.	<u>Egyptian</u>	*p3-mr-mšʿ, imy-r mšʿ, mr-mšʿ*		title
	Demotic	*r-mšʿ, mr-mšʿ, p3-mr-mšʿ*		
	Coptic	Sah**ⲗⲉⲙⲏⲏϣⲉ,** Sah**ⲙⲏⲏϣⲉ,** Boh**ⲙⲏϣ,** Ak**ⲗⲉⲙⲏⲥⲉ,** L**ⲗⲉⲙⲏϣⲉ**		
	Meroitic		*pelmos*	
	Greek	λεμεισα		

[130] However, even though /r/ and /l/ are two separate phonemes in Nubian they do show alternation depending upon the syllabic structure cf. Browne (2002:18). Rilly (2004a) advances the theory that Meroitic is a member of the Eastern Sudanic branch of the Nilo-Saharan phylum, and so draws this parallel between the Nubian languages (Eastern Sudanic).

[131] '*En particulier, elle n'alterne jamais à notre connaissance avec /l/, contrairement à ce que l'on constate dans de nombreuses langues, et notamment en vieux-nubien.*'

c.	<u>Egyptian</u>	*p3-mr-šn*		title
	Coptic	Sah ⲗⲁϣⲁⲛⲉ		
	Meroitic		*plsn*	

It could be the case that the Meroitic forms were transcribed with *l*, as the Egyptian forms in (45b) and (45c) begin with the Egyptian masculine definite article <*p3*> followed by the noun. Subsequently, the Meroites notate the form with *l*, which is found word-initially on the Egyptian noun. This could explain the Meroitic transcription of the form in (45a) if they saw this as being a form composed of the masculine definite article and the noun.

It is also interesting that when the Meroites transcribed a word that was /r/ initial, such as the Latin toponym *roma*, instead of substituting [l], which is allowed word-initially, for [r], they were faithful to the original phonetic realisation and so gave the representation as *arome*. In order to prevent [r] from being positioned word-initially, the Meroites use an epenthetic segment *a* to avoid this violation, but never alternated *r* with *l*.

It has to be taken into consideration that typical cases of complementary distribution prohibit the allophonic variants of a single phoneme from occurring in identical environments, i.e. they are context sensitive. For example in Korean there are two allophones [l] and [r] of a single phoneme /l/. The allophone [r] can only occur when preceding a vowel (46a), whereas the allophonic variant [l] occurs otherwise (46b) (Kenstowicz 1994:83):

(46)

a.	[pari]	'of the foot'	b.	[pal]	'foot'
	[mari]	'at the horse'		[mal]	'horse'
	[ratio]	'radio'			

In contrast to Korean complementary distribution, what is found in the Meroitic texts are cases where *r* and *l* occur in the identical environment of word-medial position and as such this leads me to conclude that they are not allophonic variants of a single phoneme:[132]

(47)

a.		*mlo*	adj.	"good"
b.		*drp*	verb(?)	unknown

This distribution is overtly recognised by Rilly who states there are no known variant forms where *r* and *l* show an alternation with each other. Whether our understanding of the distribution of these two liquid signs would be enhanced with more understanding of Meroitic morphology or further analysis of their occurrence, and whether neighbouring vowels or consonants affect their distribution is outside the scope of this discussion. It should be remembered that our only evidence of the language comes from the writing system where we do not expect complete consistency, as is found in living and well- documented languages. Therefore, it is the most likely possibility, at this stage of analysis, that these two liquid signs are separate phonemes i.e. *r* /r/ and *l* /l/ and that the prohibition of word-initial *r* is to do with the phonotactic constraints of the language. Furthermore, in light of the discussion given in §3.4, it is possible that these signs never vary because *l* is a lateral fricative.

[132] In light of the distribution of certain African languages such as Ewe, where the allophone [r] of the phoneme /l/ is realised only when following a coronal consonant, I conducted a search on Meroitic forms that contain *r* and *l* to see if there was a distributional change between these signs, in that it could be the case that *l* → *r* when a neighbouring segment is [+coronal]. The result of this search was negative as many forms with *l* are found to neighbour [+coronal] segments and further forms with *r* are found neighbouring [+labial] and [+dorsal] segments.

6 The ‘Dorsal’ Stop Signs

This section discusses the two Meroitic signs 𐦴 *k* and 𐦵 *q*, which I term as ‘dorsals.’ The reasons for this are outlined in the following sections and more specifically in §7.5.

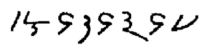
6.1 Meroitic *k* 𐦴 𐦑

The origin of the hieroglyphic form of this Meroitic sign 𐦑 was problematic for Griffith (1911:15), who thought that it was derived through the acrophonic principle[133] from the name of the Egyptian god “Geb”.[134] Priese’s (1973:291-292) investigation into the origin of the Meroitic signs supported Griffith’s theory.[135] Dembska (1987), following Zawadowski and Katsnelson (1980), states that ‘The phonetic value of the individual [Meroitic] signs derived from Egyptian and based upon the so-called “acrophonic principle” so that the value assigned to these signs was partly borrowed, partly freely invented.’ She goes on to say that the Meroitic hieroglyph 𐦑 did not have an invented value but was realised as ‘k’ in Egyptian because of a ‘phonetic development’ that took place in Egyptian (1987:75). Dembska is referring to the neutralisation of the voiced plosives that took place in the phonology of Late Egyptian and makes the claim that ‘…the pronunciation of *g* as *k* in the Late Epoch might explain why the 𐦑 sign in [the] Meroitic script represents [an] unvoiced velar occlusive consonant *k*’ (1987:75).

When it came to the origin of the Meroitic cursive sign 𐦴, Griffith suggested that it was a stylisation of the hieroglyphic form 𐦑 (1909:50), although Priese (1973:291-292) thought that it was more the case that it was linked to an old Demotic form. Rilly (2007:249) refutes Priese’s association and puts forward an alternative proposal (see Fig. 2.1). Griffith (1911:10) gave the sound value of this sign as ‘k’ based upon its representations in equivalent forms where Egyptian Demotic <*k*> /k/ = Meroitic 𐦴 *k*:

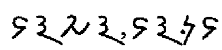
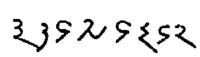
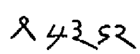
[133] This term refers directly to the evolution of writing systems in that a sign is used for the first sound of a word it stands for.
[134] See also Macadam (1949:49) for an alternative proposal but still supporting the acrophonic principle as the motivation for the adaptation of this sign.
[135] See Rilly (2007:265), for more on this discussion on the origin of this sign.

(48)

a.	<u>Meroitic</u>		*bekemete*	anthroponym
	Demotic	*bk-mṯj*		
b.	<u>Meroitic</u>		*akroro*	title
	Demotic	*ȝkrr(e)*		

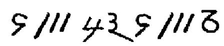
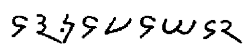
The phonemic value of /k/ for Meroitic  *k* seems to pose no ambiguity, as it is consistently represented in further equivalent forms from Egyptian <*k*> /k/, Egyptian Demotic <*k*> /k/, Greek κ /k/ and Latin *c* /k/ (summarised from Rilly 2007:372), with additional Ethiopic /x/ and updated correspondences:

(49)

a.	<u>Meroitic</u>		*kdke, ktke*	title
	Egyptian	*kntiky*		
	Greek	κανδάκη		
	Ethiopic	*ẖᵊndekié*		
b.	<u>Meroitic</u>		*apedemk*	theonym
	Demotic	*iprmk*		
c.	<u>Meroitic</u>		*akine*	"lower Nubia"
	Egyptian	*jqn, ʿqnȝ.t, iqn, ikn, ikinȝ*		
	Demotic	*ȝkjny*		
	Greek	Ἀχίνη		
	Latin	Acina		

Even with these strong representations for the value /k/ for Meroitic *k*,[136] Priese (1973:291-292) believed that in fact there was a good argument to support the value 'g' for Meroitic *k* instead. This rested upon the following equivalent forms of Egyptian and Meroitic where Meroitic *k* is represented by Egyptian <*g*> or <*ng*> with the Egyptian sound value of a voiced velar /g/ and <*k*>:

(50)

a.	<u>Meroitic</u>		*ntkmni*	anthroponym
	Egyptian	*ntk-imn, ntg-imn, ndk3mn*		
b.	<u>Meroitic</u>		*wyekiye*	title
	Demotic	*wjngj3, wjgˁj3, wˁyky*		
c.	<u>Meroitic</u>		*arebetke*	title
	Demotic	*3rbtgˁj3, 3rbtngˁj*		

This association drawn by Priese is critiqued by Rilly (2007:373), who cites Loprieno's (1995:41) discussion on the neutralisation of voiced plosives during the first millennium BCE and the first centuries CE in Egyptian, 'the phonemes /d/, /g/ and /z/ are present only in Greek borrowings, the rare exceptions to this rule being the result of sonorisation in proximity of /n/.'[137] I agree with Rilly's proposal that Meroitic *k* has the phonemic representation /k/ and the phonetic realisation of [k] (2007:377), as the evidence is overwhelmingly in favour of this sound value for this Meroitic sign. Furthermore, Loprieno (1995:245) advances the view that Egyptian <*g*> /g/ was probably articulated as an ejective [k']. This would explain why Egyptian <*g*> is always rendered by Semitic *q* [q].[138]

[136] However, the updated Egyptain correspondences indicate a variance between /k/ and /q/.
[137] Cf. Peust (1999b:80-89) for more on the opposition of stops in Egyptian.
[138] Dolgopolsky (1977) contends that ejective [k'] and uvular [q] are phonologically 'emphatic'.

As to the ambiguous representation by the Egyptian scribes of Meroitic *k*, it should be mentioned that the forms that are transcribed in Egyptian with <*g*> or <*ng*> from Meroitic, could be due to the Egyptian scribes hearing a voicing quality on the Meroitic *k*. As discussed in Chapter 1, §2.5, Meroitic 'consonant' signs contain the inherent unmarked vowel 'a' /a/ unless followed by a separate vowel sign. Subsequently, in the above forms (50), Meroitic *k* is found in an intervocalic placement or next to an inherently voiced nasal, where we might expect this voiceless phoneme /k/ to assimilate voicing. It could be this voicing quality that caused the Egyptian scribes to represent Meroitic *k* /k/ with <*g*> or <*ng*> /g/, as this Meroitic phoneme /k/ → [g]/V_V.

It is interesting to note that the voicing quality of intervocalic *k* /k/ shows a parallel with the discussion given in §1.3.1 on the voicing of the intervocalic *b* sign, and from this it could also be proposed that Meroitic /k/ is unspecified for voicing (plain voiceless).[139]

6.2 Meroitic *q* Δ

Griffith (1911:15) saw that the hieroglyphic form of this Meroitic sign Δ corresponded to the Egyptian 'alphabetic [uniconsonantal] sign for *q*.' This Egyptian uniconsonantal hieroglyph is executed as ⊿ and is traditionally transcribed as <*q*>.[140] Griffith made no associations for the origin of the Meroitic cursive form, although Priese (1973:292-293) states that its origins can be seen in the Demotic form of the Egyptian hieroglyph which is transliterated as <*kꜣ*>.[141] Griffith (1911:8-9) instanced the following equivalences of this Meroitic sign *q* with Egyptian Demotic:

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[139] This could also indicate a difference between the VOT (voice onset time) zones of Meroitic and Egyptian voiceless stops, as in English and French. If Egyptian /g/ was plain voiceless and /k/ aspirated (as in English), but Meroitic /k/ was plain voiceless (as in Modern Greek), then this graphic ambiguity, and hence phonetic ambiguity would be expected.

[140] See Rilly (1999b; 2007:268-269), for further discussions on the origins of this hieroglyph.

[141] However, it was initially Griffith who saw a connection between these two signs, even if he was coming from a different angle: 'The Meroitic *qê* [*qo*] often suggests a connextion [sic] with the famous Egyptian word the Ka, 'person' and in late times 'name,' perhaps pronounced *ko*, but it is impossible as yet to prove it' (1917b:167).

(51)

a.	Meroitic		*pileqe*	toponym
	Demotic	*p-ʿy-lq*		
	(Coptic	ⲡⲓⲗⲁⲕ)		
b.	Meroitic		*qorene*	title
	Demotic	*qrny*		

Nevertheless, Griffith (1911:22) did not propose that this Meroitic sign (even though he settled on transliterating it as *q*) represented an emphatic or uvular consonant: 'Absence of the peculiarly Semitic consonants and a general simplicity in the sounds of the language seem certain.' Griffith (1911:22) attributed a voiced velar stop value 'g' to this Meroitic sign , in line with a voicing opposition that he initially saw for the other Meroitic stop signs. This was qualified, in his view, by occasional variant forms where there is an alternation between Meroitic *k* and *q*. In a later work (1917a:27), he remarked that 'Mer. *q* sometimes represents an ancient Eg. *k*,' but, as Griffith never clearly revised his Meroitic consonantal inventory it is hard to discern what his real considerations on the sound value of this sign were in light of his further research.

The transliteration of the Meroitic sign as *q* rested upon its parallel transcription from Egyptian <*q*>, where the phonetic realisation is somewhat undecided.

Peust (1999b:107) outlines that the transcription use of <*q*> for ⊿ in Egyptian was implemented as it was a member of a set of signs that were 'easy to reproduce typographically and were also used for transcribing Semitic languages, although no clear evidence on the actual sound values of these Egyptian signs was available [at that time].' He verifies that the phonetic interpretations were not 'confirmed' until Rössler (1971 cited in Peust 1999b) who proposed that Egyptian <*q*> was actually a voiceless emphatic (although 'emphatic' was not defined) and that this proposal, based upon etymological considerations, was accepted by subsequent scholars.

That the Egyptian sign transcribed with <*q*> could have a varying phonemic value is discussed further. Peust (1999b:114) states that by Middle and Late Egyptian, 'a new non-labialised phoneme /k/ appears which comes to contrast with /k^w/, but both are indiscriminately written as <q>.' Moreover, 'Another phoneme is introduced principally for use in Semitic loan words. This phoneme might have a back and/or emphatic articulation and can tentatively be symbolised as /q/. It is expressed either as <g> or – more rarely – as <q> in writing.'[142] However, Peust (1999b:107) is hesitant in making a decision on the realisation of Egyptian <*q*> and so gives it an approximate value either representing the phonemes /k/, /q/ or the labialised velar - /k^w/.[143]

For the Egyptian use of <*q*>, his proposed 'introduced' phoneme - /q/, Peust specifies that, 'the clear majority of words containing velar no. 7 [/q/] are attested not earlier than the New Kingdom, many of which can clearly be identified as loans from Semitic. It appears that velar no. 7 is the regular representative of a Semitic uvular fricative /ɣ/, but Semitic /q/ can also be rendered as velar no. 7 [/q/]' (1999b:113). He asserts that it is uncertain how <*q*> as representing his 'velar no. 7' /q/ was actually articulated, 'This phoneme might have been characterised by a back and/ or emphatic articulation … It is unclear how this phoneme developed after the New Kingdom. The possible Coptic etymological cognates, most of which are not certain, are contradictory' (1999b:113).[144] It was proposed by Meinhof (1921/22:3) that Meroitic /϶ *q* represented an emphatic consonant. This proposal is presumably due to him correlating Meroitic with Semitic (non-Ethiopic), where languages that show pharyngealised consonants for emphatics (e.g. Arabic and Aramaic) have uvular /q/ in the dorsal series, and languages that show

[142] See also Vergote (1945:31-32).
[143] Moreover, he states that in the case of the labialised velar, 'There is no way of knowing whether these labialised velars were spoken with lip-rounding (/k^w/) or with double closure (/$\widehat{kp}$/).' (1999b:110).
[144] Loprieno (2001b:1744) also points out that in Egyptian 'During the first millennium BCE, the opposition between uvular and velars is neutralised.' See §7.6.1 for more on this.

glottalised (ejective) consonants for emphatics have ejective velar /k'/ as the cognate of this.[145] Essentially, Meinhof believed that there was a connection between the Hamito-Semitic (Afro-Asiatic) languages and Meroitic, and so found a way of drawing a phonemic parallel with these languages where emphatics are highly represented. It is very unclear as to what Zyhlarz (1930:421) believed Meroitic 𐦴 *q* phonetically represented, as Rilly (2007:373 fn. 4) highlights his erroneous understanding of articulatory terminology with Zyhlarz positioning of 𐦳 *k* as an 'alveolaire' and 𐦴 *q* as a 'velaire'. Consequently, it cannot be discerned what representation for this sign Zyhlarz actually proposed.

Vycichl (1958a:75) would follow Griffith's assertion on the value of this sign, when he states that 'Q[146] is not an emphatic sound as in Semitic languages, in spite of the transcription. We here follow Demotic spellings.' The exclusion of emphatics in Meroitic is supported by Zawadowski (1972a:24), 'The correlation of velar emphasis is rather a specific phenomenon peculiar of the Semitic languages and of the Arabic language in particular. This we could scarcely find in Meroitic and as a matter of fact it does not appear in Meroitic.' Unfortunately, there is no evidence to support this generalised claim by Zawadowski. He goes on to misquote Vycichl's (1958a:75) statement as 'According to W. Vycichl, /q/ is an "emphatic sound as in Semitic languages".' Then he puts forth his interpretation of Meroitic 𐦴 *q* as being 'a simple uvular' (1972a:25). Zawadowski's motivations for this proposal were not due to any solid research conducted on the script but in order to dismiss the theory that there may have been an opposition for voicing among the stop series of consonants. Again, however, these proposals were very hypothetical, as they did not rest upon any evidence from typological considerations or from any detailed analysis on the occurrence of this sign or through its transcription in other languages.

[145] That is, ejective /k'/ ~ uvular /q/ = phonological /ḳ/ = (Dolgopolsky 1977).
[146] Vycichl's transliteration of Meroitic 𐦴 *q* as 'Q' follows an old transliteration system implemented for typographic reasons.

Priese (1973:291-292) took up the theory initiated by Griffith that the Meroitic sign *q* was in opposition of voicing to Meroitic *k*, although he switched the voicing values that Griffith had proposed. For Priese, Meroitic *q* represented the voiceless velar [k]. His evidence for this attribution rested upon the Egyptian transcriptions that used <*k*> /k/ for Meroitic *q*. Consequently, Meroitic *k* was [g] for Priese (see the discussion in §6.1). Priese's proposal was followed by a few Meroitic scholars, although Böhm (1987:7) and Rilly (1999b; 2007) would give an alternative analysis that brings the representation of this sign in line with one of Peust's (1999b:107-114) proposed sound values of Egyptian <*q*> as /k^{w}/.

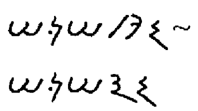
Some of the equivalent forms that Rilly (2007:372) lists are instanced here (52) along with updated correspondences, which show that Meroitic *q* is variously represented with Egyptian <*k*> or <*q*>:

(52)

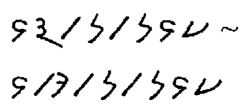
a.	<u>Meroitic</u>		*qore*	title
	Demotic	*kwr*		
b.	<u>Meroitic</u>		*tqoridemni*	anthroponym
	Demotic	*tḳrrmn*		
c.	<u>Meroitic</u>		*pqrtr*	title
	Egyptian	*pkrtr*		
d.	<u>Meroitic</u>		*qoreti*	toponym
	Demotic	*qrṯ, k3lti(t), k3rti(t), k3rt3, k3rwt-t3*		
	Greek	κορτη, κορτια, κόρτι		
	Latin	*corte*		

Importantly, for the forms in (52d), it is noted that 'In Hellenistic and Roman times κ and τ regularly transcribe the Semitic emphatic consonants *q* and *ṭ* while χ, θ, and φ are as regularly used for Semitic *k*, *t*, and *p*' (Sturtevant 1940:85). Furthermore, Meroitic variant forms show an alternation between the signs 𐦳 *k* and 𐦴 *q*:

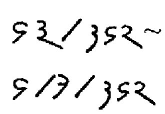
(53)

a.  *pqrtr~* title

pkrtr

b.  *beloloke~* title

beloloqe

c.  *amoke~* title

amoqe

The data in (53) indicates that the sound values of Meroitic 𐦳 *k* and 𐦴 *q* have a close correspondence. Böhm (1987:7) proposed that Meroitic 𐦴 *q* was a velar with a labial component to it and it was possible that originally the sound was a double articulated labiovelar [$\widehat{kp}$] > [k^w]. Böhm's proposal was based upon the few instances where Meroitic 𐦴 *q* varied with 𐦥 *w*, '"*q*" wechselt mit "*w*"' (1987:7).[147] These instances were discovered by Heyler (1964) who showed that certain epithets in the north of the kingdom were notated with 𐦥 *w* whereas the same epithets in the south instead used 𐦴 *q*.[148] Rilly (1999b) developed Böhm's proposal and added additional arguments in support of the theory that Meroitic 𐦴 *q* was phonetically realised as a labio-velar [k^w]

[147] Böhm (1986:115) does not make the claim here for this representation, although he is aware of the alternation of Meroitic 𐦴 *q* and 𐦥 *w* but only points out Hofmann's reference (1981a:33) where she discusses this observation of variant forms made initially by Heyler (1964:34). See also Böhm (1988a) for a revision of this sign, although in this paper he is heavily influenced by Rössler's work on etymological representations between Egyptian and Semitic that led to Rössler's proposal of Egyptian <*q*> being /q/. Cf. Peust who discusses his belief that this was a case of phoneme adoption from Semitic (1999b:107-114).

[148] See Heyler (1964:34) for more on this alternation.

and that the Meroitic *k* and *q* are correlated through labialisation and not, as Griffith and Priese argued, through voicing.

The arguments that Rilly (1999b, 2007:375-376) puts forward for this proposal are discussed here. The first argument he presents is that the origin of the Meroitic cursive *q* sign is derived from the Egyptian Demotic form of the hieroglyph.[149] This is transcribed as <*kꜣ*>, and Rilly states that it is vocalised as [ku], which, for him, is close to the value [k^w] for Meroitic *q*. Next, he looks at the Meroitic *q* hieroglyphic form Δ which is borrowed from Egyptian ⊿ <*q*>. He explains that this borrowing is explained by the 'uvular' quality of the Egyptian hieroglyph, which is close to the realisation [k^w] in Meroitic. For Rilly, the realisation of Egyptian <*q*> represents a uvular /q/ - [q].[150] Nevertheless, Peust's (1999b:107) description of Egyptian <*q*> as also representing the phonemes /k/ or /k^w/, and in etymological examples from Semitic /ḳ/ ~ /q/ would give Rilly's proposal a firmer correlation.[151]

Rilly puts forward a further argument in support for his proposal that Meroitic *q* is realised as [k^w] which is that Egyptian transcriptions show Egyptian uses <*k*> /k/ to represent Meroitic *q*.[152] He cites the equivalent example of the Egyptian transcription <*kwr*> for the Meroitic title *qore* and that the Egyptian transcription shows the presence of a labio-velar <*w*> /w/. He goes on to point out that the rare equivalent forms between Meroitic *q* and Greek and Latin show that there is a velar followed by the back vowel /o/ or /u/, as in the example below:

(54)	<u>Meroitic</u>		*qoreti*	toponym
	Greek	κορτη, κορτια, κόρτι		
	Latin	*corte*		

[149] See Fig. 2.1.
[150] Loprieno (1995:33) posits Egyptian <*q*> as the voiceless uvular stop /q/.
[151] I give the representation of the velar emphatic, as Rössler, cited in Peust (1999b), thought was present, as /ḳ/.
[152] See given examples in (52a) and (52c).

That the Egyptian sign transcribed as <*q*> is representative of more than one phoneme, is advanced by Peust (1999b:110), where one of these he asserts is the labio-velar /k^w/. Consequently, for Rilly, the Egyptians could use the sign <*q*> in its realisation as /k^w/ to notate Meroitic /? *q* [k^w], rather than using <*k*> /k/ followed by <*w*> /w/ i.e. <*kw*>.

The main argument that Rilly puts forward for the representation of Meroitic *q* being [k^w] is his 'combinatory analysis'. Integral to this argument is that Rilly follows Hintze's (1973a) proposal that the Meroitic vowel sign ϛ *e* can have the ambiguous representation of indicating a vowel and the absence of a vowel (zero-vowel).[153] In collecting a representative sample of Meroitic items, Rilly gathered a corpus of texts (he terms it *lexicon*) where he finds that there was an absence of the sequences of bilabial signs + the vowel sign ϛ *e* + velar signs and the reverse order. He concludes that this is due to the vowel sign ϛ *e* being realised as a zero-vowel in these instances, which results in the adjacency of a bilabial sign and a velar sign, where they consequently become assimilated resulting in a labialised velar. He concludes that this labialised velar was then transcribed using Meroitic *q* [k^w] for the plosives. Under Rilly's analysis, the absence of these written sequences in the Meroitic texts can be explained.[154]

As this argument rests upon Rilly's acceptance of the traditional dual representation of the vowel sign ϛ *e*, which is argued against in this thesis (Chapter 5), I therefore propose an alternative argument for the written absence of these sequences in the Meroitic script. Firstly, I do consider that Rilly's proposal that the realisation of Meroitic *q* is [k^w], as based on a distributional analysis, raises a very interesting point. Rilly observes that the Meroitic vowel / *o* /u/ never follows the other velar sign 3 *k* /k/ in that in all representations *qo* [k^wu] is evidenced (1999b:106). Rilly explains this by proposing that the vowel / *o* [u] passes on a labialised articulation to the preceding

[153] I argue against the hypothesis of a dual representation for this Meroitic vowel sign, see Chapter 5.
[154] Rilly goes on to explain that where these sequences are attested, it can be proven that the vowel sign *e* is indeed realised as a vowel in these sequences, and so it does not subsequently result in adjacency and assimilation of the labial and velar; e.g. *beqe, aqebese*. For more on this discussion, see Rilly (1999b).

velar *k* [k] resulting in *q* [k^w] being written. This thereby presupposes that there is an allophonic variation taking place.[155] As Kenstowicz (1994:41) summarises, 'labialised consonants often arise through the assimilation of [+round] from adjacent rounded vowels'. Under Rilly's analysis the phonetic realisation of a labialised velar comes from two phonemes:

(55)

a. *q* = the phoneme /k^w/ gives the phonetic representation [k^w], or

b. *k* = the phoneme /k/ gives two allophonic representations: [k] before any [-round] vowel, [k^w] before a [+round] vowel.

The distribution of the sign *q* only occurring before a [+round] vowel could be indicative of the Meroitic signs *k* and *q* being in complementary distribution. However, the signs *k* and *q* are found in contrastive environments in that *q* is not found solely in the proximity of a [+round] vowel:

(56)

a.	Meroitic		*pilqe*	toponym
b.	Meroitic		*ktke*	title

What we do find, however, is that Meroitic *q* is only ever followed by the vowels *e* /ə/ ~ /e/, *o* /u/, and the inherent 'a' /a/ vowel.[156] I propose that this distribution of the vowels is typologically indicative of a vowel 'flattening' i.e. lowering and/or retraction process, which is not only seen across Afro-Asiatic (especially Semitic) languages when adjacent to a guttural consonant (McCarthy 1994b, Hayward & Hayward 1989, Ullendorff 1955), but also throughout the world's languages.

I propose, therefore, that Meroitic *q* actually represents the uvular /q/ (hence I use the term 'dorsal' to denote these sounds that are articulated with the tongue dorsum). I shall discuss this fully with justification in §7.5, following my discussion of the 'dorsal

[155] That is *k* and *q* would be in complementary distribution.

[156] See §7.4, §7.5, §7.6 and §7.6.1, for more on the analysis of the sign *q*

fricatives', as the representation of these 'dorsal fricatives' is integral to my proposal that the Meroitic inventory contained a series of uvular consonants.

7 The 'Dorsal' Fricative Signs

There are two signs in Meroitic that have traditionally been proposed as representing velar fricatives. Due to the evidence I put forward in the current sections, I term these signs as dorsal fricatives. I discuss the claims made for the two dorsal signs' representations in two parts, firstly in §7.1 the sign *ḫ* is discussed and secondly, in §7.2 the second corresponding sign *ẖ* is discussed. §7.3 draws together the proposal for these two signs' values and a further argument for the specific representation of one of these signs *ẖ* as a uvular fricative follows in §7.5.

7.1 Meroitic *ḫ*

Griffith (1911:15) was undecided as to the exact origin of this Meroitic hieroglyph as he thought that it could have been derived from two Egyptian hieroglyphs. Firstly, he states that 'the hieroglyphic forms seem like versions of [Egyptian] ', and secondly, that the Meroitic hieroglyph 'may lead back to *ḫ*, which occurs in Egyptian writing of Ethiopian [Kushite/Napatan] and Meroitic names'. The two Egyptian hieroglyphs that Griffith thought could have been the origins of the Meroitic hieroglyphic sign are transcribed as <*ẖ*> for and <*ḫ*> for . Griffith opted for transliterating this Meroitic hieroglyph and its cursive form as *ḫ* because the equivalent Egyptian form he examined showed the Egyptian's used <*ḫ*> () where Meroitic cursive is given (1911:10):

(57)	Meroitic		*wrtḫn*	title
	<u>Egyptian</u>	*wr - tḫn*		

The Meroitic cursive form ⊆ shows a direct link to the Egyptian Demotic form of the hieroglyph 𓐍 <ḫ> (Priese 1973:289, Rilly 2007:248).[157] Priese (1973:280) was of no doubt that the origin of the Meroitic hieroglyph ⊖ was the Egyptian hieroglyph 𓐍, as occurrences of this sign are widely attested in Napatan.

For the sound value of this Meroitic hieroglyph ⊖ and its cursive form ⊆, Griffith specifically stated that its sound is 'ḫ' (1911:15). In Griffith's chart (1911:22) of the Meroitic phonological inventory, he classifies ḫ as a 'guttural spirant' but he does not fully elucidate on the articulation of this sound any further.[158]

Primarily, inquiries into Egyptian phonology lead us to understand more specifically what sound this transcription symbol <ḫ>/ḫ does indeed represent.

Loprieno (1995:33) gives the Egyptian sign transcribed as <ḫ> the phonemic value of a voiceless uvular fricative /χ/. However, Peust (1999b:115) postulates that Egyptian <ḫ> represented the velar fricative phoneme /x/ from earlier Egyptian through to Late Egyptian. These two studies, even though they diverge on the proposal for the place of articulation of this Egyptian phoneme, indicate that it is representative of a voiceless dorsal fricative.

[157] The Meroitic cursive form ⊆ ḫ was observed by Griffith (1911:15) to closely resemble the Old Nubian sign for their velar nasal phoneme /ŋ/; but this could be nothing more than the Nubians borrowing this Meroitic sign perhaps due to it representing a velar place of articulation, and so Griffith did not give this association any further consideration. However, Priese (1973:289) hinted at this borrowing as evidence for a nasal representation to this Meroitic sign, and Hintze (1973a:328), also through the correspondence between these signs in Meroitic and Old Nubian, instigated the theory that 'ḫ is not [ḫ], it may represent [ɣ] or [ŋ]'. He held to this belief in his later papers (1987:43, 1989), and adopted a new transliteration method to reflect this: i.e. *g* instead of ḫ, which was never followed. See Millet (1974a:56) for an alternative explanation into this borrowing. However, I agree with Rilly (2007:390-391), who discusses how this theory is untenable in light of more solid evidence e.g. equivalences between Meroitic ḫ and Egyptian <ḫ>, where this Egyptian sign does not represent a nasal. See also Rilly (2007:391), who cites the proposal made by Peust, for the origin of this Old Nubian velar nasal sign being derived from a Coptic sign instead.

[158] Griffith even bases this inventory on the 'old-fashioned classification of Lepsius' (1911:22).

Turning to the Meroitic sign ⊂ *ḫ*, Rilly (2007:380) asserts that it poses serious problems for a phonetic interpretation due to very few equivalences available from other languages where correspondences are found.[159] He lists two equivalent forms for the sign ⊂ *ḫ* which are given with updated forms:

(58)

a.	<u>Meroitic</u>	*arikḫror*	anthroponym
	Egyptian	*ỉrk-nḫrr*	
b.	<u>Egyptian</u>	*ḫns.w*, *ẖns.w*, *ḫ(n)s.w* "Khonsou"	theonym
	Demotic	*ḫnsw*	
	Meroitic	3⊂ *ḫs*(?)	
	Greek	χόνς	

The Greek interpretation for the Egyptian theonym form in (58b) evidences the transcription of Egyptian <*ḫ*> with χ /kʰ/ ~ /x/, and the Meroitic form with ⊂ *ḫ* is also represented by Greek χ /kʰ/ ~ /x/. Allen (1968:20) contends that Greek χ was an aspirated plosive /kʰ/ that eventually changed to a fricative /x/ circa 2nd century BCE, although he points out that the 'scholarly pronunciation of … χ as [a] plosive(s) continued for some time in the schools' (1968:22). He cites evidence from an Egyptian Demotic text of the 2nd century CE which contains some Greek transliterations and shows that Greek χ 'represented Egyptian … *kh,* and not the fricative(s) … *ḫ*' (1968:22-23).[160] However, in the equivalent form of (58b) above, the Greek sign χ /kʰ/ ~ /x/, and not Greek κ /k/, is used to transcribe Egyptian <*ḫ*> and Meroitic ⊂ *ḫ*; from this it can be claimed that the Greek velar χ was used (whether it represented an aspirated velar /kʰ/ or the velar fricative /x/ at this period is uncertain) as it was the frication of Egyptian <*ḫ*> and Meroitic ⊂ *ḫ* that was salient for the Greeks to represent this with

[159] This also applies to the sign ʊ ʒ *ẖ*, see §7.2 for more on this sign.

[160] Allen (1968) is trying to show through this association the time-period for when Greek χ spirantised.

the velar χ /kʰ/ ~ /x/. Furthermore, this does not disclude Loprieno's (1995:33) proposal of Egyptian <*ḫ*> as the uvular fricative /χ/, because Greek does not include uvulars within its inventory, it can not be taken as evidence that the Egyptian and Meroitic signs <*ḫ*>/*ḫ* were not uvulars but that Greek χ was the closest sign in representing these dorsal fricative signs of Egyptian and Meroitic <*ḫ*>/ *ḫ*.

Hence, there is still an ambiguity as to the exact place of articulation of Egyptian <*ḫ*>, whether it is specifically a uvular or velar fricative. However, I put forward evidence in §7.5 that proposes an exact place of articulation for the Meroitic sign ȝ *ẖ* as being uvular and from this analysis, the proposal for a velar place of articulation for ⊂ *ḫ* is given.[161]

7.2 Meroitic *ẖ* ȝ ʊ

Griffith (1909:50, 1911:15) did not specifically refer to the origin of this Meroitic hieroglyph ʊ, although he does note the similarity between the Meroitic hieroglyphic form and the Egyptian hieroglyphs ō and ○. In noting this similarity, Rilly (2007:264) contends that the values of these Egyptian hieroglyphs do not explain their borrowing into Meroitic for the Meroites' velar fricative, where Egyptian ō functions only as a determinative and ○ has the phonographic value of <*n(w)*>.[162] Griffith (1909:50) proposed that the origin of the cursive Meroitic form ȝ came from the Egyptian hieratic or old Demotic forms for the hieroglyphs ō and ○.[163] It would be Macadam (1966:49) who initially proposed an origin for this Meroitic cursive sign ȝ:

> The Meroitic cursive letter [ȝ] which is transcribed *ẖ* is derived from an Egyptian Demotic character which happened to have precisely the same value. In the Egyptian language it means "copy, corresponding to, according to", and could only be used when these meanings are intended. Probably it occurred many times in Demotic

[161] Unfortunately, the evidence used for the Meroitic proposal, which rests upon a vocalic distribution, cannot be used accordingly with Egyptian, as the Egyptian script does not notate vowels.
[162] See Macadam (1966:49) and Priese (1973:289-291) for alternative theories on the origin of this sign, and Fig. 2.1.
[163] Priese (1973:289-291) puts forward an alternative proposal. Cf. Rilly (2007:248) for a further discussion on these proposals, although he states that the link with the Egyptian script has not yet been definitively established for this sign (2007:381).

legal documents connected with the Egyptian occupation of Nubia, and being associated with this sound was borrowed as a simple alphabetic sign [into the Meroitic script].

Rilly (2007:248) asserts that Macadam's hypothesis cannot be completely challenged and, therefore without any firmer arguments for the origin of this Meroitic sign ȝ *h̲*, he believes that at present Macadam's hypothesis is the most likely.

Inquiring into the sound value of this sign ȝ *h̲*, Griffith (1911:15) stated that 'ȝ corresponds to [Greek] χ' through the following equivalent form (1911:9):

(59)	<u>Meroitic</u>		*ph̲rse*	toponym
	Greek	Παχωρας		

Additionally, Griffith (1911:15) also saw that Meroitic ȝ frequently varied with the other dorsal fricative sign ⊂ *ḫ* and thus he concluded that 'it [ȝ] may therefore have the sound of *ḫ* or *h̲*.' Griffith (primarily as an Egyptologist) assigned the transliteration of *h̲* to this Meroitic sign ȝ due to its variance in forms with ⊂ *ḫ*, and moreover that it was also transcribed into Greek using their aspirated velar/fricative sign χ. Subsequently, as Griffith had affirmed that Meroitic already had a dorsal fricative sign ⊂ *ḫ*, he had to distinguish this additional dorsal fricative and so implemented the use of another Egyptological transcription symbol resulting in the use of *h̲* for ȝ. If Griffith did think there was a phonemic/phonetic difference between the Meroitic signs ȝ *h̲* and ⊂ *ḫ* it was not explicity stated, as his chart (1911:22) presents both signs under the category 'guttural spirant' and it is unclear whether their positioning in this chart leads us to confirm if Griffith believed they were opposed for voicing or in their place of articulation.

It is worth discussing the Egyptian representation of the sign <*h̲*> following Macadam's (1966:49) hypothesis. Peust (1999b:115) discusses how 'in the early days of Egyptology the signs for <*ḫ*> and <*h̲*> were believed to have had an identical sound value and were transcribed indiscriminately as <ḫ> and <χ>.' Peust goes on to detail that it was Steindorff (in 1892), who deduced that that these signs were 'elementary graphemes of different phonetic value,' who then invented the transcription symbol <ẖ> for the original transcription of <χ>, and that unfortunately, Steindorff could not discern the exact nature of the phonetic distinction. Peust details how the Egyptian sign <ẖ> came to be written in certain forms for another sign <š>. He (1999b:116) asserts that this is due to a process of palatalisation of velar fricatives in Egyptian, where:

> the sound /x/ corresponding to <š> was frequently palatalised to /ʃ/ in the Old Kingdom. The grapheme <š> which formerly had expressed a back fricative thus became primarily a means of writing a palatal fricative. In the minority of words in which /x/ escaped palatalisation, the preserved back fricative now had to be expressed by a different sign for which <ẖ> was invented.

Loprieno (1995:33) in his table on the phonemes of earlier Egyptian, posits the Egyptian sign <ẖ> as being a palatal fricative /ç/ and the heir of Afro-Asiatic *x. To clarify Loprieno's assignment, Peust proposes that there are two phonemic representations for the Egyptian sign <ẖ> which are /x/ and /ʃ/ where the latter phoneme is the result of the velar fricative becoming palatalised.[164] Further, he argues that the Egyptian sign <ẖ> 'came into use for expressing the non-palatalised sound' namely /x/ (1999b:117). Loprieno (1995) does not discuss the non-palatalised representation of the sign <ẖ>. Rilly (2007:380) cites Loprieno's value for this sign in his argument that the Egyptian consonant <ẖ> probably records the voiceless palatal fricative [ç], although Rilly does not discuss two points that are quite pertinent to the representation of the Meroitic sign ȝ ẖ in light of Macadam's hypothesis. These are firstly, that Loprieno's phonemic assignation of Egyptian <ẖ> as /ç/ is given for the period of early Egyptian although it is known that there are various phonemic shifts and splits that took place from this era up until the period of the New Kingdom when the Meroitic script came to be devised. Consequently, many Egyptian signs had different phonemic representations from earlier periods by the time of the New Kingdom. Secondly, that if Egyptian <ẖ>

[164] However, Peust does state that the conditions for this particular palatalisation are not known (1999b:116).

remained a palatal fricative /ç/ by the time this sign was borrowed into Meroitic, then how does this explain the Meroitic variant forms where there is interchange of the signs *ẖ* and *ḫ* if the former sign represents a palatal and the latter sign a velar? Moreover, how does this analysis explain the following equivalent forms where the Greek and Coptic forms transcribe velars (Gr. χ = /kʰ/, Cop. /x/, **ⲭ** = /x/) and in Coptic a glottal fricative (ϩ = /h/) for Meroitic *ẖ* (Rilly 2007:380) and not a palatal fricative:[165]

(60)

a.	<u>Egyptian</u>	*p(ꜣ)-ꜥẖm*		"the sacred falcon"	anthroponym
	Coptic	Sah **ⲡⲁϩⲱⲙ**			
	Meroitic			*pẖome, pẖeme*	
	Greek	παχουμις			
b.	<u>Meroitic</u>			*pẖrse*	"Faras"
	Coptic	**ⲡⲁⲭⲱⲣⲁⲥ**			
	Greek	παχωρας			

Furthermore, there is another equivalent form from Egyptian Demotic where Meroitic *ẖ* is transcribed with Egyptian Demotic <*ẖ*>:

(61)	<u>Meroitic</u>		*ẖoẖonete*	title
	Demotic	*ẖẖnꜣtj*		

It can be concluded that if, as per Macadam's (1966:49) proposal, the Meroites did borrow their cursive sign from an Egyptian Demotic form that had the value <*ẖ*>, then the value of this Egyptian sign was certainly a velar (dorsal) fricative /x/ and not the

[165] The nearest phonemic equivalent to a palatal fricative that Greek possesses would be the alveolar fricative σ ~ ς /s/ and note that this is not used to transcribe Meroitic *ẖ*. Peust (1999b:120) states that since Greek did not possess any palatal stops, when Greek transcribes Egyptian palatal stops it variously substitutes dentals, velars and the sibilant instead (phoneme adaptation).

palatal fricative /ç/.[166] Furthermore, the evidence from the equivalent forms indicates that Meroitic ʒ ẖ does indeed transcribe a sound that has a dorsal fricative articulation.

7.3 Discussion of ḫ ⊂ 𓐍 and ẖ ʒ 𓄡

The discussions given above in §7.1 and §7.2, on the origins and values of the Meroitic signs ⊂ ḫ and ʒ ẖ, still leave a fundamental question unanswered. What is the exact phonological difference (if any) between these Meroitic signs? Meinhof (1921/22:2) proposed that not only did they represent a difference in voicing but also in place of articulation. He claimed that the sign ⊂ ḫ had a velar place of articulation - [ɣ] (voiced velar fricative) and the sign ʒ ẖ a uvular articulation - [χ] (voiceless uvular fricative), although there is no satisfactory evidence given in his discussion for these proposals,[167] and Priese (1973, table 1b) also assigns these same values. Zawadowski (1972a:28) opted for switching Meinhof's proposal on the place of articulation of these signs, although he gives no evidence as to the reasons for this assignment.[168]

For the Egyptian representation of these signs, Peust (1999b:117) states that 'The distinction between <ḫ> and <ẖ> is hard to define.' He overviews scholars who proposed, based on Semitic etymologies, that Egyptian <ẖ> was originally a voiceless fricative and <ḫ> a voiced fricative. He represents these signs as merely /x_1/ and /x_2/. Peust goes on to investigate Coptic and states that even by this stage of the Egyptian language these sounds <ḫ> and <ẖ> 'did not merge completely, nevertheless both sounds appear to have been comparatively similar since occasional variation among both signs can be found …' (1999b:117), which is also what is found in Meroitic.

An alternative analysis of the Meroitic signs ⊂ ḫ and ʒ ẖ is proposed by Rilly (2007:380-383). Rilly's analysis is that these signs do not contrast for voicing but in

[166] Evidence for this comes from the Egyptian form given in (60a) where Egyptian <ḫ> transcribes the velar fricative /x/ in Greek and Coptic and the glottal fricative /h/ in Coptic.
[167] Zyhlarz (1930:421) gives a different representation, although his chart is exceedingly obscure and inaccurate and therefore his proposal for these signs is not discussed here.
[168] More specifically; Zawadowski (1972a:28) represented Meroitic ẖ as a velar fricative and ḫ as a uvular fricative.

labialisation. According to Rilly, this analysis presents a strong theoretical argument in light of his theory of opposition for labialisation of the Meroitic signs *k* and *q*,[169] but he also notes that there are fewer clues for his proposal that *ẖ* is a labialised velar fricative sign /x^{w}/. The evidence that Rilly puts forward is taken from two Meroitic inscriptions of Egyptian proper names:

(62)

a.	<u>Egyptian</u>	*p(ꜣ)-ꜥẖm*	"the sacred falcon"	anthroponym
	Coptic	^{Sah}ⲡⲁϩⲱⲙ		
	Meroitic		*pẖome, pẖeme*	
	Greek	παχουμις		
b.	<u>Meroitic</u>		*pẖrse*	"Faras"
	Coptic	ⲡⲁⲭⲱⲣⲁⲥ		
	Greek	παχωρας		

For Rilly, the Meroitic consonant *ẖ* is a labialised consonant [x^{w}] because it transcribes a fricative followed by a back rounded vowel in the Coptic and Greek equivalences of the forms in (62). Furthermore, Rilly's discussion of the equivalence in form (62b) advances the hypothesis that since the Coptic form shows the syllable [xo:], which is transcribed in Meroitic with *ẖ*, consequently there was a change from the syllable [xo:] to [x^{w}a] due to the spreading of the labiovelar articulation in the following way: Consonant + back rounded vowel → labialised consonant + mid unrounded vowel. This analysis is slightly unclear in how it is able to explain the sequences where the inherent unmarked vowel 'a' /a/ follows the labialised velars - *q* [k^{w}a] and *ẖ* [x^{w}a]. If the labialisation is created by the assimilation of the the back vowel *o* /u/ then why do we then find the sequences *qo* [k^{w}u] and *ẖo* [x^{w}u]? Why has there been no change on the vowel? Rilly's proposal is further discussed in §7.4.

[169] See §6, for more on Rilly's labialisation of the Meroitic sign *q*.

In concluding his section on his analysis of this sign, Rilly claims that there is a parallelism between the signs *k*/ *ḫ* and *q*/ *ẖ* for labialisation (2007:382, 392):[170]

(63) Non-labialised Labialised

Non-labialised	Labialised
k = [k]	*q* = [kʷ]
ḫ = [x]	*ẖ* = [xʷ]

I argue against the representation of labialised velars in the following sections.

7.4 Labialised velars?

The sequences *qo* and *ẖo* are commonly found in Meroitic. Under Rilly's interpretation of Meroitic *q* being [kʷ] and *ẖ* as [xʷ], when these signs are followed by the vowel sign *o* /u/ this would result in the phonetically realised sequences [kʷu] and [xʷu]. It is evidenced across many languages that labialised velars are delabialised before the high back vowel /u/: kʷ → k/_u (Stephens & Woodard 1986). Furthermore, following vowels become rounded following labialised velars which subsequently delabialise to plain velars: Yuma kʷa → ku, (Bloomfield 1962:13 cited in Stephens & Woodard 1986:130); Amharic gʷädana → godana 'way'; kʷərat → kurat 'pride' (Ullendorff 1955:79); Southern Agaw *kwə* → *ku* (Stephens & Woodard 1986:130). There are also languages found, e.g. Ndumbea and Kemezung, where phonotactic constraints prohibit back vowels from following labialised velars. This co-occurrence restriction exists in many languages of Africa namely Frafra, Buli, Gwari, Dagbani, Mayogo, Moba and the Western Sawabantu languages (Cahill 1999).

[170] It is unclear as to the actual phonemic value that Rilly is proposing for *ḫ* and *ẖ*, as he puts these signs into slash bracketing as *ḫ* /ḫ/ and *ẖ* /ẖ/ without any terminological definition, and further whether or not he is saying that these signs have a different phonetic realisation from their phonemic representation (2007:392). I have used the transliteration of the Meroitic signs to show Rilly's conclusion to their surface realisation.

I propose, therefore, that in Meroitic, the presence of *o* /u/ following the signs *q* - [k^w] and *h̲* - [x^w] (as in Rilly's proposal) would result in *qo* - [k^wu] → [ku] and *h̲o* - [x^wu] → [xu], thereby the forms should be found written as *ko* - [ku] and *ḫo* - [xo] with their non-labialised counterparts. However, as Rilly observed (1999b:106), '**ko (=[ku]) n'est jamais attestée à ma connaissance.*' I disagree that the co-occurrence of the signs *q* and *h̲* followed by the back vowel *o* /u/ is evidence for the realisation of these signs as labialised velars. However, for the purposes of the proposal set forth in §7.5, I consider Rilly's combinatory observation as very important in that the signs *q* and *h̲* are only followed by certain vowel signs. I discuss how this is very indicative of a co-articulatory effect found cross-linguistically with consonants drawn from a particular articulatory class in the following section.

7.5 Uvulars retracting and/or lowering adjacent vowels

The current section discusses the Meroitic signs *q* and *h̲* and sets forth an alternative proposal to Rilly's (1999b; 2007) hypotheses that *q* is a labialised velar stop [k^w] and *h̲* is a labialised velar fricative [x^w]. This alternative proposal rests upon firm evidence from these signs in their combination with certain Meroitic vowels and not others.

The important combinatory observations that Rilly (2007:382) makes as regards the Meroitic sign *h̲* are:

(i) Various alternations are found with the sequences *h̲e* and *h̲o* e.g. *mh̲e* ~ *mh̲o*

(ii) The sequence * **h̲i* is not attested.

(iii) The sequence *h̲*'a' is frequent.[171]

[171] Where the inherent unmarked vowel 'a' /a/ follows this sign. The fact that this sequence is frequent is a further query to Rilly's proposal that *h̲* = [x^w] because of a following round vowel.

Therefore, only the combinations of *h̲* + *o* /u/, *e* /ə/ and inherent 'a' /a/ are found whereas **h̲i* is not.[172]

From an investigation into the occurrences of the Meroitic sign *q* and following vowels, I have found that *q* combines almost exclusively with the vowels *o* /u/, *e* /ə/ and inherent 'a' /a/, but exceedingly rarely with *i* /i/.

Primarily, these combinatory sequences led me to investigate whether this was due to co-articulatory effects.

Empirical evidence which is taken from a wide variety of languages shows that when vowels are adjacent to a guttural consonant they undergo a process of lowering and/or retraction (Rose 1996). The class of gutturals incorporates uvulars /q/, /G/, /χ/ and /ʁ/ and pharyngeals /ħ/ and /ʕ/ (and in some languages, e.g. many Semitic languages, the laryngeals /h/, /ʔ/ and /ɦ/). Greenberg (1962:26) outlines this process being evident in Coptic:

> The tendency of vowels to be lowered before laryngeals and pharyngeals is well known and particularly attested from Semitic languages. For example, in Arabic we regularly have *a* in the second syllable of the imperfect of verbs in place of *u* or *i* in verbs with second or third laryngeal root consonants, i.e. *yaftaḥu* 'he opens' as contrasted with *yaqtulu* 'he kills'. In the present instance [of Coptic] the alternation [bol-f] 'to unloose him' /[mah-f] 'to fill him' is one of vowel quality with the low vowel *a* before the laryngeal on any theory.

McCarthy (1994b) demonstrates the lowering effect that gutturals have on adjacent vowels within Semitic languages with evidence from Classical Arabic, Bedouin Arabic and Tiberian Hebrew. A sample of the data McCarthy (1994b) uses to show this vowel lowering is from Hebrew. In this data, the Hebrew epenthetic vowel [e] (64a) is lowered to [a] when following a guttural consonant (64b):

[172] It is reiterated that the low vowel 'a' /a/ is unwritten in Meroitic, as every 'consonant' sign (but not the 'syllable' signs) contains this vowel inherently. See Chapter 1, §2.4, for more on this and see Chapter 3 for the investigation into the Meroitic sign that is traditionally transliterated as *a*.

(64) Tiberian Hebrew

	Underlying	Singular	gloss
a.	/malk/	mel**e**k	"king"
	/sipr/	sep**e**r	"book"
b.	/baʕl/	baʕ**a**l	"master"
	/kaħʃ/	kaħ**a**ʃ	"lying"
	/lahb/	lah**a**b	"flame"
	/tuʔr/	toʔ**a**r	"form"

Further, the opposition between mid and low vowels is neutralised to low when adjacent to a guttural in the Ethio-Semitic languages Tigrinya, Harari, Gafat and Amharic (Hayward & Hayward 1989, Ullendorff 1955). The following data from Tigrinya demonstrates that the vowels /ä/ (which is close to IPA [ə]) and /a/ neutralise to /a/ when adjacent to a guttural consonant, that is, specifically the vowel /ä/ lowers to [a] (Hayward & Hayward 1989:180):

(65) Tigrinya –2m.sg. perfect forms

a.	säb**ä**r-ka	"you have broken (sthg)"
	k'är**ä**b-ka	"you have approached"
b.	bäl**a**ʕ-ka	"you have eaten"
	sär**a**ħ-ka	"you have worked"

Hayward & Hayward (1989) also assert that the opposition between /a/ and /e/ is also neutralised to /a/ in D'opaasunte (Cushitic) when following a guttural consonant.[173]

[173] For further examples of the correlation between gutturals lowering vowels, cf. Carrier, an Athabaskan language (Prunet 1990); and Danish (Durand 2003) for the uvular /ʁ/ lowering adjacent vowels. See also Loprieno (1995:47, 1997:452-3) for further Coptic evidence of vowel backing following the guttural fricative ϩ /h/.

With specific regards to the uvular consonants in Arabic, Ghazeli (1977:59) states that 'the backing of the front vowels is the only significant co-articulatory effect of the uvulars.' Herzallah (1990:58) demonstrates this process of vowel retraction with data from Palestinian Arabic where /i/ → [u] in the imperfect forms containing an adjacent uvular /χ/ or /ʁ/ (66b):

(66) Palestinian Arabic

	Perfect	gloss	Imperfect	gloss
a.	katab	"he wrote"	yikt**i**b	"he writes"
	malas	"he levelled"	yiml**i**s	"he levels"
b.	nefaχ	"he blew"	yunf**u**χ	"he blows"
	belaʁ	"he attained"	yubl**u**ʁ	"he attains"

A uvular consonant lowering a following vowel is found in the Ahousaht dialect of the Southern Wakashan language Nootka (Nuu-chah-nulth) where /i/ → [e]/q_:

(67) Nootka – Ahousaht dialect (Gick & Wilson 2003:22)

/si**qi**:ɬ/	[sɪ^{ə}**qe**:ɬ]	"to cook"
/**qi**tʃin/	[**qe**tʃɪn]	"louse"

This same process is evidenced in the Athapaskan language Chilcotin, where the uvular lowers a preceding vowel, /i/ → [e]/_q:

(68) Chilcotin (Gick & Wilson 2003:23)

/n**iq**in/	[n**eq**^{ə}ɪn]	"we paddled"
/ts'**iq**i/	[ts^{ʕ}'**eq**^{ə}ɪ]	"woman"

Achumawi, a Palaihnihan language, also lowers *i → [e] and *u → [o] when adjacent to uvulars (Good *et al* 2003). Interior Salish languages also exhibit this lowering effect of uvulars on adjacent vowels (Bessell 1998). This same effect is also maintained in the Quechua dialects of Bolivia (Elorrieta 1996), Tungusic languages (Li 1996) and further languages of the Pacific North-west (Bessell 1992).

Hansson (2001) gives an account of this same process occurring in Tepehua where the high vowels /i, u/ become lowered to [e, o] when immediately adjacent to an underlying uvular /q/:

(69) Tepehua (Hansson 2001:11)[174]

/ʔ**u**ks-laqts'in/	→	[ʔ**o**qslaqts'in]	"look at Y across surface"
/lak-tʃ**i**q'i-ɬ/	→	[laqtʃ**e**ʔeɬ]	"X broke them (perf.)"
/q**i**n-t'uj/	→	[q**e**nt'uj]	"two (people)"
/ʔaq(-)tʃ**u**q/	→	[ʔaqtʃ**o**q]	"pot"

In a study on Mong Leng (Hmong-Mien, China) phonology, Mortenson (2004:5) states that 'The high front vowel /i/ does not occur after uvulars. This is due to a historical process that lowered front vowels in this environment.'

Further phonological investigations (Traill 1985, Miller-Ockhuizen 2003) reveal that there is a restriction on a group of sounds occurring with high front vowels. This group includes post-alveolar clicks and uvularised and epiglottalised consonants. Traill (1985) terms this restriction as the 'Back Vowel Constraint'.

This cross-linguistic process of uvulars/gutturals retracting and/or lowering vowels is strong evidence to claim that this is the same process that is found in Meroitic with the signs *q* and *h̲* rarely followed by the high front vowel sign *i* /i/. I claim here that

[174] Underlying /q'/ is realised as [ʔ].

the Meroitic signs /ʔ *q* and ʒ *ẖ* are respectively /q/ and /χ/ in that, they represent the voiceless uvular stop and uvular fricative respectively. This claim is able to explain the combinatory distribution of these signs with only certain vowels. Whether this process is one of vowel lowering or vowel retraction is perhaps impossible to discern; however the following sequences of phonemic representations and phonetic realisations are proposed:

(70a)

UR of *q* + vowel		Vowel lowering	→	Written as	or	Vowel retraction	→	Written as
**qi* /qi/	→	[qe]	→	ƨ/ʔ *qe*		[qu]	→	//ʔ *qo*
qo /qu/	→	[qo]	→	//ʔ *qo*		[qo]	→	//ʔ *qo*
qe /qə/ ~ /qe/	→	[qa]	→	/ʔ *q*		[qo]	→	//ʔ *qo*
q /qa/	→	[qa]	→	/ʔ *q*		[qɑ]	→	/ʔ *q*

(70b)

UR of *ẖ* + vowel		Vowel lowering	→	Written as	or	Vowel retraction	→	Written as
**ẖi* /χi/	→	[χe]	→	ƨʒ *ẖe*		[χu]	→	/ʒ *ẖo*
ẖo /χu/	→	[χo]	→	/ʒ *ẖo*		[χo]	→	/ʒ *ẖo*
ẖe /χə/ ~ /χe/	→	[χa]	→	ʒ *ẖ*		[χo]	→	/ʒ *ẖo*
ẖ /χa/	→	[χa]	→	ʒ *ẖ*		[χɑ]	→	ʒ *ẖ*

This analysis, based upon strong empirical evidence, is able to explain the almost complete omission of the sequences * ɥ/ʔ **qi* and * ɥʒ **ẖi* in the Meroitic texts.

7.5.1 Evidence from corresponding forms

A few corresponding forms from Assyrian, Coptic, Greek and Latin transcriptions show a back vowel where Meroitic transcribes the vowel ƨ *e*, these are found with Meroitic ƨ *e* following the uvular /ʔ *q* /q/:

(71)

a.	Egyptian	*k3š, k3s, kšj, kwš, k3šj, kšwj, ks, kš, ks(t), k3š*	"Kush"	toponym
	Demotic	*kšt, kš*		
	Coptic	Sah, Ak **ⲉϭⲱϣ**, Boh **ⲉⲑⲱϣ**		
	Meroitic	зϛ/ʔ	*qes*	
	Greek	χυς, χυσι		
	Hebrew	כוש		
	Babylonian	*kasi, kaši*		
	Assyrian	*kusi, kusu*		
b.	Meroitic	ϛ⊬ωϛ/ʔ	*qerbe*	toponym
	Latin	*corambim* (?)		

The proposal put forward above in §7.5 specified that there is a process of uvulars backing/retracting the following vowel in Meroitic, therefore this process allows us to explain these corresponding forms from Greek and Latin which represent Meroitic ϛ *e* with their back vowels οῦ [oː] and *o* [oː] ~ [ɔ]. These corresponding forms are in line with my claim for the phonological process whereby Meroitic ϛ *e* /e/ ~ /ə/ → [o]/q _.[175]

7.6 Variation of Meroitic *ḫ/ẖ* and *k/q*

Griffith observed that the Meroitic signs ⊂ *ḫ* and ȝ *ẖ* commonly varied with each other (1911:15). An example of this is a form such as ϛ⊂ȝ *mḫe* ~ ϛȝȝ *mẖe*. This variation also prompted some scholars to promote the theory that these two signs were in opposition for voicing with each other.[176] The few transcriptions of these signs taken from equivalent forms in other languages shows the fricative nature of both these signs, although it is maintained here that they are not in opposition for voicing but vary as to

[175] See Chapter 4, §3 for more on this.
[176] See §7.3.

their exact place of articulation i.e. *ḫ* represents a voiceless velar fricative /x/, and *ẖ* a voiceless uvular fricative /χ/. The written variation between these signs can be explained by the fact that they both represent dorsal fricatives. This same proposal is applicable to the variations found between Meroitic *k* and *q*, forms such as *pqrtr ~ pkrtr*, *amoqe ~ amoke* and *beloloqe ~ beloloke* are attested, and it is proposed here that these signs represent the voiceless velar stop /k/ and the voiceless uvular stop /q/ respectively. Again, this written variation can be accounted for as both these signs represent dorsals.

Furthermore, it is also observed here that the vowels that precede the alternate dorsal signs *ḫ*/*ẖ* and *k*/*q* in the forms *pqrtr ~ pkrtr*, *amoqe ~ amoke* and *beloloqe ~ beloloke*, are the low inherent vowel 'a' /a/ and the back vowel *o* /u/.[177] These preceding vowels being specified for the feature [+back] could be conditioning the articulation of the following dorsal consonant. Kenstowicz (1994:32) describes this as:

> *Prevelars* and *velars* require essentially the same tongue body positioning as the front and back vowels respectively, and so can be distinguished by the feature [± back]. We can see this in the varying realisations of [k] in response to the front versus back vocalic environment: compare the relatively front prevelar of the initial stop in *keep* with the relatively back velar of *coop*.

In the case of the Meroitic examples, the [+ back] vowels i.e. the unmarked inherent 'a' /a/ and *o* /u/, could colour the postvocalic velar consonants *k* /k/ and *ḫ* /x/ leading them to be confused with the uvulars *q* /q/ and *ẖ* /χ/, which are articulated by a constriction further back than the velum by the tongue dorsum, and so this results in variant forms being written. This analysis is also able to explain why the sequence * **ko* [ku] is not found in Meroitic, as the back vowel *o* /u/ causes the backing of the velar *k* /k/, which results in this sequence being written with the uvular stop sign *q* /q/. Strong evidence for this comes from x-ray tracings of articulations of /ku/ and /qu/ in Arabic

[177] Rilly (2007:373 fn. 2) observes that this substitution of *q* for *k* is conditioned by the back vowel *o* /u/ but for him this is evidence for *q* being a labialised velar. For more on the representation of these vowels, see Chapter 4.

(Al-Ani 1970:42). In these tracings, Al-Ani shows that the articulation at the point of constriction in /ku/ and /qu/ is noticeably much closer than when compared with /ka/ and /qa/, or /ki/ and /qi/. The point of constriction for /ku/ is a back velar which is almost uvular in its point of constriction. It is possible, therefore, that the Meroites notated the sequences /ku/ and /qu/ as / /? *qo* and not * / ʒ **ko* because the sequence [ku] was so perceptually close to [qu].

What is highlighted from this investigation is that awareness has to be maintained of the problems with the Meroitic orthographic level of representation whether it is encoding the phonemic or phonetic level.

7.6.1 Further remarks on Meroitic *q* /? Δ

Griffith (1917a:27) remarked that 'Mer. *q* sometimes represents an ancient Eg. *k*', and Rilly (2007:373) states that numerous transcriptions using Egyptian <*k*> for Meroitic /? *q* were a constant source of difficulty.[178] However, Peust (1999b:84) mentions, with regard to Egyptian stop signs, that 'Both classes of stops were distinguished strictly until about 1000BC. There is no confusion between written <k> and <q>/<g> until the New Kingdom.' Peust outlines that this confusion between the Egyptian stop signs becomes very frequent in Egyptian writing after the New Kingdom, and he believes that a phonetic merger is most certainly the cause of this confusion in writing. Loprieno (2001b:1744) specifically outlines why there is confusion in writing Egyptian <*k*> and <*q*> when he remarks on the phonological neutralisation of <*k*> /k/ and <*q*> /q/: 'During the first millennium BCE, the opposition between uvulars and velars is neutralised.' The confusion between the written signs in Egyptian <*k*> and <*q*> is consequently due to a process of neutralisation between the Egyptian phonemes /k/ and /q/. Importantly, it is during this New Kingdom period of Late Egyptian that Meroitic came to be written. Therefore, it can be concluded that transcriptions showing Egyptian <*k*> for Meroitic

[178] *'Cependant les nombreuses transcriptions par l'égyptien k du q méroïtique ne laissaient pas de créer des difficultés.'*

q are due to the neutralisation of the Egyptian phonemes /k/ and /q/, hence the confusion on the Egyptians' part in transcribing Meroitic *q* /q/ [q].

In conclusion, I have contributed (in §6 and §7) strong typological evidence for the following realisations of the Meroitic dorsal signs:

(72) Dorsal signs

a.	Velars	b.	Uvulars
	k = /k/		*q* = /q/
	ḫ = /x/		*ẖ* = /χ/

8 The Glide Signs

The following section discusses the two signs *w* and *y* that are representative of glides in Meroitic.

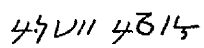
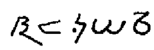
8.1 Meroitic *w*

The origin for this Meroitic hieroglyph Griffith (1911:13) saw as being a direct borrowing from the Egyptian hieroglyph, which is transcribed as <*wꜣ*>. Priese (1973:280) supports this exact association. The origin of the cursive form, Griffith thought was 'derived from an original facing to the left like the Egyptian, but it does not bear much resemblance to Egyptian hieratic or Demotic forms.' To clarify, Griffith thought the Meroite script devisors developed their cursive form directly from the hieroglyph (1911:13).[179] Priese (1973:286) agreed with this cursive form deriving directly from the hieroglyph rather than being derived from the Egyptian Demotic form of the hieroglyph. Rilly (2007:255) posits an alternative derivation that comes directly from a Demotic sign, and he states that this proposal assigns this cursive sign's link with a Demotic origin which agrees with the origin of the other Meroitic cursive

[179] See Chapter 4, §3, for Meroitic borrowing the Egyptian Demotic form for their cursive form of the sign for the vowel *o* /u/.

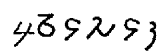
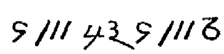
signs.[180] Griffith advances that Meroitic  has the same value as <*w*> /w/ in Egyptian as is shown by the following equivalences (1911:9-10):

(73)

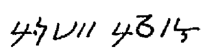
a.	<u>Egyptian</u>	*t(ꜣ)-wš.t*	"the adoration"	noun
	Demotic	*tꜣ wšte*		
	Coptic	[Sah] **ⲧ-ⲟⲩⲁϣⲧⲉ**		
	Meroitic		*tewiseti*	
b.	Meroitic		*wrtẖn*	unknown
	<u>Egyptian</u>	*wr-tẖn*		

Rilly (2007:385) draws together further equivalent forms where he declares that they leave no doubt as to the pronunciation of this phoneme being a labio-velar glide (along with updated forms):

(74)

a.	<u>Meroitic</u>		*medewi*	"Meroe"
	Egyptian	*mriw, brw.t*		
	Demotic	*mrw, mlwꜣ, mrwꜣ*		
	Coptic	**ⲡⲉⲣⲟⲩⲉ**		
	Greek	μερόη, *mi-r-wꜣ-i*		
b.	<u>Meroitic</u>		*wyekiye*	anthroponym
	Demotic	*wygy(ꜣ), wyngyꜣ, wʿyky*		

[180] For more on this see Rilly (2007:255), and see the summary in Fig. 2.1.

c.	<u>Egyptian</u>	*t(ꜣ)-wš.t*	"the adoration"	noun
	Demotic	*tꜣ wšte*		
	Coptic	[Sah]**ⲧ-ⲟⲩⲁϣⲧⲉ**		
	Meroitic		*tewiseti*	

Due to the evidence of the above correspondences no reanalysis of this sign is proposed and Griffith's (1911:13) representation of its sound value being 'w' holds and so its phonemic and phonetic realisation is most likely to be /w/ [w].[181]

8.2 Meroitic *y* /// 𓇌

The Egyptian uniconsonantal hieroglyphic sign 𓇌 corresponds directly to the Meroitic hieroglyph 𓇌 (Griffith 1909:50, 1911:13). In Egyptian transcription this hieroglyphic sign 𓇌 is represented by <*y*> and so Griffith gave the Meroitic transliteration as *y*. Griffith further corroborated this assignment through the origin of the Meroitic cursive sign /// borrowed from the Egyptian Demotic /// that developed directly from the Egyptian hieroglyph 𓇌. Priese (1973:286) agreed with this association.[182]

Peust (1999b:49) analyses the Egyptian 𓇌 hieroglyph, and discusses how this hieroglyph 𓇌 'looks like a mere sequence of two single 𓇋's. It is, however, frequently found as an alternative writing of 𓇋 under conditions which are not yet clear.' Most Egyptologists transcribe the single 'reed leaf' hieroglyph 𓇋 as <*i*> in order to differentiate it from the double 'reed leaf' hieroglyph 𓇌 <*y*>. Peust goes on to assert that during the Middle Egyptian phase, '𓇋 is not restricted in distribution, whereas 𓇌 can appear at a morpheme boundary only'. By the time of Late Egyptian, Peust outlines that these signs:

[181] Maddieson (1984:91) states that the 'great majority of languages have a voiced palatal approximant /j/… and the occurrence of /w/ is associated with the occurrence of /j/'. Further on he notes that 'the approximants /j/ and /w/ are closely related to the high vowels /i/ and /u/ respectively' (1984:94).
[182] See Rilly (2007:256), for a further note on the palaeography of this sign.

> … fall into a group of graphemes which are employed in a very inconsistent manner … It seems that the corresponding sounds had been lost in the spoken language in many positions, so these former phonograms were no longer correlated to a feature in the contemporary pronunciation.

His proposal is that the sound value of the single reed leaf <*i*> and double reed leaf <*y*> was /j/ (1999b:142).[183]

Furthermore, Peust's (1999b:50) assumption is that there was possibly no phonetic distinction between these signs, and he advances the view that they therefore expressed a 'functional difference' in demarking 'morphological boundaries or other features.' Peust does not dismiss the possibility that originally they expressed a phonetic distinction that became lost later on. However, the distribution of them during the Middle Kingdom, especially the morpheme boundary positioning of 𓇌, would point to them being functionally different by this stage of the language if not phonetically.

Griffith (1911:13) 'assured the value *y*' for the Meroitic cursive and hieroglyph signs /// 𓇌 through the following equation (1911:9):[184]

(75)	Meroitic		*atiye*	toponym
	<u>Egyptian</u>	*ḥ.t-tiy*		

Further equivalent forms are drawn together in Rilly (2007:384):

(76)

a.	Meroitic		*wyekiye*	anthroponym
	<u>Demotic</u>	*wygy(ꜣ), wyngyꜣ, wꜥyky*		

[183] Peust (1999b:49, 142) also includes another Old Egyptian hieroglyph 𓏭 as having this same representation, but this sign is not relevant to the present discussion.

[184] Griffith (1911:9) does give another equivalent form although this further form only shows a vague association between Egyptian and Meroitic *y* and so is omitted from the equivalences.

b. Meroitic *sipesiye* anthroponym
Demotic *t3-špšj.t*[185]

Rilly (2007:384) points out that the equivalent forms from other languages that evidence Meroitic *y* are very few and further that they all show the representation of the word-final particle *-ye*.[186] The origin of this sign from the Egyptian and the associated equivalent forms provide strong evidence for this Meroitic sign *y* being the palatal glide /j/ [j] as Griffith primarily claimed.

9 Conclusion

The phonological investigation conducted in this chapter has made the following major claims. I supported Rilly's assertion that the labial signs *p* and *b* are allophones of a single phoneme, and I have specified that the phoneme is /p/ and being plain voiceless, which assimilates voicing from an intervocalic placement resulting in [b]. The diachronic alternation of *m* and *b* is claimed to be the same alternation as seen across Afro-Asiatic and other language families and as such is typologically common. I have argued against the hypothesis that Meroitic *d* has a retroflex articulation based on transcriptions from Egyptian and Greek where it is transcribed with /r/. I have explained how coronal stops are subject to lenition i.e. flapping in an intervocalic environment, which explains the Egyptian and Greek transcriptions. The confusion of the transcription of Meroitic forms with /s/ in Egyptian with /s/ and /ʃ/ has been explained as that there would have been phonetic palatalisation of these coronal fricatives when adjacent to a palatal phoneme.

The orthographic practise of an unwritten nasal segment in coda position has been additionally supported with a Meroitic form found transcribed into Ethiopic. I have put

[185] The transcription of this Egyptian Demotic form is given with <j> in Rilly (2007:384), although it is unclear as to which Egyptian transcription system is being used for this form (see Chapter 1, §4.1, for more on this), however, as in the discussion given by Peust (1999b) of the varying transcriptions for the signs that represent /j/, this equivalent form shows that Demotic <j> also corresponds to Meroitic *y*.
[186] See Rilly's (2007) proposal that this sign was also used as a written vowel hiatus 'reducer.'

forward a proposal as to the origins of the Meroitic cursive sign ⅄ *ne* and advanced the claim that it would be palatalised phonetically when adjacent to a palatal phoneme as well. I claimed that the Meroitic signs /? *q* and ȝ *h̲* represent uvular consonants; the evidence for this claim came from the distribution of vowels that follow these signs where this distribution is typologically common for vowels that follow guttural consonants.

From the research conducted in this chapter, I propose the following phonological inventory for Meroitic:

(77)	p		t	d		k	q	ʔ[187]
		m		n				
				r				
			s			x	χ	
				l ~ ɬ?				
	w				j			

[187] The inclusion of the glottal stop as a phoneme in the Meroitic phonological inventory is argued for in Chapter 3.

Chapter 3

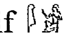
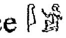
A Phonological Investigation into the Meroitic 'initial a' Sign *a* 𐦠 𐦀

This chapter investigates the phonological value of the Meroitic traditionally termed 'initial a' sign *a* 𐦠 𐦀. This sign is termed 'initial a' due to its non-occurrence anywhere other than word-initially in the Meroitic script. The investigation conducted in this chapter results in my claim for this sign's representation as a consonant, which includes the inherent unmarked 'a' vowel. Therefore, this sign represents a CV sign rather than a sign representing only a vowel of varying quality *V, as traditionally claimed. Since previous proposals for the value (representation) of this sign have heavily relied on Egyptian transcriptions, this chapter gives in-depth discussions on the Egyptian transcriptions and relevant Egyptian phonemic values. A sound change process (commonly found across Afro-Asiatic languages) contributes to my proposal to revise the value of this sign.[1]

1 Meroitic 'initial a' *a* 𐦠 𐦀

In determining the origins of this Meroitic sign, Griffith (1911:12) proposed that the Meroitic hieroglyphic form 𐦀 'may be connected with the Egyptian group for prothetic alif,'[2] and in a further work (1916b:118), he claimed that '[Meroitic] 𐦀, 𐦠 [is] apparently derived from Eg. .'[3] The differing Egyptian hieroglyphs are tied up by Rilly (2007:261, fn. 1), who explains that the form for prothetic aleph is rather [4] in

[1] See also Fig. 2.1, 2.2 and 2.3, which outline the proposals for the origin of the hieroglyphic and cursive forms of this sign, representations of this sign from equivalent forms and a summary of proposals for its sound value.
[2] The term 'prothetic alif/aleph' signifies that the sign acts as a vowel carrier with no phonological value of its own.
[3] See also Priese (1973:284-285), who gives the origins of the Meroitic hieroglyphic form as a combination of the Egyptian hieroglyphs and .
[4] Peust (1999b:221) cites Zeidler's conclusion into the Egyptian syllabic orthography that this hieroglyph sequence is an unambiguous vowel indicator representing /'a/. The Egyptian syllabic orthography is suggested as being the writing of signs to express: 'CV-syllables rather than single consonants, which led to the alternative labelling "syllabic orthography". It is argued that there was a particular need of vowel notation in writing foreign words and names' (Peust 1999b:219). See Peust (1999b:218-221) for more on the Egyptian syllabic orthography.

Egyptian, but the form  is used frequently in Napatan.[5] The origin of the cursive form 𐦠 is somewhat more complex. Griffith (1911:12) did not specifically state his thoughts on the origin of the cursive form, as his only assertion on this point was that 'the Demotic seems actually to render the two signs in a modified form, as if .' If Griffith's vague statement can be inferred that he postulated the Meroitic cursive form 𐦠 being derived from the Demotic form of the Egyptian hieroglyph sequence , then Priese (1973:284-285) was more specific as to this same origin. However, Rilly (2007:245) critiques Priese's hypothesis and presents an alternative theory that the Meroitic cursive form could have been derived from a Ptolemaic form that was hence modified to be in line with the vocalic sign 𐦡.[6]

As to the sound value of this Meroitic sign, Griffith (1911:7) discovered that Meroitic 𐦠 was used to represent the 'initial vowel or alif' in the Egyptian theonym 'Amun':[7]

(1)	Meroitic	𐦠𐦩𐦪𐦢	*amni*
	<u>Egyptian</u>	*imn*	

He also observed that the sign 𐦠 only ever occurred word-initially, and furthermore that the separate vowel signs (𐦢 *i*, 𐦣 *o*, and 𐦡 *e*) were never found to follow the 'initial a' sign 𐦠. From these observations, Griffith initially stated that the sign 𐦠 represented a 'vowel sound' (1911:7). Nevertheless, further on in the same publication (1911:9-10), Griffith then speculated that 'It seems possible that 𐦠 is really an initial vowel with aspirate, but, except in some Latin versions, the name of Ammon is without aspirate, and the frequent omission of 𐦠 in writing is against the idea of it being a real

[5] Rilly (2007) uses the term 'Napatan' to refer to the system of transcribing Meroitic names in the Egyptian script and not in the broader sense.
[6] See Chapter 2, Fig. 2.1.
[7] The value of the Egyptian sign transcribed as <*i*> is discussed in §3.1.

consonant.' A sample of the equivalent forms Griffith analysed for his proposal of the sound value for 𐦠 follows where 𐦠 = Eg. <*ḥ*> /ħ/[8] (> Coptic ϩ /h/):[9]

(2)	Meroitic	𐦠𐦶𐦢𐦤𐦡	*atiye*	toponym
	<u>Egyptian</u>	*ḥ.t-ṯy*		
(3)	<u>Meroitic</u>	𐦠𐦬	*ar*	theonym
	Egyptian	*ḥr*		
	(Coptic	ϩⲱⲣ)		

These observations were problematic for Griffith in assigning a specific sound value for 𐦠, as he stated (1911:12) that:

> The question arises whether 𐦠 spells a variety of initial words as an alif or hamza, or whether it represents only one vowel, an initial *a*; the former seems the most probable theory, as Meroitic appears to possess no other sign than 𐦠 for expressing initial vowels.

Consequently, Griffith (1911:11) chose to transliterate this sign by using *a*. In a later work on his progress of decipherment (1916b:118), Griffith put forward an alternative view on the sound value of this sign when he claimed that 'It may be looked upon like initial aleph א as a kind of consonant, a breathing followed by a vowel.' Furthermore, following an observation he made previously (1911:12 fn. 2), Griffith (1916b:122) went on to speculate that the sign 𐦠 could be used for vowels other than *a* through considerations based on the following equivalent forms, where Meroitic 𐦠 = Egyptian <*w*> /w/ (Cuneiform *u*) (> Coptic ⲟⲩ /u/):[10]

[8] See Loprieno (1995:33) and Peust (1999b:98) for the phonemic assignation of this Egyptian sign as a voiceless pharyngeal fricative /ħ/.
[9] The Egyptian sounds <*h*> /h/ and <*ḥ*> /ħ/ have phonetically merged by the Coptic stage of the language to ϩ /h/ (Peust 1999b:99).
[10] Griffith states that 'the initial 𐦠 might represent other vowels than *a*, as when it corresponds to ⲟⲩ in the Meroitic *Asori* for Coptic ⲟⲩⲥⲓⲣⲉ and to *u* in cuneiform *uputi*' (1916b:122).

(4)	Meroitic		*asori*	theonym
	<u>Egyptian</u>	*ws-ir*		
	(Coptic	**ⲟⲩⲥⲓⲣⲉ**)		
(5)	Meroitic		*apote*	title
	<u>Egyptian</u>	*wptj* ~ *wpwtj*[11]		
	(Cuneiform	*uputi*)		

Unfortunately, Griffith never specifically defined his proposal for the sound value of this Meroitic sign 𐦠 in any of his later works, although several researchers would take up the consonantal hypothesis for this sign. Zyhlarz (1930:416, 419, 421) proposed that Meroitic 𐦠 should be transliterated as ʿ in line with Egyptological transcription practice to notate a '*laryngal explosiv*' (his terminology). In Egyptian transcription practices, the sign transcribed as <ʿ> phonemically represents the pharyngeal fricative /ʕ/ (Peust 1999b:99, Loprieno 1995:33).[12] It is unclear if Vycichl (1958a:74), when discussing this sign, also considers Meroitic 𐦠 to be consonantal, as he terms it as an initial *ʾaleph* or whether he is simply following Griffith's terminology.[13] The consonantal value of this sign was also propounded by Zawadowski (1972a:19), who claimed, again without further evidence, that:

> In the initial position, the vowel /a/ is always accompanied by the laryngeal consonant /ꜣ/. In the writing it is expressed by a double sign – 𐦠. The digraph permits to suppose that, like the alif-hamza of the Arabic script it represents by itself a double phonemic sign, perhaps a combination of a consonant with a vowel (C + V).

Zawadowski (1972a:29) then notates this laryngeal with '/ꜣ/' (his notation utilises Egyptological transcription methods), and outlines that it represents 'the glottal stop Semitic *aleph* or *hamza*.' The only evidence that can be gleaned from Zawadowski's

[11] This Egyptian form has a variant transcription which is discussed in §1.1.
[12] Zyhlarz propounded the theory that Meroitic was an Afro-Asiatic language, and so attributed this sound value without any extensive research in order to associate a correlation between Meroitic and Afro-Asiatic based on the correspondence of phonemes.
[13] Priese (1968:187 fn. 121) also follows a consonantal sound value for this sign.

paper for his proposal for this sign's phonemic representation is that it is used to 'render Egyptian and Coptic laryngeals + vowel' (1972:19), since this was already observed by Griffith (1911) (see the forms in (2) and (3)) his claim did not rest upon any further detailed investigation. Vycichl (1973b:61) would critique Zawadowski's proposal by asking how he is able to accommodate Griffith's observation of 𐦠 used for Coptic /u/ in the name of "Osiris" under this analysis.

Hintze's major discussions on the principles of the Meroitic language (1973a, 1974a, 1979), left the representation of Meroitic 𐦠 somewhat unclear, although in one short paper on Meroitic vowels (1973b:332), he included the representation of Meroitic 𐦠 as being phonologically /a/. However, this was in contradiction to another paper where, he proposed in his revision to the transliteration method of Meroitic that, 'the letter *a* [𐦠] at the beginning of words could be used for practical reasons; this *a* stands for /ʿa/, /ʿe/, /ʿi/, or /ʿo/' (1974a:73).[14] Hintze (1987:48-49) revised his claim for the representation of Meroitic 𐦠 (and other word-initial vowels, he also tidied up his seeming contradiction), by stating that there was no glottal stop word-initially in Meroitic.[15] Earlier to Hintze's claim, Hofmann (1981a:31) outlined that the transliteration used by previous scholars (Priese 1973:284 etc) of ʿ for Meroitic 𐦠 was wrong as it indicates a glottal stop, which Hofmann thought the Meroites did not possess.[16] Hofmann believed that Meroitic 𐦠 was used to transcribe word-initial /a/ and /u/ (1981a:42-43), and in a further paper, also the vowel /i/ (1982:47).

The traditional theory that Meroitic 𐦠 represents word-initial /a/ [a] and /u/ [u] is also followed by Rilly, although he further extends this representation to include the vowel [ə] (2007:287-290). Rilly discusses his understanding of the Meroitic system for representing word-initial vowels is that up until the second half of the 1st century CE,

[14] Hintze (1987:48) specifies that his representation of /ʿa/ etc in this earlier paper (1974a), indicated an initial glottal stop.

[15] '*Das Meroitische hatte keinen harten Vokaleinsatz ("glottal stop") im Wortanlaut*' (1987:49).

[16] '*Der Lautwert ist nicht eindeutig, so daß Priese ... ihn mit ʿ umschreibt. Diese Schreibweise, so vorteilhaft sie beim Sprachvergleich sein mag, kann aber dazu führen, daß man unwillkürlich an einen "glottal stop" denkt, den die Meroiten mit großer Wahrscheinlichkeit nicht hatten*' (1981a:31).

the Meroites used the vowel signs 𐦡 *e* and 𐦢 *i*, independently to transcribe the word-initial vowels [e] and [i] respectively, although the other vowels [a], [u] and [ə] were transcribed with the Meroitic sign 𐦠.[17] Rilly then maintains that by the end of the 1st century CE, two changes took place in the language, these being; firstly, that a phonetic change occurred due to prosodic conditions that caused some vowels to weaken resulting in the word 'initial a' sign being realised as a schwa [ə], and secondly this schwa then completely syncopates. This proposal allows him to account for a certain number of words that appear to omit the word-initial sign 𐦠 e.g. Mer. 𐦠𐦨𐦩𐦢 *amni* > 𐦨𐦩𐦢 *mni* "Amun" theonym; 𐦠𐦰𐦫 *asr* > 𐦰𐦫 *sr* "meat (?)". Secondly, the use of independent vowel signs used word-initially such as 𐦡 *e* and 𐦢 *i* was revised/prohibited, since words had to start orthographically with their corresponding consonantal glide sign 𐦤 *y* /j/. Rilly highlights that this is not a phonetic change but is a purely orthographic process. Furthermore, Rilly additionally comments that this prohibition is in line with generalising the syllabic principles of the script i.e. the uniformity of CV sequences (2007:288).

The following sections put forward a reanalysis of this Meroitic sign, taking into consideration all of the above points, with specific regard to the Egyptian and Coptic equivalent forms.

1.1 Meroitic *a* 𐦠 𐦀 does not transcribe word-initial /u/ [u]

This section outlines that through a reliance on Egyptological transcription, the theory that Meroitic 𐦠 transcribes a word-initial vowel /u/ [u] has been mistakenly assumed. Griffith (1916b:122) initiated the assumption that Meroitic 𐦠 was also used to transcribe the vowel /u/ [u]. This section will show that the evidence from Egyptian that Griffith used for this assertion is too weak to maintain.

[17] For more on the discussion of the vowels 𐦡 *e* and 𐦢 *i*, see Chapter 4.

One of the two Egyptian forms that Griffith used for this assertion (§1, 5) *wptj* ~ *wpwtj* is also found transcribed with an initial <*ỉ*>/<*j*>: *ỉpwty*[18] ~ *jpwtj*.[19] The value of Egyptian <*ỉ*>/<*j*> being /ʔ/ (Hodge 1977:933) and where <*ỉ*>/<*j*> is /ʔ/ < /j/ (Loprieno 1995:33) does not support the theory that Meroitic 𐦠 'a' also has the value /u/. It shows that the initial sound of the Egyptian form was subject to a sound change and thus cannot be used as definitive evidence for the Meroitic borrowed form *apote* transcribing the vowel /u/ with 𐦠 'a'.

The second Egyptian form that Griffith used for this assertion comes specifically from the following equivalent form for the theonym "Osiris" (as previously given in §1 (4)), where Egyptian <*w*> /w/ and Coptic **ⲟⲩ** /w/ = Meroitic 𐦠:

(6)	Meroitic	𐦠𐦯𐦣𐦫𐦢	*asori*	theonym
	Coptic	**ⲟⲩⲥⲓⲣⲉ**		
	(<u>Egyptian</u>	*ws-ỉr?*)		

The following discussion re-examines the Egyptological transcription for this theonym. In Egyptology, the theonym "Osiris" has been traditionally transcribed as *ws-ỉr*. However, strong evidence put forward by Muchiki (1990) indicates that the transcription should be read as *ꜣs-ỉr*. Therefore, the name of "Osiris" in Egyptian transcribes a word-initial glottal stop [ʔ][20] and not the labiovelar glide [w].[21] Subsequently, this form cannot be used as primary evidence for the Meroitic sign 𐦠

[18] Form taken from Lesko (2001, Vol. VI:25) who states that this form appears in Gardiner's (1932) *Late Egyptian Stories*.

[19] This variant form appears in Osing (1976:532-3).

[20] According to Loprieno, the value of the Egyptian signs transcribed with <*ꜣ*> 'progressively tends to acquire the realization as glottal stop [ʔ] – an evolution which appears almost completed in the New Kingdom (1550-1050 BCE)' (1995:33). See also Takács (1996:345-352) for reliable lexical isoglosses that demonstrate that Egyptian <*ꜣ*> corresponds to both Semitic ~ Afro-Asiatic *r/*l *and* *ʔ.

[21] During the Ptolemaic era of Egyptian (4th century BCE – 1st century BCE), the writing of "Osiris" starts to be attested written with word-initial <*w*> (hence the Coptic form), see the discussion in §1.1.1 for more on this.

transcribing a simple vowel sign - the vowel /u/.[22] The evidence Muchiki puts forward for this revision to the Egyptological transcription of **ws-ir* to *ȝs-ir* now follows.

The hieroglyphic reading of "Osiris" is 𓊨𓁹𓀭. Each sign is read as 𓊨 = <*ws*>, 𓁹 = <*ir*> ~ <*jr*> and 𓀭 is used as a divine determinative with no phonographic reference. Muchiki (1990:191) outlines how the throne sign 𓊨 has multiple readings. Specifically four different phonographic values have been attributed to this sign: '(1) *s* in *s. t* 'seat'; (2) *ws* in *ws-ir* 'Osiris'; (3) *ȝs* in *ȝs. t* 'Isis'; (4) *ḥtm* in *ḥtmt* 'chair'.' He asserts that:

> The values of *s*, *ȝs* and *ḥtm* have been confirmed by occurrences of the requisite consonantal complements, but the reading *ws* has never been inscriptionally corroborated. What is more, 'Osiris' is the *only* case where the throne-sign has been read as *ws*. Why, then, should 𓊨𓁹𓀭 be read as **ws-ir*?

Muchiki (1990:192) criticises the evidence used by Erman, who advocated the reading <*ws*> for the throne sign 𓊨 only in the theonym "Osiris". He cites and investigates Erman's evidence for this transcription, which was based upon Coptic, Greek and Aramaic forms:[23]

(7)	Coptic	**ⲟⲩⲥⲓⲣⲉ**
	Greek	Ὀσῖρις
	Aramaic	*'WSRY ~ 'SRY*

The Aramaic forms begin with *'aleph* ('),[24] but Muchiki asserts that Erman ignored this, as he did not consider that the initial *'aleph* of *'WSRY* retained its consonantal value because, 'the *'aleph* is not written in such compound forms as *PṬWSRY, PṬWSYRY.*' Muchiki affirms that *'aleph* is not written in Aramaic compound names but this 'does not prove that *'aleph* does not function as a consonant in initial position' (1990:192). He then shows that medial *'aleph* is often elided in compound names because it is probably

[22] See also the discussion in Osing (1974) on the transcription of the name of Osiris as *ȝsr*.
[23] Aramaic is an ancient North-west Semitic language, still spoken in parts of Syria, Lebanon and recently in south east Turkey and northern Iraq. The script belongs to the Semitic group where only the consonants are expressed. For more on the Aramaic script, see Jensen (1970:300-304).
[24] Also, Aramaic *'SRMLK* "Osiris is king" (Kornfeld 1978:41).

followed by a long vowel [u:] e.g. **pete'ūsiri* → *petūsiri*.[25] Muchiki also states that the Coptic and Greek forms are redundant, as they have no means of indicating a word-initial *'aleph* and as such are 'irrelevant in deducing the original reading of any word which had initial *'aleph* [ʔ] or *'ayn* [ʕ]' (1990:192).[26]

The Aramaic forms for the name "Isis" are also cited as further evidence for the corrected reading of *ꜣs-ir* and not **ws-ir* by Muchiki (1990:192). In Egyptian, "Isis" is also written with the throne sign word-initial  where this form is transcribed as *ꜣs.t*. The theonym "Isis" is written in Aramaic as *'A* or *'SY*,[27] and in compound forms, the *'aleph* is again elided: **PṬ'SY* → *PṬSY*: **NP'SY* → *NPSY*. Muchiki (1990:192) summarises this evidence in that:[28]

> It is universally recognised that the name 'Isis' in Egyptian has initial *ꜣ*. Therefore, the attested absence of this *'aleph* within the compound forms does not prove that there was no consonantal *'aleph* at the beginning of the name 'Isis' in Egyptian. When 'Osiris' appears in Aramaic as *'WSRY* as well as *'SR*, then surely the initial *'aleph* in the fuller spelling should be taken as a consonant followed by *w* as a *mater lectionis*. It is impossible, in West-Semitic usage, to consider both *'aleph* and *w* to be vowel letters together, as Erman did.[29]

Muchiki (1990:193) adds to the Aramaic evidence with the form of "Osiris" taken from Phoenician transcriptions.[30] Phoenician scribes transcribed this divine name as *'S[R]* ~ *'SR*, again with an initial *'aleph*.[31] He states that due to the rigid consonantal system of Phoenician, this form 'strongly support[s] the inference that the name 'Osiris' starts with an *'aleph*. Phoenician scribes never fail to catch the initial *'aleph*' (1990:193-194). He also points out a further anomaly with the reading of "Osiris" as **ws-ir* in that

[25] This is in line with the *hamzat-al-waṣl* 'eliding hamza' of Arabic.

[26] See also the Egyptian Aramaic form אוסרי *'WSRY* for "Osiris" in Muraoka & Porten (1998:23) with word-initial *'aleph*.

[27] Also, Aramaic *'SWRY* "Isis is great" (Kornfeld 1978:77).

[28] The Aramaic form of "Osiris" is *'WSRY*, where *W* is used in this form as a *mater lectionis*, i.e. to indicate the vowel /u/. Healey (1990:229) specifies that this is 'the occasional use of certain consonants, particularly **h**, **w** and **y**, to represent vowels. Aramaic from an early date used them for vowels within words as well as at the end of words.' It is interesting for the present discussion that Aramaic also renders Egyptian "Osiris" without the *mater lectionis* - *W*: *'SRY*.

[29] See fn. 31 for the Aramaic form *'WSRY*.

[30] Phoenician is an extinct Semitic language of northwest Syria. The script is also consonantal, see Jensen (1970:283) and Healey (1990:197-258).

[31] See also the forms which correspond to this in Krahmalkov (2000:67).

Aramaic and Phoenician normally render Egyptian <*w*> by *W*.[32] According to Muchiki, this means that 'if "Osiris" were **ws-ir*, the normal Semitic form should be **WSR*' (1990:194), therefore it should be written with word-initial *W*. Muchiki's revised transcription of "Osiris" as *ꜣs-ir* shows a close parallel with the reading of "Isis" *ꜣs.t*.[33] He concludes that this evidence means that 'there is no doubt that the Egyptian form of the name of Osiris should be transliterated as *ꜣs-ir*' (1990:194).

Consequently, this revised Egyptological transcription of the divine name "Osiris" as *ꜣs-ir* and not **ws-ir* weakens the primary claim (along with the form *wpwtj* ~ *jpwtj*) used for the Meroitic word-initial sign 𐦠 as only a vowel sign of varying quality, where one of its values is the back vowel /u/ [u].

1.1.1 Osing's analysis of Osiris

The revision to the transcription of the name of Osiris that Muchiki proposes is also the subject of an earlier study by Osing (1974). In this paper which analyses the names of the gods Isis and Osiris, Osing puts forward that the transcription of *ꜣs.t-jr.t* should be seen as the basic form for the name of Osiris. He states that the initial consonant in the name which developed into Coptic **ⲟⲩⲥ** must have been <*ꜣ*> which was subject to a sound change. He points out that there is still an unexplained development of <*ꜣ*> to the Coptic **ⲟⲩ** although a sound change of <*ꜣ*> to <*w*> is only attested in other forms in adjacent places with the vowel /u/ in the pre-stressed syllable. He proposes that there existed a vowel between <*ꜣ*> and <*s*> and that if this vocalic position is not assumed then the sound change of <*ꜣ*> > <*w*> would be without parallel.

Osing (1974) goes on to state that the throne sign (𓊨) must be interpreted as *ꜣsˁ* / *ꜣuse* which is apparent in the name of Isis and is written in exactly the same way. He concludes that this means that the name of Osiris is made up of the name of Isis. He

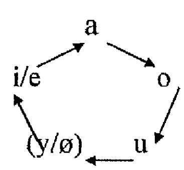
[32] E.g. Aramaic and Phoenician *WḤPRˁ*, Egyptian *wꜣḥ-ib-rˁ*.
[33] Peust (1999b:262), who also cites Osing, assumes an etymological connection between the theonyms "Osiris" and "Isis". He states that 'an etymological connection is appealing since both gods are closely connected to each other both in Egyptian mythology and in the writing of their names.'

discusses some of the issues that this brings up for the understanding of these gods as a combination and leaves the question open for future research.

1.1.2 Egyptian *ꜣs-ir* > Coptic ⲟⲩⲥⲓⲣⲉ "Osiris"

It can now be followed that the divine name "Osiris" in Egyptian, by the time of the New Kingdom (1550-1050 BCE), was probably articulated with a word-initial glottal stop [ʔ], therefore, the precise transcription should be *ꜣs-ir*. The matter now has to be addressed as to how the Coptic form transcribes this same divine name with the back vowel ⲟⲩ /u/ (and the Greek form Ὀ /o/) i.e. ⲟⲩⲥⲓⲣⲉ and Ὀσῖρις. Peust (1999b:223) puts forward evidence for this in that vowel quality from the New Kingdom period (1550-1050 BCE) to Coptic (1st century-1100 CE) was subject to major restructuring in that the vowels shifted in a circular direction so that the pronunciation of most stressed vowels changed.[34] He terms this vocalic progression as 'chain-shifts' and states that similar chain-shifts 'are known to have taken place in other languages of the area roughly at the same time, such as in the Semitic languages … and Greek.'[35] Peust (1999b:223) formulates this chain-shift and describes its process as, 'Between New Kingdom Egyptian and … Coptic, most vowels proceeded one or two steps along the following circle.'

(8)



Since Egyptian did not come to be written with vowels until the Coptic period (1st century-1100 CE), Peust and other scholars have examined Cuneiform transcriptions, where vowels are written, that are contemporary with New Kingdom (1550-1050 BCE) Egyptian words in order to ascertain their likeliest vocalisation. The transcriptions from these other writing systems contemporary with the New Kingdom stage of Egyptian are indicative in determining that the vocalisation by the Coptic stage was markedly

[34] See also Loprieno (1995:46-48) for more on these vocalic sound changes, and Zyhlarz's (1956:32) remark on this chain-shift as a proposal for the pronunciation of the name of *Kush*.

[35] Cf. Fox (1996) for more on vowel shifts in Phoenician and other Near Eastern languages including Greek.

contrastive from the earlier New Kingdom Egyptian vocalisation.[36] Evidently, vocalic chain-shifts are verified.

Interestingly, Peust (1999b:226) cites examples from Meroitic as further evidence for these chain-shifts. He explains that these certain Egyptian words must have passed into a predecessor language of Meroitic around the time of the New Kingdom (1550-1050 BCE) at the latest. This is because the Meroitic language only came to be written from the 2nd century BCE.[37] Peust explains that these Meroitic examples show that they did not take part in the sound changes (chain-shifts) that Egyptian experienced afterwards (the Meroitic forms can be termed as being fossilised). Conclusively, for Peust, the following Meroitic examples confirm the sound shift of Egyptian /a/ > Coptic **ⲱ** /o/ ~ **ⲟⲩ** /u/:

(9) Eg. *ḥr* → Mer. 𐦠𐦫 *ar* → Coptic **ϩⲱⲣ** *hôr* /ho:r/ "Horus"

(Coptic $^{\text{Old}}$**ϩⲁⲣ**, $^{\text{Old}}$**ϩⲁⲣ-ⲡϣⲱⲧ**)

In the example above (9), Meroitic 𐦠 corresponds to Egyptian <*ḥ*> /ħ/ and Coptic **ϩ** /h/, although it is maintained here that 𐦠 represents a CV syllable (this is expanded further on), thereby the vowel of this Meroitic CV sign is the unmarked 'a' [a]. Accordingly, this Meroitic form along with the Old Coptic forms reveal the chain-shift of Egyptian /a/ > (Old Coptic /a/ >) Coptic /o/, whereby the Egyptian theonym "Horus" *ḥr* /ˈħar/[38] is borrowed into Meroitic *ar* /ʔara/[39] along with the Egyptian initial syllable vowel /a/. Since, this stressed vowel in Egyptian diachronically shifts to /o/, the vocalic shift is evidenced in the Coptic written form **ϩⲱⲣ** *hôr* /ˈho:r/.

[36] Due to the lack of any other contemporary non-consonantal script rendering Egyptian words, no substantial evidence can be used to determine the vocalisation of Egyptian for periods prior to the New Kingdom.

[37] However, I point out that just because Meroitic only came to be written circa 2nd century BCE, this does not mean that before this era, the Meroitic language only existed in a predecessor form.

[38] This is possibly vocalised with a word-final vowel.

[39] For consistency in this section's discussion, which rests upon further proposals in the following sections, I am representing the Meroitic sign 𐦠 transliterated as *a* as representing a CV sequence with the glottal stop /ʔ/ in consonantal position which includes the inherent unmarked 'a' [a] vowel.

A further Meroitic example of a divine name is given by Peust (1999b:226), and one which is particularly relevant to Griffith's initial claim for the value of this Meroitic sign, also exhibits the chain-shift of Egyptian /a/ > Coptic ⲟⲩ /u/:

(10) <u>Eg</u>. *ỉmn* → Mer. *amni* → Coptic ⲁⲙⲟⲩⲛ *amun* /amun/ "Amun"

The Meroitic form *amni* has the unmarked vowel 'a' /a/ between *m* and *n* (it is reiterated here that the unmarked 'a' /a/ vowel is not traditionally transliterated in Meroitic studies). The Meroitic phonetic representation of this theonym is [ʔaˈ**mani**]. Furthermore, New Kingdom cuneiform transcriptions also give a word-medial vowel /a/ between *m* and *n* - *a-m**a**-na*.[40] Peust (1999b:226) then shows how this word-medial stressed vowel /a/ shifted to /o/ ~ /u/ from the 1st millennium BCE onwards: Cuneiform *a-m**u**-nu*; Hebrew אמון *'mwn*; Greek αμμων /amm**o**n/ ~ αμουν /am**u**n/; Coptic ⲁⲙⲟⲩⲛ /am**u**n/.

Peust (1999b:226) summarises this evidence in that the Egyptian vowel /a/ 'was preserved as such … in the ancient language(s) to the south of Egypt, whereas it shifted to *u* [diachronically] in Egypt itself.'[41] Furthermore, Peust (1999b:72) states that:

> It is curious to note that these [Meroitic] borrowings, despite their comparatively late date of attestation, show archaic phonetic features known elsewhere only from cuneiform transcriptions of the 2nd Millennium BC. So we can stipulate that these words had already spread south during the New Kingdom – a time when the area was politically dependent upon the Egyptian empire – and then failed to undergo the sound changes which subsequently took place in Egypt.

It is also evidenced that the vocalic chain-shift applies to the vocalisation of the divine name "Osiris". This is important to note, as it allows us to posit the stress placement of

[40] Peust (1999b:28) specifies that, 'The official correspondence of New Kingdom Egypt with its Asian provinces was recorded in Akkadian, a Semitic language written in cuneiform which some Egyptian scribes were taught as a foreign language.' I assume that this New Kingdom cuneiform transcription is taken from this correspondence in Akkadian cuneiform.

[41] Peust is referring to Meroitic and Nubian as the ancient languages to the south of Egypt, as he cites further evidence for chain-shifts from Nubian. For more on Coptic vowels, see Peust (1999b:226-258).

this theonym, and thereby can explain the change in the Egyptian transcription of *ȝs-ir* becoming written as *ws-ir* during the Ptolemaic era, and subsequently as Coptic **ⲟⲩⲥⲓⲣⲉ**.

This evidence comes from the Meroitic form ɥω/35ϛ *asori* for the theonym "Osiris". It has already been discussed above how Meroitic fossilised the vowels of Egyptian before the process of the stressed vocalic chain-shift changed their quality. In the Meroitic form of ɥω/35ϛ *asori* the penultimate vowel is / *o* /u/, although in the Coptic form **ⲟⲩⲥⲓⲣⲉ** the vowel is **ⲓ** /i/. In determining this change, it is evidenced that the Coptic vowel **ⲓ** /i/ has shifted two stages along from the vowel /u/ as in Peust's (1999b:223) example above (8). It can therefore be proposed that the Meroitic form indicates that the stress is on the penultimate vowel [ʔaˈsuri].[42]

Since we are now in a position to define the stress placement in the Egyptian form *ȝs-ir* we can now account for the change from Egyptian *ȝs-ir* to the Ptolemaic era form *ws-ir* (and the Coptic form **ⲟⲩⲥⲓⲣⲉ**). The Egyptian form *ȝs-ir* can be reconstructed as /ʔuˈsurV/.[43] Importantly Peust states that diachronically <*ȝ*> /ʔ/ is 'always lost in pretonic position' (1999b:149).[44] This pretonic loss of <*ȝ*> /ʔ/ results in /uˈsurV/, whereby the pretonic word-initial vowel /u/ is interpreted as a consonantal glide <*w*> /w/ (Egyptian does not represent vowels until the Coptic stage) resulting in the Ptolemaic era written form of "Osiris" as *ws-ir*. This development is also able to explain the Greek and Coptic forms with word-initial /w/ ~ /u/ i.e. Greek Ὄσῖρις, Coptic **ⲟⲩⲥⲓⲣⲉ**.

The Meroitic form is solid evidence for the stress placement in the theonym "Osiris", indeed Peust (1999b:262) proposes a similar analysis of the diachronic change of

[42] The reason as to why I am transcribing these forms in phonetic transcription will be made clear in §3.7.
[43] The evidence for the vowel quality of the initial syllable in this Egyptian theonym "Osiris" being /u/ [u] comes through the Coptic and Greek forms where this initial syllable is pretonic and as such is not subject to the chain-shift process. This is not to say though that the vowel of the initial syllable in the equivalent Meroitic form is [u], see the discussion in §3.7 for more on this.
[44] However, some forms are evidenced where <*ȝ*> /ʔ/ is not only lost in pretonic position: New Kingdom Egyptian > Coptic: Eg. *ȝtp* /ˈʔat̠pV/ > Coptic **ⲱⲧⲡ** /ˈotp/ "to load"; Eg. *ȝpd* /ˈʔapdV/ > Coptic **ⲱⲃⲧ** /ˈoβt/ (Peust 1999b:143-44).

Egyptian *ꜣs-ir* > Coptic **ⲟⲩⲥⲓⲣⲉ**, although he does not discuss the Meroitic form as evidence for the proposal of the stress placement:

> … in the name of the god Osiris (Coptic ⲟⲩⲥⲓⲣⲉ). The pretonic ⲟⲩ points to an initial consonant <*w*> of the Egyptian predecessor, which is indeed attested in writing during Ptolemaic times. On the other hand, the more ancient writings of this name, although phonetically hard to interpret, can probably only be read with initial <*ꜣ*> … If we assume that the pretonic vowel was /u/, we can reconstruct the Egyptian form as (*ꜣ*uˈsurV) (or similarly) which after the loss of <*ꜣ*> may have been reinterpreted as (ˈwsurV).

However, under Peust's analysis, the change in the placement of the stress from penultimate (*ꜣ*uˈsurV) to antepenultimate (ˈwsurV) position would not be able to explain the change in the quality of the penultimate vowel from /u/ being realised in Coptic as **ⲓ** /i/. That is, how does the unstressed vowel /u/ in the form (ˈws**ur**V) chain-shift to /i/ in the Coptic **ⲟⲩⲥⲓⲣⲉ** /ˈusirɛ/?[45] Unless the stress moved after the chain-shift process had taken place, I consider that the forms are better explained with no change on the placement of stress.

The Ptolemaic era form *ws-ir* for "Osiris" is further discussed by Muchiki (1990:192) where this is written in hieroglyphs as .[46] This form is transcribed as *ws-ir* with a word-initial labial glide <*w*> /w/. He states that this was also used as evidence by Erman for the transcription of "Osiris" as *ws-ir. However, Muchiki (1990:192) points out that 'we must bear in mind that this writing is only attested from the Greek period [Ptolemaic], and that the Greek and Coptic forms of "Osiris" may reflect merely the vocalization of these periods, when *ʾaleph* and *ʿayn* went out of use.'[47] However, he does further point out that there is evidence that Egyptian <*ꜣ*> /ʔ/ was still in use at times during the 5th century BCE (1990:194).[48] A correspondence between Egyptian <*ꜣ*> /ʔ/ and Aramaic *ʾaleph* is found in the toponym "Abydos", Egyptian *ꜣbḏw* →

[45] Peust puts forward that through etymological evidence, 'Unless (ⲉ)ⲓ and (ⲟ)ⲩ are stressed vowels, they always correspond to consonantal phonemes of Egyptian' (1999b:260), and furthermore that 'Coptic has practically no graphical means of distinguishing glides (/j/, /w/) from the corresponding vowel phonemes (/i/, /u/)' (1999b:260).

[46] The Ptolemaic/Roman era is circa 4th century BCE – 1st century CE.

[47] It is noted that Coptic #ⲟⲩ_ usually corresponds to Egyptian <*w*>, e.g. Eg. *wꜣḏ* > Coptic **ⲟⲩⲱⲧ** "green"; Eg. *wdḥ* > Coptic **ⲟⲩⲧⲁϩ** "fruit". However, this can be explained, as Muchiki points out, that the Coptic form **ⲟⲩⲥⲓⲣⲉ** was taken from the Ptolemaic era form *ws-ir*.

[48] The period just before the Ptolemaic era.

Aramaic *'BWṬ*.[49] Thereby proving that Egyptian <ꜣ> /ʔ/ did not completely drop out of use at this time and that it could be represented by Aramaic (Semitic) *'aleph* into the Late Period (525 – 332 BCE).

1.1.3 Egyptian *ꜣs.t* > Coptic ⲏⲥⲉ "Isis"

As already discussed, the etymologically related form for the theonym "Isis" is also written with the word-initial throne sign 𓊨𓆇𓏏, transcribed as *ꜣs.t*. Muchiki (1990:192) outlined that Aramaic and Phoenician forms render the initial Egyptian <ꜣ> /ʔ/ with *'aleph* in their transcriptions of this theonym.[50] Peust (1999b:262 fn. 326) reconstructs Egyptian *ꜣs.t* with the glottal stop (<ꜣ> /ʔ/) followed by the back vowel /u/ i.e. ˈꜣustV /ʔustV/.[51] His reconstruction of the theonym "Isis" is to bring it in line etymologically with his reconstruction of "Osiris" as ꜣuˈsurV. However, Peust does not take up the discussion on how Egyptian *ꜣs.t* > Coptic ⲏⲥⲉ (more specifically how Egyptian /ʔustV/ > Coptic /esɛ/).[52] The discussion into the reasons for this diachronic change now follows, as this gives an indication into the stress placement of this theonym, which is important to the discussion in §1.1.3.

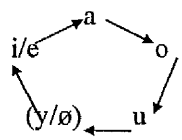
Coptic scholars generally have two different views of the phonemic representation of the Coptic vowel letters ⲏ and ⲉ. According to Loprieno (1995:15), the Coptic sign ⲏ represents the long vowel /e:/ as he follows the tradition that the difference between the Coptic vowel signs ⲏ and ⲉ is one of vowel quantity i.e. ⲏ - /e:/ and ⲉ - /e/. This quantity distinction is rejected by Peust (1999b:201), who asserts that there is 'little evidence for this claim. The main argument seems to be the fact that the respective Greek letters indicate vowel quantity in Classical Greek.'[53] He argues that the difference

[49] This Egyptian toponym *ꜣbḏw* also shows the diachronic pretonic loss of <ꜣ> [ʔ] and perhaps a vocalic shift in the Coptic form – ⲉⲃⲱⲧ /əˈβot/ (Peust 1999b:149).
[50] Egyptian "Isis" *ꜣs.t* is transcribed in Aramaic as *'S* ~ *'SY* (Muchiki 1990:193), and similarly in Phoenician (Krahmalkov 2000:65).
[51] The word-final vocalisation is Peust's theory, see Peust (1999b) for the reasons into this.
[52] The given phonemic representation of the Coptic form ⲏⲥⲉ /esɛ/ follows Peust's argument on the quality distinction of the vowels ⲏ and ⲉ.
[53] The Coptic vowel signs are derived from the Greek, although 'their phonetic values are obviously not quite identical to those of Greek' (Peust 1999b:205).

between Coptic ⲏ and ⲉ is one of vowel quality.[54] Peust proposes that the Coptic vowel ⲏ is higher in articulation than ⲉ (1999b:202).[55] Therefore, ⲏ - /e/ and ⲉ - /ɛ/, this means that in the Coptic written form ⲏⲥⲉ for the theonym "Isis" is phonemically /esɛ/. We are now in a position to explain the diachronic change from Egyptian *ꜣs.t* > Coptic ⲏⲥⲉ.

Peust (1999b:204) asserts that the Coptic vowel ⲏ /e/, in many instances, is derived from original (Egyptian) /u/. Peust charts (1999b:223) the development evidenced in cuneiform documents of the late 2nd millennium BCE of an Egyptian vowel /u/, which shifts to the vowel /e/ (ⲏ) by the Coptic stage.[56] The chain-shift model is repeated below:

(11)



(Peust 1999b:223)

Peust's (1999b:262) reconstruction for the Egyptian theonym "Isis" *ꜣs.t* as /ˈʔustV/ is credible.[57] In the Egyptian form, the initial sign <*ꜣ*> /ʔ/ is followed by the back vowel /u/, there is diachronic loss of the word-initial glottal stop /ʔ/,[58] the word-initial stressed back vowel /u/ is then subject to the chain-shift process resulting in /e/ by the Coptic stage of the language. Thus, the name "Isis" is written in Coptic as ⲏⲥⲉ /ˈesɛ/.

1.1.4 Evidence from Meroitic

The Meroitic form of the theonym "Isis" is written as 3/Ƨ *wos*, which can be phonemically transcribed as /wusa/.[59] This Meroitic form gives a clear indication that

[54] The arguments that Peust puts forward cannot be summarised here, for a fuller discussion, see Peust (1999b:201-210).
[55] Cf. Greenberg (1962) for this same treatment of the Coptic vowels.
[56] An example of this is the Egyptian toponym *nꜥ.t* "Thebes", which is attested as *nu*-[…] in cuneiform transcription of the New Kingdom > Coptic ⲛⲏ /ne/ (Peust 1999b:232).
[57] I am only concerned with the first syllable that Peust proposes for this theonym. The word final vowel is specifically Peust's theory that does not concern the present discussion.
[58] As discussed, the phoneme /ʔ/ is not only lost in pretonic position.
[59] Cf. Rilly (2007:289), for an alternative proposal for the realisation of this theonym.

the vowel of the initial syllable of this theonym was the back vowel /u/,[60] borrowed from Egyptian at a period before the vocalic chain-shift process of /u/ > /e/. Further, the Meroitic form shows the labio-velar glide 𐦥 *w* /w/ word-initially - 𐦥𐦣𐦯, where the Egyptian form has the glottal stop <ꜣ> /ʔ/ - *ꜣs.t*.

What is interesting is that in Meroitic there also exists a rare, archaic variant form of this same theonym written as 𐦠𐦯 *as*, with the word-initial sign 𐦠 *a* rather than 𐦥 *w*.[61] What does this archaic variant form lead us to conclude about the Meroitic realisation of this theonym? This could be a primary indication that the Meroitic sign 𐦠 *a* actually represents a glottal stop /ʔ/ [ʔ] including the inherent unmarked low vowel 'a' at phonetic realisation [a].[62] This would result in the phonetic representation of this form as [ˈʔasa].[63] Initially, the Meroites were trying to be faithful to the Egyptian representation of this theonym, which had a word-initial glottal stop *ꜣs.t* /ˈʔustV/. Furthermore, it can also be proposed that the inherent vowel of the Meroitic sign 𐦠 at phonetic realisation was not the back vowel [u] but the low vowel [a], and it was specifically this difference between the syllable initial vowels of the Egyptian and Meroitic forms that motivated the Meroites' necessity to change the written representation of "Isis" from 𐦠𐦯 *as* [ˈʔasa] to 𐦥𐦣𐦯 *wos* /ˈwusa/ [ˈwusa].

I propose that the evidence for the change in these Meroitic forms comes from the stress assignment. Katamba (1989:221) states that 'vowels in stressed syllables have clear or full quality while vowels in unstressed syllables are reduced.' The Egyptian form of "Isis" *ꜣs.t* /ˈʔustV/ is stressed on the first syllable (Peust 1999b:175-188), whereby the vowel /u/ would therefore have a clear quality. It is proposed here that it is this clarity of the /u/ vowel in this Egyptian form which motivated the Meroites to represent this in

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[60] For more on the Meroitic vowel 𐦣 *o* /u/, see Chapter 4, §3.

[61] Rilly remarks on this variant form (REM 0049) that it is easier to explain if we assume 𐦠 is also /u/ (2007:289). Cf. Hofmann (1981a:42).

[62] I am essentially defining here that it could be the case that there was underlying /ʔu/ → phonetic [ʔa]. The reasons into this are given in §3.7, and so for present purposes I am representing only the Meroitic phonetic forms.

[63] Furthermore, it could be the case that the phonetic realisation of the word-final vowel /a/ → [e] following a coronal consonant see the discussion in Chapter 5.

changing their transcription of this form from earlier 3ςʅ *as* [ˈʔasa] to the later form 3/Ƃ *wos* /ˈwusa/ [ˈwusa].

Through the analysis of the theonym "Isis" in Meroitic, it cannot be maintained that the sign ςʅ transcribed the back vowel /u/. If this indeed were the case, why do we find a change from the archaic variant form 3ςʅ *as* */usa/ to the standard form 3/Ƃ *wos* /wusa/, as surely this change would have been unnecessary.[64]

Fundamentally, this change in the Meroitic written form for the representation of "Isis" is indicative of the vocalisation and representation of "Osiris" in Meroitic.

2 Meroitic ɥω/3ςʅ *asori* "Osiris"

The discussions put forward in the above sections are taken into consideration for the analysis of Meroitic ςʅ in the theonym "Osiris" ɥω/3ςʅ *asori*. This theonym has been used as primary evidence for the assertion that Meroitic ςʅ represents a vocalic sign, which not only represents the low vowel /a/, but also the back vowel /u/ (Griffith 1911:12 fn. 2, 1916b:122; Hofmann 1981a:42, 1982:47; Hintze 1987:48-49; Rilly 2007: 287-290).[65]

Since the theonym "Isis" in Meroitic was changed from 3ςʅ *as* to 3/Ƃ *wos*, in order to represent the back vowel /u/ [u] of the initial stressed syllable, as I claimed above, then the question must be asked why the theonym "Osiris" in Meroitic was not accordingly changed? Specifically, whether or not the Egyptian form for "Osiris" *ꜣs-ir*

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[64] Rilly (2007:399) remarks on a rare variant form of "Isis" as 3ɥƂ *wis* [wisa]. This form alternates with the more standard form 3/Ƃ *wos*, for Rilly, realised as [uːʂa]. He states that it is possible that the initial [uː] changed to [wi] in certain conditions through an articulatory shift of "dislocation" such as ku → kwi, seen in languages such as Tswana (Bantu). However, I advance an alternative proposal in light of the evidence of chain-shifts in Egyptian through to Coptic. It could also be the case that the Meroites were representing the vowel of the intermediate stage in the Egyptian chain-shift: u → y → i/e (it was shown (§1.1.2) that the vocalic shift is evidenced in the Coptic form ⲏⲥⲉ /esɛ/). It is possible, therefore, that this intermediate stage of the front rounded vowel [y] in Egyptian "Isis" /ysɛ/, was interpreted with [wi] in the Meroitic variant form of this theonym 3ɥƂ *wis*.

[65] Some of these scholars have proposed that ςʅ could represent other vowels than these two; see the discussion given in §1.

actually had the back vowel /u/ in the initial syllable i.e. /ʔusurV/, the fact remains that Meroitic did not transcribe *3s-ir* as * 𐦥𐦣𐦰𐦣𐦬𐦢 **wosori* */wusuri/ [wusuri], but as 𐦠𐦰𐦣𐦬𐦢 *asori* [ʔasuri]. Therefore, the Meroites must have remained faithful to the Egyptian representation of the theonym "Osiris" with the word-initial glottal stop <3> /ʔ/, which is contrary to their representation of "Isis" *3s.t* as 𐦥𐦣𐦰 *wos*. What can be concluded as to these differences in Meroitic faithfulness to the Egyptian forms? Can the explanation be found in their varying syllabic structures?

As already outlined, according to the syllable structure rules Peust (1999b:175-188) proposes, "Isis" *3s.t* has tonic stress on the initial syllable /ˈʔustV/,[66] whereas "Osiris" *3s-ir* has tonic stress on the second syllable /ʔuˈsurV/. It is possible that the force of tonic stress on the initial syllable of "Isis" /ˈʔustV/ in Egyptian, influenced the Meroites representation of the stressed vowel /u/ [u] being more pronounced at the expense of its preceding consonant <3> /ʔ/ [ʔ], hence the Meroitic change from the written representation 𐦠𐦰 *as* [ˈʔasa] to 𐦥𐦣𐦰 *wos* /ˈwusa/ [ˈwusa]. Consequently, the pretonic consonant <3> /ʔ/ of Egyptian "Osiris" *3s-ir* /ʔuˈsurV/ *was* represented by the Meroites 𐦠𐦰𐦣𐦬𐦢 *asori* [ʔaˈsuri].

2.1 Pretonic loss of Meroitic *a* 𐦠 𐦀

The stress assignment of Meroitic forms obviously cannot be exactly detailed, but there are common variant forms where the Meroitic sign 𐦠 is frequently omitted. Nevertheless, forms in which this sign 𐦠 is omitted can lead us to propose their stress assignment. It is claimed here that the omission of 𐦠 is due to its pretonic position in the word.[67] When 𐦠 is not in a pretonic position, there is no omission of this sign (and

[66] Further, because it is this initial syllable that is evidenced as chain-shifting from /u/ > /e/ by the Coptic stage (§1.1.2).
[67] This section supports Rilly's (2007:288 fn. 5) observation that the preservation or disappearance of the word 'voyelle initiale' i.e. the sign 𐦠 is the result of prosodic phenomena. Rilly supports the theory that Meroitic 𐦠 is a vowel sign (V) that then deletes (aphesis), rather than the view put forward here that it represents the laryngeal /ʔ/ which includes the unmarked 'a' [a] vowel (CV) that then deletes (aphaeresis).

hence this CV syllable). In comparison, we know that in Egyptian, the phoneme <ꜣ> /ʔ/ is mostly always diachronically lost in pretonic position (Peust 1999b:149). A sample list of the Meroitic variant forms is given below:

(12)	Earlier forms with word-initial		Later forms without word-initial		
a.		*amni*		*mni*	"Amun"
b.		*abr*		*br*	"man"
c.		*asori*		*sori*	"Osiris"

(12a) *amni* > *mni* "Amun"

It was previously detailed how the Egyptian form of this theonym *imn* was stressed on the second syllable /ʔVˈmanV/:[68] the Meroitic form *amni* transcribes this Egyptian theonym with the unmarked low vowel 'a' /a/ between *m* and *n* [ʔaˈmani], where this stressed low vowel /a/ has chain-shifted to /u/ ⲁⲙⲟⲩⲛ /aˈmun/ by the Coptic stage of Egyptian.[69] This analysis can show that the Meroitic form *amni* [ʔaˈmani] indicates that the sign [ʔa] is in a pretonic position and subsequently it is subject to aphaeresis resulting in the later written form *mni* [ˈmani].[70]

(12b) *abr* > *br* "man"

From the discussion of (12a) above, I postulate that this Meroitic noun form *abr* has the representation [ʔaˈbara], with stress on the penultimate syllable. This leads to the sign , representing the syllable [ʔa], being deleted due to its pretonic position,

[68] Griffith also states in his discussion of the vowel placement of this Egyptian form that, 'in Egyptian the long vowel and stress preceded the *n*' (1916b:120).
[69] Re: §1.1.1.
[70] See Rilly (2007:395), who outlines that the 'initial a' of the theonym "Amun" in the Meroitic texts is mainly preserved unless the theonym is suffixed with the genitive postposition. In accounting for this, he states that it is plausible that the addition of the postposition modified the prosodic structure.

as the syllable [ʔa] is subject to aphaeresis, and so the later form *br* is evidenced.[71]

(12c) *asori* > *sori* "Osiris"

The vocalic process of stressed vowels being subject to chain-shifts between New Kingdom Egyptian and Coptic is solid evidence for the stress assignment of this theonym. As already discussed (§1.1.1), the Meroitic form *asori* is phonetically realised as [ʔaˈ**su**ri], containing the stressed vowel [u] on the penultimate syllable. The reasons for this, as already discussed, is that when the Meroitic form is compared to the Coptic **ⲟⲩⲥⲓⲣⲉ** /usirɛ/, it can be seen that the chain-shift has taken place: /u/ > /i/.[72] We know that the stressed vowels are subject to this process; hence, we can now explain the deletion of the word-initial sign. The Meroitic stress is on the penultimate syllable [ʔaˈ**su**ri], this means that [ʔa] is in pretonic position and consequently is subject to aphaeresis. This results in the later written form *sori* [ˈsuri].[73]

2.2 Meroitic forms with no loss of *a*

There are also forms in Meroitic where there is no aphaeresis of word-initial [ʔa]:

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[71] There is a well-known Meroitic anthroponym *brtoye* (REM 1088) ~ *bertoye* (Rilly 2007:289), that is written in contemporary Greek as Ἀβρατοεις (Eide *et al* 1998:1020-1023). Rilly (2007:289) asserts that this Greek form is evidence that even though the Meroitic form *brtoye* does not write the initial sign it must have been pronounced. In taking into consideration this form, could it be the case therefore, that it was specifically only the laryngeal /ʔ/ that was subject to deletion – this would be similar to the Egyptian process – leaving the inherent low vowel [a] remaining in pronunciation. However, because the 'initial a' sign does represent a CV syllable [ʔa], the system of the Meroitic script was unable to accommodate a purely inherent low vowel [a] independently, and so it was left unwritten - *brtoye*. It is reiterated here that it is the inherent nature of the script in being syllabic where every 'consonant' sign includes the unmarked 'a' /a/ [a] that meant that the Meroitic script had no way of notating *this* vowel without a consonant preceding (unless the structure of the script was to be revised).

[72] The Egyptian form is *ꜣs-ir* /ʔusurV/, whereby the Meroitic form must have 'fossilised' the stressed vowel at a period before the chain-shift process happened.

[73] The deletion of word-initial glottal stops in Ethio-Semitic languages is remarked on by Ullendorf (1955:43), who points out that, 'the articulation of ʾ does, in fact, exist in Cushitic languages, although initially it is often omitted. Thus: Sem. *ʾkr*; Gəʿəz *hagär;* Amh. (ʾ)*agar*; Galla *irge*; Somali *hag.*'

(13)

a.		*ar*	theonym	"Horus"
b.		*arome*	toponym	"Rome"
c.		*ant ~ at*	title	"Priest"

For the first two forms "Horus" and "Rome" in (13a) and (13b) above, I agree with Rilly's (2007:287 fn. 5) statement that no aphaeresis can take place because the following consonant *r* /r/ would then be in a word-initial position and this is prohibited, since there is a phonotactic restriction that disallows /r/ from occurring word-initially in Meroitic.[74] However, it can also be shown in the case of the Meroitic form for the theonym "Horus", the word-initial [ʔa] is the stressed syllable and so is not subject to aphaeresis. Again, evidence for this comes through the vocalic chain-shift process. As already discussed (§1.1.1), the Meroitic form *ar* [ʔ**a**ra] has fossilised the low vowel /a/ [a] from the Egyptian *ḥr* /ħ**a**r/, where diachronically this stressed vowel chain-shifts to /o/, as evidenced in the Coptic form **ϩⲱⲣ** *hôr* /h**o:**r/. From this evidence, the Meroitic stress is therefore on the penultimate syllable [ˈʔara], whereby, the sign *a* representing the syllable [ʔa] is not in a pretonic position in which to be subject to aphaeresis.

The third form in (13c) above, ~ *ant ~ at* "Priest", is interesting as evidence is put forward to show that the placement of stress is on the first syllable of the archaic and late forms. Consequently, there is evidence of reduction and subsequent syncope of the post-tonic penultimate vowel and this analysis can explain the change from the archaic to the late written forms.[75]

[74] See Chapter 2, §5, for more on this issue.

[75] Rilly (2007:395) defines this neutralisation as taking place during the first century CE. He also proposes that the reduction of this vowel is probably due to the positioning of the vowel in the word or to the force of tonic stress. See Chapter 4, §1.2.2, for more on this process of reduction.

The archaic form for "Priest" 𐦠𐦪𐦵 *ant* is phonemically represented as /ʔanata/.[76] However, the nasal sign 𐦪 *n* /na/ is not written in the late period form 𐦠𐦵 *at*, as the nasal has become resyllabified into coda position due to diachronic vowel reduction/weakening and subsequent complete syncope of the following vowel:[77]

(14) 𐦠𐦪𐦵 *ant* /ˈʔanata/ > /ˈʔanəta/ > /ˈʔanta/ = 𐦠𐦵 *at*

The vowel weakening of the penultimate syllable can be explained by it being in an unstressed (post-tonic) position, i.e. the stress is on the antepenultimate (first) syllable /ˈʔanata/ > /ˈʔanəta/ > /ˈʔanta/.[78] Therefore no aphaeresis of the sign 𐦠 representing the syllable [ʔa] takes place, and so there are no variant forms with the deletion of this word-initial 𐦠.[79]

3 Evidence for *a* 𐦠 𐦀 as [ʔa]

This section puts forward further evidence for the proposal of the representation of the Meroitic sign 𐦠 as [ʔa]. The following equivalent forms are updated and also found in Griffith (1911, 1916b) and Rilly (2007):

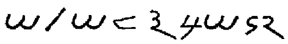
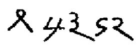
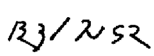
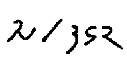
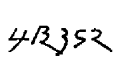
[76] For the possibility that there is a process of vowel raising following the coronal consonants /s, n, t/ in Meroitic, see the investigation in Chapter 5. To summarise: the coronal consonants /n/ and /t/ in the form 𐦠𐦪𐦵 *ant* phonemically include the unmarked low vowel 'a' /a/. It is a theory put forward in this chapter that the unmarked 'a' /a/ vowel raises to [e] when it follows one of these coronal consonants.

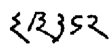
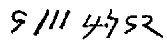
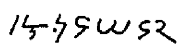
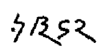
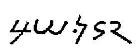
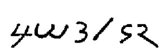
[77] Evidence for the realisation of the nasal consonant in this Meroitic form comes through the Egyptian *ḥm-nṯr* and Coptic ϩⲟⲛ̄ⲧ equivalences. For more on the Meroitic written omission of the nasal sign in coda position (closed-syllable) see Chapter 5, §4.4. David Appleyard (p.c.) brought my attention to another reason for this word-initial stress placement is on the Egyptian compound.

[78] Furthermore, stress in general, is attracted to heavy syllables, i.e. those containing a consonant in coda position e.g. ˈCVC(C).

[79] A salient point made by Griffith (1911:71) and picked up by Rilly (2007:303), which warrants further investigation is that the deletion (aphaeresis) of the 'initial a' sign in the theonym *amni* and its derivatives, seems to be blocked when the word-final vowel of the preceding word is 𐦡 *e*. See Chapter 4, §4 for more on this Meroitic vowel. A cursory proposal is that this could indicate elision of the 'initial a' sign due to being intervocalic, albeit across a word-boundary, and perhaps there is usually a length duration on Meroitic word-final vowels, but when the vowel 𐦡 *e* precedes, which perhaps is only short, this does not cause elision as it is only triggered when the preceding vowels are long – as similar to the Aramaic examples, see §3.6.

(15)

a.	Meroitic		*arikḫror*	anthroponym
	Egyptian		*ỉrk-nḫrr*	
b.	Meroitic		*akine*	toponym
	Demotic		*ꜣkjny*	
	Latin		*acina*	
	Egyptian		*jqn, ꜥqnꜣ.t, iqn, ỉkn, ỉkinꜣ*	
	Greek		Ἀχίνη	
c.	Meroitic		*akroro*	title
	Demotic		*ꜣkrrj*	
d.	Meroitic		*arebetke*	title
	Demotic		*ꜣrbtgꜥye ~ ꜣrbtngyꜥ*	
e.	Meroitic		*aborepi*	toponym
	Egyptian		*ỉbrp, jpbrp, jpbrpt, jbbrꜥnḫt, jbr, ꜣbr, jpr-mk*	
f.	Meroitic		*adomn*	toponym
	Latin		*andumana* (?)	
g.	Meroitic		*amod*	toponym
	Latin		*amoda*	
h.	Meroitic		*amni*	theonym
	Egyptian		*ỉmn*	
	Coptic		Boh ⲀⲘⲞⲨⲚ	

i.	Meroitic		*amnp*	theonym
	Egyptian		*ỉmn(-m-)ỉp.t*	
	Greek		ἀμενῶφις	
j.	Meroitic		*atiye*	toponym
	Egyptian		*ḥ(w).t –tiy, jttyt*	
k.	Meroitic		*arette*	theonym
	Egyptian		*ḥr-nd-ỉt=f*	
	Greek		Ἀρενδωτης	
l.	Meroitic		*ant*	title
	Egyptian		*ḥm-ntr*	
	Coptic		[Sah, Boh] ϩⲟⲛⲧ	
m.	Meroitic		*atri*	theonym
	Egyptian		*ḥ.t-ḥr*	
	Demotic		*ḥwt-ḥr, ḥ.t-ḥr*	
	Greek		Ἀθυρ	
n.	Meroitic		*asori*	theonym
	Egyptian		*ȝs-ỉr*	
	Coptic		ⲟⲩⲥⲓⲣⲉ	
o.	Meroitic		*ar*	theonym
	Egyptian		*ḥr*	
	Demotic		*ḥr*	
	Coptic		[Sah] ϩⲱⲣ, [Old] ϩⲱⲗ, [Old] ϩⲁⲣ, [Old] ϩⲣ, [Old] ϩⲁⲣ-ⲡϣⲱⲧ	

p.	Meroitic		*arome*	toponym
	Egyptian		*jrm, jrmj, jrmjw, jrmy, hȝlmˁ(t)*	
	Demotic		*hrme*	
	Coptic		**ϩⲣⲱⲙⲏ**	
	Latin		*roma*	

q.	Meroitic		*apote*	title
	Egyptian		*ỉpwty, jpwty* (*wpwtj*)	

These equivalences show the following phonemic correlations:

(16)

a.	Meroitic *a* = Egyptian	<*ỉ*> /ʔ/,[80] <*ḥ*> /ħ/, <*ȝ*> /ʔ/
b.	Meroitic *a* = Eg. dem.	<*ȝ*> /ʔ/
c.	Meroitic *a* = Coptic	ϩ /h/
d.	Meroitic *a* = Greek	Ἀ /a/
e.	Meroitic *a* = Latin	*a* /a/

3.1 The correspondence between Egyptian <*ỉ*> /ʔ/ and Meroitic *a*

The correspondence between Egyptian <*ỉ*> /ʔ/ and Meroitic [ʔa] is very indicative. Loprieno (1995:33) gives the phonemic representation of Egyptian <*ỉ*> as diachronically shifting, during the Middle Kingdom (2000-1750 BCE), from /j/ > /ʔ/ before 'an unstressed vowel in initial position (*/ja'nak/ > */ʔa'nak/ "I")'. It can be seen how this representation is applied to the Egyptian form *ỉmn*. We know that the stress of the Egyptian form *ỉmn* is on the second syllable /ʔa'manV/, through the chain-shift of

[80] I follow Loprieno's (1995:33) and Hodge's (1977:933) theory that Eg. <*ỉ*> is /j/ > /ʔ/, contra Peust (1999b:97-97), who supports the realisation of Eg. <*ỉ*> as only the glide /j/. Peust (1999b:97) does state that the question of whether there were glottal stops /ʔ/ in Egyptian is 'difficult to judge.' It is highly problematic to the theory that Egyptian <*ỉ*> is only /j/ when this Meroitic equivalence is examined. If it was the case that Egyptian <*ỉ*> is only /j/, then why is this Meroitic equivalence of Egyptian <*ỉ*> not transcribed with the Meroitic glide sign *y* /j/? E.g. Egyptian *ỉmn* is transcribed in Meroitic as *amni* and not as * **ymni.*

the stressed vowel /a/ (/ʔaˈmanV/) to /u/ in the Coptic form ⲁⲙⲟⲩⲛ /aˈmun/ (see also §1.1.1).[81] Therefore, we expect the phonemic representation of the Egyptian form *ỉmn* with <*ỉ*> as /ʔ/ because it is before an unstressed vowel in initial position /ʔaˈman/, that is, the vowel /a/ of the initial syllable is unstressed and <*ỉ*> /ʔ/ occurs before it. Subsequently, there is a direct correlation between Egyptian <*ỉ*> /ʔ/ and Meroitic 𐦠 [ʔa].

3.2 The correspondence between Egyptian <*ḥ*> /ħ/ (> Coptic ϩ /h/) and Meroitic *a* 𐦠 𐦀

The Egyptian sign <*ḥ*> represents the guttural consonant /ħ/, a voiceless pharyngeal fricative (continuant).[82] There is no evidence for the existence in the Meroitic inventory of this phoneme, therefore it could be the case that the Meroites represent Egyptian <*ḥ*> /ħ/ with their nearest equivalent guttural phoneme – /ʔ/, which is incorporated into their CV sign 𐦠 [ʔa]. McCarthy (1994b:192) states that 'the [pharyngeal] consonants are produced with a constriction anywhere in the entire region that encompasses the larynx through to the oropharynx,' and follows Hayward & Hayward's (1989) proposal, evidenced through a particular phonological processes, that the guttural consonants should be defined by a 'zone' of articulation rather than a specific place.[83]

By the Coptic stage of Egyptian, Egyptian <*ḥ*> /ħ/ had merged with the laryngeal /h/, and subsequently both sounds conflated into ϩ /h/ (Peust 1999b:99). Here also we have a correlation between Egyptian/Coptic guttural phonemes and the Meroitic laryngeal (guttural) 𐦠 [ʔa].

[81] New Kingdom cuneiform transcriptions give the vowel of the second syllable as /a/ – *a-ma-na*. This is evidenced in the Meroitic phonetic representation [ʔamani].
[82] Cf. Peust (1999b:98-99) for evidence of this phonemic representation.
[83] See Chapter 2, §7.5 for more on this phonological process.

3.3 The correspondence between Egyptian and Demotic <ꜣ> /ʔ/ and Meroitic *a* 𐦠 𐦀

Egyptian and Egyptian Demotic forms transcribed with <ꜣ> also have the phonemic realisation of /ʔ/ (Loprieno 1995:33). It is evidenced that Meroitic 𐦠 [ʔa] is used to represent both this Egyptian and Egyptian Demotic phoneme.

3.4 The correspondence between Greek Ἀ ~ α /a/ and Latin *a* /a/, and Meroitic *a* 𐦠 𐦀

Greek and Latin do not contain the glottal stop phoneme /ʔ/ in their inventories, and it is observed that the vowel /a/ is positioned in the Greek and Latin equivalences where Meroitic positions the word-initial 𐦠 sign [ʔa]. Coulmas (2003:127) demonstrates the reasons into this when he writes about the borrowing of the Phoenician alphabet for the inventory of the Greek:

> the glottal stop /'/ encoded by the letter *alef*, and the emphatic laryngeal /ʻ/ encoded by the letter *ayin*, are not phonemic in Greek and therefore not easily perceived by speakers of Greek. The Greeks were likely, therefore, to pronounce the initial sound of the name of the first letter of the Phoenician alphabet not as a glottal stop but as /a/. *Alpha* thus came to be interpreted as a V[owel], whereas *alef* is a C[onsonant] letter.

In the case of the laryngeals, Harris (1936:15) also refers to the Greek borrowing of the Phoenician script for their alphabet, in that:

> it is the same acrophonic principle which explains the appearance of vowels when the Greek borrowing of the Phoenician alphabet gave vocalic value to the Phoenician laryngeal signs. This change is not to be understood as an intentional dropping of the laryngeals "because the Greeks had no use for them," but rather as a purely mechanical development. From the fact that the Greeks took over, together with the letters, also their names, it follows that the Greek borrowing consisted not so much of a set of signs with their phonetic values, as of a set of signs with their acrophonic names. Thus they took over the name *'alp* with the sign which represented its first sound. But the first sound in *'alp* was to them not ' but *a*, for ' was not phonemic in Greek, i.e. it was not recognised as a speech sound. Therefore the value of that sign to the Greeks was *a*.

Consequently, the Greek forms cannot be specifically relied upon to determine an exact value for this Meroitic sign.[84]

3.5 Interchange of word-initial *a* and *y*

An interesting process is observed whereby variant forms are found in Meroitic where word-initial interchanges with *y* /j/. This interchange could be indicative for the proposal that Meroitic consonantally represents the glottal stop /ʔ/ [ʔ]. Rilly (2007:261 fn. 4) contends that this variation is due to a hesitation in writing some words between *a*, - *yi-* or - *ye-*, therefore for Rilly this seems to prove that the vowels /e/, /ə/ and /i/ could also be written with . A sample of these Meroitic variant forms are listed below:

(17)

a.	*atepoke*	~	*yetepoke*		
b.	*ato*	~	*yeto*		"water"
c.	*ari<u>h</u>lo*	~	*yere<u>h</u>lo*[85]		

It is very interesting that these Meroitic examples correspond with this process found in Semitic (Afro-Asiatic) languages that show many examples of similar interchanges between initial *'alef* (' ~ *a* /ʔ/) and *yod* (*y* /j/) (Isbell 1978):

(18)

a.	Ugaritic	*aṣḥ* ~ *yṣḥ*	"he shouts"
		aḥd ~ *yḥd*	"with no change in meaning"
		akl ~ *yakl*	"food"

[84] Nevertheless, it is a salient point that Greek and Latin represent the glottal with the vowel /a/, as the correspondence between gutturals and this low vowel is typologically evidenced. See Chapter 2, §7.5 and this chapter §3.7 for more details into this.

[85] The form *yere<u>h</u>lo* is a late version where the more archaic form is *ere<u>h</u>lo*, without the word-initial glide *j*.

b.	Hebrew	*'d ~ yd*	"hand"
		'šr ~ yšr	"go straight/be straight"
		'śr'lh ~ yśr'lh	proper name
		'hyh ~ yhwh	"Yahweh"
c.	Ugaritic	*yrq*	"gold"
	Akkadian	*arqu*	"yellow"

Isbell (1978:229) puts forward many examples of this kind from Semitic languages, mainly Biblical Hebrew, Ugaritic, Aramaic and Amorite, and that, 'the appearance of so many examples of similar interchanges in other Semitic languages, examples which show clearly that initial *'alef-yod* inter changes' (1978:231). She also states that 'several Hebrew roots exhibit either initial *'alef* or initial *yod* with identical or closely related meanings, as is well known.'[86]

This is an interesting process which could explain the Meroitic examples showing variation between word-initial 𐦠 *a* /ʔ/ [ʔ] and 𐦤 *y* /j/ [j]. This does not discount that another process could be at work, however, the Meroitic variant forms are very reminiscent of the interchange found in Semitic languages between *'alef* [ʔ] and *yod* [j]. Therefore, this could be evidence towards the proposal that the Meroitic word-initial sign 𐦠 *a* represents the glottal stop consonant.[87]

3.6 The non-occurrence of word internal *a* 𐦠 𐦀

In light of the above proposal that Meroitic 𐦠 represents [ʔa], it is a query as to why this sign, and therefore this syllable, is only ever found word-initially. The proposal that is put forward here is that the glottal stop /ʔ/ [ʔ] is elided word-medially in Meroitic due to its intervocalic positioning. Whereby, for example, a phonemic representation of a

[86] Cf. Kautzsch and Cowley (1910) for the other examples of *ye-* or *yi-* to *'i* in Hebrew.
[87] The proposal that 𐦠 *a* represents a consonant was also Griffith's speculation (1916b:118). Zawadowski (1972a:19) claimed the representation of a glottal + /a/ for 𐦠 *a*, although without firm evidence conducted on the script other than a theoretical treatment and through considerations on the palaeography of the sign.

hypothetical form such as /baʔa/ will elide the intervocalic glottal stop /ʔ/ resulting in [baa], this form would then be written as *b* /baa/ [baa].[88] Consequently, the representation of word internal glottal stops could be impossible to discern within the Meroitic script and hence their language.

This elision of a word-internal glottal finds a correlation between Egyptian and Aramaic. Aramaic transcriptions of Egyptian personal names (circa late 1st century BCE) show that Egyptian <ꜣ> /ʔ/ is represented in Aramaic with *'alef* /ʔ/ only when <ꜣ> is in word-initial position, in other word positions, Aramaic does not indicate the glottal stop (Satzinger 1997:29).[89]

The omission of word internal glottal stops is reflected in certain Arabic dialects and in historical variation with the articulation of the *hamzat-al-waṣl* (eliding hamza) sign which indicates a glottal stop /ʔ/.[90] al-Nassir (1993:82-83) presents the Arabic grammarian Sibawayh's reference to the change in *hamzah* when it is in an intervocalic position:

> the phonetic value of the Hamzah is not observed in all dialectal variants of Arabic of his time, and adds that the prevailing tendency in Hijaz was to weaken the Hamzah in this context, while most of the speakers in Eastern Arabia ... are more inclined to realize a full glottal stop ...

al-Nassir (1993:82-83) examples the realisations of *hamzah* that Sibawayh proposes occur in intervocalic position in these dialects: (i) when *hamzah* (') is weakened it either becomes [ɦ]; or (ii) it is replaced by a long vowel (elision):

(i)	/ya'isa/ → [yaɦiisa]	"he despaired"
(ii)	/sa'ala/ → [sa:la]	"he asked"

[88] Vowel length is not explicitly distinguished in Meroitic writing if indeed it does exist. Cf. Rilly (2007:290-294).
[89] Cf. Vittmann (1989).
[90] Abdalla (1992:22) speculates that the representation of the Meroitic 'initial a' sign *a* is similar to 'Semitic *hamza*' due to its non-occurrence in word-medial or final position.

Recent research on Arabic dialects also reports on the elision of *'alef* in intervocalic placement (Al-Ani 1970, Ingham 1982). In discussing the correlation between Hebrew and Arabic, Rosenhouse (1991:1351) summarises this inter-linguistic similarity with regards to the elision of *'alef* in that, 'The manner of production of *'aleph* does not seem to differ between native speakers of Hebrew and Arabic. Also its inherent weakness (often leading to its elision) is common to the two languages.' More specifically, she goes on to state that '/'/ often elides so that only the vowel remains (with [vowel] lengthening as a possible compensation for the lost phoneme)' (1991:1353).[91]

Harris (1936:27) asserts that the Phoenician laryngeal א /ʔ/ 'was weak … as seen from a number of changes which it suffered,' such as being absorbed into a preceding vowel in same syllable (elision). Furthermore, as already discussed (§1.1), Aramaic does not notate *'alef* /ʔ/ in compound forms as it is elided because of its intervocalic position (or that the following vowel is long): **PṬ'WSRY* → *PṬWSRY* (**pete'ūsiri* → *petūsiri*); **PṬ'SY* → *PṬSY*; **NP'SY* → *NPSY* (Muchiki 1990:192). Aramaic also shows alternate forms where *'alef* /ʔ/ is either represented word internally or not (Steiner 2001:261):

(19)	Aramaic	*mt'kdh ~ mtkdy*	"the land of Akkad"
	Old Aramaic	*mr'lh' ~ mrlh'*	"lord god"

In fact, we can see this same elision process in the Meroitic example:

(20)	Meroitic	𐦪𐦵𐦳𐦩𐦪𐦢	*ntkmni*	anthroponym
	Egyptian	*ntk-imn, ntg-imn, nḏk3mn*		

The Meroitic anthroponym contains the Egyptian divine theonym "Amun" 𐦩𐦪𐦢 *mni*, as is evidenced through its transcription into Egyptian <*imn*> ~ <*3mn*>,[92] further it corresponds to the Meroitic isolated form 𐦩𐦪𐦢 *mni* with pretonic loss of 𐦠 *a*. This

[91] Cf. Blav (1980), for more on Biblical Hebrew laryngeal 'weakening'.
[92] It is evidenced that Egyptian retains the glottal stop <i> ~ <3> /ʔ/ in this compound position.

example is very distinct in showing that there is omission of the sign 𐦠 *a* [ʔa] when it is compounded to 𐦩𐦴𐦲 *ntk* exactly as in the Aramaic examples (and also from other Semitic languages). This form is evidence that the sign 𐦠 *a* representing the syllable [ʔa] must have been elided due to an intervocalic placement: Mer. * 𐦩𐦴𐦲𐦠𐦨𐦩𐦢 **ntkamni* /natakaʔamani/ → *[natakaʔamani] thereby written as 𐦩𐦴𐦲𐦨𐦩𐦢 *ntkmni* [natakaamani] ~ [natakamani].

Whether the resulting phonetic form after the elision of the glottal consonant in 𐦠 *a* /ʔ/ exhibits a long vowel [aa] or a short vowel [a] cannot be discerned from the text, as vocalic length (if present) is not marked in the Meroitic script. It is further proposed that this Meroitic form encodes the phonetic level of the script where perhaps the glottal stop consonant is phonologically present but is lost at phonetic realisation.

3.7 The non-occurrence of separate vowel signs following *a* 𐦠 𐦀

As initially observed by Griffith (1911:7), there is a complete non-occurrence of the separate Meroitic vowel signs 𐦢 *i*, 𐦡 *e* and 𐦣 *o* following the Meroitic 'initial a' sign *a* 𐦠 𐦀. A tentative explanation for this could be that it is due to the laryngeal (guttural) articulation of the consonant of *a* 𐦠 𐦀 /ʔ/ and as such was always perceived by the Meroites to be followed by the vowel [a] as a CV 'consonant' sign. Hayward & Hayward (1989:179) state the effect the guttural consonants have on vowels as being, 'typologically associated with low vowels and/or phonological processes involving vowel lowering.' Rose (1996:84), in her paper analysing laryngeals and the vowel-lowering effect they have on adjacent vowels, evidences this in that, 'In Arabic, a vowel [i] or [e] is lowered to [a] in the environment of guttural consonants.' She instances an example to illustrate this from Palestinian Arabic (taken from Herzallah 1990), where the feminine suffix -i is lowered to [a] when following a guttural consonant:

(21)

a.	Non-gutturals -i		b.	Gutturals -a	
	hilm-i	"a dream"		buzẓ-ɑ	"ice cream"
	samak-i	"fish"		simʕ-a	"reputation"
	zibd-i	"butter"		walh-a	"a surprise"

The vowel [e] is also lowered to [a] in these examples from Syrian Arabic with the feminine suffix -e (Rose 1996:85):

(22)

a.	Non-gutturals -e		b.	Gutturals -a	
	daraž-e	"step"		wa:žh-a	"display"
	šerk-e	"society"		mni:ħ-a	"good"
	madras-e	"school"		dagga:ʀ-a [sic]"tanning"[93]	

Rose (1996) further conducts an analysis on the quality of the epenthetic vowel from across a range of languages with specific investigation into the laryngeals. This systematic patterning leads her to conclude that, 'These examples of the quality of the epenthetic vowel indicate that laryngeals do pattern with the other guttural consonants in conditioning the appearance of a low vowel.'

McCarthy (1994:25-26) discusses the quality of the epenthetic (schwa) vowel in Tiberian Hebrew. He asserts that when a guttural is word-initial in a plural noun the vowel is the a-coloured schwa:

(23)	Plain initial noun	Plural	
a.	melek	m^{ə}lōkim	"king"
	sēper	s^{ə}pōrim	"book"

[93] [sic]; this should presumably read dabba:ʀ-a "tanner".

b.	ʔeben	ʔ[a]bōnim	"stone"
	hebel	h[a]bōlim	"vapour"

He contends, through analysing other positional epenthesis sites in Tiberian Hebrew, that, 'the consistent picture is one where gutturals are followed by a-colored schwa' (1994:25).

The lowering effect of the laryngeals on vowels in Ethio-Semitic languages is also discussed in Ullendorf (1955:212-216), Hayward & Hayward (1989), Rose (1996) and McCarthy (1994). Ullendorf (1955:215) states that:

> The preference of a laryngal for the vowel *a*, if in immediate contact, is, of course, well-known everywhere in Semitic. More recently, C. Rabin ... has shown that Eastern Arabian dialects frequently have *a* in the neighbourhood of a laryngal, where Western dialects present *u*.[94]

I have kept to examples of the laryngeals (gutturals) lowering vowels to [a] from Afro-Asiatic languages, although this lowering effect is seen as a typologically common, cross-linguistic process, see also Chapter 2, §7.5 for more examples of this process from other languages. I have already put forward evidence in Chapter 2, §7.5, based on the distributional restriction of certain vowels and not others following the dorsal signs 𐦴 *q* and 𐦯 *ẖ*, which led me to propose that these signs represented uvular consonants, as it was observed that this indicated a strong case for vowel lowering and/or retraction.

From this discussion, I put forward that Meroitic does not transcribe any separate vowel signs following the 'initial a' sign *a* 𐦠 𐦀 possibly because of the consonantal value being the laryngeal /ʔ/, which is always followed by the vowel [a] and therefore is left unmarked (inherent 'a'). It could further be proposed that underlyingly perhaps vowels other than /a/ are present i.e. /ʔu/, /ʔi/ and /ʔe/ but due to the lowering effect that the laryngeal has on the vowels, this means that at phonetic realisation, the vowel is always

[94] Ullendorf's terminology of a 'laryngal' class encompasses what is now referred to as guttural consonants.

realised (lowered) as [a] = [ʔa] and accordingly is left unmarked. This analysis would indicate the Meroites were encoding the phonetic level of the script in these forms (or perhaps just the syllable [ʔa]) and therefore this could explain why no separate vowel signs duly follow the 'initial a' sign *a* 𐦠 𐦀.

Due to the speculative proposal of vowels other than /a/ being underlying in this sign, I have tried to be consistent in the discussions given in this chapter by representing the sign *a* 𐦠 𐦀 with its phonetic realisation [ʔa] rather than phonemic.

4 Conclusion

Through the investigation into the Meroitic 'initial a' sign *a* 𐦠 𐦀 conducted in this chapter I make the following claims. This sign represents a CV syllable which is composed of the laryngeal glottal stop and the inherent unmarked 'a' vowel at phonetic realisation [ʔa]. However, it is possible, but speculative, that underlyingly this vowel can be of a varying quality, which is lowered by the laryngeal at the phonetic level to [a]. The reliance on the Egyptological transcription of "Osiris" as **ws-ỉr* for the claim that Meroitic *a* 𐦠 𐦀 is a vowel sign (of varying quality) has been argued against and revised. It is also claimed that the syllable [ʔa] (*a* 𐦠 𐦀) is subject to aphaeresis in a pretonic position except when its deletion would cause a violation in the phonotactics of the Meroitic language, i.e. the resyllabification of /r/ as word-initial. The interchange of forms with word initial *a* 𐦠 𐦀 and *y* 𐦤 𐦄, are strong evidence, that the 'initial a' sign *a* 𐦠 𐦀 does not indicate a vowel sign of varying quality but that it is because the 'initial a' sign is a laryngeal that alternates with the glide word-initially, as evidenced in Semitic (Afro-Asiatic) languages. Finally, I argued that the sign *a* 𐦠 𐦀 is not found word internally can be explained if it is followed that consonantally it represents the glottal stop /ʔ/ [ʔ], which is strongly subject to elision in this intervocalic placement.

Chapter 4

A Phonological Investigation into Meroitic Vowels

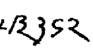
This chapter presents a somewhat preliminary investigation into the Meroitic vowels. The Meroitic script explicitly notates three independent vowel signs: *i*, *o* and *e*. However, there is a further vowel present in the script but not specifically marked; it is the unmarked 'a' vowel inherently contained within every 'consonant' sign. Following the proposal put forth in Chapter 3, concerning the traditionally termed 'initial a' sign *a* I do not include its representation here as a vowel sign.

Any investigation into the Meroitic vowels is somewhat problematic. This is primarily due to the nature of vowels i.e. their instability and variability across languages is well known. Therefore a cautionary view should be maintained and perhaps principally because the evidence for the attribution of the Meroitic vowels is taken from loan words where we expect their representation to be particularly unstable.

Furthermore, there are problems associated with the main source of equivalent forms between Meroitic and Egyptian. This is primarily because the vowels from equivalent forms with Egyptian and Egyptian Demotic cannot be discerned due to the non-representation of the vowels in the Egyptian writing system (as per typical Semitic consonantal scripts). It is only until the latest stage of Egyptian - Coptic that there is evidence for the vocalisation of equivalent forms in Egyptian. The earlier Egyptian vocalism of these equivalent forms can only be reconstructed through this Coptic evidence and through Akkadian Cuneiform transcriptions. This in itself poses problems in that there are various sound changes that diachronically affected the Egyptian vowels and which show up as discrepancies between these and the Meroitic forms, and as such, should be defined.

This chapter is divided into specific sections dealing with each Meroitic vowel sign, including an overview into the origins of their hieroglyphic and cursive forms. Previous proposals for their sound values are also discussed and analyses into indications for their values are mainly taken from Greek and Latin equivalent forms.

1 Meroitic inherent unmarked 'a'

The first indication that the Meroitic script did not expressly write the low vowel 'a' /a/ was observed by Griffith (1911:7), who determined that in the Meroitic form for the Egyptian theonym "Amun"  *amni*, 'a short vowel in the middle of a word (between the *m* and *n* ...) was neglected in writing.' He summarised his observations on the non-notation of vowels in Meroitic:

> Vowelless consonants also are frequent both at and before the end of the words; and not infrequently collections of three or more consonants are seen ... The signs composing such collocations seem quite promiscuous, and there is no need to suppose a vocalic value for any of them. A vowel is occasionally indicated in variants, and we must simply suppose that the vowels were not necessarily given in the writing, any more than the second vowel in Amani ...

Nevertheless, Griffith (1911:16) speculated on the non-representation of this vowel:

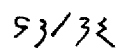
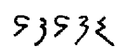
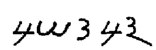
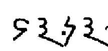
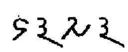
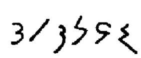
> In transcribing Meroitic names I have frequently supplied the vowel *a* where no vowel is marked: to some extent this is justified by the spelling of [Greek] *Νάπατα*, *Κανδάκη*. Amani, *Παχωρας* ... It is of course impossible to decide in most cases where a vowel is to be inserted, and some other vowel than *a* may often be required.

He later confirmed that 'Unwritten *a* appears to be common' (1916b:119). Zawadowski (1972a:18) followed Griffith's theory of an unwritten vowel 'a' and specified it as a phoneme /a/, although he did not contribute any further examples other than the ones already used by Griffith. This system of Meroitic writing was outlined by Hintze (1973a:322-323), who stated that it should be understood as every 'consonant' sign, which is not followed by a separate vowel sign, signifies a consonant + vowel 'a'. Hintze represented this unwritten vowel phonemically /a/ and phonetically [a].[1]

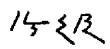
[1] The majority of Meroitic scholars accept the inherent 'a' vowel system.

Rilly (2007:393) asserts that this unmarked vowel ‘a’ /a/ is the most frequent vowel in his representative sample of Meroitic texts (“lexicon”). The occurrence of /a/ is as high as almost 50% out of all occurrences of the Meroitic vowel phonemes. He states that this explains why it was chosen as the inherent vowel. Rilly cites examples of Greek equivalents of Meroitic names or Egyptian words where Meroitic inherent ‘a’ /a/ is represented by Greek α /a/, confirming this Meroitic value (2007:393-394):[2]

(1)

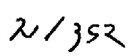
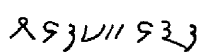
a.	Meroitic		*p‘**a**’yesi*	Eg. anthroponym
	Greek	Παῆσις		
b.	Meroitic		*t‘**a**’yesi*	Eg. anthroponym
	Greek	Θαῆσις		
c.	Meroitic	 ~	*p‘**a**’ẖome ~*	Eg. anthroponym
			*p‘**a**’ẖeme*	
	Greek	Παχουμις		
d.	Meroitic		*kis‘**a**’ri*	Latin title
	Greek	Καῖσαρ		
e.	Meroitic	 ~	*k‘**a**’t‘**a**’ke ~*	title
			*k‘**a**’d‘**a**’ke*	
	Greek	Κανδάκη		
f.	Meroitic		*pelmos‘**a**’*	Eg. title
	Greek	(π)λεμεισα		

[2] It is not customary to transliterate the inherent ‘a’ vowel in Meroitic studies, although I do so here for ease of identification and I notate these inherent ‘a’ vowels in quote marks to differentiate them from the sign that is traditionally transcribed as ‘initial a’ *a*. See Chapter 3, for more on the ‘initial a’ sign.

g.	<u>Meroitic</u>		*pil'**a**'qe*	toponym
	Greek	Φίλαι		
h.	<u>Meroitic</u>		*n'**a**'p'**a**'te*	toponym
	Greek	Νάπατα		
i.	<u>Meroitic</u>		*p'**a**'<u>h</u>r'**a**'se*	toponym
	Greek	Παχωρας		

Latin also indicates the representation of *a* /a/ for the Meroitic inherent vowel:[3]

(2)

a.	<u>Meroitic</u>		*qer'**a**'be*	toponym
	Latin	*Corambim* ~ *Curambeta* (?)		
b.	<u>Meroitic</u>		*amod'**a**'*	toponym
	Latin	*Amod**a***		
c.	Meroitic		*m'**a**'kesemene*	anthroponym
	<u>Latin</u>	*M**a**ximinus*		

Sturtevant (1940:106) states that, 'Scholarly tradition is nearly unanimous in making Lat. *a* a low vowel.' He also cites examples where Greek α corresponds with Latin *a* in loan words.[4]

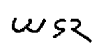
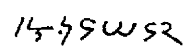
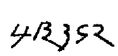
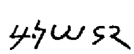
[3] Where Latin is transcribing *a* in word-initial position for the form in (2b), I do not share the view that this denotes that the Meroitic form transliterated with word-initial 'a' is the vowel [a], but is the Romans' closest representation to this Meroitic sign which I propose is actually the laryngeal syllable [ʔa]. This also holds for the Greek equivalent forms in §1.1. For the evidence and discussion on this, see Chapter 3, specifically §3.4.

[4] See also Allen (1968:59-60), for this same assertion.

1.1 Meroitic inherent unmarked ‘a’ /a/ equivalent to Greek back round vowels

Certain transcriptions from Greek equivalences give the representation of the Meroitic inherent ‘a’ /a/ vowel as a back round vowel. Rilly (2007:394) importantly observes that the Meroitic forms were borrowed from a stage of Egyptian[5] before the phonetic change took place amongst the vowels, which explains why the Greek forms are transcribed with a back round vowel which corresponds to the pronunciation of the Egyptian Demotic period. Rilly is referring to the diachronic vocalic chain-shift, as discussed in Chapter 3, of stressed vowels in Egyptian, whereby they shifted one or two stages along in a circular direction resulting in a change of vocalic quality. Therefore, in the forms of (3), Meroitic inherent ‘a’ /a/ = Greek ο [o], ω [ɔː], ου [oː] and υ [u] (Rilly 2007:394):

(3)

a.	Meroitic		*ar‘a’*	Eg. theonym
	Greek	Ὡρος		
b.	Meroitic		*ḫ‘a’s*	Eg. theonym
	Greek	Χόνς		
c.	Meroitic		*aret‘a’te*	Eg. theonym
	Greek	Ἀρενδωτης		
d.	Meroitic		*am‘a’ni*	Eg. theonym
	Greek	Ἀμουν ~ Ἀμμων		
e.	Meroitic		*at‘a’ri*	Eg. theonym
	Greek	Ἀθυρ		

[5] For Rilly, this stage is the Middle Kingdom.

f.	Meroitic		*m'a't*	Eg. theonym
	Greek	Μουθ		
g.	Meroitic		*n'a'bse*	Eg. toponym
	Greek	Πνούψ		
h.	Meroitic		*pls'a'n*	Eg. title
	Greek	[π]λεσωνις		
i.	<u>Meroitic</u>		*p<u>h</u>'a'rse*	toponym
	Greek	Παχωρας		

Griffith (1916:122) noted that this same representation of Meroitic inherent 'a' /a/ was found also in Coptic; 'There are plenty of cases in which an unwritten [Meroitic] vowel corresponds to an *o* or *ō* in Coptic,' e.g. in the toponym "Faras" Meroitic *p<u>h</u>rse*, Coptic **παχωρας**. Griffith's explanation is that this was due to a 'substitution' of these vowels, rather than the diachronic chain-shift process between New Kingdom Egyptian and Coptic stressed vowels.[6]

The evidence for Meroitic containing an inherent unmarked 'a' /a/ vowel is very strong, with firm correspondences from Greek equivalent forms indicating α /a/. Further evidence for the realisation of the Meroitic inherent vowel being 'a' /a/ comes from the Greek forms (corresponding to the Egyptian Demotic pronunciation period) which transcribe a back round vowel where Meroitic has 'a' /a/. These Greek vowels can be satisfactorily explained as due to the chain-shift process whereby they are one or two stages along from the vowel /a/ i.e. /a/ > /o/ > /u/.

[6] It could be the case that this process was not recognised at the time Griffith was writing.

1.2 Vowel reduction

Investigations into vowel reduction usually distinguish between that which is phonetic vowel reduction and that which is phonological vowel reduction.[7] The phonological process of vowel reduction in unstressed positions is well known; and this usually results in the neutralisation of vowel phoneme contrasts.[8] The quality of a reduced or neutralised vowel is assumed to become centralised i.e. the realisation of this reduced vowel is commonly (cross-linguistically) a schwa like vowel e.g. [ə]. Furthermore, Crosswhite's (2004) typological survey concludes that in cases of phonological vowel reduction, non-high vowels e.g. /a/ and /e/ are targeted more so for reduction.

Cases of phonetic vowel reduction, however, usually result in an undershoot of vowel targets, which primarily occur when there is insufficient time for the articulator to reach the vowel target. This undershoot is commonly seen in a short unstressed vowel in a closed syllable i.e. CvC, where long vowels are usually more resistant to this undershoot. The segmental content of the consonants flanking a short vowel are also liable to affect the quality of the phonetically reduced vowel. Essentially, phonetic vowel reduction results in a contraction of the overall vowel space (Lindblom 1963).

The investigation into instances of vowel reduction in Meroitic being specifically either phonological or phonetic, and furthermore whether there is in effect a phonologisation of phonetic vowel reduction is outside the scope of this thesis.[9] However, in this chapter I refer to cases of phonological vowel reduction with relevant reasons given.

---

[7] Recent research investigates the connection between phonetic and phonological vowel reduction, cf. Flemming (2001), Crosswhite (2004) and Barnes (2002).
[8] Or understood as neutralisation in weak stress environments.
[9] The investigation into phonetic vowel reduction would have to take into account so many more mitigating factors not only of stress but also of co-articulatory affects of segmental (consonantal) context where the vowel targets could assimilate to those of the surrounding segments. I leave this area open for future investigation.

1.2.1 Meroitic word-final inherent ‘a’ /a/ not represented in Greek

In the following transcriptions of native Egyptian forms, it is evidenced that the Meroitic data exhibit a word-final inherent vowel ‘a’ /a/ whereas the Greek forms do not:

(4)

a.	Meroitic	3⊂	*ẖ‘**a**’s‘**a**’*[10]	Eg. theonym
	Greek	Χόνς		
b.	Meroitic	ϟ3	*m‘**a**’t‘**a**’*	Eg. theonym
	Greek	Μουθ		
c.	Meroitic	3/Ƨ	*wos‘**a**’*	Eg. theonym
	Greek	’Ισις		
d.	Meroitic	3ς/∃	*qes‘**a**’*	Eg. toponym
	Greek	χοῦς		

Rilly (2007:394) refers to these Greek examples in that they show how, by the Egyptian Demotic stage, either the word-final vowel was elided, or, as in the Coptic form of the theonym “Isis” ⲏⲥⲉ /esɛ/ (Greek equivalent in example 4d), it was prone to reduction.[11] It is proposed that it is highly likely to be the placement of stress in these forms that is responsible for this vowel reduction. Moreover, as these forms in (4) are bisyllabic, resultantly the stress is on the initial syllable. In fact, this proposal is substantiated by the analysis for the form (4d), as discussed in Chapter 3, §1.1.2.[12]

[10] The unwritten nasal segment is not traditionally transliterated, although there is evidence that it is realised, as such we expect this nasal in coda position of this Meroitic form, see Chapter 5, §4.4 for more on this.

[11] I follow Peust’s (1999b:201) claim for the Coptic ⲉ phoneme as qualitatively /ɛ/, rather than Loprieno (1995:15), who claims it is /e:/. See the discussion in Chapter 3, §1.1.2.

[12] Furthermore, this analysis is expected in the form of (4a), as the Greek equivalent form shows the representation of the nasal segment in coda position Χόνς /xons/, where this nasal is also evidenced in the Egyptian theonym *ẖnsw*. It can be deduced that the Meroitic form is not notating (by convention) the

1.2.2 Reduction of Meroitic inherent 'a' /a/

The reduction of Meroitic inherent 'a' /a/ is addressed by Rilly (2007:394-395), who specifies that this vowel is relatively unstable in certain positions. In these positions, it is notated with the Meroitic sign *e*, which in these instances probably represents the schwa /ə/. He finds that there are roughly forty words in his "lexicon" where this variation between inherent 'a' /a/ and *e* is evidenced, although he points out that it is not easy to locate at which times the forms with inherent 'a' /a/ and those with *e* correspond. Rilly presents an early Meroitic form and its equivalent from a later period where vowel reduction of the inherent 'a' /a/ vowel is specifically seen (2007:395). I make the claim here that this would be a case of phonological vowel reduction where the Meroitic phoneme /a/ is centralised to [ə], and for the forms in (5) and (7) below, to then complete reduction, as evidenced in these diachronic forms:[13]

(5)

a.	Early Meroitic	*pes'**a**''n'to*	/pesantu/	title
b.	Late Meroitic	*pes**e**'n'to*	/pesntu/	title

I put forward the proposal in Chapter 5 that the 'syllable' sign *se* is a plain consonant sign, with no inherent vowel 'e' *e*. This inherent 'e' *e* vowel is bolded in (5b), although I claim that there is actually no vowel represented here. Subsequently, the late Meroitic form indicates that the inherent 'a' /a/ vowel has actually reduced to complete syncope, although I posit the intermediate stage of the 'a' /a/ vowel reducing to schwa before its complete loss. Under this analysis:

(6) Early Mer. = /pesantu/ > /pesəntu/ > /pesntu/ =
Late Mer. /pesntu/

nasal in coda position, whereby, this form is phonemically /xansa/. This shows that the stress is likely to be on the initial syllable /ˈxansa/ as, in general, it is attracted to heavy syllables i.e. ˈCVC(C).

[13] Rilly's (p.c.) hypothesis is that there is a vowel inherent in the 'syllable' signs, which is either /e/ ~ /ə/, where the latter vowel can reduce to zero.

I further propose that this same plain consonantal value should be applied to the nasal 'syllable' sign *ne*. Moreover, a comparison with an early Meroitic form and its later equivalent evidences the syncope of the inherent 'a' /a/ vowel:

(7)

a.	Early Meroitic	***an'a't'a'***	/ʔ**ana**ta/	title
b.	Late Meroitic	***a'n't'a'***	/ʔ**an**ta/	

As discussed in Chapter 3, §2.2, the nasal sign *n* /na/, as evidenced in the early Meroitic form is not written in the late period form *at*, as the nasal has become resyllabified into coda position due to diachronic vowel reduction and subsequent complete syncope of the following vowel. The non-notation of a nasal segment in coda position is a principle of the Meroitic script.[14] This means that the nasal segment must be directly adjacent to the following coronal *t* /t/, with no intervening vowel. Therefore, the following process of vowel reduction to complete syncope can be gleaned from the script, which adapts diachronically in accordance with the neutralisation of this form. The following stages in this reduction are given in (8):

(8) Early Mer. = /ʔ**ana**ta / > /ʔanəta/ > /ʔanta/ = Late Mer.

Further evidence for this inherent 'a' /a/ vowel being subject to reduction is that it is an unstressed syllable position.

(9) Early Mer. *ant* /ˈʔan**a**ta/ > /ˈʔanəta/ > /ˈʔanta/ = Late Mer. *at*

Confirmation for this, as discussed in Chapter 3, §2.2, comes from the 'initial a' sign *a* [ʔa] not being subject to aphaeresis because it is the stressed syllable.

[14] Evidence for the realisation of the nasal consonant in this Meroitic form comes through the Egyptian *ḥm-nṯr* and Coptic ϩⲟⲛ̣ⲧ equivalences. For more on the Meroitic written omission of the nasal sign in coda position (closed-syllable), see Chapter 5, §4.4.

Rilly (2007:395) established the reduction of the forms in (5), on palaeographical considerations, as taking place during the first century CE. I am in agreement with him when he maintains that the reason for this process is due to the position or force of tonic stress.

2 Meroitic *i*

The origins of the hieroglyphic form of this Meroitic sign Griffith saw as being equivalent to the Egyptian hieroglyph (1911:13). Griffith explains that this sign is used in Late Egyptian texts for the exclamation <'y>, which is transcribed as ΗΙ in Coptic. However, Griffith could not link the Egyptian hieratic and Demotic forms of this Egyptian hieroglyph with the Meroitic cursive form. Nevertheless, the link between the Demotic form of the Egyptian hieroglyph is confirmed by Rilly (2007:249), who cites recently published palaeographic material (El-Aguizy 1998:289), whereby Ptolemaic signs from Upper Egypt show a very close association with the Meroitic cursive form. Priese (1973:297) had earlier tried to explain the origins of the Meroitic cursive sign as being developed from two Egyptian Demotic signs.[15]

Griffith transliterated this Meroitic sign as *i* in accordance with his claim for its sound value as 'i' through the following correspondence with Coptic (1911:8):

(10)	Meroitic		*pilqe*	Eg. toponym
	Coptic	ΠΙΛΑΚ	*pilak*	

However, Griffith found further correspondences where Meroitic *i* he assumed it transcribed with a vowel of differing quality:

(11)	Meroitic		*atiye*	toponym
	<u>Egyptian</u>	*ḥ.t-tiy*		

[15] See Fig. 2.1, for Priese's proposal.

Griffith gave the pronunciation of the Egyptian correspondent form in (11) as *ḥa-teye*, whereby Meroitic corresponded to his reconstructed vowel '*e*' (1911:9). Griffith (1911:9) translates this form as the 'fortress of Teye', which perhaps led to his reconstructed pronounced form of the mid vowel 'e' for this Egyptian toponym.[16] Since the Egyptian script does not notate vowels until the Coptic stage of the language, it would be difficult to discern the vocalic correspondence between Meroitic and Egyptian, unless the vowels of a Coptic corresponding form could be used to reconstruct the Egyptian vowels.[17] Moreover, Peust (1999b:49) discusses the sound value of the Egyptian hieroglyph 𓇋 <ꞽ> put forward by various Egyptologists, and he opines that this sign was originally /j/ but was lost by the Coptic stage. However, Loprieno (1995:33) posits a further phonemic value, whereby the Egyptian sign <ꞽ> /j/ > /ʔ/, when 'between two vowels in post-tonic position (*/ˈbaːjin/ > */ˈbaːʔən/ "bad") and before an unstressed vowel in initial position (*/jaˈnak/ > */ʔaˈnak/ "I").' As the stress position of this toponym (11) cannot be exactly detailed at present, I am assuming, therefore, that in this Egyptian form, the sign <ꞽ> is functioning as the phoneme /j/, this is indicated by the Meroitic corresponding form, which utilises the palatal vowel /i/.[18] It could further be the case that it was borrowed before Egyptian <ꞽ> /j/ > /ʔ/.

(12)	Meroitic		*tewiseti*	Eg. noun
	Coptic	**ⲧ-ⲟⲩⲁϣⲧⲉ**	*t-wašte*	

In the form (12) above, Griffith saw that Meroitic *i* corresponded to Coptic ⲁ /a/, although he gave no discussion into the reasons for this correspondence (1911:9). The

[16] Cf. Griffith (1916b:119), who states that 'The name of the city dedicated to [Teye] in Nubia was therefore pronounced Ha-Teye and appears in Meroitic as .' Griffith is basing this vocalic reconstruction on Akkadian, as this is the script and language used in the Amarna tablets (Moran 1992). 'The name of the queen of Amenhotp III is rendered Teie, *i.e.* Teye, in the Amarna tablets' (Griffith 1916b:119).

[17] I am unaware, at present, whether a Coptic form of this toponym does exist.

[18] The analysis of Egyptian <ꞽ> /j/ is only posited here for this form, and not for the form discussed in Chapter 3, §3. See also Chapter 3, §3.

Egyptian form *t(ꜣ)-wšt.t* gives no indication for the vocalic quality, and so it is speculated here that the vowel of the Meroitic form is stressed and therefore it could correspond to an earlier Egyptian vowel /i/ that underwent the stressed vocalic chain-shift to /a/ by the Coptic stage. Griffith (1916b:120) alludes to this when he states that for the form in (12), Meroitic *i* stands for Coptic short /a/ in the 'accented syllable.'

The other forms that show a variance between Meroitic *i* /i/ and Coptic ⲁ *a*, ⲉ *e* or ⲓ *i* are taken from Griffith (1916b:119):

(13)	Meroitic		*sipesi(ye)*	dem. anthroponym
	Coptic	'T(-)shap**shi** ~ (T)shep**she**'[19]		

Griffith suggests that *i* /i/ stands for the short ⲉ *e* or ⲓ *i* of this feminine termination in (13) (1916b:120), and further that in the form 'T(-)sh**a**pshi' it also stands for the accented syllable 'a'. Again, it is postulated that the stressed vowel chain-shift is the reason for this association between the Meroitic vowel *i* /i/ and Coptic /a/, in that the Meroitic form was borrowed at a stage of Egyptian before the vocalic chain-shift process changed the quality of this stressed vowel, as confirmed by the Coptic form.[20]

This chain-shift is not specifically discussed by Hintze (1973b:333-334), although he alludes to this process when he analyses Griffith's data as, '[Meroitic] /i/ = äg. $^{+}$i (> kopt. a),' that is, Meroitic /i/ = Egyptian /i/ (> Coptic /a/). Further, Hintze (1973b:334) also gives Meroitic /i/ = Egyptian/Coptic /ē/ (ⲏ /e:/) and Greek η /ɛ:/,[21] through the following equivalent forms:[22]

[19] Griffith's transliteration of Coptic, perhaps (ⲧ-)ϣⲁⲡϣⲓ ~ (ⲧ)ϣⲉⲡϣⲉ.
[20] Griffith (1916b:119) gives a further corresponding form between Meroitic *tebiki* and Coptic 'T-beke(?)', where he states that Meroitic *i* is equivalent to the 'accented' '**e**' in this form.
[21] See Allen (1968:66), where he discusses that Greek words that are transcribed into Latin show that η is represented by Latin ē.
[22] Equivalent forms initially given in Griffith (1916b).

(14)

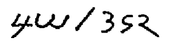
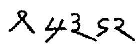
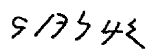
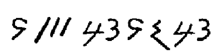
a.	Meroitic		*tebiki*	Eg. anthroponym
	Greek	τβηκις		
	Egyptian	*t3-bk.t*		
b.	Meroitic		*perite*	Eg. title
	Coptic	**ПРНТ**		
c.	Meroitic		*atiye*	Eg. toponym
	Egyptian	*ḥ.t-tiy*		
	Akkadian	*tēye*		

The data above was also observed by Vycichl (1973b:61-62), who surmises that it is possible Meroitic *i* also served to transcribe *e* or *ē* (/e/ ~ /eː/) of the pre-Coptic era of Egyptian.

2.1 Proposals for the realisation of Meroitic *i*

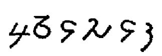
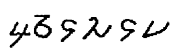
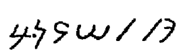
The majority of scholars who have discussed and/or investigated the Meroitic writing system followed Griffith's determination of the sign *i* as representing the high front vowel 'i' (Meinhof 1921/22, Zyhlarz 1930, Vycichl 1958a, Zawadowski 1972a, Hintze 1973a, 1973b, Priese 1973, Hofmann 1981a, Rilly 2007). Hintze (1973a:322), however, would give two phonetic realisations [i] and [e] for the phoneme /i/ of the Meroitic sign *i*, although he does not posit these phonetic realisations in his only paper that specifically discusses the Meroitic vowels (1973b). Priese (1973:297) gives an alternative proposal to Hintze, in his paper of the same conference, in that the Meroitic sign *i* actually represented two phonemes /i/ and /e/. Rilly (2007:398) discusses how the phoneme /i/ (*i*) generally corresponds to Greek ι /i/ and Latin *i* /i/ in the following equivalent forms:

(15)

a.	Meroitic		*asori*	Eg. theonym
	Greek	Ὄσιρις[23]		
b.	<u>Meroitic</u>		*akine*	toponym
	Latin	*acina*		
c.	Meroitic		*pilqe*	Eg. theonym
	Greek	Φίλαι		
d.	Meroitic		*sipesiye*	Eg. anthroponym
	Greek	Σειψις[24]		

That Meroitic  *i* is also transcribed with Greek η and Latin *e* is also instanced by Rilly (2007:398):

(16)

a.	<u>Meroitic</u>	 ~	*medewi* ~	toponym
			*bedewi*	
	Greek	Μερόη		
b.	<u>Meroitic</u>		*qoreti*	toponym
	Greek	Κορτη		
	Latin	*corte*		

[23] Furthermore, in this form it is evidenced that Meroitic / *o* /u/ corresponds to Greek ι /i/ this is due to this vowel being stressed in this theonym "Osiris" of the Egyptian and Coptic form, whereby it is subject to the vocalic chain-shift process. Therefore, Meroitic notates the original vowel /u/ before it chain-shifted from /u/ > /e/ ~ /i/, as evidenced in the Coptic form **ⲟⲩⲥⲓⲣⲉ**, which also corresponds to the Greek form. See Chapter 3, §1.1.1.

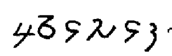
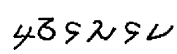
[24] Rilly (2007:397) points out that the Greeks of Egypt added the word-final element -ις systematically after consonants (except /t/ and /d/) in the indigenous forms in order to provide them with 'a base of declension.' In addition, a final sigma -ς was added when forms finished with a vowel. He points out that from this, at times, it is difficult to discern whether or not a Meroitic word-final vowel is indicated in Greek.

The forms in (16) above, show that Meroitic *i* is transcribed with Greek η /ɛː/~ /eː/[25] and Latin *e* /e/ when the positional distribution of the Greek and Latin vowels are word-final.[26] This is different to the Greek and Latin transcriptions of Meroitic forms in (15) above, where Meroitic *i* is transcribed with Greek ι /i/ and Latin *i* /i/ when these Greek and Latin vowels are word-internal i.e. CιC/C*i*C. It could be the case that the positional variation of this vowel is indicative for its quality as transcribed into Greek and Latin as a front mid vowel.

2.1.1 Reduction of Meroitic *i*

A cursory hypothesis for these correspondences, repeated here for clarity, is that possibly the Meroitic vowel *i* lengthens in word-final position, and it is specifically this lengthening that is reflected by the Greeks' transcription of this Meroitic long vowel as η /ɛː/ ~ /eː/:[27]

(17)

a.	<u>Meroitic</u>	 ~	*medewi* ~	toponym
			*bedewi*	
	Greek	Μερόη		
b.	<u>Meroitic</u>		*qoreti*	toponym
	Greek	Κορτη		
	Latin	*corte*		

This length indication hypothesis is assuredly erroneous. If the Meroitic word-final vowel was long, the Greek forms would not have been representing this vowel with η /ɛː/ ~ /eː/ but still with ι where it could represent short /i/ and long /iː/. Classical Greek

[25] I follow Sturtevant (1940:41) who gives the representation of η as developing to /eː/ during the 1st century BCE due to its progression to the vowel /iː/.
[26] Sturtevant (1940:112) remarks that Latin *e* corresponds to Greek ε and η.
[27] See Priese (1973:297) who proposes phonemic /i/ and /e/ for this sign due to these equivalent forms.

did not devise a method of indicating length in the 'periphery' vowels /a/, /i/ and /u/, and Allen (1968:85) states that as a consequence these vowel signs were known as δίχρονα 'of two lengths.' He goes on to say that the Alexandrian grammarians invented superscript signs to indicate length, which are occasionally used in papyri, but did not become a normal part of the orthographic system (1968:85-86), although he does not state at which time this practice was implemented.[28]

The case for the Meroitic vowel being long in these forms where it is word-final is supported by the fact that vowels are phonetically longer in duration in word-final position than vowels in non-final position. Thus, this phonetically longer duration *is* why the Greeks transcribe these Meroitic forms with η /ɛː/ ~ /eː/ rather than with the short vowel ε /e/. However, it still has to be explained why the Greek forms transcribe the Meroitic high vowel 𐦢 *i* /i/, which in this position is most probably realised phonetically as [iː], with their mid vowel η /ɛː/ ~ /eː/.[29]

The proposal for this is that the Meroitic vowel phoneme 𐦢 *i* /i/ is phonetically realised as [i] and [iː], but when undergoing reduction, the corresponding phonetic realisations are [ə] and [eː] (this is somewhat in line with Hintze 1973a:322).[30] In these word-final forms, the realisation of 𐦢 *i* /i/ [iː] → [eː] is due to /i/ [iː] being in an unstressed position in these word-final examples and is subsequently subject to reduction.[31] I propose also that if Meroitic 𐦢 *i* /i/ was a short vowel in these positions e.g. [i], we would expect the vowel to centralise through phonological reduction i.e. to become a schwa vowel [ə], but accordingly this would then not allow us to explain why the Greek representations

[28] See Allen (1968:88-89), for a discussion on the loss of phonemic length distinctions in Modern Greek. He reasons that this loss can be placed about the 3rd century CE due to the development of Greek from a tonal to a stress accent language.
[29] However, it is also possible that the Greek forms relate to the confusion between η /ɛː/ > [i] and ι /i/ [i], which begins about 150 CE (Allen 1968:71, Sturtevant 1940:38).
[30] However, with reduction of unstressed long vowels we could also expect this vowel to shorten to [e]. Furthermore, I do not consider that length is phonemic in Meroitic at this stage of investigation, but that the vowel is phonetically lengthened due to its word-final position.
[31] I point out here that this would be due to phonological vowel reduction rather than phonetic, which is commonly seen in short unstressed vowels in closed syllables, see §1.2.

of this schwa are transcribed with η /ɛː/ ~ /eː/. The evidence for Greek η /ɛː/ ~ /eː/ not being used to transcribe schwa vowels comes from transcriptions of Egyptian Demotic schwas into Greek, where Greek transcribes them with ε /e/ and not with η /ɛː/ ~ /eː/.[32] Furthermore, Greek transcriptions of Aramaic proper nouns (circa. 3rd century CE) regularly use the short vowel ε /e/ where classical Aramaic has reduction of unstressed vowels to schwa (Kaufman 1984:90).

We are left then with evidence for the claim that this word-final Meroitic vowel 𐦢 *i* /i/ is phonetically realised as long [iː]. Due to its length, this long vowel, when subject to reduction, does not centralise to schwa [ə], but moves towards a more centralised position to the mid vowel [eː]. This analysis is then able to explain the Greek and Latin transcriptions.[33] Further, albeit small evidence for the Meroitic word-final vowel 𐦢 *i* /i/ being prone to reduction comes from the variant form of the Meroitic toponym "Meroe" written as 𐦦𐦡𐦸𐦡𐦥𐦢 *bedewi* ~ 𐦦𐦡𐦸𐦡𐦥𐦡 *bedewe* where the word-final vowel 𐦢 *i* /i/ [iː] → [eː] is written in the variant form with 𐦡 *e* /e/ [e] ~ [eː].

The proposal for this realisation of the reduced high vowel /i/ could also explain Meroitic alternate forms where there is variation between the written vowels 𐦢 *i* /i/ [i] → [ə] and 𐦡 *e* /ə/ [ə],[34] as in the following:[35]

(18)

a.	Meroitic	𐦯𐦭𐦦𐦢𐦫 ~	*ḫlbine*~	title
		𐦯𐦭𐦦𐦡𐦫	*ḫlbene*	

[32] I am grateful to Claude Rilly (p.c.) for bringing this point to my attention.
[33] Sturtevant (1940:112) remarks that Latin *e* corresponds to Greek ε and η.
[34] I follow Rilly (2007), who specifies that the Meroitic vowel sign 𐦡 *e* has two phonemic values of /e/ and /ə/, see §4 for more on these values.
[35] At present, I do not consider that these word-internal vowels are long.

b.	Meroitic		*pirite~*[36]	title
			perite	
c.	Meroitic		*womnise-l<u>h</u>~*	title
			womnese-l<u>h</u>	
d.	Meroitic		*pilqe~*	toponym
			pelqe	

Alternatively, Rilly (2007:398) explains this as perhaps being due to the Meroitic phoneme /e/, represented by the sign *e*, having a broad range of phonetic realisation since it corresponds to Greek ῖ [iː] and η [ɛː] in transcriptions of the Meroitic toponym *pedeme* i.e Πρῖμις, Πρῆμις.[37] He points out that the Greek versions are not always phonetically precise, and further that there is a vocalic change ("*iotacisme*")[38] that takes place, where the distinction between ι and η is disturbed.[39] Allen (1968:71) asserts that there is confusion between ι and η beginning around 150 CE.

Essentially, these discussions lead to two proposals that could account for the Meroitic variant forms with *i* /i/ and *e* /e/. Firstly, as per Hintze (1973a), I propose that Meroitic *i* /i/ is phonetically realised as [i], and when it is subject to reduction as [ə].[40] Secondly, Rilly's account is that Meroitic *e* /e/ has the realisation [e], and as

[36] The more standard form for this title is *perite* so this would not seem to be a case of vowel reduction; an investigation into the number of occurrences of the form *pirite* would be needed in order to account for this variation.
[37] The central and mid vowels have less well-defined acoustic properties than the corner or peripheral vowels.
[38] See Sturtevant (1940:35-36), for his discussion on the rare confusion of η with ι in Ptolemaic papyri, which for him, indicates perhaps an "itacistic" pronunciation in some social strata of certain localities (1940:37).
[39] The value of Greek η gradually changed to become a more close vowel resulting in /ɛː/ > /eː/ > /iː/, as in Modern Greek, whereby the distinction between *eta* η and *iota* ι was neutralised.
[40] It could further be a query as to whether this reduction is in fact phonetic rather than phonological, as phonetic reduction involves a contraction of the overall vowel space and not necessarily a move towards centralisation of vowel quality.

being a close-mid vowel is nearer to the close vowel [i].[41] This is an area open to further investigation, but presently is outside the scope of this thesis.

2.2 Meroitic word-final *i*

There are also correspondences with Greek where Meroitic word-final *i* is not transcribed:

(19)

a.	Meroitic		*kisri*	Latin title
	Greek	Καῖσαρ[42]		
b.	Meroitic		*amni*	Eg. theonym
	Greek	Ἀμουν ~ Ἀμμων		
c.	Meroitic		*atri*	Eg. theonym
	Greek	Ἀθυρ		

As these forms are Meroitic borrowings of a Latin title (19a) and Egyptian theonyms (19b & c), which were probably not borrowed into Greek from Meroitic, they cannot be used to detail any apocope of the Meroitic word-final vowel.

To conclude this section on the Meroitic vowel sign *i*, I follow that the evidence from Greek and Latin strongly suggests that phonemically this vowel is /i/ which is realised

[41] Rilly (2007:398) presents a second phonemic value to the Meroitic *e* sign. See §4 for the discussion.

[42] See Rilly (2007:295), who states that the Meroitic form follows Greek pronunciation and therefore the word must have been pronounced with a diphthong in the initial syllable, but where only the second vowel of the diphthong is written. However, the case here is one of loan-word phonology. If the Meroites did not have this diphthong [ai] in their vocalic inventory (or in fact any diphthongs?), then it would be unlikely for them to follow Greek pronunciation exactly, but to adapt the diphthong accordingly to their vocalic system. This adaptation could be through monophthongisation of the diphthong into a long single vowel such as [iː] where in fact this is written in the Meroitic form with *i* /i/.

as [i] and [i:]. Furthermore, that when subject to reduction these vowels are realised as [ə] or [e:] respectively.

3 Meroitic *o* 𐦣 𐦃

Since Griffith (1911:13) found that Meroitic 𐦃 𐦣 'is the only sign in the alphabet that is purely vocalic,' it caused him problems when trying to identify the source in Egyptian for its hieroglyphic origin. He specified that, 'There is no alphabetic sign like 𐦃 in Egyptian; but in the syllabary 𐦃 is an abbreviation for *ỉḥ* 'ox', Copt. ⲉϩⲉ.'[43] He points out that a similar sign to 𐦃 is used in Egyptian transcriptions of the earlier Ethiopian kings. He cites Schaefer's suggestion that this hieroglyph may stand for <*ḥ*> in substitution for the hieroglyph 𓃾. Griffith (1916b:122) returns to Schaefer's hypothesis and adds that the hieroglyph 𓃾 in Coptic would be ϩⲟ /ho/. He believed that the Meroites could not pronounce ϩ /h/ and so would convert ϩⲟ into *o*. He states this firmly as, 'the ox's face [𐦃] or head [𓃾] would naturally represent to them [the Meroites] the vowel *o*,' (1916b:122).[44]

For the origins of the cursive form 𐦣 being a stylisation of the hieroglyph 𐦃 was erroneous according to Griffith (1911:13) who remarked that 'The simplifying of 𐦃 to an oblique stroke 𐦣 in Demotic is quite intelligible, though it has no parallel in Egyptian hieratic or Demotic.'[45] Priese (1973:297-298) would find the parallel of the Meroitic cursive sign 𐦣 from an Egyptian Demotic sign,[46] which Rilly (2007:252) affirms as being frequently used in Late Egyptian to transcribe the sound /o/, particularly in foreign names.

[43] I infer from Griffith's term 'syllabary' that he is referring to the Egyptian "syllabic orthography", which was thought to have been developed to indicate vowels in the notation of foreign words and names. See Peust (1999b:218-221) for an overview into the Egyptian "syllabic orthography". Also see Priese (1973:278) for a discussion on the Egyptian "syllabic script" as the inspiration for the Meroitic script.

[44] See Priese (1973:297-298) for a discussion into Griffith's proposal with alternative variants, and Rilly (2007:267) for an additional piece of evidence for Griffith's proposal, also Fig. 2.1.

[45] Griffith does note that there are two Egyptian Demotic signs that are similar to the Meroitic cursive form, but as they have such different values, he does not propose to link these with the origins of the Meroitic cursive form.

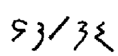
[46] See Fig. 2.1.

The specific sound value of this sign, however, would be a source of difficulty for Griffith. Griffith (1911:11, 13) transcribed this vowel sign / as *ê* [eː], but did not specifically give any further indication into its vocalic quality in this study.[47] He wavered with Coptic equations that might indicate an '*o* value' present in the Meroitic vocalic inventory, but contended that there was no clear proof for the existence of the vowels 'o' or 'u' in the Meroitic language (1911:22).

That the Meroitic sign / had the value 'ê', Griffith thought was supported by further forms from Coptic and Greek, although he also stated that 'there is cogent evidence also for an *o*, *u* value' (1916b:121).

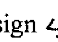
This 'cogent evidence' that Griffith (1916b:119) found comes from cases of correspondences where Greek ου /oː/ and Coptic ω /oː/ indicated that Meroitic / did indeed represent a back vowel (1916b:119, 121). Two examples of these are given below:

(20)

a.	Meroitic		*p<u>h</u>ome*	Eg. anthroponym
	Greek	Παχουμις		
	Coptic	ⲡⲁⲭⲱⲙ		
b.	<u>Meroitic</u>		*brtoye*[48]	anthroponym
	Greek	Ἀβρατοεις		

---

[47] This was due to the data from equivalent forms that was available to Griffith at this time. The correspondent forms from Greek and Coptic indicated that Meroitic / was a long front mid or front high vowel, hence his transliteration of this sign. I believe that as later research has concluded evidence for a chain-shift between Egyptian and Coptic stressed vowels; it was this vocalic shift that caused Griffith confusion in his investigation of the quality of the Meroitic vowel.

[48] Griffith assigned the vowel 'o' as inherently contained in the 'syllable' sign .

Griffith also noted the advice given to him that 'it is almost inconceivable that a language should have existed without the *o-u* vowel' (1916b:122). Consequently, he hypothesised that the value 'o' could also be representative of the Meroitic sign /. Since Griffith did not seem particularly content in determining an exact value to this Meroitic sign, in that he could not instance any further unambiguous evidence for this association, he kept to the original transliteration of this sign as *ê*.

3.1 Proposals for Meroitic *o* /

Most researchers, who have investigated the Meroitic vowel sign /, have affirmed the evidence indicates that its value is not a front mid long vowel as Griffith's initial investigation hypothesised (1911), but a back round vowel, as his second investigation speculated (1916b).

Vycichl (1958a:74) declared, albeit without any discussion, that 'In my opinion, *ê* represents an *o* or *u* sound and I therefore transcribe *o*,' he also points out that this value *o* is but approximate.[49] Nevertheless, we have to look further to find out that Vycichl (1958b:178) does indeed instance the evidence for his earlier assertion, which is essentially the same correspondence data given in Griffith (1916b:121). In a later publication (1973b:62), Vycichl again discusses the sound value of this sign as being phonetically realised as [u] or [o], and settles with the latter value as the (phonetic) realisation of this Meroitic sign /. From a phonological angle, Zawadowski (1972a:20) prefers to represent this sign as phonemically /u/, and he states that the phonology theoretically requires this phoneme in the vocalic system. He believes that languages which have the phonemes /a/ and /i/ must phonologically oppose (through symmetry?) the phoneme /u/, rather than /o/ which would have to be balanced with /e/. The phoneme /u/ in the system allows Zawadowski to posit a tridirectional vocalic system for Meroitic, with the three peripheral vowels /a/, /i/ and /u/ and a centralised phoneme /ə/.

[49] See also Meinhof (1921/22:4), who discussed the vowel *o* and *u* as being present in the language, but did not relate this vowel to a specific Meroitic sign. Zyhlarz (1930:415) also posits the vowels *o* and *u* but proposes that different signs represent these vowels, which is dependent upon their positioning in a word, whether initial or medial.

Nevertheless, two phonemic values of /o/ and /u/ are given to the Meroitic sign / by Priese (1973:197) from a discussion which is principally concerned with the palaeography of the Meroitic sign. Whereas Hintze (1973a:322-323), working independently from Zawadowski and from looking specifically at corresponding forms, would represent this same sign with the phonemic value /u/.[50] Hintze posits the phonetic realisations of the phoneme /u/ as [o] or [u]. This is from analysing most of the correspondences between other languages with the Meroitic vowel sign /, which for him indicates these two values. In consideration of his definite proposal, Hintze (1973a:321) implemented the revised transliteration of this sign / to *o*.

Rilly (2007:403) agrees that the phoneme for the sign / *o* is /u/, and supports Hintze's phonetic realisation proposal for this phoneme as [u] and [o]. This support for the dual phonetic realisation is made through analysing the representation of this Meroitic vowel phoneme in correspondent forms, particularly Greek and Latin ones. I support the claim that the vowel sign / *o* is phonemically /u/, but the claim that it is phonetically realised as [u] and [o] based on the indication of these vowels from equivalent forms is perhaps a little too tentative.

The correspondent forms that indicate Meroitic / *o* /u/ has the phonetic realisation [u] are from Coptic and Latin transcriptions. Coptic **ⲟⲩ** - /u/ and Latin *u* /u/ [uː] ~ [ʊ]:

(21)

a.	<u>Meroitic</u>	 *qoreti*		toponym
	Coptic	**ⲕⲟⲩⲣⲧⲉ**		
b.	<u>Meroitic</u>		*dor*	toponym
	Latin	*Andura*		

[50] However, we have to be careful with Hintze's method of representing this phoneme as he writes it as /o/, he explains his reasons into this as, 'For practical reasons the u-phoneme is better written *o* in transliteration and /o/ in phonemic transcription, to avoid confusion with *n* in writing' (1973a:323). Hofmann (1981a:32) notes Hintze's remark but decides that, for clarity, this phoneme should be represented as /u/.

Further correspondences with Coptic, Latin and Greek indicated for Hintze and Rilly that the phonetic realisation of Meroitic *o* /u/ is also [o]. Coptic **ⲟ** - /o/, Latin *o* - [o:] ~ [ɔ], and Greek ου - [o:], ο - [o], and ω - [ɔ:]:

(22)

a.	Meroitic		*p<u>h</u>ome*	Eg. anthroponym
	Greek	Παχουμις		
	Coptic	**ⲡⲁⲭⲱⲙ**		
b.	<u>Meroitic</u>		*qoreti*	toponym
	Greek	Κορτη		
c.	Meroitic		*arome*	Latin toponym
	Greek	῾Ρώμη		
d.	Meroitic		*boq*	Eg. toponym
	Greek	Ἀβοῦνκις		
	Latin	*bocchis*		

However, if the phonemic value of the Meroitic sign *o* is /u/, which is phonetically realised as [o] (as in the examples 22 above), then we expect these examples to exhibit a conditioning environment that lowers the phoneme /u/ to [o]. This conditioning environment could be the adjacency of the /u/ phoneme with a uvular consonant. It was previously discussed (Chapter 2, §7.5) how there is evidence for the process of vowel lowering/retraction in Meroitic of adjacent vowels to uvular consonants. The forms of 22a, b and d above all show the uvular consonants *q* /q/ and *<u>h</u>* /χ/ (as per my claim in Chapter 2) adjacent to the vowel sign *o* /u/ which is realised as [o] as in the equivalent forms. Following my proposal of these signs being uvular, the phoneme /u/

would be lowered when adjacent to the uvular consonants resulting in the phonetic vowel [o].[51] However, this analysis would not be able to explain the form in (22c). It is then also a strong possibility that the Meroitic sign 𐦣 *o* /u/ is only realised as [u] in any other environment, but the varying vowel quality in the equivalent forms from Greek and Latin, where Meroitic 𐦣 *o* /u/ is transcribed with [o] is a result of the phonology of the languages in which these vowels are shown. Therefore, the evidence for the phonetic realisation of /u/ as [u] and [o] is supported more strongly from the lowering/retraction process rather than from the equivalent forms.

4 Meroitic *e* 𐦡 𐦁 – Part 1

The representation of this vowel sign is integral to my argument and subsequent proposal of the 'syllable' signs in Chapter 5 of this thesis. Subsequently, the investigation into the representation of this sign consists of two parts: in Part 1 of this chapter, I discuss the origins of the hieroglyphic and cursive forms of this sign and the proposal for one of the representations of this sign as indicating the mid vowel /e/ as per Rilly (2007:397-398); Part 2, (Chapter 5) discusses and challenges the traditional representation of this sign as a zero-vowel indicator.

Griffith (1911:12) discussed the origins of the Meroitic hieroglyphic form 𐦁[52] and since it corresponded, in certain forms, to the Egyptian hieroglyph 𓇌, he thought that it was probable that the Meroitic script devisors confused the Egyptian 'reed flower' hieroglyph 𓇋 with the 'ostrich feather' 𓆄. Further, he also thought that it could be the case that the Meroites deliberately substituted the 'ostrich feather' for the 'reed flower' for aesthetic reasons. Rilly (2007:263) is in support of Griffith's second proposal that the modification of this Meroitic hieroglyph was intentional.[53]

[51] It could then be speculated that these equivalent realisations could also be indicative of Meroitic 𐦣 *o* /u/ [u] ~ [o] having long counterparts phonetically e.g. [u:] ~ [o:], due to the indications given from the vowels in the equivalent forms.
[52] See also Priese (1973:298).
[53] See Rilly (2007:263) for his reasons into this modification hypothesis.

However, the origin of the cursive form has drawn no definite conclusions. Griffith (1911:12) opined that it was possible that the cursive sign was a stylisation of the corresponding hieroglyph and Rilly (2007:247) agrees that this is a plausible hypothesis. Rilly also contends that the influence of stylisation of one sign on another could also be attributed from the cursive to the hieroglyphic form, but maintains that the origin of the cursive sign still remains uncertain.[54]

In his discussion and investigation of attributing a sound value to this Meroitic sign, Griffith (1911:9) corresponded it with the vowel 'e' of Akkadian, as the Meroitic form gives *atiye* and 'The name of the queen of Amenhotp III is rendered Teie, *i.e.* Teye, in the Amarna tablets' (Griffith 1916b:119). Furthermore, Griffith also observed that 'is more usually a weak vowel … it is the vowel of the Egyptian definite article, which in Coptic is vowelless' (1911:12). He proposed that the transliteration of this sign should be *e* to denote his same proposed vocalic value.

In a later work, once more correspondent forms from other languages had been discovered; Griffith (1916b:121) drew a parallel with Meroitic *e* and Greek η [ɛː], but he never further discussed the Meroitic vowel's representation in light of this data:

(23)

a.	Meroitic		*kdke*	title
	Greek	Κανδάκη		
b.	Meroitic		*arome*	Latin toponym
	Greek	᾿Ρώμη		

Hintze's investigation into this vowel sign would lead him to conclude that it represented a schwa vowel phonologically and phonetically /ə/ [ə], although he would

[54] See also Macadam (1949:110), for an alternative proposal and Priese (1973:298) for a comparison with an old Demotic sign.

use the phonemic transcription of this schwa as /e/.[55] Whether this was done for typological reasons, as in his same transcription for the /u/ phoneme being /o/, or because of an alternative proposal is hard to discern as he only states that, 'For the ə-phoneme the writing *e* resp. /e/, seems to be the best' (1973a:322-333). In his second study on correspondent forms with this vowel (1973b:334-335), Hintze utilises the phonemic transcription of the vowel sign 𐦡 *e* as /e/, although we can assume that, as in his preceding statement, the phonemic transcription is perhaps really /ə/.[56]

The hypothesis that this vowel sign was phonemically a schwa /ə/, was also proposed by Zawadowski (1972a:21). He supposed that 'this vowel had no phonologic[al] relevance in oppositions and that consequently it is the best way to note it as an indefinite or neutral vowel /ə/, which does not belong to any of the timbre classes.' This proposal rested upon him balancing out the Meroitic vocalic system theoretically, in that if the sign 𐦡 *e* was not a schwa vowel, but a mid front vowel, this would then cause a gap in the corresponding back section of the vowel space, as there was only one back vowel phoneme for Zawadowski i.e. 𐦣 *o* /u/.

4.1 Rilly's proposal for Meroitic 𐦡 *e* as /e/

A new analysis is made by Rilly (2007:397-398) for the phonemic value to this Meroitic sign. This analysis is based on Greek correspondent forms that transcribe Meroitic 𐦡 *e* /ə/ with η [ɛː], which is indicative for Rilly (2007:397) in proposing a further phonemic value to this sign, namely /e/:

(24)

a.	Meroitic	𐦲𐦷𐦲𐦡	*kdke*	title
	Greek	Κανδάκη		
b.	Meroitic	𐦠𐦬𐦣𐦩𐦡	*arome*	Latin toponym
	Greek	'Ρώμη		

[55] He also proposed the null value (zero-vowel) for this sign as well, see Chapter 5.

[56] See also Priese (1973:298), who follows Hintze's proposal, as well as Hofmann (1981a:32).

c.	Meroitic		*beke*	Eg. anthroponym
	Greek	Πβηχις		
d.	Meroitic		*pyesi*	Eg. anthroponym
	Greek	Παησις		
e.	Meroitic		*tyesi*	Eg. anthroponym
	Greek	Θαησις		
f.	<u>Meroitic</u>		*selele*	toponym
	Greek	Τεληλις (?)		
g.	<u>Meroitic</u>		*pedeme*	toponym
	Greek	Πρῆμις		

I agree with Rilly's proposal that the use of Greek *eta* η [ɛː] in these forms does not support an interpretation of the Meroitic vowel 𐦡 *e* being only /ə/ (along with /e/).[57] My proposal is that the Meroitic vowel 𐦡 *e* is used to represent two vowels; one being an underlying /e/ and the other a surface [ə]. Accordingly, the Greek correspondences point to this Meroitic vowel having a dual value but that the dual value is dependent on whether the vowel is in a stressed position. Further evidence for this, as already discussed in §2.1.1, is that Kaufman (1984:90) discusses Greek transliterations of Aramaic proper nouns use *epsilon* ε /e/ to transcribe a reduced Aramaic vowel (schwa).

A further remark is made here on the use of Greek *eta* η [ɛː] in the forms, which correspond to Meroitic 𐦡 *e*. Allen (1968:66) asserts that the transcription of Greek words in Latin represent *ē* [eː] with η [ɛː], and as such *eta* is used to transcribe long mid

[57] As Rilly (2007:397) points out, a few further Greek and Latin correspondences which transcribe Meroitic 𐦡 *e* with Greek ι /i/, and Latin *i* /i/, again this does not lend itself as evidence for the transcription of a phoneme /ə/.

vowels. That Greek η [ɛː] transcribes a long mid vowel could be indicative of the Meroitic vowel *e* being phonetically long i.e. [eː].[58] Consequently, this would have repercussions on the dual representation hypothesis of *e* as /ə/ and /e/ as per Rilly. The forms in (24) where there is a correspondence between the Meroitic vowel *e* /e/ and Greek η [ɛː] could indicate the following vocalisation where Meroitic *e* /e/ is [e]:

(25)

a.	Meroitic		*kdke*	/kandake/
	Greek	Κανδάκη		[kandake]
b.	Meroitic		*arome*	/ʔarume/
	Greek	᾽Ρώμη		[ʔarume]
c.	Meroitic		*beke*	/beke/
	Greek	Πβηχις		[bekə]
d.	Meroitic		*pyesi*	/payesi/
	Greek	Παησις		[payesi]
e.	Meroitic		*tyesi*	/tayesi/
	Greek	Θαησις		[tayesi]
f.	Meroitic		*selele*	/slele/
	Greek	Τεληλις (?)		[slelə]
g.	Meroitic		*pedeme*	/pedeme/
	Greek	Πρῆμις		[pedemə]

[58] Rilly (2007:398) does not consider the length distinction to be relevant.

The following correspondent forms show Meroitic *e* as a short mid vowel [e] or schwa [ə] as represented in Greek by *epsilon* ε /e/:

(26)

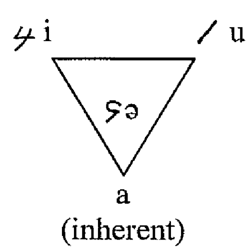
a.	Meroitic		*medewi*	toponym
	Greek	Μερόη	[mədewi]	
b.	Meroitic		*arette*	Eg. theonym
	Greek	ʽΑρενδωτης	[ʔarəntat]	
c.	Meroitic		*peseto*	Eg. title
	Greek	ψεντης		

The traditional hypothesis initiated by Griffith (1911) and succinctly described by Hintze (1973a) that the Meroitic vowel sign *e* is also used to represent a zero-vowel is discussed and argued against in Part 2 of this vowel sign in Chapter 5.

5 Structural symmetry and the Meroitic vowel inventory

The studies by Hintze (1973a) and Zawadowski (1972a), who proposed the vowel sign *e* is a mid central vowel /ə/, allowed them to maintain a structural balance in the Meroitic vocalic system:

(27)

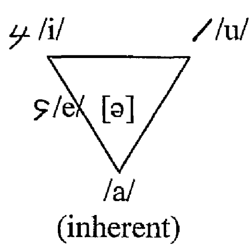


Investigations and research into vowel typology ascertain that vowel phonemes tend to pattern evenly in the available phonetic space, thereby ensuring that vowels are not crowded into certain areas with other parts of the vowel space left empty. This is in order to keep vowel phonemes distinct in their acoustic quality.

Moreover, the traditional proposal that Meroitic / *o* is a high back phoneme /u/ rather than a mid back /o/, is supported typologically in that it is marked for a vowel inventory to contain a mid back vowel /o/ and not a high back vowel /u/. The vowels /a/, /i/ and /u/ are variously defined as corner, peripheral or 'quantal' (Stevens 1972) and those which are particularly stable acoustically and they are perceptually maximally distinct (Ewen & van der Hulst 2001). Furthermore, Greenberg (1966b) showed that these peripheral vowels also have a frequency hierarchy pattern of /a/ > /i/ > /u/.

However, as I propose that the Meroitic vowel sign ϛ *e* represents an underlying /e/ and a surface schwa (central) vowel [ə] which is [e] when stressed:

(28)



The structural asymmetry of Rilly's vowel inventory is recognised (2007:402-404), and he discusses how, although this vocalic arrangement is not dominant, it is nevertheless found and that languages with this structural asymmetry have a strong tendency to reproduce the front vowels with a wider margin of articulation.

Since Rilly's proposal of a front mid vowel underlyingly is based on indications from Greek transcriptions,[59] this evidence should be looked at from how languages can have

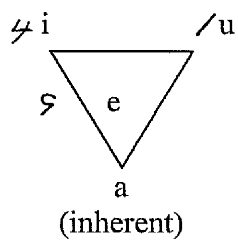
[59] Which evidence from Kaufman's (1984) study has supported with Greek transcriptions of Aramaic schwa with *epsilon*.

variant vowels between what is represented at surface level and those that are underlying.

6 Conclusion

Primarily, this chapter has discussed and explained certain areas to do with the transcription of Meroitic vowels in equivalent forms from other languages that have caused some confusion as to their values. I maintain that there are four phonological vowels in the Meroitic inventory:

(29)



Queries to the transcription of these vowels in equivalent forms can be summarised as follows. The inherent unmarked ‘a’ /a/ vowel in certain Greek equivalences is transcribed with a back rounded vowel, this is due to the vocalic chain-shift process that affected Egyptian stressed vowels so that by the Coptic stage of the language, these vowels had shifted one or two stages along. The Greek forms would have been borrowed from a later stage of Egyptian, including Coptic, by when these vowels would have chain-shifted. The Meroitic equivalences indicate that they were borrowed from Egyptian at a stage preceding this chain-shift process. There is also evidence to show that the phoneme /a/ reduced to /ə/ and to complete syncope in unstressed positions.

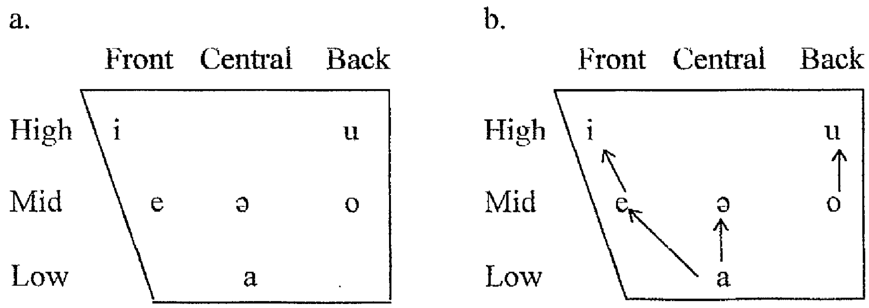
The Meroitic vowel 𐦂 *i* /i/ is also evidenced as reducing to /ə/ in unstressed positions, this explains the variation in written forms where there is a change from the sign 𐦂 *i* /i/ to 𐦁 *e* /ə/. Greek equivalent forms indicate that there was lengthening of this vowel when in a word-final placement. This lengthening would be phonetic as there is no evidence of contrastive length distinctions, if indeed they did exist, of the Meroitic vowels.

That the Meroitic back vowel sign / *o* is phonemically /u/ is supported through typological considerations and equivalent forms. I believe that the phonetic realisation of this phoneme as not only [u] but also [o] based on considerations of equivalent forms is too tentative with the little equivalent data known at present, but is substantiated by the process of uvulars conditioning vowel lowering/retraction.

The phonemic value of the Meroitic vowel sign ϧ *e* as /e/ as Greek equivalences vary with their notation of this Meroitic vowel sign in using *eta* η /ɛː/ and *epsilon* ε /e/. It could be the case that the Greek *eta* forms indicate the stressed Meroitic vowel which is [e] phonetically. It is comparatively evidenced that the Greeks transcribe a schwa from another language with *epsilon* ε /e/, and therefore a single surface value of [ə] for the Meroitic vowel sign ϧ *e* can be explained if we allow different surface form realisations due to stress positioning and thus it can be explained how there are Greek transcriptions which use *eta* η /ɛː/. The further value of this sign as being null is discussed and argued against in Chapter 5, which follows.

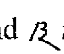
tongue body and the shape of the lips. Conventionally, the representation of the vowel space is shown in the diagram of (16a):

(16)



Vowel raising (16b) is shown where a low vowel such as /a/ can raise to a mid vowel – [e], [ə] and even to the high vowel – [i]. It follows that the mid vowel - /e/ can also raise becoming the high vowel – [i], along with the back mid vowel - /o/ raising to a high back vowel – [u].

The Tibetan data (15), even though a small piece of evidence, is interesting in that it shows the process between the script and the language whereby coronals trigger the vowels to raise. This process is very common cross-linguistically (Hume 1994; McCarthy 1994a) and is especially found for the vowels that follow coronal consonants.

I put forward that the vowel raising phonological process could be functioning in Meroitic. This means that in the orthographic forms where we find the inherent unmarked 'a' 'consonant' signs  *t* /ta/, *s* /sa/ and  *n* /na/ they could be phonetically realised with a following front mid vowel at surface form (17):

(17)	Meroitic	Transl.	Underlying form	Surface form[43]
		*t*	/ta/	[te] ~ [tɛ]
		*s*	/sa/	[se] ~ [sɛ]
		*n*	/na/	[ne] ~ [nɛ]

[43] The specific surface form of this front mid vowel can only be speculated.

This process can be captured with the phonological rule as in (18):

(18) /a/ → [e]/ {t, s, n} ____

The discussions put forward in Chapter 4 on the Meroitic vocalic system proposed that there is only one phonemic value for the sign ϛ *e* and that is a central schwa value /ə/. Accordingly, the Meroitic vocalic inventory is given again in (19):

(19) /i/ /u/

/ə/

/a/

The process of the coronal consonants /s, n, t/ raising the following vowel means that the surface form (phonetic realisation) of the vowels following these coronals will be as in (20a) whereas the vowels following all other consonants is shown in (20b):[44]

(20a) SF of vowels after coronals (20b) SF of vowels after non-coronals[45]

(20a)		(20b)	
i	u	i	u
e ə		e ə	
		a	

Moreover, this analysis also means that the phonetic realisation of the 'consonant' coronal signs with an inherent 'a' /a/ vowel will be so perceptually close to the phonemic representation of these signs if they were followed by the separate vowel sign

[44] Due to the proposals put forward in Chapter 2, §7.5 that there is a vowel lowering/retraction process evident after the uvular consonants in Meroitic, accordingly the phonetic realisations given in (20b) would be different for these specific consonants.
[45] The vowels following the uvular consonants in Meroitic, as claimed in Chapter 2, §7.5 would not have these surface representations.

𐦡 *e* that they would make the written use of these redundant, and hence this could explain their written omission within the texts:

(21)

	Meroitic	Translit.	Underlying form		Surface form
a.	𐦴	*t*	/ta/	→	[te] ~ [tə]
	𐦯	*s*	/sa/	→	[se] ~ [sə]
	𐦩	*n*	/na/	→	[ne] ~ [nə]
b.	*𐦴𐦡	*te*	/tə/	→	[ti] ~ [tɪ]
	*𐦯𐦡	*se*	/sə/	→	[si] ~ [sɪ]
	*𐦩𐦡	*ne*	/nə/	→	[ni] ~ [nɪ]

Furthermore, the phonetic form of the unfound sequences in (21b) would be identical to the phonemic and phonetic forms of the following sequences in (22), and consequently, the forms of (21b) would not be notated, as they would perhaps be too perceptually close to the following sequences:

(22)

	Meroitic	Translit.	Underlying form		Surface form
c.	𐦴𐦢	*ti*	/ti/	→	[ti] ~ [tɪ]
	𐦯𐦢	*si*	/si/	→	[si] ~ [sɪ]
	𐦩𐦢	*ni*	/ni/	→	[ni] ~ [nɪ]

This phonological analysis can explain the 'gap' in the written Meroitic texts whereby there is a conspicuous non-occurrence of the 'consonant' signs followed by the separate vowel sign 𐦡 *e* i.e. *𐦴𐦡 /te/ [ti], *𐦯𐦡 /se/ [si] and *𐦩𐦡 /ne/ [ni]. Accordingly, the gap that possibly exists in the language is a phonetic one, because of vowel raising, where it is the sequences *[sa], *[na] and *[ta] that are missing.[46]

4.3.1 Equivalents with coronals + e

Further support for the proposals already given, these being: (i) the 'syllable' signs do not contain a vowel, and (ii) vowel raising is triggered by the preceding coronals /s, n, t/, comes from equivalent forms discussed in Griffith (1916b). Griffith (1916b:119) stated the importance of this data:

> Transcripts by Meroitic scribes in the third century A.D. of Egyptian names...ought to furnish particularly reliable guides to the values of the vowel signs, especially as Coptic equivalents and Greek versions give a very good idea of what the vocalisation of the names must have been at that time.

It should be noted that this data should be analysed with a cautionary view as it does deal with the vowels of loans (see §5), since vowels are particularly unstable, their representations from one language into another are not 'particularly reliable guides.' However, certain discrepancies between the vocalic representations in this data and Meroitic can be explained if the process of coronal consonants triggering the following vowel to raise is taken into account. Therefore the data from Griffith (1916b) enables us to explain the change in the vowel that is represented.

Throughout the data, we expect the Meroitic forms to notate a front mid-vowel as found in the equivalent forms, but what we find instead is that Meroitic positions a high front vowel. This data is interesting as it reveals that the front mid vowel in the equivalent

[46] I am not excluding the possibility that the reason why the sequences /ne/, /se/ and possibly /te/ are not found in the script is due to the phonotactics of the Meroitic language. A thorough frequency analysis of phoneme + vowel sequences in Meroitic, which is outside the scope of this thesis, could give valid indications for these missing sequences and others, as being the result of phonotactic constraints. Bender (1974) does just this with Amharic (Ethio-Semitic). His results conclude that the distribution of CV's with tense vowels shows indications that certain phonemes, such as /ɲ/ and /ʃ/ do not pattern with these vowels (1974:22). Further, in light of my revised proposal (Chapter 2, §2.1.2) that the sign 𐦸 *d* is a coronal stop /d/, it could be a query why this sign is found preceding the vowel sign 𐦡 *e*. Speculations such as whether this is the result of a gap in the system or is due to phonetic reasons, cannot be investigated at present but is the subject of future research.

forms is not interpretable in Meroitic when preceded by the coronal series /s, n, t/. This is because a coronal + /e/ will be realised phonetically as a coronal + [i] in Meroitic. Therefore, equivalent forms containing a coronal + mid vowel will be raised in Meroitic resulting in the sequence coronal + high front vowel [i].[47]

A further highly pertinent point is that the 'syllable' signs are not used to notate these equivalences, whereas if they were we would have conclusive evidence of these 'syllable' signs containing an inherent vowel.

Griffith asserts that 'If the vocalisation of a word is known some kind of explanation of the reasons for the use of the vowel signs in [Meroitic] writing can be given...' (1916b:121). It is shown in the following discussion of Griffith's data (1916b) that where equivalent forms position a front mid vowel 'e', Meroitic transcriptions interpret this vowel as a front high vowel *i* /i/ [i] when the consonant that precedes is a coronal. In all of the data, the coronal unmarked 'a' 'consonant' signs - *s* /sa/, - *n* /na/ and - *t* /ta/ are found followed by the vowel sign - *i* [i], thereby displaying the sequences [si], [ni] and [ti].

(23)

a. The name of the queen of Amenhotp III is rendered Teie, *i.e.* Teye, in the Amana tablets. The name of the city dedicated to her in Nubia was therefore pronounced Ha-Teye and appears in Meroitic as

The transliteration of the form of (23a) 'Ha-Teye' is *atiye* in Meroitic. It is seen that in the transcription of the original Akkadian vocalisation 'Ha-**te**ye' the mid-vowel 'e' follows the coronal consonant 't' where we find the vowel is interpreted in the Meroitic form as [i] not 'e' *atiye* following the coronal consonant sign *t* /t/.

[47] McCarthy (1994a:4), uses data taken from Abboud (1979), showing the raising of the low vowel /a/ to the high vowel [i] in the Najdi dialect of Arabic: /katab+at/ > [ktibat] 'she wrote'; /nataf+aw/ > [ntifaw] 'they (m.) pulled feather'; /samiʕ/ > [simiʕ] 'he heard'; /galam+ih/ > [glimih] 'his pen'.

b. It was the Pharaohs of the New Kingdom that introduced Ammon into Nubia and established his worship in temples throughout the country from Debod to Napata, and it is easy to trace the origin of the Ethiopian form in the New Kingdom pronunciation which is rendered Amānu, Amāna in the cuneiform of the Amarna tablets. The Meroitic-Greek –αμενης and the Ethio-Assyrian -amanē indicate for 4/3ʒ(52) the pronunciation Amănē or Amănĕ.

Griffith's (1916b:119) discussion of the Ethio-Assyrian equivalent 'ama**nē**' shows a mid-vowel following the coronal nasal, the Meroitic form, 4/3ʒ52 ***amni*** and its transcription as /ʔama**ni**/, shows that this mid vowel is interpreted as [i] in Meroitic, again when preceded by the coronal nasal /3 *n*.[48]

c. (T-)shapshi (in Old Coptic…) or (T)shepshe, Mer. *š 4p 9š 4(y 9)*.

The Meroitic form 9 /// 43 9 ξ 43 *sipesiye* shows that where both of the vowels are interpreted as 4 *i* [i] following the coronal 3 *s* /s/, where the Coptic equivalent shows the mid vowel 'e' *shepshe*.[49]

d. Pa-Êse, Ta-Êse Mer. *Py 9š 4*, *Ty 9š 4*

The Meroitic forms are 43 9 /// ξ ***pyesi*** and 43 9 /// ϟ ***tyesi***.[50] In both forms the Coptic word-final mid-vowel 'e' follows the coronal 's', the Meroitic equivalents both indicate that they are interpreted as the front high vowel 4 *i* [i] following the coronal 3 *s* /s/.

e. With these may be associated the transcript of the following Egyptian word: t-washte or t-weshte Mer. *t 9w 4s 9(?)t 4*.[51]

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[48] However, the transcription of the word-final vowel in Meroitic could coincide with the original vocalisation of this Egyptian theonym.

[49] In the Meroitic transcribed forms, the vowel is interpreted as a front high vowel [i].

[50] As there are two vowels adjacent in the Coptic forms – 'Pa-Êse, Ta-Êse' Meroitic writes the glide /// *y* to break up this vowel sequence.

[51] The Meroitic form is confusingly transliterated by Griffith as *t9w 4s9(?)t 4*, he queries his positioning of the vowel 9 *e* as this form is actually written with the 'syllable' sign 4ϟ⅃// 4Ƨ/4,

The Coptic forms have a word-final mid-vowel 'e' (t-washte ~ t-weshte) which again is interpreted in the Meroitic equivalent ***tewiseti*** with the front high vowel *i* [i].[52] In this instance, we again find this change of vowel following the coronal *t*.

This data indicates that Meroitic interpreted the loans as a coronal + [i] and not coronal + [e].

Furthermore, from these equivalences, we have to ask the question that if the 'syllable' signs *ne* and *se* (and *te*?), really do represent a coronal consonant with an inherent mid-vowel /e/ or /ə/, then why are they not found in the cases where we expect to find them, as of above? If, in the data of (23), the 'syllable' signs were used to transcribe these nouns, then this would be firm evidence for their traditional phonemic representation of containing an inherent mid or central vowel. However, since we do not find them, this section adds to the body of evidence that the 'syllable' signs *ne* and *se* do not contain an inherent 'e' *e* vowel.

4.3.2 Vowel reduction as evidence for the 'syllable' signs *ne* and *se* not containing an inherent vowel

I am reiterating in this section the process of vowel reduction given in Chapter 4, §1.2.2, as the forms where it is exactly evidenced are relevant to my proposal of the 'syllable' signs *ne* and *se* not containing an inherent vowel.

The process of diachronic vowel reduction/neutralisation is seen in a few Meroitic lexical items that have been semantically identified. Rilly (2007:395) states that this neutralisation takes place in the first century CE where this dating is established upon palaeographic grounds. He proposes that the reduction of /a/ is probably due to the positioning of the vowel in the word or to the force of tonic stress. As discussed in

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therefore (following Hintze's revised system) it should be transliterated as *tewiseti*. See §1.2 for Griffith's analysis of this.

[52] It is observed that in this example the vowel following *w* in the Meroitic form has also changed.

Chapter 4, Rilly (2007:398) reconsiders the case of the *e* sign and puts forward the proposal that in fact it represents two phonemes /e/ and /ə/ where the schwa can be realised as a schwa or simply the absence of a vowel. He follows Hintze's assertion that the 'syllable' signs *ne* and *se* contain this inherent vowel 'e' *e*, thereby in the later Meroitic form of (24a) the 'syllable' sign *se* is used which shows that the inherent vowel 'e' *e* is a reduced vowel. I argue that the 'syllable' signs *ne* and *se* do not contain an inherent vowel but represent a closed-syllable position i.e. not followed by a vocalic position.

The forms in (24) are repeated here from Chapter 4, showing an instance of this vowel neutralisation to complete reduction:

(24)

a.	Early Meroitic		*pes**'a'**'n'to*[53]	/pə**sa**ntu/	title
b.	Late Meroitic		*pese'n'to*[54]	/pəsntu/	

The early period Meroitic form uses the 'consonant' sign *s* /sa/, whereas the late period form has changed the use of the 'consonant' sign to the 'syllable' sign *se* /s/. I maintain that this diachronic change of the 'consonant' sign to the 'syllable' sign was motivated due to diachronic vowel reduction, whereby /a/ > /ə/ > /ø/. Furthermore, it is not the case that this 'syllable' sign *se* includes an inherent vowel 'e' *e*, but it was devised to represent a closed-syllable position. This means that in the form of (24b), the vowel reduction has diachronically resulted in complete syncope of this reduced vowel, which explains the use of the 'syllable' sign *se* /s/ in the late period forms (25) where the phoneme /s/ is now in a closed-syllable position i.e. CVC(C):

[53] I am transliterating the unmarked inherent 'a' in this form for clarity. These forms are found in REM 0453, 0521, 1003 and dated as early texts.
[54] The traditional transliteration of this sign as *se* should not be taken as indicating a vocalic position, although I maintain the traditional transliteration here. This form is found in REM 0277, 0544, 1063 and dated as late period texts. See Griffith (1911) for discussions into the dating of texts, and Rilly (2004b, 2007).

(25) Early Mer. = /pəsantu/ > /pəsəntu/ > /pəsntu/ =

Late Mer. /pəsntu/

Diachronic vowel reduction is also evidenced in a second form where there is also an orthographic written change, indicating this reduction which results in complete syncope:

(26)

a.	Early Meroitic		***an‘a’t‘a’***[55]	/ʔ**ana**ta/	title
b.	Late Meroitic		***a‘n’t‘a’***[56]	/ʔ**an**ta/	

The ‘consonant’ inherent ‘a’ sign *n* /na/ is changed from the earlier form to where it is omitted in the later form (no nasal sign is written). This non-notation of the nasal sign in the late period form is due to it being resyllabified into the closed-syllable (coda) position. This non-notation of a nasal in coda position is a principle of the Meroitic script and is discussed in a later section (§4.4). The nasal in coda position of the late period form is due to the diachronic vowel reduction of the inherent ‘a’ vowel contained in the ‘consonant’ sign *n* /na/:

(27) Early Mer. = /ʔa**na**ta/[57] > /ʔa**nə**ta/ > /ʔa**n**ta/ = Late Mer.

What the form in (27) highlights is that if the Meroitic ‘syllable’ sign *ne* did contain an inherent ‘e’ vowel, then why are there no instances of the above form with diachronic vowel reduction where this ‘syllable’ sign is used i.e. why do we not see the form * ***anet*** /ʔa**nə**ta/? This point is picked up again in §4.4.

[55] REM 0453, 1003 dated as early texts.
[56] Late period form.
[57] Rilly (p.c.) also proposes the transcription /annata/. Cf. the Coptic equivalent ϩⲟⲛⲧ /hont/.

This section gives additional weight to the claim that the 'syllable' signs *ne* and *se* do not contain an inherent vowel.

4.3.3 Vowel raising and reduction

This section puts forward the hypothesis that the vowel reduction of the two forms in §4.3.2 above could be more firmly accounted for in light of the hypothesis for coronals raising the following vowel, as in §4.3. Namely, if we analyse the phonological underlying representation of the 'consonant' inherent 'a' sign *s* /sa/ as being phonetically [se] ~ [sə] due to vowel raising, then the reduction/neutralisation that takes place during the first century CE could be better accounted for. This is due to the mid vowel [e] or central vowel [ə] being more likely to reduce to complete syncope:

(28)[58] Early Mer. *pes'**a**''n'to* /pə**s**antu/→ [pes**e**ntu] ~ [pes**ə**tu] >
Late Mer. *pese'n'to* /pesntu/ → [pesntu]

In the above diachronic forms (28), the Meroitic written form of the late period texts uses the 'syllable' sign *se*, whereas the early form uses the 'consonant' inherent unmarked 'a' sign *s* /sa/. The proposal that the mid or central vowels [e] ~ [ə] are the phonetic realisation of phonemic /a/ after the coronal series *s*, *n*, *t*, where these phonetic vowels then reduce complete vowel loss (syncope) is substantiated by the evidence of the later written form using the 'syllable' sign *se*, and thus showing no vocalisation between *se* and *to*.

A corresponding Greek transcription of this Meroitic title could also be used as evidence for this proposal:

(29) <u>Meroitic</u> *pes'**a**''n'to* /pə**s**antu/ [pes**e**ntu] ~ [pes**ə**ntu]
Greek ψεντης

58 Compare the Egyptian equivalent of this title written without /t/ i.e. *p sj-nsj*.

The Greek corresponding form transcribes the vowel following the coronal /s/ (ψ /ps/), with *epsilon* ε /e/, which, as discussed in Chapter 4, §4.1 is utilised by the Greeks to represent a reduced vowel. However, it is impossible to discern whether the Greek vowel *epsilon* ε /e/ is transcribing a reduced vowel /e/ ~ /ə/, or one that has raised to [e] ~ [ə] as could either be the case in the Meroitic form.

Moreover, this same analysis could also be applied to the change of the written forms for the borrowed Egyptian title into Meroitic, as in (30):[59]

(30) Early Mer. *ant* /ʔ**ana**ta/ → [ʔ**ane**te] ~ [ʔ**an**ətə] > [ʔ**ant**ə] =
Late Mer. *at* /ʔ**ant**ə/ → [ʔ**ant**ə]

The inherent unmarked 'a' nasal 'consonant' sign *n* /na/ is used in the earlier texts *ant* which could give [ne] ~ [nə] phonetically, this vowel could then reduce further to complete syncope resulting in the nasal /n/ and coronal /t/ becoming adjacent and, as Meroitic scholars have confirmed, the nasal is not written in coda (closed-syllable) position in Meroitic, this results in the late form *at* being written. This writing practice is discussed in the following section.

4.4 Non notation of nasal + consonant clusters in the Meroitic script

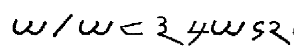
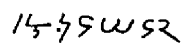
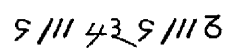
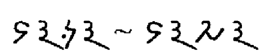
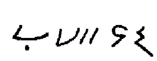
It has long been accepted within the field of Meroitic studies that a nasal consonant in word-internal coda position is not written in the Meroitic script. Griffith (1911:22) gave the first indication into this supposed practice when he stated:

> The writing indicates that the words consisted mainly of open syllables commencing with a consonant. There were also closed syllables, as is shown by the Greek transcriptions *Ἐργαμένης, Κανδάκη*.

[59] For consistency with this proposal, the phonetic forms of the vowel after the coronal *t* /ta/ show the same vowel raising [te] ~ [tə].

Griffith (1916b:120) specifically outlined this convention: 'the omission of *n* is a constant phenomenon in Meroitic writing.' The majority of Meroitic scholars affirm that this is a principle of the Meroitic script, and Rilly (2007:389) gives a list where this is especially verified from equivalent forms in other languages, where there are nasal consonants notated in coda position, but which are unwritten in Meroitic. Egyptian <*n*> /n/, Greek ν /n/ and Coptic ⲛ /n/:

(31)

a.	Meroitic		*arikhror*	anthroponym
	<u>Egyptian</u>	*Ỉrknḫrr*		
b.	Meroitic		*arette*	theonym
	<u>Egyptian</u>	*ḥr-nḏ-it=f*		
	Greek	Ἀρενδωτης		
c.	Meroitic		*ḫs* (?)	theonym
	<u>Egyptian</u>	*ḫnsw*		
	Greek	Χόνς		
d.	Meroitic		*wyekiye*	anthroponym
	<u>Eg. Demotic</u>	*wyngy3*		
e.	<u>Meroitic</u>		*ktke* ~ *kdke*	title
	Egyptian	*kntiky*		
	Greek	Κανδάκη		
f.	<u>Meroitic</u>		*peseto*	title
	Egyptian	*p sj-nsj*		
	Greek	ψεντης		

g.	<u>Meroitic</u>		*arebetke*	title
	Eg. Demotic	*3rbtngy*ʿ		
h.	Meroitic		*at*	title
	<u>Egyptian</u>	*ḥm-ntr*		
	Coptic	**ϩONT**		

Rilly (2007:388) summarises this writing practice as the nasal is not written in Meroitic when it directly precedes the consonants *h̲, k, d, t* and *h̲*.

Primarily, the question has to be asked as to why the Meroites did not notate a nasal coda segment in the script when it was present in the spoken language, even though the traditional hypothesis is that they possessed an assumed zero-vowel indicator i.e. the vowel *e* inherent within the 'syllable' nasal sign *ne*? If this was the correct representation of this 'syllable' sign, this would have enabled the Meroitic scribes to notate the absence of a vowel between the nasal in the coda position and the following consonant - * **ned* /nd/.

Taking the oft-cited example for this phenomenon, a female title in Meroitic is written as *ktke* ~ *kdke*, although it is believed to phonemically contain a nasal in coda position: /ka**n**take/ ~ /ka**n**dake/, based upon the Greek transcription - Κανδάκη.[60] It is strange that we do not find this Meroitic word written as * **knedke*, with the written sequence *ned* representing phonemically the sequence /nd/. In fact there is no evidence of the vowel sign *e* written between the nasal + stop sequences of all the comparative data in (31), this in itself is another factor to be taken into account towards the proposal that the vowel sign *e* is not a zero-vowel indicator (see also the discussion in §5).[61] Consequently, we are left with the verification that the nasal segment is left unwritten as

[60] See also the evidence from an Ethiopic transcription of this title in Chapter 2: *ḫan(ə)dākē* where there is further evidence for a nasal in coda position (Dillmann 1907:48).
[61] Cf. Priese (1973:288); Hofmann (1981a:34-35).

has been adduced from the comparative data of Egyptian, Egyptian Demotic, Coptic, Greek and, now we can add to this, from Ethiopic.[62]

This orthographic omission of the nasal segment adds evidence to the claim that there is not always a direct mapping between the orthographic and phonetic levels of the Meroitic script. This proposal is in agreement with Rilly (2007), who considers that this written omission of an enunciated nasal segment shows that the Meroitic orthography does not have a straightforward and direct mapping with the actual pronunciation.

4.5 Assimilation and coalescence of the 'syllable' signs

Further evidence for the claim made here that there is no inherent vowel 'e' *e* in the 'syllable' signs 𐦰 *se* and 𐦪 *ne* comes from two processes that are well-attested features of the Meroitic script; these being; (i) the assimilation of the 'syllable' sign 𐦪 *ne* (*ne* + *l* > *ll*), and (ii) the coalescence of 𐦰 *se* (*se* + *l* > *t*), Griffith's Law, when both of these signs are adjacent to the lateral 𐦬 *l* /l/, usually the determiner.[63] For this assimilation to take place, the consonantal segments must be in immediate contact with no intervening vowel, as Hintze and Millet rightly claimed. Nevertheless, this assimilation process led Hintze (1973a:330) to make the proposal that it could be accounted for if the *e* vowel was inherently contained in the 'syllable' signs, where this vowel would then ambiguously also represent a zero-vowel. Some examples of this process are found (32) below:

(32)	Stem		Stem + determiner	
a.	𐦯𐦬𐦡𐦲𐦡𐦪	*sleqene* ~	𐦯𐦬𐦡𐦲𐦡-𐦬	*sleqe-l*
b.	𐦭𐦦𐦭𐦪	*ḫbḫne* ~	𐦭𐦦𐦭-𐦬	*ḫbḫ-l*
c.	𐦭𐦫𐦧𐦭𐦡𐦪	*ḫrpḫene* ~	𐦭𐦫𐦧𐦭𐦡-𐦬	*ḫrpḫe-li*

[62] It is noted that the written omission of a nasal segment of an NC cluster is also seen in other writing systems such as Old Persian and the Cypriot syllabary.

[63] I follow Rilly (p.c.) here for the term "determiner" as opposed to "article" for *–l* and *–li*. See the discussions into these processes by Hintze in §3.1, as the evidence for the 'syllable' signs 𐦰 *se* and 𐦪 *ne* containing an inherent 'e' vowel.

The nasal 'syllable' sign *ne* is not written in the forms with the suffixed determiners since the lateral has assimilated the nasal by being in immediate contact, as proposed by Hintze (1973a:330). Hintze believed that this results in the lateral geminating; however, this is not seen in written in the script, as geminates are not notated, if indeed they are present.[64]

The coalescence of /s/ + /l/ resulting in [t] first noticed by Griffith (1911:38)[65] was also given as evidence by Hintze (1973a:330) for his theory of an inherent vowel 'e' *e* in the 'syllable' sign *se* doubles as a zero-vowel indicator in order for the coalescence of /s/ + /l/ resulting in [t] to take place:[66]

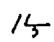
(33)	Actual form		Coalescent written form
a.	*smleyoselo*	>	*smleyoto*
b.	*womniselẖ*	>	*womnitẖ*
c.	*adbliselo*	>	*adblito*

These assimilatory processes show that the 'syllable' signs *ne* and *se* must be functioning as plain consonants. The argument Griffith gave for the inclusion of the vowel 'e' *e* in the 'syllable' signs was fundamentally only based on his observation that there are no instances in the texts of where the separate *e* sign follows their consonantal equivalents, the 'consonant' signs *n* and *s*. However, the phonological proposal of the vowels raising following the coronal series /s, n, t/ could be taken as a 'cogent objection', and, consequently, the reason as to why this occurrence is never found could be accounted for.[67] We should, therefore, remove the instance of the vowel 'e' *e* being inherent in the 'syllable' signs *ne* and *se*, and thus they are plain consonant signs. Once this ambiguous assignation is removed from the 'syllable' signs,

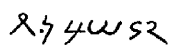
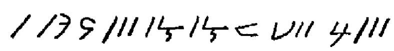
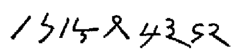
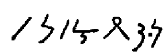
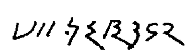
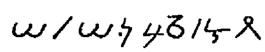
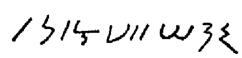
[64] '..doubling of consonants is not expressed in writing' Hintze (1974a:74).
[65] This coalescence has traditionally been referred to as 'Hestermann's sound law' although Rilly (2007) calls for a revision of the naming of this law as applied to Griffith, see Chapter 2, §3.4, for more on this.
[66] For discussions on the phonetic/phonological reasons for this assimilation cf. Vycichl (1958a:75), Millet (1973a), Böhm (1987:11) and Rilly (2007:416-17), and summarised in Chapter 2, §3.4.
[67] Along with the proposal that this could be due to the phonotactic constraints of Meroitic.

there are implications on the analysis of the vowel sign  *e* having the traditional dual representation of notating a vowel and a zero-vowel. This is investigated in §5. Before this investigation can be put forward a discussion follows on problems with the analysis of  *ne* and  *se* as plain consonant signs.

4.6 Problems with the hypothesis?

There exists data from the Meroitic texts that could pose a problem with the proposal that the 'syllable' signs are plain consonant signs. I am including here in the discussion the assumption that the 'syllable' sign  *te* is also a plain consonant sign /t/.[68] This analysis is tentative at present, but as the combination of the 'syllable' signs mainly includes the 'syllable' sign  *te*, an in-progress hypothesis is put forward. Listed below (34) is a sample of data where two 'syllable' signs are adjacent:

(34)

a.		*ari**tene***
b.		*yiseh̲**tete**yeqo*
c.		*aki**nete**-lo*
d.		*tm**nete**-lo*
e.		*amnp**tese***
f.		***nete**witror*
g.		*ph̲r**sete***

The occurrence of consecutive 'syllable' signs could pose a problem with the proposal that these signs function only as plain consonant signs in light of the apparent syllable structure of Meroitic of being CV, CV(C).[69] This means we would find phonemic sequences such as /paχarast/ as in the form of (34g) *ph̲r**sete***, which should perhaps be disallowed by the syllabic structure. However, if these forms are analysed as being morphologically complex, as the 'syllable' signs in these instances are denoting

[68] Cf. Aubin (2003) for an epigraphic proposal to revise the transliteration of *te* > *d*.
[69] See §5.3 for more on this.

grammatical morphemes then perhaps there is no violation of Meroitic syllable structure i.e. [[paχaras]t]. This Meroitic toponym has word-final /s/ denoted by the word-final 'syllable' sign *se* which the 'syllable' sign *te*, functioning as the locative morpheme, is then suffixed to.

If these 'syllable' signs in these instances are functioning as grammatical morphemes then perhaps this could explain why they are still able to function phonologically as plain consonants, because we are now dealing with morpho-phonology – in that these sequences are permissible because they give intuitions of word division.[70]

Furthermore, it is known that the data above (34 bar 34b) all show proper names, theonyms, anthroponyms, toponyms or a combination of both (*Amnptese* theonym + toponym "Amun of Napata").[71]

Due to the fact that these words all seem to share a lexical class, could the proposal be put forward that the Meroites were using signs with a polyvalent value which means they could also function as semantic indicators or more specifically, based upon Ancient Egyptian, determinatives and/or ideograms, rather than the accepted view that they are grammatical morphemes carrying pure phonetic or phonological value in these instances.

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[70] Hudson (1995:787) reports on the extensive use of epenthesis in word-formation in Ethio-Semitic languages, since many morphemes, both roots and affixes, consist only of consonants.

[71] Another form that occurs is *teneke-l*, which Griffith believed indicated a geographical term (1916b:113), see Rilly (2000) and Peust (2000) for different semantic interpretations of the construction *netese* which occurs in a few Meroitic royal steles. Also, see Rilly (1999a) who has noted that there is a difference in the 'genitive' construction when proper names are found. The 'genitive' postposition 'syllable' sign *se* directly follows the names of gods (a) rather than following the article as in other names (b):

(a)	*ant*	*Wos*	*-se*	(b)	*ttne*	*lẖ*	*peseto*	*–li*	*–se*
	nom A	nomB	postp.		nomA	adj.	nomB	det.	postp.

4.6.1 Polyvalence of Meroitic signs?

A distinct feature of the Ancient Egyptian script is the polyvalence of its signs. A sign could function as a phonogram, determinative and/or ideogram. Determinatives were usually written following the word they pertained to. Words could be written with one or more determinatives. The main function of determinatives was to identify a word as belonging to a certain category and so are termed 'generic determinatives'. These 'generic determinatives' could cover a wide-range of categories such as people, gods, animals, places etc. In this sense, they function as semantic indicators, with recent research investigating the importance of determinatives as category markers using linguistic Proto-type theory (Goldwasser 1995; Shalomi-Hen 2000).[72]

As the Meroitic writing system is modelled on the Ancient Egyptian and the Meroites were completely familiar with the neighbouring dominant Egyptian culture, it would seem logical that the Meroites were aware of the use of determinatives and ideograms within the Egyptian script and consequently could also have assigned certain signs of their own as not only having a phonographic reference, but also a categorical one.

The belief that Meroitic contains no determinatives or ideograms rests, in part, on a supposition made by Griffith (1911:7):

> ...but at any rate we can assume that the [Meroitic] Demotic alphabet is so small as to exclude the idea of word-signs, diphthongs, determinatives or the like forming a considerable part of it.

Nevertheless, Griffith states in a later publication (1916b:113):

> [There are] some other rarer classes of signs, namely (3) purely numerical signs, (4) metrical signs, (5) a few doubtful symbols such as ☥ in the hieroglyphic texts, and those like an arrowhead and a brush which are found in accounts on ostraca. These last are probably ideographic.

[72] 'Determinatives are related to the word preceding them in two main ways: metaphoric or metonymic, i.e., categorical or schematic. Together they form part of domain. Sometimes the word carries two determinatives representing both axes. Any arbitrary look at the determinative in the dictionary will reveal the kind of movement we are already familiar with – from the iconic to metaphoric or metonymic relations. The determinative may have an iconic relationship with the preceding word, or may relate to it in metaphoric or metonymic ways' Goldwasser (1995:80).

Rilly (2007:276) is in agreement with Griffith as he believes that the Meroites eliminated determinatives and ideograms from the writing system, due to the Egyptian polyvalent system being unsuited to the transcription of another language. However, it is known that the Meroites did use a sign that had no phonographic reference, the mark of division, which in this sense is used as a determinative in indicating a word-boundary.[73]

In her paper analysing the suffixes ᒍ// *se*[74] and /ϟ *te*, Hoffmann (1978:265) suggests that the results on the grammar have not changed since the time of Griffith and she asks whether these suffixes have other meanings since the texts cannot be exactly translated. She asserts that there is a need to look at other resources to investigate their meanings. Considering this point, should not all avenues of possibility be discussed and examined in relation to problematic areas of the Meroitic script, which the 'syllable' signs assuredly are.

Nevertheless, one has to consider that according to Rilly (p.c.) the hypothesis of polyvalence in the Meroitic script is unlikely, as he discusses how there is evidence of the eradication of determinative signs in a few archaic Meroitic texts. However, there are some points and remarks I would like to raise in the following section which give a brief discussion of the Ancient Egyptian hieroglyphic signs borrowed by the Meroite script devisors, as it is especially relevant why the Meroites borrowed the signs they did from the plethora of Ancient Egyptian signs.[75]

[73] This mark of division takes the form of three dots in the hieroglyphic texts ⁝ and two dots in the cursive :. Priese (1973:282-283) believes that the borrowing of this Meroitic sign is more likely to have been from the Ancient Egyptian where he also points out that the plural or collective sign in Ancient Egyptian ııı functions as a determinative signalling the end of a word. Cf. Peust (1999b:124), who also agrees on this sign having a determinative function. Rilly (2007:257) states that this sign was utilised to compensate for the loss of determinatives, whereby the writing system notates purely phonetic information.
[74] Hofmann is here using the transliteration method pre Hintze's revision so that this 'genitive' is now transliterated as the 'syllable' sign ᒍ// *se*, for those who follow Hintze's method.
[75] 'The basic writing system of Ancient Egyptian consisted of about five hundred common signs.' Allen (2000:2).

4.6.2 Meroitic hieroglyphs borrowed from Ancient Egyptian

This section discusses and outlines certain points, which raise the possibility that perhaps there were more reasons to the Meroites borrowing of the signs they did from Egyptian than just based on the correlation between the sound values of the signs. This section specifically looks at the Egyptian hieroglyphic signs borrowed by the Meroites for the three 'syllable' signs: *ne*, *se* and *te*.

(35) ( ) *ne*

Griffith (1911:14) believed that the hieroglyphic sign *ne* was borrowed from the Ancient Egyptian sign , which functioned phonemically as a geminate /n/. This association is drawn from the use of this sign in Egyptian inscriptions of Ethiopian kings as a variant of *n* in spelling Ethiopian names.[76] What is peculiar about this association is that the Egyptian form is the 'rush' sign whereas the Meroitic form uses the 'sedge' , which is then doubled. This 'sedge' sign in Egyptian is polyvalent in that it functions as a phonogram <*sw*> and as an ideogram for both 'king' *nswt* and 'sedge' *swt*. The 'sedge' sign is often used as the abbreviated form of the word *nswt* meaning 'king.' Is it plausible that the Meroitic script inventors borrowed the 'sedge' sign from the Ancient Egyptians and retained the initial phoneme /n/ of *nswt* perhaps along with its ideogrammatical meaning? Could this explain why this sign is found in divine epithets such as *nete* ( ). de Meulenaere (1994) instances the Egyptian form <*nṯr*> being written as <*nṯ*> with loss of <*r*>. It is a peculiar coincidence that this Egyptian form means "divine" and we also find the sequence *nete* in Meroitic divine epithets. Moreover, we find this 'syllable' sign *ne* in royal titles such as *qorene* ( ). What is interesting about the Egyptian hieroglyphic sign is that it refers to the king's divine power as opposed to the form <*ḥm*> which refers to the actual individual who holds the divine power (Allen 2000:31).[77]

[76] Cf. Priese (1973:280, 288) for an alternative proposal.
[77] Hintze (1962:23, fn. 1) outlines that when the Egyptian title *nswt-bit* is found in a Meroitic context it is best rendered as "King", thereby we know from this that the Meroites were familiar with this Egyptian title.

Furthermore, I raised the possibility in Chapter 2, §4.2.1 that the cursive form of this sign could have its origins in the Demotic version of the hieroglyph, which functions in Egyptian as an abbreviated form of the hieroglyphic sequence *nswt* for 'King'.

(36) *se*

Griffith saw this sign as being a reduplication of the Egyptian sign (1911:11, 15). In Ancient Egyptian, this sign is polyvalent in being the phonogram <*s*> and functioning as an ideogram for "door-bolt".[78] Is there a semantic concept encoded in this sign that expresses its use as a possessive that the Meroitic script devisors borrowed?

(37) *te*

This Meroitic sign is a combination of two Egyptian signs and that Griffith (1911:16) recognised as occurring in 'Egyptian spellings of the older Ethiopian names for *t* + *h*, notably in the name of Taracus [Taharqo].'[79] The Ancient Egyptian sign has polyvalent representations by also being a phonogram for <*tꜣ*>, an ideogram for 'land, earth, world' and a determinative in the words for 'estate' and 'eternity'. The second sign is also used as a phonogram for <*h*> and as an ideogram for 'courtyard.'

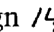
What is remarkable about the Egyptian hieroglyph borrowed by the Meroites, is that it has the same consonantal phonographic reference as the Meroitic sign, namely /t/, further, its use as an ideogram for the indication of 'land, earth, world' which represents a location, and of course being a determinative for 'estate' where in Meroitic it is also a locative, perhaps this is not a coincidence? It would have been fortunate for the Meroitic script devisors that this Egyptian hieroglyphic sign is so well suited, both phonographically and semantically, for representing their locative morpheme.

[78] Priese (1973:280, 291) proposes an alternative borrowing for this sign from the Ancient Egyptian see Rilly (2007:270) for a refutation of Priese's proposal.

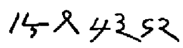
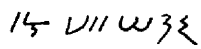
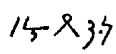
[79] Cf. Griffith (1911:16) where he indicates another combination that could be related to the Meroitic sign and Priese (1973:280, 293) puts forward an Egyptian hieroglyphic group that means "land". Rilly (2007:271) agrees with Griffith's association of the Egyptian hieroglyphic with the Meroitic form.

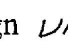
This being said, could it not be the case that a locative morpheme is similar in essence to a locative determinative? It is a query as to whether it is only the enunciation of a morpheme that distinguishes it from being a determinative?

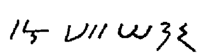
4.6.3 Toponyms

In words that are known toponyms the 'syllable' sign  *te* is used. Traditionally, this sign is explained as being a locative grammatical morpheme:

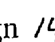
(38)

a.		*akinete-lo*	(REM 0247)
b.		*ph̲rsete-lo*	(REM 0247)
c.		*tmnete-lo*	(REM 0247)

It can be seen in the above forms that there are sequences of adjacent 'syllable' signs. However, if we take the well-known toponym 'Faras'  *ph̲rse*, as discussed in §4.1, this toponym is assuredly consonant final, where the 'syllable' sign  *se* denotes /s/. Perhaps it is possible to analyse the form as being composed of the toponym and the determinative:

(39)  *ph̲rse+ te* "Faras"

toponym + locative determinative

In the cases of these toponyms, the theory that the 'syllable' sign  *te* could be a locative determinative is tentatively proposed rather than the traditional view that it is a locative morpheme. If this proposal is followed, then the instances where we do find sequences of adjacent 'syllable' signs leads me to suspect that perhaps they are not all enunciated, thereby having no phonographic role when they are functioning as semantic category markers (determinatives). The positioning of these signs, word-initially and finally is also indicative of them having a possible semantic function.

Further evidence for this proposal comes from toponyms, which have been analysed as having word-final nasal consonants, such as 𐦠𐦳𐦢𐦫 *akine* "lower Nubia" and 𐦵𐦩𐦫 *tmne*. The orthographic convention in Meroitic whereby a nasal consonant followed by another consonant is not written (§4.4),[80] is discussed by Rilly (2007:371), who states that this convention was not systematically respected and gives the toponym 𐦠𐦳𐦢𐦫𐦶 *akine-te* [akiŋ̊ʈ(ə)] as an example. The word-final nasal 'syllable' sign 𐦫 *ne* is followed by the 'locative' particle 𐦶 *te*, but this nasal omission convention leads us to expect the written form *𐦠𐦳𐦢𐦶 **akite*. Could it be that in the case of these toponyms, where the nasal is apparently followed by a consonant, it is not that this orthographic convention is not respected but that there is no consonant /t/ enunciated following the nasal, as the sign 𐦶 *te* in these toponyms is functioning as a locative determinative with no enunciation. In other words, the sign 𐦶 *te* has no phonetic or phonological relevance in these cases and the orthographic convention is therefore not violated. However, an alternative possibility is that the nasal omission convention is not applied when a form is morphologically complex. Therefore, in the example of 𐦠𐦳𐦢𐦫𐦶 *akinete* the nasal segment would be separated by the coronal stop sign by a morphological domain boundary: [[ʔakin]t]. The written omission of a nasal segment in coda position would then only apply within a form when this nasal does not straddle a morpheme boundary.

4.7 Conclusion to Part 1

Part 1 of this chapter has provided ample evidence towards the representation of the 'syllable' signs 𐦲 *se* and 𐦫 *ne* as being /s/ and /n/ respectively with no inherent 'e' *e* vowel. To recap this evidence is: (i) the positioning of the 'syllable' signs at word edges; (ii) equivalent forms showing no vocalisation along with equivalent forms from other languages that show a coronal consonant followed by a front mid vowel, therefore we should expect Meroitic to transcribe these forms with the 'syllable' signs showing a coronal consonant and a front mid vowel but this is not the case; (iii) the diachronic

[80] Cf. Griffith (1911:22), Hintze (1987:45) and Rilly (2007:367-372, 388).

vowel reduction resulting in the 'syllable' signs written instead of the 'consonant' signs and (iv) the assimilation and coalescence of the 'syllable' signs. There clearly exists no comparative data evidencing the 'syllable' signs containing an inherent mid vowel, but much evidence towards them being plain consonant signs.

The cross-linguistically common phonological process of coronal consonants raising and/or fronting adjacent vowels could be an explanation for the non-occurrence of the inherent unmarked 'a' equivalent 'consonant' signs (3 *s*, ʎ *n* and ϟ *t*) being very rarely followed by the separate vowel sign ς *e*. Moreover, this point also highlights that a comprehensive frequency occurrence of consonant + vowel sequences needs to be conducted on the Meroitic script, which could give an indication that the omission of these sequences is perhaps simply due to phonotactic constraints.[81] In conclusion, I dismiss the analogous assignment of the vowel 'e' *e* being inherent in the 'syllable' signs ⅄ *ne* and ᒍ// *se*; therefore, these 'syllable' signs should be phonemically transcribed as plain consonants.

If this proposal is accepted, it follows that the Meroitic script devisors represented two sets of phonographic coronal signs; one set being the 'consonant' inherent 'a' signs that denote a CV sequence, and the other set being the 'syllable' signs that are only C with no following vocalic position. This representation signifies that Meroitic can have word-final consonants (coda) drawn from the coronal series /s, n, t/. It is evidenced cross-linguistically that languages which contain restrictions on the consonants that can close a word draw them from the coronal class.[82] Moreover, as Yip (1991:61) states 'coronal consonants can occur in positions in syllables where consonants with other places of articulation cannot occur.'[83]

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[81] It is pointed out that Rilly (1999b, 2007) has importantly implemented the use towards a frequency analysis of the Meroitic signs and their sequences, and with more work conducted, this will hopefully bring about a deeper understanding of Meroitic phonology.

[82] E.g. languages such as Finnish can only close a word with the coronal series - /l, t, s, n, d/ (but never /r/) and Ancient Greek has the series - /s, n, r/. Cf. McCarthy (1998) for an analysis of Morpheme Structure Constraints explaining word-final consonant restrictions.

[83] For more on this also see Clements (1988).

This part has also queried whether there is polyvalence in the value of the Meroitic signs, which could explain violations in the orthographic conventions and the consecutive use of the 'syllable' signs at the word edge of proper names, titles and divine epithets.[84]

Crucially, the claims made in this part of this chapter go towards explaining the supposed 'peculiarity' of the Meroitic script, namely the inclusion of the 'syllable' signs, that has long been noted, but not understood, by script typologists and Meroitic scholars alike.

The traditional representation of the 'syllable' signs 𐦰 *se* and 𐦪 *ne*. was disputed here. The claims made contend that these 'syllable' signs are plain consonants with no inherent 'e' *e* vowel. This is supported through a critique of the line of reasoning made by Hintze (1973a) for this value. This has also been substantiated through a positional frequency analysis of these 'syllable' signs, along with their participation in phonological processes – namely assimilation and coalescence. Furthermore, the conclusions propounded that these 'syllable' signs do not contain the inherent vowel 'e' *e* have impacted also on the traditional representation of the vowel sign 𐦡 *e*.

The implication for these claims is that the 𐦡 *e* sign is not a zero-vowel indicator after all, which is where we now turn.

[84] Cf. Rilly (2000) for an investigation into these constructions.

Part 2

The Reanalysis of the Vowel Sign ⳯ *e* and its role in Determining Consonantal Compatibility Restrictions

1 Meroitic ⳯ *e* as the epenthetic vowel – Part 2 (ii)

This section recaps the data used for the claims made that the vowel sign ⳯ *e* also functions as a zero-vowel indicator. Empirical phonological evidence is provided which counters these claims but supports the original proposal made by Millet (1974a:53) that, when found in equivalent forms, the vowel sign ⳯ *e* is utilised to break up consonant clusters and thus is used as the epenthetic vowel. The main argument, i.e. the analysis of the 'syllable' signs, for the vowel sign ⳯ *e* being a zero-vowel indicator has been challenged in the preceding part of this chapter. Subsequently, this part supports the implications of the conclusion made in Chapter 5, Part 1 namely, the rejection of the analogous assignment of the vowel 'e' *e* being inherent within the 'syllable' signs ⳳ *se* and ⳱ *ne*. It follows that a brief discussion is given on the syllable structure differences between Meroitic and the languages where equivalent data is found. This discussion supports the claim of ⳯ *e* used as the epenthetic vowel specifically looking at the phonology of epenthesis as a loanword repair strategy.[85]

1.1 Loanword phonology

This section overviews the repair strategies used in loanword phonology. Kenstowicz (2003:1) summarises loanword adaptation as:

> The adaptation of a loanword involves the resolution of often conflicting demands to preserve as much information from the source word as possible while still satisfying the constraints that make the lexical item sound like a word of the recipient language.

A major part of the investigation into the phonology of loanword adaptation involves analysing the means by which a language 'repairs' a borrowed word to satisfy violations

[85] See Hyman (1970) for a discussion on the phenomenon of borrowing where this has been made to conform to the phonological properties of the interpreting language.

in its phonotactic and/or syllable structure constraints. The area that specifically interests us here is the strategies used by languages that prohibit consonant clusters when faced with borrowing words from a language where these clusters are encountered.

The two structural solutions available to languages that are essentially CV or CV(C) when encountering consonant clusters in borrowed words are:

(i) Epenthesis

The insertion of a vowel or vowels to break up consonant clusters.

(ii) Deletion

The deletion of one or more of the consonants within a cluster.

The most favoured structural solution is epenthesis (i) as a minimal repair strategy (Paradis & LaCharité 1997). The following data (Paradis & LaCharité 1997, Charette 1984, Kenstowicz 2003) is taken from a selection of languages that have a CV or CV(C) syllable structure and shows the reparation of consonant clusters in loanwords through epenthesis:[86]

(1)

a.	Fula		French
	[kala:s]	←	classe
	[doketa:]	←	doctor
b.	Dida		French
	[pʊlʊmʊ]	←	plume
	[biki]	←	bik

[86] The phonology of these languages is different and so [ə] is not the epenthetic vowel in these cases.

c.

Fijian		English
[wisiki:]	←	whiskey
[darapɔ]	←	drapeau

It is evidenced in (1) above that epenthetic vowels can appear in two different positions; these being firstly, the epenthesis site is between a consonant cluster (this epenthesis can either be a reparation of syllable structure or to bar an illegal consonant sequence) and secondly, epenthetic vowels are inserted to syllabify consonants as onsets which would otherwise be in coda position (hence the word-final epenthesis in the data of 1b).

1.2 Schwa – the epenthetic vowel

Further substantiation that the vowel sign ϛ *e* is used as the epenthetic vowel and not devised as a zero-vowel indicator comes from phonetic evidence. Perceptually, the peripheral vowels /i/, /u/ and /a/ occupy the furthest corners of the vowel space (Ch. 5, (16)), whereby maximal contrast is maintained. The equivalent forms reveal that the Meroites do not use the vowels /i/, /u/ or /a/ as the epenthetic vowel or as their schwa vowel because these peripheral vowels carry information content in that they are grammatically distinct. The vowel sign ϛ *e* with its phonemic value of /ə/, as a central vowel, has an even distribution in the acoustic pattern and is used as the epenthetic vowel because it is not maximally contrastive in perception (it is also the vowel that is most likely to be affected by surrounding consonants).

With epenthesis, the vowel position has to be (phonetically) realised in order to retain the Meroitic CV syllable structure, therefore, the vowel sign ϛ *e* [ə] is realised because [ə] is the 'neutral' vowel, i.e. the vowel that requires the least perturbation of the tongue body from its neutral 'rest' position.

1.3 Meroitic syllable structure

It is followed that the syllable structure of Meroitic is CV (Griffith 1911:22) and CV(C).[87] Contributing to this are the claims made in Part 1 of this chapter, whereby the combination of consonant clusters in Meroitic is disallowed unless (i) they are homorganic sequences of nasals + obstruents (§4.4), or (ii) they straddle morpheme boundaries or indicate word divisions. It is then expected that when Meroitic encounters consonant clusters in other languages it will repair violations of its own syllable structure through epenthesis. The vowel sign ϛ *e* is positioned between the consonant clusters to indicate a vowel, albeit a reduced vowel, and not to indicate the absence of a vowel as has been previously thought. Furthermore, if an equivalent form ends in a word-final consonant that Meroitic disallows, it will repair these with word-final epenthesis.

1.3.1 Coptic equivalents with epenthesis in the Meroitic forms

As Griffith (1916b) first proposed that the vowel sign ϛ *e* indicated the absence of a vowel through his analysis of Coptic equivalents, this section discusses and compares the data Griffith used to make this claim through contrasting Coptic syllable structure with Meroitic and shows that the use of the vowel sign ϛ *e* is epenthetic and does not indicate a zero-vowel.

Griffith's (1916b:119-120) data from Chapter 5, §3, with his transliterations of Coptic forms, is presented here again:

(2)

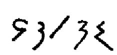
a.	Meroitic	ϛ3/3ξ	*p<u>h</u>ome*	Eg. anthroponym
	Coptic	Pakhôm	(ⲡⲁϩⲱⲙ)	

[87] Rilly (2007:405) also states that '*il semble que les structures les plus représentées dans le lexique méroïtique soient CVCV et CVC.*' However, it is unclear how Rilly's claim that the vowel sign ϛ *e*, doubling as representing a zero-vowel indicator (2007:397), does not contradict his proposal on the syllable structure – see §5.3.2 on Rilly's data showing Meroitic consonant clusters. Is it that the vowel has weakened to zero producing these clusters or is it that the vowel notates a zero-vowel?

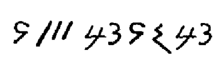
b.	Meroitic		*beke*	Eg. anthroponym
	Coptic	(P-)Bêk	(**ⲡ-ⲃⲏⲕ**)	

Griffith observed that the Coptic forms were consonant final; however, in the Meroitic equivalents the vowel sign *e* is written word-finally. Griffith therefore assumed from this that the Meroitic vowel sign *e* indicated the absence of a vowel (zero-vowel). This chapter has followed the claim that Meroitic words can be CV(C) but that possibly only the consonants /s, n, t/ can be found in a word-final coda position. It is seen in the data of (2) that these consonants are not found in the Coptic forms and we expect the syllable structure CV in Meroitic to be maintained. Epenthesis is the repair strategy used by the Meroites, and so the vowel sign *e* is written to indicate an epenthetic vowel and not a zero-vowel in borrowed forms.[88] These two borrowed forms into Meroitic should therefore be realised with an epenthetic schwa [ə] word-finally:[89]

(3)

a.	Meroitic		*p<u>h</u>ome*	[paχumə]
b.	Meroitic		*beke*	[bekə]

In a work on Egyptian Phonology, Peust (1999b:183) affirms that 'Consonant clusters are common in Coptic.'[90] Given this, we therefore expect Meroitic to break up these consonant clusters whenever they are encountered in borrowed forms through the process of epenthesis. Subsequently, this is what we expect with the borrowed anthroponym in (4):

(4)	Meroitic		*sipesiye*	[sipəsiye]
	Coptic	*shapshi ~ shepshe*		
	Greek	Σεψις		

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[88] This claim is in agreement with Rilly (2007:397-398), who proposes that, '*les noms méroïtiques empruntés à l'égyptien Beke et P<u>h</u>ome sont très probablement terminés par un schwa.*'

[89] It could further be the case that the Meroitic forms were borrowed from Egyptian directly where a word-final vowel was found but has elided by the Coptic era.

[90] See also Hintze (1980), Kasser (1991) and Loprieno (1995).

The anthroponym borrowed from Egyptian in (4) indicates that the word-internal consonant cluster *'psh'* /pʃ/ of the Coptic form has been broken up with the epenthetic vowel sign 𐦡 *e* in the Meroitic equivalent to retain the CV sequence of the Meroitic syllable structure.[91] This gives the phonetic transcription [sipəsiye] and not *[sipsiye]. It is noted that the Greek transcription does not insert an epenthetic vowel between the word-internal consonant cluster, but transcribes this consonant cluster with the digraph *psi* ψ /ps/. Nevertheless, this cannot be used as evidence that the Meroitic vowel sign 𐦡 *e* is functioning as a zero-vowel indicator as what it does signify is that Greek and Meroitic have divergent syllable structure constraints.

1.3.2 Greek and Meroitic equivalent forms

Griffith's claim that the vowel sign 𐦡 *e* ambiguously indicates the absence of a vowel (zero-vowel) is followed by Rilly (2007). Presented below in (5) is a selection of Meroitic forms with their transcriptions into Greek that Rilly puts forward. Rilly asserts that the Meroitic vowel sign 𐦡 *e* shows the notation of a zero-vowel as the Greek transcriptions have consonant clusters (2007:397):

(5)

a.	<u>Meroitic</u>	𐦦𐦡𐦬𐦷𐦤𐦡	*bertoye*	anthroponym
	Greek	Ἀβρατοεις		
b.	<u>Meroitic</u>	𐦨𐦡𐦲𐦷	*peseto*	title
	Greek	ψεντης		
c.	<u>Meroitic</u>	𐦨𐦡𐦸𐦡𐦩𐦡	*pedeme*	toponym
	Greek	Πριμις		

[91] The consonant cluster in the Greek form /ps/ is written with the digraph *psi* ψ/ps/, the phoneme /ʃ/ is not part of the Greek phonological inventory, see Newton (1972:13), Somerstein (1973:3) and Allen (1968:43) for more on Greek phonology.

d.	Meroitic		*qoreti*	toponym
	Greek	Κορτη		
e.	Meroitic		*pẖrse*[92]	toponym
	Greek	Παχωρας		

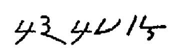
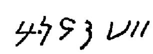
The above data (5) outlines that the Greek transcriptions show sequences of consonant not separated by a vowel in the place where the Meroitic *e* vowel is found. However, the reason as to why these Greek transcriptions do not transcribe a vowel in these positions could be due to the 'weakness' of this Meroitic vowel. In that, this Meroitic vowel is not perceptually salient at certain positions within a word, therefore Greek, which allows the clusters /br/, /ps/, /pr/ and /rt/ transcribes these words without this Meroitic vowel. Therefore, these transcriptions into Greek cannot be taken as solid evidence that the Meroitic vowel *e* is a zero-vowel indicator.

The forms in (5b) *peseto* and (5e) *pẖrse* are now compared, as I believe this highlights a distinct problem associated with the ambiguous assignation of the vowel sign *e* representing a vowel and a zero-vowel. Both these forms are written with the 'syllable' sign *se*. However, in (5b) (under Rilly's analysis) the inherent vowel 'e' *e* of the 'syllable' sign is vocalised whereas in (5e) it denotes a zero-vowel position.[93] In equivalent forms that transcribe proper names from other languages into Meroitic means that if the Meroitic vowel sign *e* does indeed indicate a vowel and a zero-vowel then this ambiguity would have caused as much confusion for the Meroitic speakers as to the correct vocalisation of the majority of non-native words, as it does for Meroitic scholars who follow this system today.

[92] The traditional claim of the 'syllable' sign *se* is used here in this equivalent form by Rilly to denote the zero-vowel position with the 'e' *e* vowel inherent within this 'syllable' sign, although this representation is specifically argued against in the preceding part of this chapter.
[93] Rilly (p.c.) proposes that the 'syllable' signs contain an inherent vowel 'e' *e* but which indicates a zero-vowel when found in most word-final positions.

Two other equivalent forms need further qualification. The forms in (6) show two Meroitic forms of borrowed Egyptian names that are written with the 'syllable' signs word-initially:

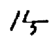
(6)

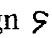
a.	Meroitic		*tebiki*	Eg. anthroponym
	Greek	Τβηχις		
b.	Meroitic		*semeti*	Eg. anthroponym
	Greek	Σμιθις		

Chapter 5, Part 1 has claimed that these 'syllable' signs notate a consonant that is not followed by a vowel, although in the forms of (6) this could be an apparent contradiction as this section has claimed that consonant clusters which violate the syllable structure of Meroitic, are repaired through epenthesis. However, in the instances of (6) it seems that some clusters are evidenced, as I have argued that there is no vowel in the 'syllable' signs and no epenthesis is seen - or importantly, epenthesis is not notated by the usual method with the distinct vowel sign *e*.

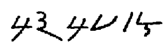
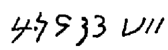
What we find in (6) are perhaps *orthographic* consonant clusters (transcribing non-Meroitic words). In (6a) the Greek equivalent form is given in Rilly's (2007:397) data showing the indication of a zero-vowel by the vowel sign *e*, although I believe the analysis should come from the original Egyptian equivalent *t3 b(j)k(.t)* "the female falcon" (2007:364), where the consonant cluster straddles a word-boundary, namely the Egyptian article <*t3*> and its noun <*b(j)k(.t)*>. It is more likely that the Egyptian equivalent was borrowed directly to Meroitic rather than from Egyptian through to Greek and then to Meroitic. It has already been discussed that the vowel is diachronically syncopated in the Egyptian article.[94] The Meroites have the capability to

[94] The data in (6a) and (6b) show other Egyptian forms with the definite article transcribed by the Meroites with the 'syllable' sign *te*. See also Chapter 5, §4.1.

transcribe this form with the 'syllable' sign  *te* (which I claim is also possibly a plain consonant with no inherent 'e' *e* vowel /t/) which is positioned word-initially, because through this the Meroites can notate the Egyptian form to its closest representation. However, I claim that there is no violation of Meroitic syllable structure, since at the phonetic level these forms could have been pronounced with a schwa vowel.[95]

I term this vowel an excrescent vowel[96] (Levin 1987, Davidson & Stone 2003) in order to distinguish it from the epenthetic vowel that *is* notated with the vowel sign  *e*.[97]

(7)

a.	Meroitic		*tebiki*	[t^{ə}biki]
b.	Meroitic		*semeti*	[s^{ə}meti]

What the Meroitic forms in (7) suggest is that again distinct levels have to be discerned in any analysis of the Meroitic script: orthographic, phonological and phonetic.[98] The assumption that there is a direct relationship between the orthographic and phonetic levels of the script is erroneous and this is evidenced in the problems associated with the long-held ambiguous transliterations/transcriptions of the 'syllable' signs and the vowel sign  *e*.

[95] Kenstowicz & Suchato (2004:2) outline that the loanword adaptation process 'can take into account a variety of factors to achieve the best match to the source word including phonetics as well as orthography.'

[96] Defined here as a transition vowel that blocks the violation of the Meroitic syllable (CV).

[97] The difference between excrescent and epenthetic vowels is not phonetic, as they are both realised at surface form, but at the level of the script where the epenthetic vowel is notated whereas the excrescent vowel is not.

[98] Chapter 5, §4.4 already discussed that in nasal + stop sequences the nasal segment in not written. This contributes to the claim, and Rilly's assertion, that there is not always a direct relationship between the orthographic and phonetic levels. Also, see Depuydt's (1994) discussion on the principle that the Egyptian script should be studied as distinct from but yet in conjunction with the language that it represents.

2 Consonantal compatibility restrictions in Meroitic

This section makes the claim that there is an alternative analysis of Rilly's (1999b) important study, where he supports the theory that the vowel sign ϛ *e* is a zero-vowel indicator with a combinatorial analysis.[99] The analysis here proposes that there is a strong possibility of consonantal compatibility restrictions in Meroitic rather than the theory that the vowel sign ϛ *e* functions as a zero-vowel indicator.

Rilly (1999b), in this study, draws upon a corpus of Meroitic texts through which he conducted a combinatorial analysis. His study concludes that the sequences $C_\alpha e C_\alpha$, where the consonants α = labials or α = velars, are never found flanking the vowel sign ϛ *e*.[100] Rilly puts this absence down to haplography in the Meroitic script, as it is believed that the language has a very high assimilation tendency,[101] and this is due to the vowel sign ϛ *e* being rarely pronounced as '*l'absence de voyelle entre deux consonnes est notée par un signe translittéré e* [ϛ]' (1999b:104). Thus, when the vowel sign ϛ *e* notates a zero-vowel, the two consonants that share a labial or velar place of articulation will be adjacent and therefore assimilate, hence the absence of these written sequences in the texts.

However, in light of the study conducted in this chapter that dismisses the theory that the vowel sign ϛ *e* notates a zero-vowel a stronger case is made here as to why there are no combinations of velar or labial consonants flanking the vowel sign ϛ *e*. An examination of Meroitic texts was conducted that revealed that not only are the sequences $C_\alpha e C_\alpha$ not found but also that the combinations C_α'a'C_α, $C_\alpha i$ C_α and $C_\alpha o C_\alpha$ are very rarely evidenced (where α = labial or α = velar/dorsal consonants).[102] Primarily, this examination leads me to claim that the absence of the identical place sequences of

[99] Importantly, Rilly uses texts from the archaic period through to the late period and therefore through this shows that the omission of these sequences is not due to diachronic vowel weakening.
[100] '*Une étude faite sur le "lexique" cité montre que les séquences graphiques* *bep, *bem, *meb, *mep, *peb, *pem *ne sont jamais représentées*' Rilly (1999b:105).
[101] As observed by Hintze (1979:65-67).
[102] I have drawn upon a collection of texts that include the longest known Meroitic inscriptions i.e. REM 1044, 1003, 1182, 1183, 0094.

consonants is not due to an assimilation process ($C_{\alpha}eC_{\alpha}$ because ϧ *e* is a zero-vowel in these instances as per Rilly). In fact I propose that it is due to Meroitic exhibiting strong evidence for the process of consonantal compatibility restrictions as the labial and velar/dorsal consonants are also not found flanking the peripheral vowels /i/, /u/ and /a/. It can be stated that these peripheral vowels of Meroitic would be resistant to the assimilation of the consonants they separate, even if the weak medial vowel ϧ *e* /ə/ is not.

This investigation is further support for my claim put forward in this chapter that the vowel sign ϧ *e* was not developed or used to indicate a zero-vowel position.

2.1 Consonantal Compatibility Restrictions

Consonantal compatibility restrictions are well attested in Semitic languages (Greenberg 1950b, Bender & Fulass 1978, McCarthy 1986, 1994b, Hayward & Hayward 1989) and in the wider Afro-Asiatic language family (Bender 1978).[103] Furthermore, it is found that consonantal compatibility restrictions are a typological process as they are found in languages outside of the Afro-Asiatic language family (MacKay 1970, Yip 1989, Pozdniakov & Segerer 2007).

The first seminal study into consonant compatibility restrictions (or dissimilation) is Greenberg's 1950b paper.[104] In this study, Greenberg analysed and discussed the evident restrictions between certain consonantal segments in the verbal roots, but not on derived forms, of Semitic languages. His investigation, which included the Semitic

[103] It is remarked that the restrictions in Semitic languages are gradient in being (i) positional adjacency of positions I-II is stronger than positions I-III etc., and importantly, (ii) articulatory, as the gradient restrictions always involve the coronal consonantal series. For more on this restriction in Afro-Asiatic languages see: Zaborski (1994, 1996); Voigt (1981); Petráček (1964, 1969); Kurylowicz (1972); Pierrehumbert (1993); McCarthy (1979, 1988, 1994b); Buckley (1997); Reiner (1966); Bender & Fulass (1978); Edzard (1992); Peust (1999b); Takács (1996); Watson (1979); Reintges (1994); Roquet (1973), and Rössler (1971).

[104] Greenberg (1950b:162) does point out 'The only general study of the topic under discussion is that of J. Cantineau [1946], which arrives independently at the same conclusions described here. However, Cantineau's study is more restricted in scope, only Arabic being considered, and without discussion of patterning in the first and third positions. None of the standard Semitic comparative grammars mention this topic.'

languages Syriac, Hebrew, Ugaritic, South Arabian, Ethiopic and Assyrian, was also extended to Egyptian, an autonomous branch of Afro-Asiatic. This led him to make the important assertion that 'The general subject of the patterning of consonantal phonemes within the morphemes of Hamito-Semitic [Afro-Asiatic] languages would seem to be a promising subject of investigation and one whose results must be kept in mind for their bearing on the historical analysis of this family of languages' (1950b:181). The restriction that takes place in Semitic languages is generally that within a lexical root two consonants that share the same place of articulation (homorganic) cannot co-occur.[105]

Bender (1978) extended the consonantal compatibility restriction analysis to all the branches of Afro-Asiatic. From this analysis, he found 'strongly positive results' for Tamazigt (Berber), an autonomous member of the Northern branch, and the Cushitic languages Beja and Oromo.[106] Further he found 'More equivocal positive results are obtained for Hausa, Mubi, and Logone (Chadic), Awngi and Sidamo (Cushitic), Welamo (Omotic), Koma (Nilo-Saharan),[107] and Proto-Indoeuropean (all verb roots). Negative results, equivocal or clearcut are obtained for Margi (Chadic), Kefa and Ari (Omotic), Kanuri and Masai (Nilo-Saharan), Proto-Bantu and Moro (Niger-Kordofanian)' (1978:9).[108] Bender breaks down the consonantal restrictions into their articulatory classes such as labials, dentals (coronals) etc. and gives an overview of their positional incompatibility. He concludes that the results obtained show that 'the co-occurrence restrictions are a good Afro-Asiatic isomorph…' (1978:9-10).[109]

[105] Greenberg's (1950b) observation is based on consonantal roots and not on derived forms. It is pointed out also that restrictions on identical consonants co-occurring take place on the first and second radical of a triliteral root, but that, in instances found when two identical consonants do co-occur this is usually due to reduplication of the root.
[106] Bender (1978:10) also finds that Proto-Indo-European verb roots (CVCVC) also show positive results. He asks the question, as a side issue, of whether this finding may 'prove to be an important addition to the accumulating evidence of Afro-Asiatic-Indoeuropean commonality.'
[107] Bender (1978:10) notes that the inclusion of Koma (Nilo-Saharan) is problematic but does not discuss this association further.
[108] In the plenary session of the conference where Bender (1978:19) presented his results, Hayward points out that these co-occurrence restrictions 'are adhered to very strictly in 'Afar [Cushitic]. In this language, however, such phenomena are not confined to verb roots alone, but are found in nominal roots also.'
[109] See Hayward (1990) for co-occurrence restrictions on Aari roots (Omotic).

The following sections outline evidence in support of Meroitic also exhibiting the typological process of consonantal compatibility restrictions.

2.2 Overview of consonantal compatibility restrictions

Of all the languages where consonantal compatibility restrictions are evidenced, Arabic probably has one of the most well documented phonological dissimilatory processes in terms of its root consonantal system. This has led to many phonological discussions and analyses into these restrictions. The fundamental characteristic of Arabic (and Semitic) morphology is the consonantal root template, where vowels are inserted between the consonants to make forms according to a CV template (McCarthy 1979). Subsequently, Semitic languages are classed as having a non-concatenative morphological system.

The most common root type throughout the Semitic languages is the triliteral root form whereby a root is made up of three consonants, although, Semitic roots can also be biliteral and quadriliteral. Greenberg's (1950b) study specifically dealt with the combinations of consonants that could occur in the triliteral root forms.

A Semitic triliteral root can take the form such as /drs/ made up of three consonants or 'radicals'. These fixed ordered consonants have a range of templates where vowels are interspersed, depending on the grammatical form, which can also take inflectional affixes, shown in the following example:

(1)	**daras**-a	'he studied'
	dars-un	'a lesson'
	diraas-ah	'studies'
	daaris	'studying'

Greenberg's (1950b) study showed that the combination of consonants that can make up a root in Arabic is restricted. There is not a free co-occurrence of consonants. These restrictions depend upon the placement of consonants within a root. Therefore, a triliteral root has consonants in the placement of C_1 C_2 or C_3 positions:

(2)

$$\begin{array}{ccc} C_1 & C_2 & C_3 \\ | & | & | \\ \text{d} & \text{r} & \text{s} \end{array}$$

The adjacency of the positions C_1 C_2, and C_2 C_3 were found to have the strongest restrictions on which consonants could occur, with the non-adjacent C_1 and C_3 positions still having a co-occurrence restriction, albeit a weaker one. Greenberg (1950b:162) concluded that not only are identical adjacent consonants prohibited in a root but also that consonantal homorganicity (non-identical consonants sharing the same place of articulation) is strongly dispreferred. McCarthy (1979, 1988, 1994b) developed Greenberg's observation, specifically with regards to Arabic, and demonstrated further that the consonant compatibility restrictions were fundamentally determined by the place of articulation and furthermore by the major manner feature of [sonorant] for the coronal place articulator.

McCarthy (1988, 1994b) set the consonants of Arabic into the following articulatory groups or natural classes (3). Note that the coronal place of articulation has subsets of three groups that are determined by their manner feature specification being [±sonorant] and [±continuant]:[110]

(3)

a.	labials	[f, b, m]
b.	coronal sonorants	[l, r, n]
c.	coronal stops	[t, d, ṭ , ḍ]
d.	coronal fricatives	[ð, θ, s, z, ṣ, ẓ, ʃ]
e.	dorsals	[g, k, q]
f.	gutturals	[ʕ, h, ʔ, ħ, ʁ, χ]

[110] Cf. Pierrehumbert (1993), for more on dissimilation in Arabic.

2.3 Meroitic consonants

The Meroitic consonantal signs can be classified into the following articulatory sets. The standard transliteration of the signs is given in italics, along with their phonemic values as proposed in Chapter 2:

(8)

a.	labials	*b* /p/, *p* /p/, *m* /m/
b.	coronal sonorants [-nasal]	*l* /l/, *r* /r/,
c.	coronal sonorants [+nasal]	*n* /n/, *ne* /n/
d.	coronal stops	*t* /t/, *d* /d/, *te* /t/, *to* /t/
e.	coronal fricatives	*s* /s/, *se* /s/
d.	dorsals	*k* /k/, *q* /q/, *ḫ* /x/, *h̲* /χ/
e.	glides	*w* /w/, *y* /j/

A preliminary look at Meroitic texts shows that the sequences (9) with any vowel are very rarely attested. From this, it initially supposes that two consonants taken from the same articulatory set (as above) cannot co-occur in the same form; hence there is a strong likelihood that Meroitic also evidences this typological process:

(9)

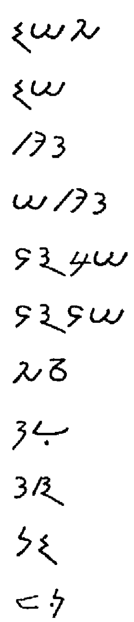
a.	*	**b'a'p*	*/bapa/
b.	*	**bip*	*/bipa/
c.	*	**bop*	*/bupa/
d.	*	**m'a'p*	*/mapa/
e.	*	**mip*	*/mipa/
f.	*	**mop*	*/mupa/
g.	*	**h̲'a'h̲*	*/χaχa/
h.	*	**h̲iḫ*[111]	*/χixa/

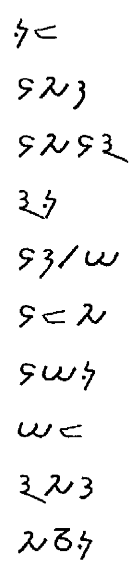
[111] The two signs transliterated as *h̲* and *ḫ*, are proposed in Chapter 2, as having a dorsal place of articulation, specifically uvular and velar respectively.

2.3.1 Meroitic verbal forms

Typologically, and especially within Afro-Asiatic languages, consonantal compatibility restrictions are stronger for verbal forms than nominal ones. It follows from this that from an observational analysis of Meroitic lexemes; it is found that restrictions hold strongly for the following list of supposed/known verbal forms of Meroitic these are given below (10) without any easily discernable affixation. The list is compiled mainly from Hintze (1963, 1979) and Hofmann (1981a).

(10)



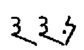


drp	/darapa/	*ḫt*	/xata/
rp	/rapa/	*mde*	/madə/
sq	/saqa/	*kede*	/kədə/
sqr	/saqara/	*tk*	/taka/
rike	/rikə/	*roh̲e*	/ruχə/
reke	/rəkə/	*dḫe*	/daxə/
wd	/wada/	*tre*	/tarə/
toh̲	/tuχa/	*ḫr*	/xara/
ns	/nasa/	*sdk*	/sadaka/
pl	/pala/	*twd*	/tawada/
tḫ	/taxa/		

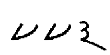
On a purely observational level, even though the data is quite small, it can be seen that the assumed verbal forms do not contain any consonants that are identical for place of articulation, and further there are no homorganic sequences of consonants (consonants drawn from the same articulatory series) except one form – *twd*, although the coronal consonants *t* and *d* are separated by the word medial consonant glide *w*. This is strong support for the consonantal compatibility restriction theory.

2.3.2 Violation due to weakness of positional restriction and affixation

From the corpus, there are found two known verbal forms which seem to be problematic to the claim that Meroitic exhibits consonantal compatibility restrictions. The following discussion outlines that by looking closer into how this restriction functions in other languages, it can thus be concluded that these forms are accountable without dismissing the claim.

a.  *tkk* /takaka/

No definite associated meaning found for this form, although looking at the known/assumed grammatical particles (Meeks 1973), -*k*(*e*) is used as a verbal suffix, if this is the correct interpretation for this form, it is therefore morphologically complex with the verb stem being *tk* with the verbal suffix *tk-k*. This analysis would discount this form from the incompatibility exceptions, as the two identical consonants no longer belong to the same constituent i.e. the medial *k* belongs to the root and the final *k*, as a morphological affix, to the word. This type of violation indicates that Meroitic consonantal restrictions are limited to 'root-incompatibility' i.e. morphological affixation allows violations of the restriction which is similar to Arabic.[112]

b.  *kbb* /kababa/

This form is found in Griffith (1911:70) with the locative morpheme/'particle' -*te* suffixed *kbbte*.[113] Rilly (p.c.) outlines that this is a verbal form and as such should be evidence against the compatibility restriction hypothesis advocated here. However, there are instances in Semitic languages such as Arabic whereby geminated consonants such as [sdd] are found but only in the second and third position of a root (triliteral) and never in first and second position *[ssd]. This type of positional restriction has been attributed to a diachronic process in Semitic languages of an alteration to the template

[112] Greenberg (1950b:179) noted this in regards to Arabic whereby a root such as *ftḥ* 'to open' can have the nominal instrument prefix *m-* attached with no change on the labial quality of the consonants, thereby resulting in the form *mifta:ḥ* 'key' with two labial consonants adjacent and seemingly violating the consonant compatibility restriction in Arabic.

[113] See Chapter 5 for a discussion into this locative morpheme.

pattern of biliteral roots transformed into triliteral ones.[114] This is not to say that Meroitic therefore is a Semitic language but this exception to the compatibility restriction is in accordance with the same positional violations found in Semitic languages. Therefore this exception should not dismiss the claim that Meroitic exhibits consonantal compatibility restrictions.

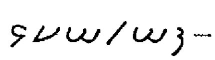
2.3.3 Violations due to nominal category forms

This section shows that when violations are found to the consonantal compatibility restriction process it is due to the category of the word class being nominal. It is typologically evidenced that nominal forms are weaker in adhering to the restriction.

For this study, a corpus of lexical items was gathered that were formed of two or three consonants only and where any discernable affixation was removed. At a first approximation, all easily identifiable proper nouns such as anthroponyms, titles, toponyms and epithets were also removed, which resulted in the corpus consisting of 341 lexical items.[115] Only the following 18 items were found as exceptions in the investigation of consonantal incompatibility from the selected corpus. This data lists sequences found where the consonants are adjacent (adjacency should be taken as meaning only separated by a vowel and not a consonant) and identical in place and manner of articulation. The items that show exceptions to compatibility restrictions are listed here.

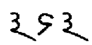
(11)

a.  *mror* /marura/

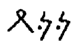
This word is highly likely to be nominal as Griffith (1912:68) gives the nominal item  – *mrorbe* with its plural form  – *mrorleb*.

[114] See Chapter 7 for more on this.

[115] These nominal forms were omitted due to consonantal compatibility restrictions not being strongly upheld in non-verbal forms. Further, these items are the most readily identifiable from the corpus.

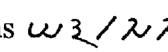
b.  *kek* /kəka/

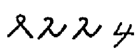
No associated meaning or lexical category can be found for this form, although it could indicate a conjunction (Rilly p.c).

c.  *ttne* /tatan/

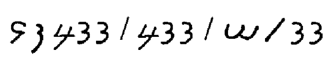
Title (Rilly p.c.)  *ne* is also evidenced as a morpheme/'particle' used in many forms where Rilly (2007) believes it is a nominal derivational suffix.[116] Further, Hofmann (1981a:104) gives *ttne-lẖ* (although she uses Griffith's transliteration for the coronal nasal sign) and *-lẖ* is understood as an adjective meaning 'great' thereby contributing to the supposed nominal lexical category of the stem word.

d.  *dd* /dada/

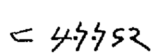
A similar form is found in Griffth (1912:123) who lists it as  – *ddokr*, and states that it is a personal name (anthroponym) and thus can be discounted.

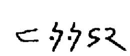
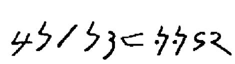
e.  *iddne* /idadan/ ~ /yidadan/

No associated meaning can be found for this form, although see description of (c) & (d) above. As such there is a strong likelihood of this form being in the nominal category.

f.  *ssime/ssi/ssor* /sasimə/ /sasi/ /sasura/

Griffith (1911:119) lists these forms as sacerdotal titles along with another exceptional form *ssmri*, which he states is also titular. From Griffith's analysis, it can be taken that these forms are also nominal.

g.  *attiẖ* /ʔatatixa/

This form is found in Griffth (1911:110) as  *attẖ*. In Griffith (1912:64), this form is found in the construction  *attẖ-mlo-li.* This construction breaks down into *mlo*, which is known to have the associated meaning 'good' and *li* is

[116] See also the discussion in Chapter 2, §4 on this sign.

the determiner, whereby this construction is a nominal phrase indicating that *attiḫ* can be assumed to be a nominal form also.

h. *kedd* /kədada/

No associated meanings found for this form.

i. *kroro* /karuru/

Griffith (1911:120) gives this word as from an Egyptian equivalent, and being the possible title for 'prince' (1912:76). Griffith states this form is 'evidently a superior qualification' as 'considering the position of persons having the epithet *akrêrê,* I am inclined to attribute to it the meaning "princely"' (1912:55). Consequently, this item can be discounted, as it is a non-verbal form.

j. *penn* /pənana/

No associated meaning can be found for this form.

k. *snn* /sanana/

Hintze (1963:28) lists this form as being nominal. Griffith (1911:119) gives *snnlitebkwi* "of Shanen' deity (?) pl.' indicating a toponym.

l. *kmom* /kamuma/

No associated meaning can be found for this form.

m. *wwike* /wawikə/

This is the only item that is defined as a verb by Hintze (1963:29). Griffith (1911:113) cites the form *wwikelo* and states that it occurs in descriptive phrases. However the form *wwi* is found in front of a proper noun in Meroitic.

n. *pipn/pipl* /pipana/ /pipala/

Griffith presents these two forms without speculating their associated meanings. Millet (2003:58) states that *p-* can be the 'initial element of the predicate word…indicator of the optative mood'. If this can be applied to the above forms this means that the two identical consonants belong to separate constituents and therefore discounted.

o. *h̲h̲* /χaχa/

This form is found in Griffith (1912:118) as – *h̲h̲ll*. He discusses that the written form *h̲h̲* is a 'briefly' written form of () () – *h̲(m)h̲(e)*. Rilly (p.c.) outlines that Griffith's forms can be revised to read *h̲llh̲* 'a big meal', and so these seemingly adjacent consonants are in fact separated. Therefore, the two identical consonants are not adjacent and this form can be discounted.

p. *trri* /tarari/

No associated meanings can be found for this form.

q. *bobt* /bubata/

No associated meanings can be found for this form.

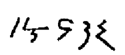
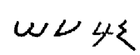
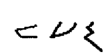
r. *sseno* /səsnu/

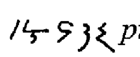
Griffith (1911:71) gives this form as – *sseno* as a personal name of a father, therefore discounting this item, as it is a nominal form.

Therefore, out of the 18 forms from the corpus which were found to show exceptions to consonantal compatibility restrictions, 11 of these can be discounted as belonging to the nominal category which is known to show weaker results in upholding the restriction. In summary, only seven forms are instanced which show that adjacent identical consonantal compatibility restrictions are violated where no associated meaning or lexical categorisation can be found. In the forms which show clear identical consonants (11h, j, l, p and q) it is noted that if it is possible they are verbal forms then they correspond to the weakened positional restriction of Consonants II & III where geminated consonants are commonly found (as discussed in §2.2.2). Nevertheless, this is an extremely low occurrence of forms containing identical adjacent consonants and so the process of consonantal compatibility restrictions is assuredly upheld as evident in Meroitic.

2.4 Adjacent homorganic forms

If there are strong restrictions against identical adjacent sequences of consonants in Meroitic then restrictions should be evidenced on adjacent homorganic sequences also, subsequently this restriction is also attested. Only four forms were found in the corpus that contained adjacent homorganic sequences of consonants, i.e. consonants drawn from the same articulatory series namely the labial series, these being:

(12)  *pmete*  *pibr*
 *kḫene*  *pbḫ*

The form  *pmete* can be discounted as it contains the verbal stems as given in §4.4 fig. (20) and therefore must be a prefixed forms as the element *p-* is considered to be a verbal prefix. It is reiterated here that this is in line with Egyptian, where Watson (1979:100) pointed out 'affixal elements do not obey patterning.'[117]

Hofmann (1981a:203) and Abdalla (1979:158) discuss the form *bḫ* as being an 'infix' and a plural form of the datival postposition, Rilly (p.c.) affirms that this is in fact a verbal suffix. This suggests that there is no violation of compatibility restrictions as the form *pbḫ* contains the prefixed element *p-* and it was already discussed how the compatibility restriction in Meroitic only affects the root and not the word.

[117] The form *mpl* is erroneously given in Griffith's word-list appendix (1912:68) as it appears in the Kharamadoye Inscription (REM0094) as *mkl*.

The form *kẖene* is given in Griffith (1912:41) as '*khabkheñ* of the king' and therefore shows to be part of a nominal form. However, no associated meaning could be found for the form *pibr* but this is the only instance of this form which occurs in the texts and the only adjacent homorganic sequence that cannot be lexically categorised.

2.5 Summary of section

Overall, it has been seen that of the known and assumed Meroitic verbal forms, none exhibit adjacent identical consonants or adjacent homorganic consonant sequences at the root level, although a small number of exceptions can be found when affixation is taken into consideration or for consonant positions II and III (of triconsonantal forms), where it was discussed as corresponding with other languages violations to compatibility restrictions. In non-verbal forms (nominal), these restrictions are weakened as found in Afro-Asiatic languages. The affixes do not obey patterning and so the consonantal compatibility restrictions in Meroitic are only subject to the root and not the word.

3 Chapter 5, Parts 1 & 2 Conclusion

This chapter has revised the representation of this vowel sign as the epenthetic vowel when encountered in borrowed forms from other languages and showed that it is used for the reparation of disallowed consonant clusters and not as a zero-vowel indicator. To summarise, the following proposals are put forward; (i) the 'syllable' signs have the realisation of plain consonants i.e. *se* = /s/ and *ne* = /n/; (ii) the gap in the system of the equivalent 'consonant' signs *s* and *n* never preceding the vowel sign *e* could be due to vowel raising or to the phonotactic constraints of the Meroitic language, (iii) the vowel sign *e* is used as the epenthetic vowel [ə] when consonant clusters are encountered in borrowed forms, and consequently, (iv) the vowel sign *e* was not ambiguously devised as a zero-vowel indicator. It has also been evidenced that the further argument for the vowel sign being a zero-vowel indicator due to identical consonants not found flanking this vowel is disputed. Through analysing the non-occurrence of identical consonants flanking any of the Meroitic vowels, it was found that (v) there is a strong case to be made for the typological process of consonant compatibility restrictions being evident in Meroitic.

Chapter 6

Major claims supported by phonological theory

The major claims that are made in this thesis are supported in this present chapter by an analysis conducted using the phonological theory of Government Phonology (Kaye, Lowenstamm & Vergnaud (KLV) 1985, 1990; Charette 1990, 1991, 2004; Harris 1994, 1995, among many others). This analysis leads to the identification of the constituent structure of Meroitic forms and the language-specific parameter settings for Meroitic. Processes of assimilation are analysed in terms of how the ECP and OCP are implemented in Meroitic. The proposal that Meroitic forms consist of domains is put forward which is able to capture the occurrences of non-assimilated forms. An element theoretical account is given which shows that the OCP is active in Meroitic, following on from the proposal that there is a process of dissimilation in the language. An element account is also applied to Griffith's Law and is able to capture this long-misunderstood and unique process.

1 Motivation for applying Government Phonology

The theory of Government Phonology (GP) is well-suited to capturing the phonological processes that other scholars have described as being evident in the language and further processes as argued for in this thesis. It is discussed in this chapter that Meroitic exhibits phonological processes at the segmental level which interestingly do not apply in certain forms. These exceptions can be explained by referring to the syllabic structure of Meroitic which GP is able to capture and explain. A linear-based theory is unable to capture this information feed from the segmental level to the prosodic organisation and so an autosegmental framework such as GP is called for.

The agglutinative structure of the Meroitic language demands an inspection of the phonology-morphology interface to understand the interaction of processes at morphological boundaries. As Meroitic is a concatenative language, the CV template framework (McCarthy 1979) as applied to Semitic languages is unsuitable for Meroitic phonology. Further, the theory of Lexical Phonology (Mohanan 1982; Kiparsky 1982) whereby the morphological component of a grammar is organised into hierarchical levels is fraught with too many problems (cf. Goldsmith 1990) in which to draw strong proposals for Meroitic. Principally this is due to the lack of semantic understanding of many morphemes and roots in the Meroitic language. A theory such as GP where the visibility of morphological information in the phonology is elegantly captured for concatenative languages is applicable to an analysis conducted on Meroitic. This chapter also proposes that the OCP is active in Meroitic as a typological feature of the phonology. In applying the OCP, certain assimilations and restrictions can be captured with an overall constraint at work in the language. In proposing the OCP with reference to the syllabic structure couched within GP, the theory is able to restrict the description of separate distinct processes and combine these into one main constraint. This is in line with reducing phonological processes to a small set of formal operations which GP strongly adheres to.

GP also departs from utilising binary-based subsegmental representations which refer to auditory or vocal anatomy, by using monovalent unary representations (elements). In this chapter, the application of these unary elements shows an elegant account for the phonological process of Griffith's Law which proves its phonological basis. In contrast, an analysis using feature theory is unable to account for this unique Meroitic process.

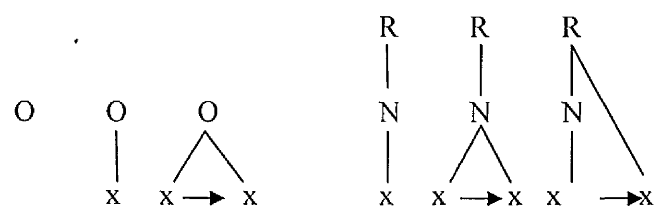
In referring to the prosodic organisation with GP, the structure preserving proposal of domains (as put forward in this chapter) as a barrier to the overall OCP constraint can account for resistance to morphological haplology effects (OCP). This resistance is empirically observed in 'disyllabic' words. In this respect, a GP analysis revises what constitutes a 'syllable' and thus is the most-suited theory in which to support the observed phonological processes in Meroitic.

2 Government Phonology

Government Phonology is based upon the notion of principles and parameters in that the principles are inviolable and parameters express a system of language-specific facts. GP is primarily concerned with representations and follows the stipulation that *processes apply whenever the conditions that trigger them are satisfied.* This stipulates that phonological processes which apply at different stages of a derivation are prohibited (as in Lexical Phonology). Kaye states that 'derivations are assumed to be 'blind' in the sense that no process is aware of the history or the future of any derivation in which it is involved' (1995:290). Representations are assigned into their constituent structures where the phonological information is positioned on a skeletal tier that consists of timing units. The skeletal tier is assigned governing and licensing relations that build into the constituent structure of onsets and nuclei. Each nucleus is dominated by a rhyme. These constituents may or may not branch depending upon the parameter setting for a given language. The governing relations between timing units are strictly local and strictly directional thereby allowing only maximally binary branching constituents. Furthermore, for a governing relation to hold, the governor must be of no less complexity in element terms than its governee.

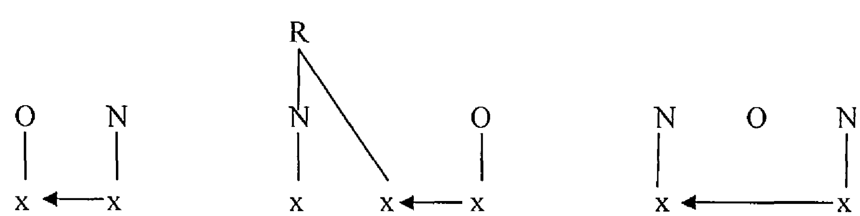
GP utilises three prosodic constituents: the onset (O), the nucleus (N) and the rhyme (R). The constituents can be represented as follows:

(1)



If a constituent is able to branch (parameter) the governing relation is defined as being head-initial, in this case the leftmost head is the governor (constituent government) as indicated by the arrow. Governing relations in GP adhere to the principles of strict adjacency (locality) and strict directionality. These principles constrain constituents to maximal binary branching (Kaye 1987, 1990, Charette 1991). Governing relations also hold from right to left between constituents. A nucleus licenses its immediately preceding onset and an onset trans-constituently governs a preceding post-nuclear rhymal position i.e. a branching rhyme or 'coda':[1]

(2)



[1] Note that in practice the rhyme constituent is not usually notated unless it is branching.

Government also holds at the level of nuclear projection and is parametrically variable in its directionality. Government at the nuclear level seeks to account for prosodic processes such as tone, stress and vowel harmony.

The GP principles and parameters that are relevant to supporting the major claims made in this thesis will be covered in this chapter.

2.1 GP element theory

The subsegmental representations that are employed in GP are unary features termed 'elements', these elements can remain in isolation or are able to combine to form complex phonological expressions. GP advances that a theory must be as restrictive as possible and as such elements are specified for a unary value as opposed to the binary value employed in feature theory which is subject to over-generating.[2] The GP subsegmental elements that comprise phonological expressions can combine in language specific ways, which are restricted through Licensing Constraints (Charette & Göksel 1998). The set of elements that are followed in the analysis presented in this chapter are the revised set of elements; the following elements can be defined for consonants as follows:[3]

(3) Revised series of elements

A	-	coronality	ʔ	-	stop/edge
I	-	palatality	H	-	aspiration, voicelessness
U	-	labiality	L	-	voicing, nasality

The series of elements [A], [I] and [U] are also used as resonance elements in vocalic phonological expressions, along with [H] and [L] (which are used to represent tones). In functioning as resonance elements, their characteristics can be defined as [A] = lowness, [I] = front and [U] = round. Elements may combine (complex phonological expressions) or stand in isolation (simplex phonological expressions). The elements that make up a complex phonological expression can enter into a head/dependent relationship. Only

---

[2] GP is allied with Dependency Phonology (Anderson & Ewen 1987) and Particle Phonology (van der Hulst 1989) in the proposal for a unary value for subsegmental representations, whereby the unary values in Dependency Phonology are *components*.

[3] Not all GP phonologists employ the revised series of elements in their investigations, for different proposals see Harris (1994), Harris & Lindsey (1995). Furthermore, not all GP investigations subscribe to Licensing Constraints as some incorporate element geometry (Backley 1993, 1995).

one element can assume the role of head within any expression, with any others present in a complex expression assuming the role of operator(s). The headship of any element is language specific and can be determined by an analysis of the phonological processes evident within the language.

2.2 Vocalic phonological expressions

Within GP element theory (KLV 1985, 1990; Harris, 1990, 1994) the vowel space is defined as being of a 'tridirectional' dimension (Ewen & van der Hulst, 2001). This theory is able to capture the internal representation of vocalic expressions by the certain combination or isolation of the three melodic primes or elements [I], [U] and [A]. The combination (or fusion) of the element [A] with the element [I] results in the vowel *e*, the isolation of the element [A] gives the independent interpretation of the vowel *a*. For Harris (1994), these melodic primes each reside on their own autosegmental tier and allow the vowel systems found in the world's languages to be captured. An example of which is the vowel system for English where we do not find front round vowels. This is encapsulated by the parametric conflation of the [I] and [U] tiers:

```
(4)                     x  x  x  x  x
                        |  |  |  |  |
        I/U tier        I -- I -----U -U
                           |  |  |
        A tier          ----A--A--A----
                        i  e  a  o  u
```

The distinction between tense and lax vowels in English such as i/ɪ, u/ʊ and ATR is explained by the incorporation into the theory of an asymmetrical governing relationship (that is language specific) between the elements that make up the vocalic expression. The governing relationship attributes headship (or status of governor) to one of the elements, and if a combination of elements is expressed, the role of operator or dependents to the governed elements.[4] The English vowel inventory can also be captured with licensing constraints, the complete analysis is outside the scope of the present discussion, see Kaye (2001) for more on this.

[4] See Harris (1990) for more on head/dependent asymmetry. See Charette & Goksel (1998) for licensing constraints on vowels in Turkic languages.

2.3 Element representation of Meroitic vowels

Chaper 4 proposed that there are four underlying vowels in Meroitic, these being /a/, /i/, /u/ and /ə/. The Meroitic vowel system could be accounted for through the parametric conflation of the [I], [A] and [U] tiers prohibiting the fusion of all three elements (Harris 1994). This conflation is in accordance with three-vowel systems found in languages such as Classical Arabic.

(5)	I/A/U tier	/I/	/A/	/U/
		|	|	|
		i	a	u

The Meroitic vowel system is defined in element terms as consisting of simplex phonological expressions:

(6)	unmarked *a* – not transliterated	/a/	[A]
𐦢	*i*	/i/	[I]
𐦣	*o*	/u/	[U]

Finally, this leaves the schwa vowel 𐦡 *e* /ə/ represented in element terms as the empty expression [ ]. This vowel has variously been described as 'cold' [v] (Kaye *et al.* 1985), 'neutral' [@] (Harris, 1994) and comprising 'centrality' (Anderson and Ewen, 1987).

In element theory, the empty element covers the area that is non-palatal, non-open and non-labial. Languages differ with regard to the phonetic property of the schwa vowel. The specification for the varying placement of schwa in the world's languages can be accounted for by the combination of one of the elements [I], [A] or [U] with the empty element to describe the varying position this vowel can take in the available vowel space. The positioning for the Meroitic schwa in this paper is kept to the mid-central placement and as such no combination of the elements in association with the empty element is supported. The vocalic phonological expressions of Meroitic can have the following licensing constraint applied in order to constrain the combination of elements within expressions: Operators are not licensed. This licensing constraint prohibits the generation of any complex expressions i.e. those that consist of a head and an operator. As no operators are licensed this means that all expressions will be headed and if there is no head element then there can not be any operator, resulting in only simplex phonological expressions. This gives the vowel inventory of Meroitic with their element representation in (7):

(7)	Unmarked *a* – not transliterated		/a/	[$\underline{A}$]
		*i*	/i/	[$\underline{I}$]
		*o*	/u/	[$\underline{U}$]
		*e*	/ə/	[ ]

3 Meroitic constituent structure

Griffith's work on the Meroitic language led him to propose that it consisted of mainly open syllables i.e. CV sequences, but also that closed syllables were evidenced through Greek transcriptions of two Meroitic names i.e. CVC (1911:7).[5] This was previously discussed in Chapter 5, §4.4, whereby evidence is adduced from transcriptions taken from other languages strongly indicates that the Meroitic script does not notate a nasal consonant when it is immediately followed by an obstruent consonant. This non-notation can be seen as a function of the Meroitic writing system, and this transcription evidence is strong enough to conclude that this nasal consonant was actually enunciated.[6]

Accordingly, Meroitic allows certain constituents to branch and not others therefore the following GP parameter settings can be initially stated for Meroitic:[7]

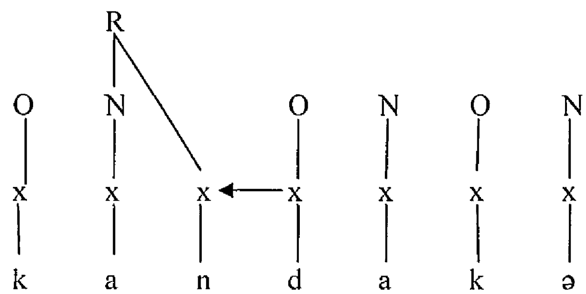
[5] Griffith's assumption could be seen as contradictory to his further statement that '...and not infrequently collections of three or more consonants are seen' (1911:7). These collections of three or more consonants would be clarified by Hintze's research into the unmarked /a/ being inherent within 'consonant' signs (1973a, 1974a).
[6] In a Universalist approach to script typology, Justeson (1976:76) remarks that one of the script universals from his corpus is that nasal consonants are often omitted before stop consonants.
[7] The parameter setting for whether nuclei can branch or not cannot be determined, as the script does not indicate a contrast for vocalic length.

(i) Branching onsets OFF

(ii) Branching rhymes ON

Through these considerations, it can be a preliminary proposal that the constituent structure of a Meroitic form with homorganic nasal + obstruent sequences under GP will be as follows:[8]

(8)



The above form instances the constituent structure of the Meroitic title *ktke* /kandakə/. The Coda Licensing Principle states that a rhymal adjunct position must be licensed by an onset position (Kaye 1990). The Meroitic form is able to syllabify the nasal consonant /n/ to the branching rhyme as it is licensed to branch by the following filled onset position /d/.[9] The sequence of /n/ + /d/ means that /d/ is a good governor for trans-constituently governing /n/. This is a requirement of the Complexity Condition (Harris 1990, KLV 1990)[10] which states that governees must be no more complex than their governors. Complexity refers to the element composition of a segmental representation. A possible segmental representation of these Meroitic consonants using the revised set of elements in GP would posit the nasal segment /n/ as being composed of [A L ?] and /d/ as [A L̲ ?].

[8] The evidence for Meroitic displaying homorganic coronal nasal + stop sequences could be problematic for the following proposal that there is an OCP-place constraint in the language. However, Pierrehumberts's (1993) research into the OCP calls for gradiency in the restriction within the coronal class of consonants. See §4 for more on this.

[9] I use the term 'syllabify' to mean where a segment is associated to the constituent structure and not as any reference to the syllable *per se* as a constituent itself as the syllable has no theoretical status in GP.

[10] The complexity condition was initially proposed comprising a theory of charm and government (KLV 1985, 1990; Harris 1990). The theory of charm was disposed of due to its ability to over-generate and the set of elements was later revised (Backley 1993; Jensen 1994). The revised theory incorporates headship into the representations to constrain over production.

3.1 Assimilation of the word-final 'syllable' sign 𐦫 *ne*

In Chapter 5, it was claimed that the 'syllable' signs do not contain an inherent schwa vowel and therefore are representative of plain consonants. The following theoretical analysis is further support for this claim.

The following nominal forms are found in Meroitic texts (Hintze 1979:62)[11] and show that the final 'syllable' sign 𐦫 *ne* is lost when a liquid-initial suffix is attached to the word:[12]

		'Syllable' sign word-finally		Omission of 'syllable' sign when liquid initial suffix is attached	
(9)	a.	𐦰𐦭𐦡𐦴𐦡𐦫		𐦰𐦭𐦡𐦴𐦡𐦭	
		s l e q e ***ne***	~	*s l e q e* ***l***	
	b.	𐦮𐦬𐦨𐦮𐦡𐦫		𐦮𐦬𐦨𐦮𐦡𐦭𐦢	(REM 0325)
		ḫ r p ḫ e ***ne***	~	*ḫ r p ḫ e* ***li***	
	c.	𐦮𐦦𐦮𐦫		𐦮𐦦𐦮𐦭	(REM 0088)
		ḫ b ḫ ***ne***	~	*ḫ b ḫ* ***l***	

In contrasting these forms, it is evidenced that the word-final 'syllable' sign 𐦫 *ne* of the noun is lost (and therefore unwritten) when the liquid-initial determiner morpheme is suffixed to these stems.

These contrastive forms contributed to Hintze's (1973a:330; 1979) argument that the schwa vowel (which he thought was contained in three of the 'syllable' signs) could also represent a zero vowel as part of the structure of the Meroitic language and not only used for the transcription of foreign names. Hintze believed that the omission of the 'syllable' sign 𐦫 *ne* in these suffixed forms indicates that the schwa was unrealised in these instances and thus a zero vowel which therefore led to the nasal consonant /n/ being adjacent to the liquid /l/. Hintze (1979:62) hypothesised that once these consonants were adjacent there would be regressive assimilation from the liquid onto

[11] These data are taken from Hintze, where possible I have given the REM number for reference, however, in Hintze's data no REM numbers are given.

[12] The liquid-initial suffixes here are thought to represent the definite article or demonstratives in Meroitic. Rilly (2007) prefers the term 'determiners'.

the nasal resulting in the liquid geminating: nl → ll/_l. The claim made in this thesis advances the theory that the 'syllable' signs *ne* and *se* are representative of consonant only signs, which therefore dismisses the dual vocalic representation of these signs (schwa ~ zero), however Hintze's regressive assimilation proposal is agreed with here. A theoretical account of this assimilation follows.

3.2 Theoretical analysis of assimilation

GP is able to capture the assimilation of the word-final 'syllable' sign *ne* by invoking the phonological Empty Category Principle (ECP), which I consider next. The phonological ECP as proposed by Kaye (1987) has the following definition:

Empty Category Principle

(a) A p-licensed empty nucleus has no phonetic realisation.
(b) An empty nucleus is p-licensed if (i) it is properly governed or (ii) it is domain-final in languages which parametrically p-license domain-final empty nuclei.

Proper Government

A nuclear position α properly governs a nuclear position β if

(a) α is adjacent to β on its projection,
(b) α is not itself licensed, and
(c) no governing domain separates α from β.[13]

GP recognises empty skeletal positions and their distribution are very tightly constrained by the ECP where only properly governed p-licensed positions may remain empty and those which are parametrically licensed domain-final positions. A parameter setting for Meroitic can be proposed:

Licensed domain-final empty nuclei: ON

This parameter setting is supported by the discussion in Chapter 5 that claimed that the 'syllable' signs particularly *ne* and *se* are indicative of consonant only signs i.e. /n/ and /s/. This would mean that Meroitic can have word-final consonants _n# and _s#.[14]

[13] The ECP has further definitions which are not relevant to the present analysis; see Charette (1991) and Kaye (1992) for these.
[14] This follows from the claim that Meroitic only allows the coronal series of consonants (t, s, n) word-finally. This could be due to the licensing potential of the final nucleus position and is subject to future investigation.

Subsequently, the following constituent structure is instanced using as an example the form from (9a)  *sleqene*:

(10) Domain-final p-licensed form

O	N	O	N	O	N	O	N
x	x	x	x	x	x	x	<u>x</u> ←p-licensed
s	a	l	ə	q	ə	n	

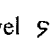
The form in (10) shows that the 'syllable' sign *ne* /n/ is word final and attached to the last onset of the structure, this is then followed by a domain-final p-licensed nucleus which is thus phonetically inaudible.[15]

As I have argued for the representation of the 'syllable' sign *ne* as indicating a plain consonant sign, therefore the forms in (9) are consonant final and the word-final nucleus has no phonetic content due to being domain-final p-licensed for all these forms. This parameter setting accounts for languages that only allow vowels in word-final position such as Italian where the parameter is set to OFF so domain-final nuclei are always filled, whereas languages such as English that allow vowels and consonants in word-final position and the parameter is set to ON.

It is now discussed how these forms with consonant-final /n/ show deletion of /n/ when suffixed with the liquid-initial morphemes. The constituent structure of the morphologically concatenated form is given in (11):

(11)

O	N	O	N	O	N	O_2	N_2	O_1	N_1
x	x	x	x	x	x	x	<u>x</u>	x	x
s	a	l	ə	q	ə	n		l	a

[15] I point out here that the word-internal representation of the Meroitic vowel  which I show for consistency as /ə/ could be the vowel /e/ and thus no Proper Government affects these vowels as they are lexical. This same representation is found in languages such as English and Ewondo where the ECP is restricted to domain-final nuclei. The claim can be made that Meroitic orthographically represented the lexical vowel /e/ and their schwa vowel with the same grapheme.

The structure in (11) shows that when the determiner suffix is attached, the last nucleus N_1 is not itself licensed by being a filled (lexical) domain-final category. The stem word is already p-licensed by being domain-final and so this nucleus cannot have any phonetic content.

It now has to be explained why there is deletion of the nasal segment when the liquid-initial determiner is suffixed. It is claimed here that for certain suffixes, such as the determiner, the morphological structure is not visible to the phonology. Within GP, two types of morphology are relevant to this analysis, these being *analytic* and *non-analytic* (Kaye 1995). An analytic form will carry domains to the phonology whereas a non-analytic one will not. Analytic morphology can be represented as consisting of two morphemes such as A and B that are incorporated into a domain structure. One type of analytic morphology is the compound structure e.g. [[A][B]] which consists of three domains: the domain [A], the domain [B] and combined to form the third domain [[A][B]]. An example of this type of analytic morphology can be shown with the word *kilometre* – [[kilo][metre]]. Kaye (1995:302) describes that the brackets should be interpreted as representing how the phonological string should be processed. This means that phonology should be applied to *kilo* and to *metre,* this string is then concatenated to form another string where phonology is applied once again.

The second type of analytic morphology is comprised of two domains which form the structure [[A]B]. The domains for this type of structure are composed of [A] and [[A]B]. This type of analytic morphology indicates that B acts as a suffix and does not form an independent domain of its own. An example of this type of morphology can be shown with an example from English inflectional morphology, such as *walked.* This analytic domain structure is processed by phonology applied to *walk* then this is concatenated with *-ed*; then phonology is applied to the result of this concatenation.[16]

Non-analytic morphology consists of only one domain i.e. [A B].[17] For these forms, the morphology is invisible to the phonology which means that there is no phonological

[16] This morphology is seen as being stress neutral, productive, no lexical selectivity and no closed syllable shortening which explains forms in English such as [[ri:p]t]. Lexical Phonology terms this stage as Level 2.
[17] This morphology shows that primary stress is affected, lexical selectivity and closed syllable shortening takes place; consider the word [pắrent] with its non-analytic suffix [paréntal] showing the movement of the primary stress. Within Lexical Phonology this is Level 1.

indication that it is morphologically complex, inasmuch as it behaves as a morphologically simplex form.

It is proposed that the Meroitic forms which show the loss of the 'syllable' signs are non-analytic otherwise we expect the domain (i.e. the morphology to be visible) would be a barrier to the visibility of the nasal segment and the liquid.[18] Thereby the domain structure of the form is [saləqənla] and not *[[saləqən]la].

(12) Non-analytic morphological domain form

[O	N	O	N	O	N	O_2	N_2	O_1	N_1]
x	x	x	x	x	x	x	$\underline{x}$	x	x
s	a	l	ə	q	ə	n	⟷	l	a

As there are no internal domains the non-analytic morphology will be invisible to the phonology. Subsequently, there is adjacency of the two onsets O_1 and O_2 which I propose causes an OCP-place violation.[19] The two onsets both share a coronal place of articulation specification. This analysis proposes that the assimilation is a product of the OCP-place being active in Meroitic, as Harris (1994:173) points out 'the OCP…remains active during derivation. In this guise, it intervenes in a language-particular manner to block processes which would violate it or to set off processes which repair such violations. In the latter function, the convention triggers coalescence of identical melodic expressions, which accidentally become juxtaposed as a result of

[18] To elucidate on this point an example from English morpho-phonology can be used. English evidences regressive assimilation of the nasal consonant in the prefix from the consonant of the stem when the negative morpheme [in] is prefixed. This assimilation is total when the stem consonant is a liquid e.g. illogical < inlogical, irrational < inrational; or partial for other consonants e.g. impossible < inpossible. Thereby the domain structure for these morphologically complex forms will be non-analytic i.e. the morphology is invisible to the phonology. Whereas the nasal consonant of the other English negative morpheme prefix [un] is resistant to the following consonant assimilating it. This leads to the morphological domains being visible to the phonology and therefore structures with this morpheme would be analytic.

[19] The OCP or Obligatory Contour Principle is used here following the weak version of OCP-Place 'Adjacent identical place features are disfavoured' (McCarthy 1988).

morphological concatenation.[20] This affects so-called 'fake' (i.e. non-lexical) geminates, such as the *nn* in *unnerved*.'[21]

The morphological concatenation at the word-level of the form in (9) results in introducing segment sequences that are not found in underived and root-level forms (Harris 1994:22), which I propose that in Meroitic this is due to a non-analytic structure. As this is a morphologically concatenated form, Meroitic blocks a violation of the OCP by deletion of the nasal segment.

This OCP trigger causes the loss of the nasal and then the associative spreading of the liquid into this empty onset position i.e. O_2 to O_1 (nl → l →ll).[22] The nasal is lost due to the OCP-place although there is no deletion of the skeletal point of O_2 (13):

(13) OCP-place violation causing deletion of nasal segment in O_2

[O	N	O	N	O	N	O_2	N_2	O_1	N_1]
x	x	x	x	x	x	x	<u>x</u>	x	x
s	a	l	ə	q	ə	[n]		l	a

delinking of [AʔL]

In summary, the nasal consonant deletes (delinks) due to an OCP-place violation as it is adjacent to the liquid as the morphological division of the determiner suffix is invisible to the phonology. GP theory constrains the deletion of the skeletal point of O_2 as this would lead to a resyllabification of the constituent structure. This would be in violation of the Projection Principle (KLV 1990) which states that governing relations are defined at the level of lexical representation and remain constant throughout a phonological derivation. This principle can be summarised as allowing for the addition of governing

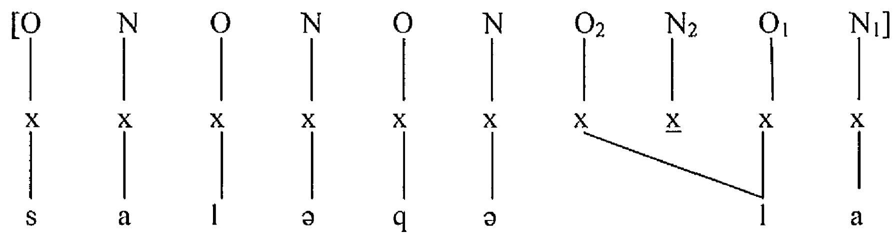
[20] Rilly (1999b) discusses the theory that there is a process of assimilation in Meroitic due to adjacent segments sharing a labial place specification.

[21] Harris's example is one of analytic morphology of the compound type under Kaye's proposal i.e. [[A][B]], but this 'fake' geminate in English is caused due to the lexical negative morpheme 'un' prefixed to a stem that has a nasal word-initially. I am citing Harris's description as an example of how non-lexical geminates can be formed, but this is not the same as the Meroitic proposal where the geminate is formed due to an OCP violation resulting in segmental loss and then spreading, although either case is possible.

[22] This type of regressive assimilation of nasals with liquids is evident in languages such as Klamath hollina < honlina (Barker 1964), and Ponapean nalleng < nanleng (Rehg and Sohl 1981:57).

relations in the course of a derivation although the deletion of or change to existing governing relations is prohibited i.e. there is no resyllabification (Brockhaus 1995:192). This means that the liquid in O_1 compensates for this segmental loss (or delinking) by also associating to the empty skeletal point of O_2:

(14) Liquid associating to empty skeletal point



This analysis theoretically supports Hintze's claim (1979:62) and Millet (1971) who also proposed that there is gemination of the liquid in these Meroitic forms.[23] This phonological analysis is now able to explain why in the written form we find omission of 𐦬 *ne* /n/ but the stability of 𐦰 *l* /l/.

In conclusion, the surface form of the non-suffixed item is [saləqən] whereas its suffixed form has a geminated liquid [saləqəlla].

The script is unable to indicate geminated consonants, which was already observed by Hintze (1974) due to the syllabic nature of the writing system. A sequence of two written 'consonant' signs such as 𐦰𐦰 *ll* would lead to the inherent unmarked 'a' vowel being articulated after the first liquid [lala] and not *[lla]. Therefore the script is unable to represent geminate consonants and so evidence for their realisation has to come through studying alternate forms such as these.

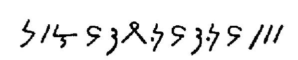
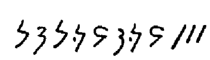
3.2.1 Non-analytic domain of adjectival suffix morpheme /*l*/

Kaye's (1995) discussion of morphology being either visible or invisible to the phonology shows that certain morphemes in English carry domains to the phonology whereas others do not. The variance in domain visibility is investigated here and

[23] These proposals were put forth by Hintze and Millet not through a phonological analysis but by an analysis of the script.

extended to various liquid-initial suffixes in Meroitic. The possibility that domains in Meroitic are sensitive to the information content of the suffixal morphemes i.e. certain morphemes such as the determiner being non-analytic (because of the deletion of the nasal) where the adjectival suffix could be analytic (because there is no deletion of the nasal) can be discounted. The following data suggests that liquid-initial suffixes, regardless of their information content, will cause an OCP-place violation when adjacent to the nasal 'syllable' sign *ne* /n/. We can see this OCP-place violation clearly in the following forms; hence the possibility that other suffixes are analytic can be discounted:

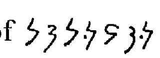
(15)

a.  b.  (Hintze 1973a:330)

y e- t m e t ***ne -m*** *e te -l* ~ *y e -t m e t-* ***l*** *h̲ -l*

pref. +noun+adj.+det. pref.+noun+adj.+det.

The form in (15a) shows that the stem-final 'syllable' sign *ne* does not delete when there is an adjective suffixed which does not cause an OCP-place violation. Moreover, the 'syllable' sign is a coronal nasal /n/ and the initial consonant of the adjective is a labial nasal /m/. However, there is an OCP-place violation when the adjective is liquid-initial. This data shows that the adjectival suffix also does not carry domains to the phonology for this process to take place. Therefore the following structure can be proposed to account for the noun and adjectival suffix morpheme as given above in (15b):

(16) Non-analytic domain structure of  *y e -t m e t-* ***l*** *h̲ -l*[24]

[O	N	O	N	O	N	O_2	N_2	O_1	N_1	O	N]
x	x	x	x	x	x	x	x̲	x	x	x	x
t	a	m	ə	t	a	n	↔	l	a	χ	a

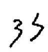
OCP violation

[24] Only the structure of the noun and the adjectival suffix is given here, as the other affixes are not specifically relevant to the analysis.

The structure shows that N_2 is p-licensed and so has no phonetic content (as previously proposed). There is now an OCP-place violation as the nasal and the liquid are adjacent and they are not separated by a domain, which leads to the morphology being invisible to the phonology. This results in the deletion of the nasal in O_2 and thus the liquid in O_1 spreads into this onset position:

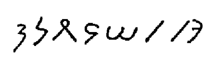
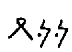
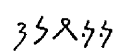
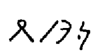
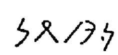
(17) Non-analytic domain structure resulting in assimilation

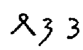
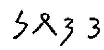
[O	N	O	N	O	N	O_2	N_2	O_1	N_1	O	N]
x	x	x	x	x	x	x	<u>x</u>	x	x	x	x
t	a	m	ə	t	a			l	a	χ	a

This analysis is evidence for the non-analytic domain structure of these liquid-initial suffixal morphemes regardless of their grammatical/lexical status. In conclusion, the liquid-initial adjectival suffix  *l<u>h</u>* also has a non-analytic domain structure, therefore yielding [tamtətallaχa].

3.3 Non-assimilation of *ne* forms

A number of forms are found within the Meroitic script which could appear to be problematic for the preceding analyses. These forms exhibit the word-final 'syllable' sign *ne* not being deleted when followed by suffixed liquid-initial morphemes:

(18)	'Syllable' sign word-finally		No omission of 'syllable' sign when liquid initial suffix is attached	
a.				(REM 0521)
	*q o r e **ne***	~	*q o r e **ne** **l** <u>h</u>*	
b.				(REM 1065)
	*t t **ne***	~	*t t **ne** **l** <u>h</u>*	
c.				(REM 1044)
	*t q **ne***	~	*t q **ne** **l***	

d.				(REM 1044)
	a r e ***ne***	~	*a r e* ***ne l***	
g.				(REM 1003)
	t r o ***ne***	~	*t r o* ***ne l***	
f.				(REM 1044)
	s h̲ ***ne***	~	*s h̲* ***ne l***	

Following the previous analysis, these forms should exhibit the 'syllable' sign *ne* /n/ assimilated by the suffixed liquid-initial morphemes, but no assimilation is evident. What contrasts these nouns in (18) with the nouns where assimilation is seen (9) is the number of onset-nucleus constituents. More specifically, the nouns of the non-assimilated forms in (18) consist of three onset-nucleus pairs whereas the nouns of the assimilated forms detailed in (9) consist of more than three pairs.[25] Could this be an indication that Meroitic imposes a minimal word constraint whereby no deletion of segmental material can take place?

3.4 The OCP and haplology

Typological research and phonological investigations into morphological haplology might indicate the reasons for the non-deletion of the nasal segments of the forms in (18). Plag (1998:199) discusses how recent approaches to haplology have stressed that it is best described as the avoidance of identical phonetic or phonological material in morphologically complex words. Further, a broad based application of 'haplology in one form or another seems to occur in almost any language with enough morphology to create phonetically identical sequences' (Plag 1998:199). Plag's investigation concludes that the phonological constraints of the OCP in its various versions i.e. weak/strong/place/manner etc, are responsible for morphological haplology effects. For de Lacy, the process of haplology is one of coalescence rather than deletion of segmental material and Lawrence (1997:382) contributes evidence from Japanese to

[25] As the syllable has no theoretical status in GP, these forms are not defined by relating to a 'syllable' but through their onset-nucleus pairs. However, a more traditional approach could define the forms in (15) as being bi- and monosyllabic.

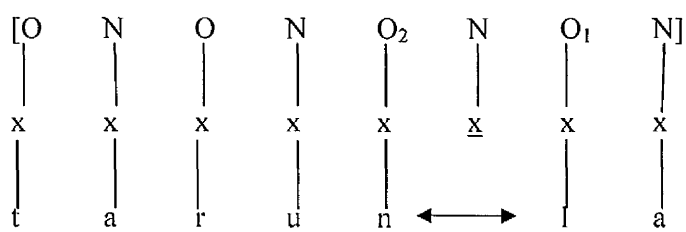
show that haplology occurs in cases where the segments involved are not completely identical.

Importantly, for the Meroitic exceptions, research into incidences where haplology is resisted reveals that the 'syllable' (or the prosodic organisation) is involved. Dressler's (1976:45) investigation concludes that 'haplology is rare in disyllabic words.' This restriction is echoed in de Lacy's investigation where he finds a constraint on haplology if words are too small and so identical adjacent segments are not subject to the process (1999). This research indicates the possibility that the Meroitic data in (18) are resistant to the OCP/haplology due to the forms being of three onset-nucleus pairs (disyllabic).[26]

3.5 Domains as a barrier to the OCP

If it is followed that there is a minimal word structure that the OCP-place triggered by morphological affixation is restricted from applying to, then how can GP encapsulate this? A preliminary hypothesis is that it is restricted from applying to words that are of three or less onset-nucleus pairs.

(19) Structure of non-assimilated form *tronel*



As it has been proposed that there is no analytic domain with this liquid-initial determiner suffixed morpheme then there is adjacency of the nasal /n/ O_2 and the liquid /l/ O_1 we then expect the nasal to delete. If it did in this case, then the liquid /l/ O_1 would spread into the empty onset position of O_2 * **trol* */tarulla/:

[26] I do not specifically refer to haplology as the deletion of morphological elements, but following Plag (1998:215) whose investigations lead him to propose that morphological haplology must be seen as a purely phonological phenomenon. My view is that haplology is the result of morphology creating the phonological environment to trigger an OCP violation.

```
(20) *[O   N   O   N   O2  N   O1  N]
      |    |   |   |   |   |   |   |
      x    x   x   x   x   x   x   x
      |    |   |   |               |   |
      t    a   r   u               l   a
```

If the structure in (20) cannot account for this restriction to the OCP-place triggered assimilation process, what can?

Recent research into morpho-phonological phenomena using a GP framework (Goh 1997, Denwood 1998, Charette 2004) has proposed that words in Beijing Mandarin and Turkish have a 'templatic' structure. Charette (2004:60) proposes that Turkish words consist of the analytic phonological domains [[A]B] whereby the first domain [A] consists of two onset-nucleus pairs. A full account of the arguments Charette puts forward in support of this domain structure for Turkish words is beyond the scope here. However, if the proposal of domains is extended to Meroitic and adapted (parameterised), we are now in a position to propose an explanation of the exceptions with non-assimilated forms with a theoretical account.

It is tentatively proposed here that the phonological structure of Meroitic words is made up of three onset-nucleus pairs within the domain A of the analytic type [[A]B]. An example of how this structure is applied to Meroitic words and its consequences for assimilation is now shown. The phonological domain structure of a Meroitic word is given below:[27]

```
(21)  O1   N1   O2   N2   O3   N3
      |    |    |    |    |    |
      [x   x    x    x    x    x ] ← phonological domain
```

When a noun stem ending in the 'syllable' sign *ne* is applied to this domain structure, the domain-final nucleus (N_3) is p-licensed:

[27] This GP domain structure can be compared with Dressler's 'disyllabic' forms which are resistant to haplology e.g. CVCV(C).

(22)	O_1	N_1	O_2	N_2	O_3	N_3	*trone*
	[x	x	x	x	x	x]	
	t	a	r	u	n		

This phonological domain structure now allows us to account for the non-assimilation of the liquid-initial suffix *tronel*:

(23)	[O_1	N_1	O_2	N_2	O_3	N_3	O_4	N_4]	
	[x	x	x	x	x	x]	x	x	
	t	a	r	u	n	←//→	l	a	no OCP violation

The phonological domain at N_3 is a barrier to the OCP-place assimilation and the non-assimilation of this morphologically complex form can now be accounted for.

It is evidenced that once Meroitic is proposed to have three onset-nucleus pairs that consist of a phonological domain, the non-application of the OCP-place constraint can explain the data in (18).

When we return to the data where this OCP-place is applied, it can be shown that the phonological domain structure proposal is not disrupted:

(24)	[O_1	N_1	O_2	N_2	O_3	N_3	O_4	N_4	O_5	N_5]
	[x	x	x	x	x	x]	x	x	x	x
	s	a	l	ə	q	ə	↑		l	a
							delinking of n [A?L]			

The phonological domain structure ends at N_3 whereas the nasal /n/ is positioned at O_4 which is outside of the phonological domain thereby the liquid-initial suffix is not blocked from causing an OCP-place violation, therefore the nasal deletes and the liquid associates to O_4.

This analysis has shown that the proposal that the 'syllable' sign *ne* represents a consonant only /n/ and not a CV sequence */nə/ can be supported by applying GP theory.[28] This theoretical analysis can capture the written forms of *ne* which show a variation in assimilated and non-assimilated forms by proposing that Meroitic words are composed of a phonological domain which consists of three onset-nucleus pairs. Therefore it can also be concluded that the variations in the transcriptions of the 'syllable' sign *ne* in the suffixed forms do not indicate that there was a vowel inherent within the sign that could alternate as a zero-vowel.

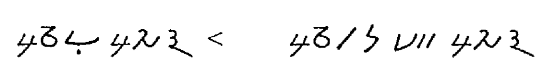
4 Theoretical account of Griffith's Law

Chapter 2 discussed the unique assimilatory/coalescent process evident (although not always systematically) within the Meroitic script. This process concerns the 'syllable' sign *se* preceding a liquid-initial suffix *l* /l/ which results in /t/, defined by Rilly (2007) as Griffith's Law. This process contributed to the claim made in this thesis that this 'syllable' sign actually represents a consonant only /s/ and not a CV sequence */sə/. Furthermore, Meroitic scholars have found difficulty in defining why the assimilation/coalescence of these consonants should result in [t]. It will be shown in this section how GP can account for Griffith's Law; (i) by the constituent structure supporting /s/ and /l/ being in contact and (ii) by using a GP elements theoretic approach as to how the assimilation of /s/ and /l/ results in [t].

4.1 Constituent structure of Griffith's Law process

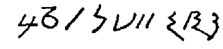
The data from Chapter 2, §3.4 where Griffith's Law is evidenced are repeated below:

(25)

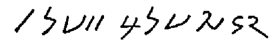
a. Meroitic 

kditowi < *kdise-lowi*

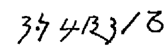
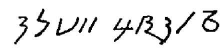
[28] It is reiterated here that I argue against the dual representation of the vowel *e* being /ə/ ~ zero vowel which Hintze's analysis of these 'syllable' signs contributed to thereby leading him to determine this vowel's representation in the 'syllable' signs *ne, se* and *te.*

b. Meroitic  < 

mnptowi < ***mnpse-lowi***

c. Meroitic  < 

adblito < ***adblise-lo***

d. Meroitic  < 

womnit<u>h</u> < ***womnisel<u>h</u>***

Following the proposals put forward in the preceding sections that Meroitic has a minimal word restriction whereby words that are of three onset-nucleus pairs and under are not subject to assimilatory/coalescence processes, the form in (25a) seems to be an apparent exception, and thus would be contradictory to this major claim. It follows that I argue that this form is not an exception to the claim, but is evidence for a revision to the preliminary parameter setting of branching rhymes being ON in Meroitic §1.2, whereas they are in actual fact set to OFF. I now discuss why the form in (25a) is evidence for this revised parameter setting.

4.1.1 Constituent structure of *kdise*

The form in (25a) *kdise* is semantically identified as defining the term 'sister'. It is highly probable that this term is related to the semantically identified forms for 'woman' – *kdi* and 'queen/queen's sister' – *kdke*. It was determined that the form *kdke* contains a nasal segment in a branching rhyme, where this nasal is not written but evidence from comparative forms shows that it was present. This term is therefore realised as /kandake/ and not */kadake/.

It is proposed here that the terms that are semantically related could also contain a nasal segment that is not notated in the script.[29] This means that *kdi* 'woman' could be realised as /kandi/ and *kdise* 'sister' would be /kandis/. Evidence for the realisation of this nasal segment is also theoretically motivated by the proposal of minimal word phonological domains in Meroitic. I will now show why this is motivated by analysing

[29] It could be the case that the terms *kdise* and *kdke* are derived forms of *kdi*.

the term *kdise* when morphological suffixation reveals the process of Griffith's Law i.e. *kdise-lowi* > *kditowi*.

Following the proposal that in Meroitic morphological domains are invisible to the phonology (non-analytic) as evidenced from the OCP-place analysis in §2, we know that liquid-initial morphemes will cause a stem-final nasal /n/ to delete which results in the liquid of the suffixal morpheme associating to the deleted nasal's skeletal position. However, evidence was shown how this OCP-place process is disallowed from crossing a phonological domain, where a Meroitic phonological domain consists of three onset-nucleus pairs. Therefore, words that are composed of more than three onsets will be applicable to this process and those that are under will not.

This proposal has repercussions on the analysis of *kdise-lowi* > *kditowi* as it could mean that the environment for Griffith's Law to apply is contradictory to the above claim.

If *kdise* is analysed as being realised as /kadis/, then Griffith's Law would not be able to apply as it is proposed that the phonological domain of three onset-nucleus pairs is resistant to assimilatory/coalescent processes:

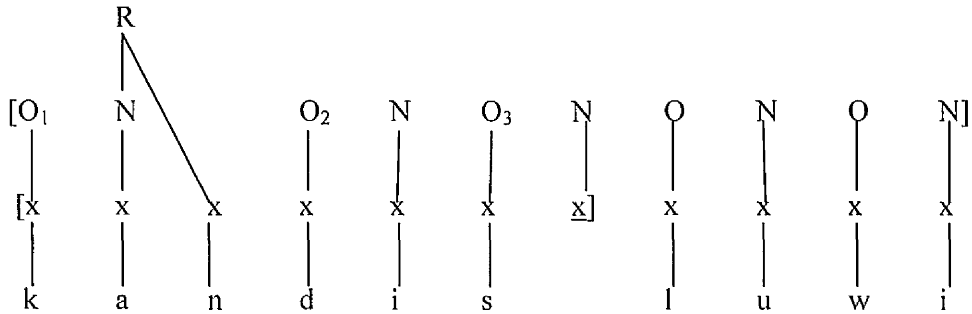
(26) Constituent structure of *kdise* as /kadis/ with suffixation of *lowi*

[O_1	N	O_2	N	O_3	N	O_4	N	O	N]
[x	x	x	x	x	x]	x	x	x	x
k	a	d	i	s		l	u	w	i

This structure shows that as the segment /s/ is inside the phonological domain boundary O_3 whereby the liquid /l/ in O_4 is unable to coalesce across this boundary meaning that we should not find instances of *kdise-lowi* > *kditowi*. Nevertheless, evidence from the script shows us that this process does indeed take place.

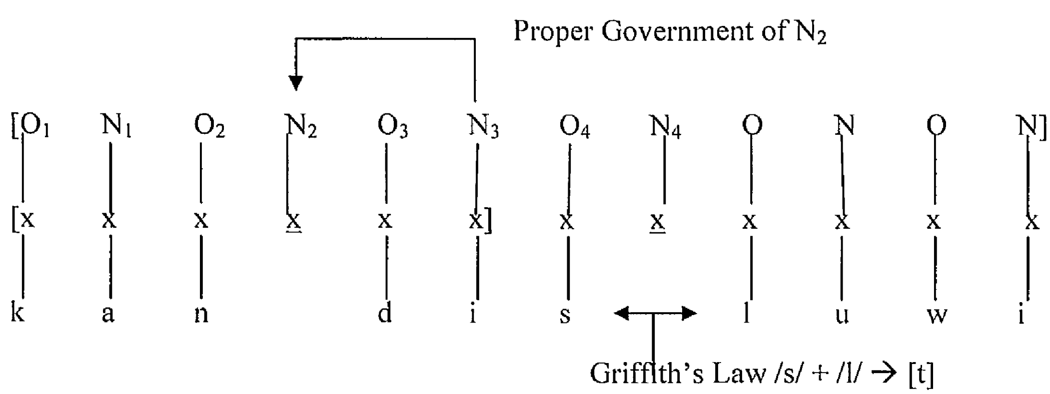
If it is followed that the term is realised with a nasal segment /n/ preceding the segment /d/ as in *kdke* /kandake/, so the term is realised as /kandis/ with the proposal of the branching rhyme parameter set to ON, then this would still result in a structure where the coalescence cannot take place:

(27) Constituent structure of *kdise* as /kandis/ with suffixation of *lowi* with branching rhyme parameter set to ON



With the proposal for the branching rhyme parameter set to ON, the phonological domain boundary would still mean that the segment /s/ in O_3 is within the domain and so not subject to the coalescence from the liquid-initial suffix. What this means is that the branching rhyme parameter setting should be OFF in Meroitic, therefore there is an empty nucleus separating the nasal which is now in an onset position from the next onset position where /d/ is syllabified:

(28) Revised structure of *kdise* /kandis/ with suffixation of *lowi* with branching rhyme parameter set to OFF resulting in *kditowi*



With this revised setting of the branching rhyme parameter to OFF, leads to /n/ being syllabified into O_2 and /d/ into O_3. This results in /s/ being syllabified outside of the phonological domain – O_4 and so Griffith's Law applies where /s/ and /l/ coalesce to [t]. The empty nucleus of N_2 is subject to the ECP and is p-licensed (hence inaudible) by being properly governed by N_3.

4.1.2 Revised constituent structure of *kdke*

The implications of the above analysis are that the structure proposed in (4) should be revised to the following with no branching rhyme:

(29) Revised structure of *kdke* /kandakə/

O	N	O	N	O	N	O	N
[x	x	x	<u>x</u>	x	x]	x	x
k	a	n		d	a	k	ə

The ECP conditions allow the inaudibility of the empty nucleus word-internally as it is also p-licensed by being properly governed by the following nucleus. If it is followed that the forms *kdise* 'sister' and *kdke* 'queen/queen's sister' are derived from *kdi* 'woman', then the Projection Principle (KLV 1990:221) where 'governing relations are defined at the level of lexical representation and remain constant throughout a phonological derivation' has to apply to these forms i.e. the constituent structure of /n/ and /d/ being separated by an p-licensed empty nucleus has to be consistent in all these forms.

By revising this parameter setting, it is concluded that Meroitic allows no branching onsets or rhymes, but does allow the word-final empty nucleus parameter set to ON.

In fact, this revised parameter setting mimics the 'syllable'-based organisation of the Meroitic 'consonantal' and 'syllable' signs. The Meroitic non-vocalic signs ('consonant' and 'syllable' signs) represent CV sequences; however whether the V position is realised phonetically or not is immaterial to the organisation of the script and as such their language. Harris (1998:141) refers to syllable-based writing systems which have the characteristic of notating a 'dull' syllable i.e. an onset position which is followed by a non-realised nucleus position. It can be proposed that Meroitic does not represent consonants that are syllable-final - CV(C)$ even though they are pronounced, but does notate domain-final consonants - CV(C)].

4.2 Element account of Griffith's Law

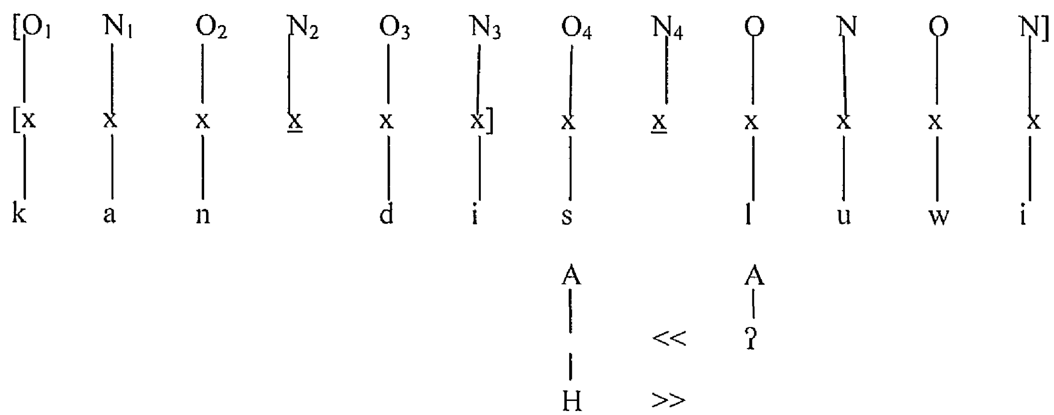
GP is able to explain the process of Griffith's Law where a feature based analysis cannot. Within feature theory, there is no explanation of why the binary value of the feature [+continuant] of the two sounds that undergo this process (/s/ and /l/) could result in a sound that is [-continuant] (/t/). Under GP element theory the unary internal representation of the segments which undergo this process are composed of the following elements:

(30) /s/ [AH]

/l/ [Aʔ]

The discussion in the preceding sections has shown that the constituent structure of the forms where Griffith's Law takes place evidences no domain separating the segments which coalesce/fuse.

(31) Fusion of elements



It is proposed that there is coalescence (or fusion) of these element expressions [AH] + [Aʔ] which results in [AHʔ]. The element expression of [AHʔ] is the internal representation of the segment /t/ and thereby Griffith's Law can be accounted for by using a phonological theoretical approach which incorporates syllabic structure with unary valued elements.

5 Dissimilation in Meroitic verbal forms

This thesis put forward evidence in Chapter 5, Part 2, §2 that there is a process of dissimilation in Meroitic, whereby there is a restriction on consonants being drawn from the same articulatory category occurring in verbal forms. It was also discussed how this dissimilation process is positionally gradient in that the restriction is weaker for triconsonantal forms for the second and third consonants. It was also proposed that the process applies to the root and not to the word, as morphological affixation creates sequences of consonants that are drawn from the same category.

5.1 Dissimilation as the OCP in phonological theory

The investigation into consonantal co-occurrence restrictions in Arabic led McCarthy (1986) to propose that this was an instantiation of the Obligatory Contour Principle (OCP) in phonology. McCarthy proposed that the total OCP, (initially proposed by Leben 1973 for tonal processes), is a principle of Universal Grammar which functions as an output filter on phonological rules, and applied to the consonant root tier:

(32) Obligatory Contour Principle (McCarthy 1986:208)
At the melodic level, adjacent identical segments are prohibited.

This leads on from McCarthy's (1979) original proposal that Arabic (and Semitic languages) have a consonantal root template, where vowels are inserted between the consonants to make forms according to a CV template. This formulisation was couched within an autosegmental framework whereby the morphology of a verbal root was represented by separating the vowels and consonants of the word onto different autosegmental tiers. An example is given in (33):

(33)	Vowel tier:		a		a		a	/drs/ 'study'
			|		|		|	daras-a 'he studied'
	template:	C_1	v	C_2	v	C_3	v	
		|		|		|		
	Consonant tier:	d		r		s		

The strongest positional co-occurrence restriction in a verbal root is the adjacent positions C_1 and C_2, subsequently; roots of the type /ddm/ are completely unattested. However, this restriction is violated in roots for the adjacent positions C_2 and C_3, and therefore verbs are instanced of the forms *madad* /mdd/ etc., where these positions can contain identical consonants. McCarthy claimed that there was no real violation of the OCP as the triliteral roots with identical adjacent positions C_2 and C_3 are underlyingly a biliteral root form, such as /md/, with only two consonants. At the surface form, McCarthy argued, the rightmost consonant associates to the empty C_3 position (of the triliteral template) as the association of consonants to the template proceeds in a left to right process.[30]

(34) C_1 v C_2 v C_3 v   /md/ > [madad]

   | \ /

   m   d

Further, McCarthy argued that under certain morphological conditions the OCP blocked rules that would normally apply, such as the deletion of a segment when this segment is between two identical segments. McCarthy (1986:220-221) uses data from 'Afar (Cushitic) to show that a vowel fails to delete when the consonants on either side of it are identical (35a), although this process is expected in a certain context (35b). McCarthy refers to this process specifically as 'antigemination' (1986):[31]

(35)

a.	mi-da-dí	*mi-d-dí	'fruit'
	sababá	*sabbá	'reason'
	xarar-é	*xarr-é	'he burned'
b.	xamíla	xaml-í	'swampgrass'
	ʕagára	ʕagr-í	'scabies'
	darágu	darg-í	'watered milk'

[30] For a further analysis, see Yip (1988b).

[31] Cf. Counterexamples of vowel deletion rules that fail to be blocked between identical consonants in Odden (1988). However, McCarthy suggested (in foresight) that in these cases the OCP would have to be a parameter setting.

The issue of the consonant co-occurrence restriction among consonants from the same articulatory set was explained by McCarthy (1988) with the constraint of OCP-Place – 'Adjacent identical place features are prohibited.' This constraint of applying the OCP to individual place feature tiers ruled out roots with homorganic consonants in any position. An example is that a hypothetical root such as */mbt/ is prohibited because of adjacent features on the labial tier would violate the OCP-Place constraint:

```
(36)    labial tier:    [lab]   [lab]            /*mbt/
                          |       |
        template:        C1  v   C2  v  C3
                                         |
                                       [cor]
```

McCarthy (1988) further splits the coronals into two major classes for the feature [sonorant] in the OCP-Place constraint. He maintains that there has to be a distinction between the total OCP and the OCP-Place constraints as the total OCP is a stronger restriction as adjacent identical consonants are prohibited whereas roots with homorganic consonants do occur but are rarer. Pierrehumbert (1993) followed McCarthy's proposals, but highlighted that the division of the coronals into their non-place features, specifically manner, meant that any non-place feature must be as potentially relevant to the strength of the OCP-Place constraint. This means that the gradiency of consonantal compatibility refers to maximal similarity. This being that identical consonants are maximally similar and therefore have the strongest co-occurrence restriction whereas homorganic consonants that differ in many features have weaker constraints on their co-occurrence. This gradiency can also be seen in the positional strength of adjacent consonants as opposed to the weaker constraint for non-adjacent consonants.[32]

[32] For more on the phonological analysis of the OCP in consonantal incompatibility see Frisch *et al* (2004), Frisch & Zawaydeh (2001), Yip (1988a), Paradis & Prunet (1990) and Milam Berkely (2000).

5.2 GP analysis of Meroitic verbal dissimilation

The following sections outline a tentative GP analysis of the dissimilation process in Meroitic of verbal forms. As discussed in Chapter 5, the restriction is evident on root level forms and not those where identical or homorganic forms are created by word-level affixation. This restriction is also positional in that forms are instanced where identical consonants are found in triconsonantal forms for the second and third consonant, but not for first and second consonants.

The following GP theoretical proposal is put forward to account for this restriction. The analysis conducted does not use McCarthy's CV template theory as Meroitic expresses its morphology very differently from Semitic languages. Morphology is expressed through the root template in Semitic and is thus non-concatenative, whereas Meroitic is agglutinative and concatenative. As the OCP is a typological feature it is not restricted from being applied to theories other than the CV template.

5.2.1 Biconsonantal dissimilation

The following data were concluded as representative of Meroitic biconsonantal verbal forms that have a restriction on roots containing identical consonants:

(37)

ḫt	/xata/	*ns*	/nasa/
rp	/rapa/	*mde*	/madə/
sq	/saqa/	*kede*	/kədə/
tk	/taka/	*pl*	/pala/
rike	/rikə/	*roẖe*	/ruχə/
reke	/rəkə/	*dḫe*	/daxə/
wd	/wada/	*tre*	/tarə/
toẖ	/tuχa/	*ḫr*	/xara/
tḫ	/taxa/		

These biconsonantal forms show that there is an OCP restriction on identical sequences of consonants. The following constraint on the language is put forward:

(38) OCP – identical element expressions of onsets in a verbal domain are prohibited.

This constraint affects only the elements present in onset positions which determine the place and manner of articulation of consonants, as elements present in nuclear positions function as resonance elements only. It is also proposed that biconsonantal forms are syllabified to a domain of three onset-nuclei pairs; however, the third onset of the domain for biconsonantal forms consists of an empty skeletal point:

(39) Domain structure for biconsonantal verbal forms e.g. 3/ʒ *ns* /nasa/

```
O1    N     O2    N     O3    N
|     |     |     |           |
[x    x     x     x           x]
|     |     |     |
n     a     s     a
|           |
|    [A]    |    [A]
A           A
|           |
ʔ           |
|           |
L           H
```

Taking the form 3/ʒ *ns* /nasa/ as an example, it is seen that there is no OCP violation as the element expressions in onsets 1 and 2 are not identical. The biconsonantal form has onset 3 with no skeletal point.

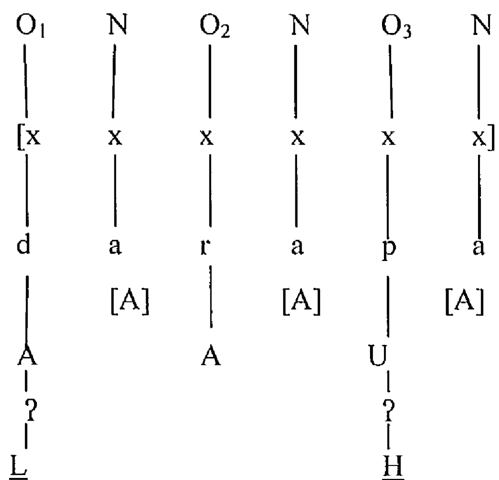
5.2.2 Triconsonantal dissimilation

For verbal forms which consist of three consonants, the following data is evidenced:

(40)		*twd*	/tawada/
		sdk	/sadaka/
		kbb	/kababa/
		sqr	/saqara/
		drp	/darapa/

It is shown below how these forms can be syllabified to the domain structure, however the third onset does contain a skeletal point which allows the association of segmental material into this position and the OCP is still enforced:

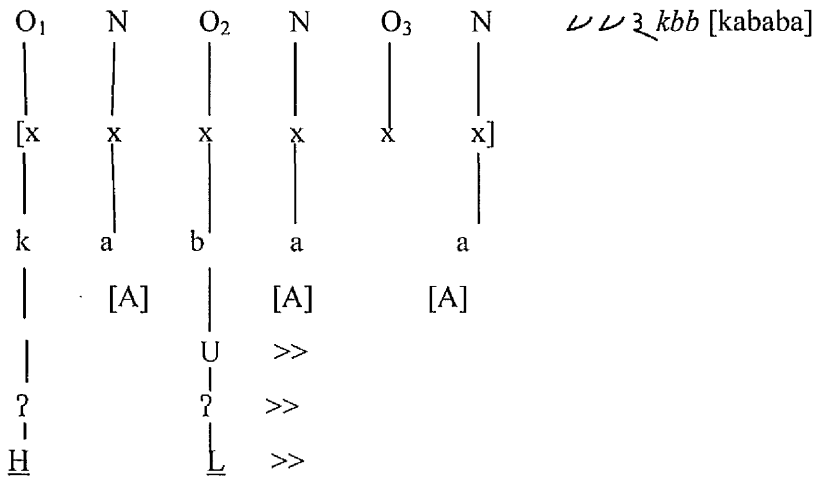
(41) Domain structure of triconsonantal verbal forms e.g. *drp* /darapa/



5.2.3 Triconsonantal forms which seem to violate dissimilation

A few forms were instanced in Chapter 5, which seem to violate the OCP from applying. Following the positional restriction that is outlined as applying to other languages where the OCP is evidenced, whereby consonants in the second and third position do not adhere to the OCP restriction as strongly, it is claimed here that this is due to a left to right association (as in McCarthy's analysis of Arabic). This association can be explained as spreading (or linking) of elements in onset 2 to a pointed onset position 3:

(42)



This analysis is thus able to capture the forms where there appears to be a violation to the dissimilation process. However, the Meroitic exceptions as above are not surprising in an OCP analysis as the positional restriction in the second and third consonant of a form is weakened as evidenced in Semitic.

5.2.4 Left to right spreading within a phonological domain

I put forward the following proposal that spreading of elements can only take place left to right when onsets which have a skeletal point but no segmental material are contained within a phonological domain. This means that if onset 3 has a skeletal point but no segmental material, then segmental material from onset 2 will spread to link with this skeletal position. Outside of this phonological domain spreading takes place in a right to left direction. This means that spreading of elements cannot cross a phonological domain. This restriction on the direction of spreading can explain why the assimilated forms given in §2 evidence right to left association of segmental material.

6 Conclusion

Certain areas identified in this thesis on the phonology of Meroitic are supported by a theoretical analysis couched within a GP framework. An element framework which utilises licensing constraints is applied to the Meroitic vocalic system, showing that the combination of elements is disallowed. Through the syllabification of Meroitic forms which invoke the ECP, it is shown that Meroitic has the parameter set to ON for domain-final p-licensed empty nuclei and therefore Meroitic words can end in a consonant. However, whether the domain-final consonants have to be licensed in being drawn from the coronal class is subject to future work. Meroitic forms were also analysed as to their morphological domain structure where it was concluded that the morphology is invisible to the phonology and as such there is non-analytic morphological domains. Due to this, deletion of nasal consonant final stems is evidenced when liquid-initial suffixes are attached. This was explained as an OCP-place violation causing the liquid to associate to the now empty stem final onset position resulting in gemination.

Instances where this process is resisted were explained through the proposal that Meroitic words consist of a phonological domain which comprises three onset-nucleus pairs. This means that liquid-initial suffixes could not associate across this phonological domain thereby forms of three onset-nucleus pairs and under are resistant to this spreading.

The Meroitic process of Griffith's Law was also given a theoretical treatment, which led to a revision of the initial proposal that the branching rhyme parameter in Meroitic was ON to it actually being OFF. This results in the constituent structure of Meroitic being onset-nucleus sequences with no branching of constituents. Invoking the ECP and following the phonological domain proposal led to an explanation of the data where Griffith's Law is evidenced. The actual coalescence/assimilation of the segments /s/ + /l/ resulting in [t] can be captured with an element account as the fusion of the elements that comprise the phonological expressions of /s/ and /l/.

An overview of the templatic theoretical account as proposed by McCarthy (1981) for the process of dissimilation evident in Semitic languages was given. A GP analysis of Meroitic dissimilation of verbal forms as put forward in this thesis was also discussed. It was proposed that the OCP-place is active in Meroitic as identical element expressions in onsets are prohibited. When this is violated in triconsonantal forms, which is reminiscent of the relaxation in the restriction of Semitic languages dissimilation, it was attributed to the third onset of the phonological domain having a skeletal point but lacking segmental material. Thereby, there is association of segmental material from the second onset to this pointed third onset. Thus, the association is left to right within a phonological domain, but outside of the domain, material associates in a right to left direction.

Chapter 7

General Conclusion

In this thesis, I have contributed to the investigation into Meroitic phonology with the following claims. Chapter 2 investigated the phonemic representation and phonetic realisation of the Meroitic consonants. In this chapter, I presented evidence to support Rilly's claim that voicing was not phonologically contrastive for the Meroitic labial stop signs *p* and *b*, and therefore the Meroitic script encodes the phonetic realisations of a single phoneme /p/. I claimed that the instances of alternation between the Meroitic signs *m* and *b* correspond typologically to examples from Afro-Asiatic languages, where this same alternation is also widely attested. The sound value of the Meroitic sign *d* has long been debated due to transcriptions from Egyptian and Greek where it is notated with /r/. I argued that these transcriptions indicate that this sign is a coronal stop that lenites intervocalically to a flap. Further evidence for this claim came from transcriptions from Latin. The Latin transcriptions indicated that this sign's sound value was /d/, as this sign was not in an intervocalic position in these examples where it would then not be subject to lenition. From these claims, I argued against the realisation of this sign as being a retroflex. I accounted for the certain transcriptions from Egyptian which transcribe Meroitic /s/ with <š>, being the result of Meroitic /s/ palatalised (phonetically) when adjacent to a palatal segment. I put forward a proposal on the origin of the Meroitic cursive sign *ne*, and showed that this sign was also subject to being palatalised (phonetically) when adjacent to a palatal segment. I suggested that the signs *r* and *l* were separate phonemes. Finally, I declared that the Meroitic signs *q* and *h̲* were uvular consonants through analysing the occurrence of certain vowels and not others that followed these signs. This claim rested on the typologically common process of vowel lowering/retraction following uvular (guttural) consonants. This chapter concluded with a revised proposal to the phonological inventory of Meroitic.

Chapter 3 dealt with the value of the Meroitic 'initial a' sign *a*. This investigation gave explanations for the Meroitic transcriptions of the Egyptian theonyms "Osiris" and

"Isis", which have long been observed but not understood. I also contended that the reliance on the Egyptological transcription of the name of "Osiris" for the value of the 'initial a' sign could not be maintained. Therefore, the traditional attributed sound value of this sign as being /u/ should be discounted. I showed strong evidence for the claim that this sign's value is phonologically and phonetically a glottal stop, which contains the inherent unmarked 'a' vowel i.e. [ʔa]. This evidence was fundamentally advanced through the variation of the 'initial a' sign 𐦠 *a* with the glide sign /// *y* /j/ in word-initial position. This variation or interchange is evidenced across Semitic (Afro-Asiatic) languages with the glottal stop and glide. The revision to this sign's value, I asserted, was also able to explain the non-occurrence of this sign word-medially or finally, as it would therefore be in an intervocalic position in which it would be phonetically subject to elision. Further evidence for the elision of a glottal stop in intervocalic position is found Afro-Asiatic languages, which exhibit this process. I also explained the omission of the 'initial a' sign in certain forms is due to being in a pretonic position, and so subject to aphaeresis.

In Chapter 4, I investigated the phonology of Meroitic vowels. This chapter presented evidence to show that in cases of variation between the vowels of Meroitic and Greek transcriptions these could be explained by the vowels in the Greek equivalences corresponding to the chain-shift process that took place between the Late Egyptian and Coptic stages. The Meroitic vowels in these instances corresponded to the stage of Egyptian before the vocalic chain-shift process took place. It was outlined how reduction of the Meroitic vowel /a/ > /ə/ (and complete syncope) was indicated by differences between earlier written Meroitic forms and later ones, due to the vowel's unstressed positioning. It was also discussed how the Meroitic vowel /i/ also reduced to /ə/ in unstressed positions, which could also contribute to understanding the Greek transcriptions. The phonemic representation of the vowel sign / *o* as /u/ was supported through typological considerations. The phonetic realisation of this vowel as [u] and [o] was contended to rest more firmly with the process of uvular lowering/retraction rather than the transcriptions from Greek and Latin. I also contributed that the Meroitic vowel sign ϛ *e* is phonemically representative of the vowel /ə/ but surfaces as the schwa and [e] , based upon Greek transcriptions which transcribe this sign with *eta* and *epsilon*. I outlined evidence from Greek transcriptions of Aramaic, which show that Greek transcribes a schwa vowel with *epsilon*. In concluding this chapter, I proposed that the Meroitic phonological vowel inventory consists of four vowels from the evidence that exists at present.

Chapter 5 presented a reanalysis of the traditional representation of the Meroitic 'syllable' signs ⅄ *ne* and ꓵ// *se*. I claimed that there existed no firm evidence for the proposal that these signs contained an inherent 'e' *e* vowel, other than that which rested upon a combinatory proposal. I showed how there was much evidence towards their representation of plain consonant signs. This was based mainly upon various evidence such as; a frequency analysis of their positional distribution; equivalent forms indicating that these signs contain no inherent vocalisation, and assimilation and coalescent processes that affect only these signs. I explained that the written omission in the Meroitic texts of the phonemically equivalent 'consonant' signs /ʒ *n* and ȝ *s* being followed by the vowel sign ϛ *e* could be due to a process of vowel raising, or is simply due to the phonotactics of the Meroitic language. I added evidence to support the argument that the Meroitic script does not notate a nasal consonant in coda position with an additional transcription of a Meroitic item from Ethiopic. I asserted that due to the revised proposal for these two 'syllable' signs, the traditional representation of the Meroitic vowel sign ϛ *e* as denoting a vowel and a zero-vowel could not be maintained. I put forward evidence to show that an understanding of loan-word phonology has to be applied to the representation of this vowel in equivalent forms. I concluded that the Meroitic vowel sign ϛ *e* is not a zero-vowel indicator, but is used as the epenthetic vowel when transcribing borrowed forms from other languages when consonant clusters are encountered.

Finally, Chapter 6 comprised a theoretical analysis of the major claims put forward in this thesis. The theoretical framework of Government Phonology is able to capture the process of Griffith's Law by implementing an element account. The noted 'assimilation' of the nasal 'syllable' sign when a liquid-initial suffix is attached can be accounted for by invoking the ECP and investigating the domain structure of these Meroitic forms where it is concluded that the morphology is invisible to the phonology. This was further explained as being due to an OCP-place violation causing the nasal to delete. Where this process is resisted, it was proposed that this is due to certain forms consisting of a phonological domain, which is similar to the prohibition in haplology processes of the minimal word being a barrier. This chapter also discussed the observation that it is highly likely that there is a process of dissimilation evident within the language.

This thesis does not make any claims as to the likeliest individual language for relatedness with Meroitic, but I hope that the research conducted can be used to redirect investigations into the Meroitic language with promising results.

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