Scansion and alliteration in *Beowulf*[*]

Chris Golston and Tomas Riad

This paper outlines a model of metrical scansion of *Beowulf*. We assume that the meter is quantitative in a principled way, and based on vowel quantity (Golston & Riad 1998a, 1999). However, since the permitted variation of line length is large, additional means besides quantity are needed for a secure scansion into structured meter. We argue that alliteration is the chief aid here. Alliteration provides crucial top-down information that ascertains a basic division of text into lines and half-lines, and, roughly, verse feet, since the simple binarity of the metrical structure provides the fixed number of four verse feet per line. From this point, scansion becomes more deterministic by looking at syntax, syllable integrity and the left-headedness of verse feet, besides quantity. Much of the verse structure, such as its overall binary structure and the primacy of prosody over syntax, follows from general principles of the theory of meter adopted here.

1. The task

Below, we take a look at Old English meter from the perspective of scanning text into meter. This is a useful exercise since it lays bare some assumptions made about the meter itself. Indeed, the theory of the meter and the scansion of text should be governed by the same set of statements, though this is not always the case. We ask here what the procedure looks like that a student needs to master in order to correctly scan OE poetry.[1] By 'scansion' we simply mean organising all text into lines, half-lines, verse feet and metrical positions. Any scansion is going to be dependent on theory and our theory of meter will be made clear below. The argument for that particular theory will only be given in brief here, a fuller discussion occurring elsewhere (Golston & Riad 1997, 1998a, 2000; Golston 1998; Riad 2000).

Sievers' style of scansion is hard to teach and hard to learn. This has been stated several times in the literature, and probably indicates that the theory and the scansion it provides are inadequate (Cable 1994). While there has been a general awareness of the shortcomings of Sievers-style analyses of OE meter for a long time, the model still remains accepted as a useful way to scan a text (cf. discussion in Stockwell &

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[*] We would like to thank Fred Brengleman and Jason Brown for their helpful comments on an earlier version of this text. All mistakes are our own.

[1] This is also the knowledge that the poet needs to master in order to produce text in a given meter.

Minkova 1997). The student might ask why Old English meter is so hard when other meters aren't. It does not seem reasonable that we should have to memorize a large number of types and their variations, as well as the several adjustment rules that are sometimes needed, sometimes not, in the matching of text to meter. Scansion should be a simple mechanical operation, easily convertible into the theory that defines it. Thus, already the fact that scanning a line of OE meter is such a complex task warrants the assumption that the theory and the scansion that goes with it are not fully adequate. Another reason why it might be so much harder to teach the scansion of OE than to teach the scansion of dactylic hexameter or iambic pentameter is the fact that there may be properties of OE that are not properties of Modern English. If there is no simple conversion procedure (as there is for the Greek meters), it might be difficult for speakers of Modern English to tap into a system that was simple to the speakers of Old English, simply because of the differences between the languages. We think that both these factors combine to make scansion with the Sievers system clumsy and unenlightening.

1.1 Scansion with Sievers

Several authors have expressed concern about Sievers-type models based on stress and types (e.g. Pope 1966, 7; Hoover 1985; Fulk 1992, 223; Cable 1994, 8: Stockwell & Minkova 1997; Golston & Riad 1998a, 1999; Riad 2000). A particularly disturbing aspect of most theories of OE meter is that the scansion is forced to ignore large quantities of linguistic material. Here we would like to first review the central types of information that must be available in order to scan a line of OE text within such a model.

(1) Scansion in Sievers-type models

- Identification of stressed and unstressed syllables
- Matching stresses with ictic position in the 5 types of verse
- Licenses for anacrusis and expanded dips
- Licenses for resolution and elision
- Suspension of licenses for anacrusis, resolution and elision
- Syllable count (to know when to apply and suspend resolution and elision)
- Licenses to demote and promote linguistic stress

In order to scan a line of OE text into meter in this theory, the student must first identify the stressed and unstressed syllables in the text. Then the pattern of stresses is matched with the ictic positions in one of the 5 types, which must also be known.[2] If there are extra syllables that don't fit in one of the five types, one must take note of the points of deviation and figure out which of several licenses should take care of them. If extra syllables are found line-intially they can be disregarded by virtue of anacrusis. If the extra syllables fall between stresses they can be discounted as expanded dips. If an extra syllable ending in a vowel is followed by syllable which lacks a proper onset it can be overlooked through elision; if a syllable is light and stressed the following syllable can be written off as a case of resolution. These licenses all have the effect of pruning syllables from the text when there are too many in relation to what the theory stipulates. The licenses are cancelled when their operation would lead to too few syllables in a line (cf. Stockwell & Minkova 1997, 70).[3] Since over 90% of the lines in *Beowulf* have more than the 8 syllables Sievers wants us to find, with fully 60% at 10 or more syllables, pruning is industrial in the Sievers paradigm. But we should worry about a theory that spends as much effort ignoring text as it does scanning what remains.

Syllable count is the first source of mismatch between types and text. A second type of mismatch arises between ictic positions in the verse and stressed syllables in the text. Each metrical type contains two or three ictic positions, but there are half-lines with just one stress and half-lines with four. In order to scan such half-lines there are mechanisms that promote syllables from unstressed to stressed and demote syllables from stressed to unstressed. This adds considerably to what the student of Old English must learn. The source of the complexity is the fact that the rules are so obviously ad hoc and plastic in application. They apply merely to make text match type, to make reality match theory. And they fail to apply when text does match type, even if their structural descriptions are met. Resolution of two syllables is suspended if it would give us too few syllables, and so is elision, and anacrusis, and so on. Having rules that fix the text to match the types is bad enough; but having to suspend those rules raises the suspicion that there is something fundamentally circular about the whole approach to the problem.[4]

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[2] Ultimately, one must articulate how a given line of text is assigned to a particular type. It often requires a global analysis of the half-line, and so the details of that procedure should be made clear.

[3] Indeed, the B-type (.x.x) is never even seen as a problem for anacrusis (or vice versa), even though these two features are in conflict.

[4] We are not interested here in Sievers' model as a purely descriptive device, even though some researchers seem to view it that way. Our general stand is that the closer we get to a proper analysis of the meter, the better the description is going to be

Note that things do not really improve if we abandon some rules and licenses in favour of expanding the set of types past five (to 6 if we follow common usage; to 130 if we follow Bliss 1958; to 279 if we follow Pope). Increasing the number of types, puts us in a position where it becomes less and less reasonable to talk of *one* meter. The problem is one of principle, of course. How many types can we tolerate? How many rules? As far as we can see, there is no natural cut-off point at the number 5. 1 seems to be a much better number of types. This is the number we find in the *Iliad*, *Imru'l-Qays*, *Divina Commedia*, *Canterbury tales*, *Herkules*, *The song of Hiawatha*, etc.). As for the number of rules, the usual assumption is the fewer the better.

A third feature of the Sievers-type scansion procedure is the treatment of linguistic stresses. There is some variation among researchers regarding how many degrees of stress they assume and how the levels of stress interact with position in the template. A good presentation is given in Cable (1991, 22), who provides a clear statement of the stress properties of lexical categories with regard to how they function as ictus or non-ictus in meter.

(2) Ictus-bearing categories
   A. Always stressed: *adjectives, nouns, infinitives, participles*
   B. Demotable: *lexical adverbs, finite lexical verbs*
   Non-ictus-bearing categories
   C. Promotable: *Pronouns, auxiliaries, conjunctions, prepositions, articles*

The problem with this description, true though it is within the formal system in which it is set, is that it is so flexible that the defining criteria lose meaning. For instance, what is the difference between a non-ictus-bearing category that can be promoted, and an ictus-bearing category that can be demoted? Although the tendencies may differ, these two objects—as defined in the model—cover the same empirical ground. Demotion and promotion of stress, and the separation of words into ictus-bearing and non-ictus-bearing is an attempt at negotiating the relationship between linguistic stress and metrical prominence that is highly dependent on the model of description. Some stressed syllable needs to lose its stress so that the half-line may fit into type A^2 or so. We think that the difficulties with finding a simple recipe for matching lexical

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anyway, so it does not seem fruitful to *not* treat Sievers-type models as purported linguistic analyses of meter. (For an interesting discussion of the status of the Sievers-type model as theory, cf. Getty 1998, chapter 2).

stress and non-stress with alleged metrical ictus and dip stem from the misguided role assumed for stress in the type theory (cf. Hoover 1985, for a similar view).

The evaluation of theories of metrics is best made via coverage of data. This is what drives the proliferation of types or adjustment rules. In Golston & Riad (1998a, 1999) and Riad (2000, section 2), we show what the yield is of an actual count of types and tokens according to the (often tacit) assumptions made by Sievers-type analyses. Even with allowance made for the most common types of variation (extra weak positions in dips, resolution, anacrusis) and with some simplification of the assumptions of Sievers-style theories, the coverage stops at 63%. This means that 37% of the data is treated as very marked by Sievers-type theories, which is far too much.

Another requisite of a good theory, beyond its success in covering the data, is its ability to exclude non-existent verse lines. It is hard to falsify a theory on this criterion, since the absence of a verse does not entail that it is absent in principle. Nevertheless, it is a very reasonable criterion if seen in a larger context, and here the Sievers-type tradition has probably been more successful (Fulk 1992). However, we remain skeptical of how a theory can be said to ascertain unmetricality until there is a firm description of metricality that does not suffer from the above mentioned weaknesses within that theory. Cable (1991, 38) expresses this unease:

> It is often assumed that the Five Types have a kind of factual status beyond theory, because they simply describe, neutrally, "what is there." By this assumption, theories can try to refine and simplify the Five Types, but they must always be tested by the hard core of facts that the Five Types represent. The truth, of course, is that the Five Types are a theory and an abstraction.

This brief discussion serves to give a hint of why learning how to scan *Beowulf* is such a hard task compared to learning how to scan Shakespeare or for that matter the *Iliad* (in Greek or in English or Swedish translation) or the Arabic meters tawiil, kaamil, waafir and basiit. We understand the latter meters better than we understand OE meter. The conclusion to draw, we think, is that we should keep looking for a simpler analysis of OE meter. But we should also look more closely at the linguistic differences between Modern English and Old English. As discussed in the next section, maybe we are using the wrong yardstick to measure OE.

1.2 Why OE meter is different

One reason why it is harder to teach OE meter than Elizabethan meter is the fact that OE meter is in part based on prosodic distinctions that are no longer present in the language. In particular, the sensitivity to quantitative distinctions was much stronger in OE just as in the other Germanic languages in their earlier stages. Later on, a change known as the quantity shift led to changes in the quantity system (Prokosch 1939, 140; Riad 1995; Lahiri & Dresher 1999). While the result varies between the modern languages, it was in all cases a simplification involving the loss of some quantitative distinctions. As a result, speakers of Germanic languages are no longer able to linguistically control quantitative distinctions at the segmental level, or at separating quantity from stress each other. A simple testimony of this is the way speakers of English or Swedish read Greek hexameter. The typical reading pattern of a dactyl is *dumdidi* or *dumdi*, while in Ancient Greek the rhythm induced by the quantity system is rather *dumdumdi* or *dumdum* (L=light syllable, H=heavy syllable).

(3) Dactylic hexameter in Greek and Swedish

Gk dumdumdi dumdumdi dumdum dumdumdi dumdumdi dumdi
(H L L) (H LL) (H H) (H LL) (H LL) (H H)
(μμ)(μ μ) (μμ)(μμ) (μμ)(μμ) (μμ)(μμ) (μμ)(μμ) (μμ)(μμ)
mê:.ni.n|á. ei.delt^{h}e .á: |pe:. le:. i.á. deo: |a.k^{h}i. lê:. os

Sw dum- di- di dumdi-di dumdi- di dum- - di- - di dumdidi dumdum
(x . .)(x . .) (x . .) (x . .)(x . .)(x .)
Sjung! O gudinna om vreden som brann hos peliden Akilles
‘Sing, O goddess, the anger of Achilles son of Peleus’

The Greek speaker’s phonology uses moraic trochees and prominence is assigned to heavy syllables and to the first light syllable in a sequence of two (Allen 1973). The dactylic verse foot thus comes to contain a clash in each realization (´H´H or ´H´LL), which is its defining metrical property (Golston & Riad 2000). A speaker of a Germanic language will instead equate only the initial heavy position with stress, and since Germanic languages avoid clashing stresses (to a greater extent than Classical Greek) and prefer alternation, the second metrical position is considered weak irrespective of the fact that it always contains a full Greek foot, H or LL. The way this plays out in Swedish is that stressed syllables are largely avoided in the second position of the verse-foot. The few times a stressed syllable occurs in a dip position, it is deprived of its stress.

Having just observed that differences between prosodic systems obscure a proper understanding of the Old English verse system, it is surprising that the tradition has assumed a quite striking difference between Modern English and OE (and *mutatis mutandi* the other Germanic languages) without considering it a problem. Germanic is often said to possess ‘strong stress’, and so the assumption is that this strong stress must determine the meter (Sievers 1893, 23; Kaluza 1909, 3; Wessén 1958, 10). However, there are two major flaws with this assumption, whether it is made tacitly or aloud. First, there is no non-circular evidence for any special quality of Germanic stress. Usually, the reduction of unstressed syllables is given as argument for the strength of the stress, but then the strength of the stress is assumed to be the reason why reduction is common in Germanic (cf. van Coetsem 1996; Riad 1998). The phonetic argument for strong stress is still lacking; and so is the typological, for we are unaware of any crosslinguistic connection between strong stress and vowel reduction. The other flaw is the expectation that a language with such a strong stress should have incorporated such rhythmic anomalies into the definitions of meter (Pope 1966; Hoover 1985). If Modern English is anything like OE, then it is a mystery why iambic pentameter and similar meters with basically alternating rhythm predominate, while OE allegedly has no problem with clashes or the constant switching between rhythmical patterns every new half-line. Also, the research tradition has not provided any typological support for the meter. As far as we are aware, there is no extant verse system that uses any of five types of verse foot in a line, and that would be well described by the Sievers model.

The tradition from Sievers, then, is founded on an unsupported, and we think unwarranted, assumption about the nature of stress and how it determines meter. This should make us wary of accepting the system. The uniformitarian principle tells us that nothing is new (or old) under the sun. The typical situation in meters where the lines contain stresses or accents in variable places and numbers is instead that the meter is based on the quantity of syllables (Greek, Latin and Arabic) or the number of syllables per line (Spanish, French and Italian). Thus, we think, the variability of stress patterns in Germanic meter is a sign in itself that the meter is not based on stress, but rather on quantity.[5]

OE meter does not appear to have many properties in common with meters that work well in Modern English, Finnish, German, Russian, Swedish, etc. Thus, dactylic hexameter works in Modern Swedish because we translate some of the quantitative constraints of Greek into stress constraints of Modern Swedish. There is a fixed number of ictuses which contain stressed syllables and the number of unstressed positions between the stresses is strictly controlled. It varies between one and two, and unstressed positions are realized in such a way that the ictuses remain equally spaced temporally. This isochrony does pretty much the same duty for Swedish as quantity does for Greek. Also, iambic pentameter and the related Alexandrian verse work well in Modern Swedish and English, because they regulate the number of

[5] Syllable count is out of the question, unless we are willing to accept all those unappealing licenses that discount syllables for the purposes of making the text meet the model.

syllables quite rigidly. Regular iambic rhythm can be attained by performing an exaggerated scansion, which will often promote an unstressed element to an ictus. But this is not necessary. As shown by the research tradition (even though the conclusion is not always this), iambic pentameter is virtually unregulated with regard to which type of syllable can go where. There are tendencies, such as the avoidance of stressed syllables of polysyllabic words in metrically weak positions (Kiparsky 1977), but there are no exceptionless rules (cf. Golston & Riad 1998b for the argument and the data). Nevertheless, the meter is reasonably easy to master, because we have a sense of syllable count up to the last stressed syllable (which may be followed by an unstressed syllable). So we count 10 or 11 syllables, maybe we pair them off as five units (verse feet), or both, such that we have an idea of the length of a line.

If we compare this state of affairs with the situation in OE meter, things are quite different. There is no firm syllable count and there is no firm stress count (cf. below), or stress spacing. Thus, we can't base our scansion on either of them without first going over all those licenses that remove excess syllables and adjust the number of stresses by promotion and demotion. In iambic pentameter, we have a fairly fixed number of syllables and a predictable pattern emerges, should one like to scan the meter hard. None of the features of this meter goes against the grain of Modern English, and so it is easy to learn as well as produce iambic pentameter. However, nobody would get the idea to write Old English meter. There is simply nothing that our modern eyes finds to base a hard scansion on. To find a pattern, we must look a little deeper into the unfamiliar, which is, we think, the quantity. OE is a quantitative language to a much larger extent than Modern English.

2. Why and how does it work?

Old English meter is comparatively loose when we look at its surface properties. First, the number of stresses is not regulated in any strict sense. While many lines have four stresses, it is a mistake to take this to be a constitutive fact of the meter. A count made over the whole corpus reveals that 57% of the non-corrupt lines have four stresses. The rest have fewer or more stresses in decreasing numbers (Golston & Riad 1999):

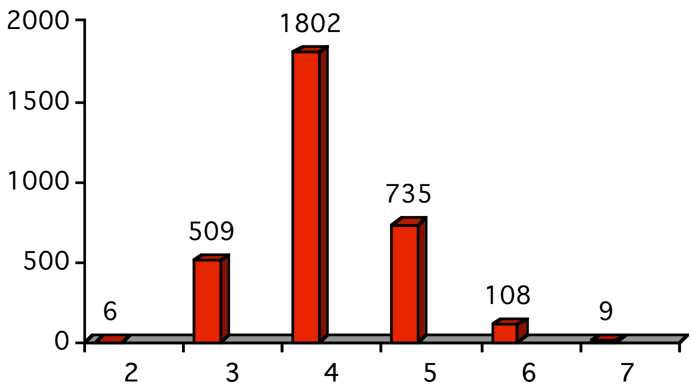


Figure 1. Number of stresses per line in the 3169 non-corrupt lines of *Beowulf*.

Four stresses per line is thus a tendency, much as in iambic pentameter, where the number of stresses is typically four. Second, the number of syllables varies between 6 and 18, with an average of about 9. The most common single number of syllables per line is ten, but less than a third of the lines have precisely this number. So, the number of syllables is not a constitutive feature of the meter, the way it is in iambic pentameter (10 syllables). Finally, there is no *obvious* quantitative measure that regulates OE meter. In a typical quantitative system such as Classical Greek, we find well-defined quantitative units like the dactylic metron (invariably 4 moras) and the iambic metron (6–7 moras in tragedy). We find no such correspondingly crisp units in OE meter, but we will see below that the quantitative basis is there, albeit looser than in the classical meters.

Taken together, these observations yield the impression of an unregulated meter, and indeed, it has sometimes been considered pointless to distinguish alliterating meter from alliterating prose in older texts of the Germanic languages (Kabell 1978, 64ff.; Daunt 1946). In itself, this is not surprising. It is well-known that meters within a system may be controlled to different degrees, and so, there is no reason to think that some meters could not be very near prose, especially since there are eurhythmic phenomena like the avoidance of clash and lapse in prose (Nespor & Vogel 1989). However, we are not much helped by stating that OE meter is rather like prose, and it is at any rate a rather pessimistic stance to take with regard to the presence of structure behind the meter. Rather, we should try to formulate more precisely the role of stress and quantity in the meter.

2.1 Low-level determinateness

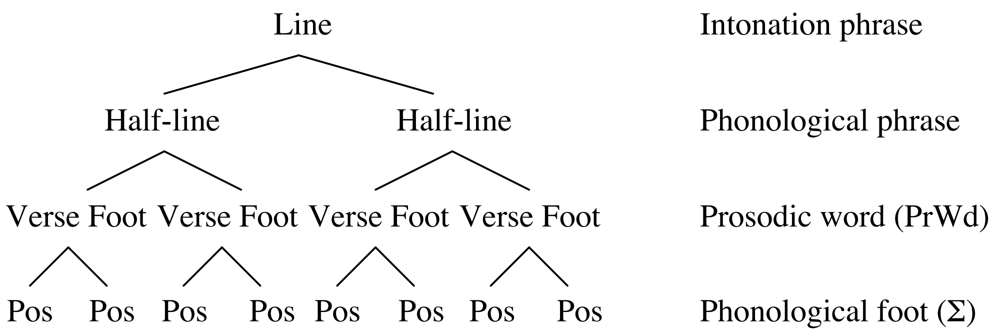
Meters which are organized more strictly in terms of stress (iambic pentameter) or quantity (haiku) differ from *Beowulf* in what we may call *low-level determinateness*. In these meters, we can parse moras or syllables from left to right without looking ahead to see what is coming. The first and last lines of a haiku have 5 moras all the time and we don't have to discount moras in anacrusis or suspend resolution in order to find them. The dactylic hexameter of Greek and Latin is an endless succession of HLL and HH, requiring no look ahead (cf. (3) above). And for most lines of Milton's pentameter one can simply count out ten syllables and that will be a line. In each case the information needed to scan a line is exclusively prosodic (moras and syllables). The scansion of the meter thus becomes determinate with just a little information from the lowest levels of prosodic structure.

This is not true of OE meter. There is no fixed number of moras or syllables in a given verse foot—indeed, it is often impossible to determine where a verse foot begins or ends even if we look at several syllables. The stress and syllable count is simply too unreliable for us to be able to carve out verse feet one at a time going from either end toward the other.[6] This lack of determinateness at the lowest levels indicates that information from some higher level is needed in order to properly scan a text into lines.

2.2 The alliterative line

In agreement with many other researchers, we assume that OE meter has a straightforward binary structure (cf. Stockwell & Minkova 1997).

(4) OE Meter: the alliterative line



The categories in this hierarchy usually go under metrical names like the ones given in the tree structure (line, half-line, verse foot, metrical position). However, let us not miss the opportunity to generalize across the prosody of speech and meter. The hierarchical layers of metrical structure are roughly homologous to the categories of the prosodic hierarchy (Selkirk 1986; Hayes 1989). We all assume, after all, that there is some relation between a language and the meters used by poets who speak that

[6] This may be the reason why the type-theory arose in the first place. By looking at larger chunks of text, we seem to see more structure.

language. By extension, many share the fundamental intuition that certain meters are especially well suited to certain languages. Thus, there is a reason why iambic quantitative meter is good for Arabic but not for Swedish, why iambic pentameter is fine for English but not for Japanese. The relationship between language and metrics is empirically manifest e.g. as preferences among poets or tendencies for people to use certain meters for impromptu verse production.

The relationship between the phonology of the language and the phonology of the meter in that language can be made formally more precise if we take the view proposed in Golston (1998) and Golston & Riad (2000), that bound meter emerges when we change the rank order between morphosyntax and prosody in a regular grammar of some language. The basic idea is as follows. In normal speech, syntax is more important than prosody (Golston 1995), and prosody has to adjust to whatever structures the syntactic component produces. In meter this natural relation is turned around, such that the prosodic structure is given, and the syntax must be adjusted to fit the prosodic mould. Schematically we can represent this as in (5).

(5)	Prose:	Syntax	>>	Prosody
	Poetry:	Prosody	>>	Syntax

Obviously, we need to get much more precise in the analysis of individual meters—e.g. as regards what particular grammatical constraints are involved in the switch—but several expectations are generated simply by the reranking indicated in (5). For, instance, we expect meter to exhibit unmarked prosodic features to a greater extent than prose, since the prosodic categories need not constantly adjust to the constellation of syllables and words produced by morphology and syntax. Instead, it is the other way around. The poet values most highly the prosodic structure of a line, and fits the lexical material into it. In order for this to work out without the poetry losing meaning, marginal syntactic and morphological structures tend to become more frequent (Youmans 1989; Rice 1997). One of the unmarked prosodic properties that emerges in verse is binarity. The extensive binarity of metrical systems across the world is thus an unmarked linguistic feature.[7] Another expectation that follows from

[7] This is not to say that all meters need have lines consisting of an even number of syllables, or verse feet, but we might expect the most unmarked of the meters used in a language to be that way. For Greek, anapestic meter is unmarked relative to the other meters (Golston & Riad 2000), for Arabic it is tawiil, an iambic meter (Golston & Riad 1997).

this view is that the categories that we use to describe verse metrics should be the same as those used in the prosodic hierarchy, as indicated in (4) above.

The structure of the OE meter as given in (4) looks very simple. The line divides into two half-lines, each of which contains two verse feet. A line thus contains four verse feet or 'prosodic words' (cf. Russom 1987, 1998). Each prosodic word contains two linguistic feet.[8] If this is the correct general characterization of OE meter, then we would say that *Beowulf* is written in a fairly unmarked meter.

If we accept this general picture of verse structure as unmarked linguistic structure, the next question concerns how to scan lines of text such that the structure of (4) is manifest in line after line, with all linguistic material incorporated. If we can attain this, then the meter of *Beowulf* is indeed just one meter like the other great poems we have mentioned. We already observed that the scansion is not determinate at the lowest level. We shall look at this in greater detail below, but let us note the following. If metrical positions correspond to linguistic feet, then we should consider what properties the OE linguistic feet possess. All the older Germanic languages shared the same prosodic system, and the linguistic foot used was the moraic trochee (Riad 1992). This is the same foot as in Classical Greek, Arabic and Latin. Thus, we expect to find these terminal positions filled with the same quantitative material as in the meters of these classical languages. A canonical foot contains two moras ($\mu\mu$) and a degenerate foot contains one (μ). Classical Greek has meters which require canonical feet in both positions of the verse foot (dactylic, anapestic, spondaic meter) and meters which require canonical feet in some but not all positions (iambic, trochaic). The latter meters may require degenerate feet in some positions or positions may be filled with feet consisting of either one or two moras. Old English is even freer. *Every* metrical position (=linguistic foot) may contain one or two moras, i.e. a degenerate or a canonical linguistic foot. This is so, because there are no metrical constraints regulating the internal structure of linguistic feet, beyond binarity. The quantitative consequence of this is that a minimal line contains 8 moras and a maximal line contains 16 moras, which amounts to a claim about what is quantitatively a metrical line of OE. Furthermore, the verse would seem to be based on vocalic moras only (see Golston & Riad 1998a, 1999). The prediction that flows from these hypotheses turns out to be empirically superior to those of Sievers-type

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[8] The term 'foot' has variable denotation in linguistic and metrical discussions and could easily cause confusion. We shall therefore use the somewhat cumbersome terms 'verse foot' and 'linguistic foot' to make sure the right referent is always selected. The thing to keep in mind is that the verse foot of metrics corresponds to the prosodic word of linguistics (cf. (4)).

analyses we have seen. About 99% of the lines in *Beowulf* contain between 8 and 16 moras, scanning all syllables and ignoring none. We take this to be a basic characteristic of the meter.[9]

2.3 Variability

We have now made a number of observations regarding variation. The number of syllables per line is 6–18, the number of stresses varies between 2 and 9 per line, and the number of moras varies between 8 and 16. Why should we pay attention to the 8–16 moras rather than the 6–18 syllables or the 2–9 stresses? Because the figure 8–16 follows from the basic metrical/linguistic structure of the line. The free choice between canonical (μμ) and degenerate (μ) feet paired with binarity in all the higher categories of the prosodic hierarchy gives us exactly 8–16. By contrast, there is no relationship between 6–18 syllables or 2–9 stresses and the structure of the line. If every terminal position were typically a syllable (this is the assumption behind Sievers-style analyses, all half-line types consisting of four positions in their canonical form), we would expect 8 syllables per line, but this is not even the most common line length. And 4 stresses per line is only true of a little more than half the lines.

At this point we need to make clear that not every prosodic word (=verse foot) will be matched with a lexical unit the same size. The fact that not all lines have four stresses means that the matching of text and prosodic structure is not perfect. And we should not expect it to be perfect. A brief comparison with almost any other verse system will show this. For example, the dactylic verse foot of Greek is a prosodic word, but the degree of matching between words and verse feet is not strong. However, we might expect to find tendencies towards good matching one way or another. The fact that 57% of the lines in *Beowulf* have exactly 4 stresses is such a tendency; as is the fact that the next most common numbers of stresses per line are 3 and 5. Thus, we have signs of what the preferred structure is like with regard to individual constraints or desiderata, but the preferred structure is not the same thing as mandatory structure. Some constraints are important, such as the ones instantiating the 8–16 mora window, other constraints are weaker, such as the one trying to match every prosodic word in the meter to a lexical head. When it comes to the matching of word edges with the prosodic edges, the match is very weak indeed, but we find this in all sorts of verse. Also, the locus of the prosodic head is variable. Assuming that the OE prosodic word has its head to the left, stress tending to be word-initial, we might expect meter to prefer half-lines that contain two trochees over and above half-

[9] The remaining 1% is all made up of lines that are too long.

lines that contains two iambs. This is also a tendency in the meter, but a fairly weak one, and it interacts with other constraints.[10]

2.4 Determinateness and alliteration

Let us now turn to the issue of determinateness. It is a basic requirement of meter that it can be scanned. Successful scansion means we have figured out what the meter is. Unsuccessful scansion either means we have not figured out what the meter is or that the meter is indeterminate. In the latter case, we have free verse (of some brand). For bound meters, however, a sufficient amount of structure must be exposed in the text for us to determine what the meter is.

People have always assumed that the old Germanic meters are not free, and we won't either, but consider the options. The preferred number of moras in a line is between 8 and 16. The mora count (based on vowels only) is borne out in 98.9% of the lines. This is demonstrated for a subcorpus of 1000 lines used in Golston & Riad (1998a, 1999), where it is also shown that the figure for a corpus the same size for the older Edda is very similar indeed (99.2%). That much looks like an important generalization about this meter. Since the metrical positions (i.e. linguistic feet) may contain either 1 or 2 moras, the size of each verse-foot (i.e. prosodic word) may vary between 2 and 4 moras. Also, the number of syllables per line varies greatly. This would seem to make the scansion pretty indeterminate. Or rather, the moraic structure and its deployment in syllables does not in itself contain enough information for us to uncover the metrical structure of each and every line.

By contrast, Greek dactylic, anapestic and spondaic meter is completely determinate at the level of quantity. Every linguistic foot is bimoraic, every prosodic word contains four moras. The distribution of quantity between syllables, however, is not fully determinate except for spondaic meter.

(6) Syllables and moras in some Greek meters

<table>
<tr><td></td><td>anapests</td><td>dactyls</td><td>spondees</td></tr>
<tr><td>syllables</td><td>HH
HLL
LLH
LLLL</td><td>HH
HLL</td><td>HH</td></tr>
<tr><td>moras</td><td colspan="3">μμμμ</td></tr>
</table>

[10] If we only look at half-lines this is true (Riad 2000), but the preference for trochees is not maintained at the line level. That is to say, the most common line types do not have falling rhythm in both half-lines. Rather, if the first half-line is falling, the second tends to be rising and vice versa (Golston & Riad 1999).

The quantitative situation obviously limits the scope of variation in syllables. We can see that spondaic meter is more severely constrained and therefore more determinate than dactylic and anapestic meter. For spondees, we can basically disregard quantity and simply scan syllables into pairs and still get the correct parsing of a line. For the other two, we need to look at the mora level. However, the mora count is completely determinate in itself, so the other constraints on syllables are only important for distinguishing dactyls, anapests and spondees from each other. Things are different in iambic meter. Here, the mora count is not fully determinate (Raven 1962, 30–32):

(7) Possible iambic metra in Greek drama

1	2	3	4	
(L	H	L	H)	tragedy & comedy
(L	H	L	LL)	
(L	LL	L	H)	
(L	LL	L	LL)	
(H	H	L	H)	
(H	H	L	LL)	
(H	LL	L	H)	
(H	LL	L	LL)	
(LL	H	L	H)	comedy only
(LL	H	L	LL)	
(LL	LL	L	H)	
(LL	LL	L	LL)	
(L	H	H	H)	
(L	H	H	LL)	
(L	LL	H	H)	
(L	LL	H	LL)	
(H	H	H	H)	
(H	H	H	LL)	
(H	LL	H	H)	
(H	LL	H	LL)	
(LL	H	H	H)	
(LL	H	H	LL)	
(LL	LL	H	H)	
(LL	LL	H	LL)	

In tragedy (Aeschylus, Sophocles, Euripides), only the first position of the metron varies between long and short syllable. In comedy (Aristophanes), things are looser and one finds LL initially, as well as a variation between L and H in the third position. This makes the meter less determinate, of course, but the fact that the second and fourth positions invariably contain two moras, and the third very strongly tends to contain a light syllable, will greatly help to solve the task of scanning a line of text into the meter. Also the very fact that Greek iambic meter organizes iambs in pairs into metra provides extra cues to the scansion. Thus, recurring points that exhibit stable behaviour are helpful for disambiguating the structure.

Turning now to *Beowulf*, the flexibility of 8–16 moras per line of text obviously allows too much variation for us to solve the scansion task on the basis of quantitative information alone. Also, there is no particular way the moras are organized into syllables that provides a pattern like those we find in Greek meters. Thus, there is no tendency for the first syllable of every verse foot to be heavy or for the stressed syllables to occur at regular intervals connected to the quantity. This indeterminateness as regards quantity can easily be illustrated. Consider the following two lines from *Beowulf*, one minimal and one maximal, where we have parsed the moras blindly into minimal and maximal verse feet, respectively.

(8) Minimal line

```
 PrWd   PrWd   PrWd   PrWd                   minimal parse (=perfect)
  /  \     / \     /  \    /  \
Σ     Σ    Σ Σ    Σ    Σ   Σ   Σ
|     |    | |    |    |   |   |
(μ    μ)   (μμ)   (μ   μ)  (μ  μ)
|     |    | |    |    |   |   |
on bearm nacan beorhte frætwe                 (line 214)
|     |    | |    |    |   |   |
(μ    μ    μ μ)   (μ   μ   μ   μ)
 \   /      \/      \  /    \  /
   Σ        Σ        Σ       Σ
     \    /              \    /
      PrWd             PrWd      PrWd  PrWd   maximal parse (=overparse)
```

‘on the breast of the ship their bright weapons’

(9) Maximal line

```
PrWd   PrWd PrWd PrWd                          minimal parse (=underparse)
  / \      / \   / \   /\
Σ   Σ     Σ  Σ Σ  Σ Σ Σ
|   |     |  | |  | ||
(μ  μ)    (μ μ)(μ μ)(μμ)
|   |     |  | |  | |/
cempan gecorone  êa#ra êe he#  ce#noste (line 206)
 |    |     | | | |   /|  |  |   Λ   Λ  |   |
(μ    μ     μ μ)(μ μ  μμ)(μ  μ  μμ)(μμ  μ μ)
 \   /       \/   \/   \/   \ /   \/   \/  \ /
   Σ         Σ    Σ    Σ    Σ     Σ    Σ   Σ      maximal parse (=perfect)
     \      /      \  /       \  /       \  /
      PrWd        PrWd       PrWd       PrWd
```

‘comrades chose, the keenest of warriors’

In (8), a minimal parse is appropriate. A maximal parse, or anything broader than the minimal parse, creates structure that is not filled with metrical content (cf. the left-over prosodic words). In (9), a maximal parse is required. If we make a minimal parse, or anything narrower than a maximal parse, up to half the line is unparsed, or is treated as a new line, which is obviously not correct. Most lines are somewhere in between the maximal and minimal parse and require a medial parse of just the right size.

We see that a blind quantitative parse from the prosodic bottom will not get us the correct result. We need information from higher levels of structure, and the key factor that provides this information is alliteration. The line of verse is constructed from unmarked linguistic structure, viz. the prosodic hierarchy under binarity. Alliteration tells us roughly where in that structure we are in a given line. This information is key in the scansion of the line, as we shall see.[11]

Binarity is unmarked for metrical structure. The binary grouping of lower-order constituents into higher-order constituents is mechanical and does not in itself help us with determining the structure of a line.[12] What does help are properties of higher-order constituents which have a direct relation to the text. The prosodic word in OE (the language) typically contains a word-stress. The job of this prosodic category in prose/speech is to organise lexical material into prosodic domains headed by a main stress. Now, in verse, the unmarked binary structure leads us to expect four prosodic words per line. Alliteration selects two or three of them and mark their heads. The one stable property of alliteration in Germanic verse is that it invariably picks out one target from the first half-line and one from the second. In about half the lines, there is a third target, almost always in the first half-line (cf. Hoover 1985, 55). The target point in the second half-line is usually near the beginning of that half-line, hence near the middle of the line.[13] The two crucial pieces of information that we get from alliteration are, roughly, (i) what text belongs in one and the same line, and (ii) where the center of the line is located. This already makes the scansion much more determinate than the blind quantitative parses in (8) and (9) above.

---

[11] Several people have, of course, suggested that alliteration is key to the structure of Germanic verse. For instance, Heusler (1941, 31) points out that structural relevance is an important difference between alliteration and end rhyme, which is typically decorative, and Hoover (1985) is an attempt at elevating alliteration to the chief structural principle of Germanic verse. Nevertheless, one lacks in these analyses an algorithm that is sufficiently determinate to analyze each and every line of meter.

[12] We can easily erect a perfectly fine binary hierarchy on the minimal as well as maximal parses in (8) and (9). This does not make the wrong parses any more correct.

[13] If the alliteration point in the second half-line were near the end, or less stable, it would be a lesser signal of the structure.

There are two things that have been said about the role of alliteration in Germanic, which we would like to take issue with. First, one sometimes sees off-hand remarks about alliteration being a chiefly mnemonic device. While such a function might seem reasonable, it does not in itself provide a full answer and there are indications that speak against it, cf. the following quotation from Sawyer & Sawyer (1993, 19), which concerns alliteration as well as other features like rhythmic constructions and quasi-proverbial formulas:

> Anthropologists and students of modern folklore have shown that these are, in fact, not very effective mnemonic devices, and other recent studies have cast serious doubt on the value of such features as proofs of great age. There is, for example, more alliteration in church law and other manifestly new laws than in those that are older.

Obviously, law and poetry might not compare in their use of alliteration, but either way, this means that there is more to say about alliteration.

Second, there is also a tendency to think of alliteration as some kind of ornament to the meter, much the same way as one thinks of rhyme. In both cases, the rhyme or alliteration may serve as a source of information about the structure of the meter. Typically, however, rhyme is expendable. It tells us where the end of the line is, but we could figure that out anyway, simply by looking at quantity or counting syllables. And of course, there are many strict metrical meters that do not use rhyme (dactylic hexameter, some blank verse, etc.), whereas less strict meters with rhyme are uncommon. Rhyme seems to go with meter that is relatively well-organised anyway. Alliteration, by contrast, seems typically to occur in meters that are not so well structured metrically. Or rather, alliteration tends to occur in meters which do not provide enough information on the scansion in and of themselves. We think that alliteration is important in precisely this way in *Beowulf*, and by extension, in Germanic meters of the same type. Heusler (1941, 33) notes that alliteration lacks the ability to form complex grouping in Germanic, and Fabb (1999) finds that this property of alliteration being local is found crosslinguistically. It will occur between adjacent domains, e.g. prosodic words or phonological phrases, and an alliteration domain will not overlap with another alliteration domain, the way rhyme very often does. Thus, while ABAB is a common pattern for rhyme, it is highly atypical for alliteration. Thus, alliteration would seem to convey crucial clues to the structure that would otherwise be hard to recover in a secure manner in line after line. In *Beowulf*, alliteration is straightforwardly line-based, tying together words in a line, not in a half-line or in two lines (Flom 1930, 156ff.).

Other information like non-alliterating stresses can be of further help in disambiguating the structure. In a line with four stresses, chances are that each of those stresses belong to their own prosodic word. We can roughly match stresses with separate prosodic words, and that will yield us a more successful scansion than would a minimal or maximal quantitative scansion of moras alone. But without alliteration, the stress information is not reliable. Lines are better formed to the extent they fulfill prosodic (and other) desiderata in a canonical way, but such information is only reliable to the same extent that the variation is permitted.[14] Meter is built on reliable properties, which are usually complemented with variable properties. In order to write the meter, one must fulfill the obligatory criteria, while the variable criteria help differentiate between styles.

3. The scansion

Editors are generally agreed on what the lines are in *Beowulf*, independently of what theory they embrace (Hoover 1985, 51). Both alliteration and syntax are sources which provide information on where a line begins and ends, and both of them are relatively uncontroversial aspects of the text, unlike most other statements regarding the meter. Everybody agrees on which syllables participate in alliteration and on the boundaries between higher-order units like clauses and sentences. The student of OE should have no problem in finding these pieces of information. This is not to say that the syntax of *Beowulf* is everywhere completely clear, but it does not generally cause difficulties in deciding where the boundaries between clauses are located. Nevertheless, when we proceed to scan the first lines of the poem, we cannot assume that the line breaks are already given. Line breaks must be inserted, so let us begin by scanning the running text.

(10) Running text

hwæt we# Ga#r-Dena in gea#Rdagum êe#odcyninga êrym gefru#non
hu# Da# æêelingas ellen fremedon Oft Scyld Sce#fing sceaêena
êre#atum monegum mæ#gêum meodosetla ofte#ah egsode eorlas
syDDan æ#rest wearD fe#asceaft funden he# êæs fro#fre geba#d
we#ox under wolcnum weorDmyndum êa#h oDêæt him æ#ghwylc
êæ#r ymbsittendra ofer hronra#de hy#ran scolde gomban gyldan êæt
wæs go#d cyning

[14] We get the same thing with syntax. In verse we tolerate many more constructions and word orders than we do in prose, but we will find such lines with more canonical word orders (say prose-like) better formed than those with twisted albeit acceptable word order.

The division of the text into lines can be made quite reliably on the basis of alliteration and syntactic information. First we mark the alliteration points.

(11) Alliteration points

hwæt we# Ga#r-Dena in gea#Rdagum êe#odcyninga êrym
gefru#non hu# Da# æêelingas ellen fremedon oft Scyld Sce#fing
Sceaêena êre#atum monegum mæ#gêum meodosetla ofte#ah
egsode eorlas syDDan æ#rest wearD fe#asceaft funden he# êæs
fro#fre geba#d We#ox under Wolcnum WeorDmyndum êa#h ODêæt
him æ#ghwylc êæ#r ymbsittendra ofer hronra#de hy#ran scolde
gomban gyldan êæt wæs go#d cyning

In order to determine where the line ends are, we simply identify the first alliterating pattern and then the one following. The first alliteration point is typically at or near the beginning of the line. Let us cut out lines at the beginning of each new alliteration pattern.

(12) Preliminary lines

hwæt we#
Ga#r-Dena in gea#Rdagum
êe#odcyninga êrym gefru#non hu# Da#
æêelingas ellen fremedon oft
Scyld Sce#fing Sceaêena êre#atum
monegum mæ#gêum meodosetla ofte#ah
egsode eorlas syDDan æ#rest wearD
fe#asceaft funden he# êæs fro#fre geba#d
We#ox under Wolcnum WeorDmyndum êa#h
ODêæt him æ#ghwylc êæ#r ymbsittendra ofer
hronra#de hy#ran scolde
gomban gyldan êæt wæs go#d cyning

We are already close to a correct segmentation into lines. Now we adjust the lines according to syntactic information, and see to it that all bits of text are incorporated into lines (adjustments are underlined).

(13) Final lines

hwæt we# Ga#r-Dena in gea#Rdagum
êe#odcyninga êrym gefru#non
hu# Da# æêelingas ellen fremedon
oft Scyld Sce#fing Sceaêena êre#atum
monegum mæ#gêum meodosetla ofte#ah
egsode eorlas syDDan æ#rest wearD
fe#asceaft funden he# êæs fro#fre geba#d
We#ox under Wolcnum WeorDmyndum êa#h
ODêæt him æ#ghwylc êæ#r ymbsittendra
ofer hronra#de hy#ran scolde
gomban gyldan êæt wæs go#d cyning

There could of course be points in the text where one could argue whether a word belongs to this or that line, but since alliteration goes such a long way towards providing the line divisions, syntactic information will be needed just to decide which line (of two) a word belongs to. The narrow scope of alternatives makes this a simple decision.

Scansion should now proceed to find the break between half-lines. Again the alliteration pattern is helpful. It is commonly assumed that the last alliteration point in a line is in the first verse foot of the second half-line, but note that this contention will depend on the theory assumed. Thus, while we find this tendency in our scansion too, it does not seem very meaningful to rely on this tendency without clarifying some aspects of the model used. In our model, verse feet are parsed out over the entire line. Thus, if either half-line is unusually long, it might have to yield some of its syllables to the other halfline, so that the amount of unparsed material is kept at a minimum. The overriding priority of parsing all syllables into lines might thus well occasion the odd mismatch in other respects. To see this, let us now first divide the lines into half-lines on the basis of alliteration alone, and then do the requisite adjustments until we obtain a reasonable structure.

(14) Preliminary half-lines

hwæt we# Ga#r-Dena in	gea#Rdagum
êe#odcyninga	êrym gefru#non
hu# Da# æêelingas	ellen fremedon
oft Scyld Sce#fing	Sceaêena êre#atum

monegum mæ#gêum	meodosetla ofte#ah
egsode eorlas syDDan	æ#rest wearD
fe#asceaft funden he# êæs	fro#fre geba#d
We#ox under Wolcnum	WeorDmyndum êa#h
ODêæt him æ#ghwylc êæ#r	ymbsittendra
ofer hronra#de	hy#ran scolde
gomban gyldan êæt wæs	go#d cyning

At this point, we call in syntax again and shift some syllables over. Thus the preposition *in* at the end of the first half-line should move over to the second half-line. In line 6, *syDDan* begins a new sentence, and *he# ɷæs* of line 7 clearly belongs syntactically to the second half-line, as does *ɷæt wæs* of line 11. The syntactic boundary between the half-lines is less important than the one at the end of the line, as it should be.

(15) Final half-lines

(hwæt we# Ga#r-Dena)	(in gea#Rdagum)
(êe#odcyninga)	(êrym gefru#non)
(hu# Da# æêelingas)	(ellen fremedon)
(oft Scyld Sce#fing)	(SCeaêena êre#atum)
(monegum mæ#gêum)	(meodosetla ofte#ah)
(egsode eorlas)	(syDDan æ#rest wearD)
(fe#asceaft funden)	(he# êæs fro#fre geba#d)
(We#ox under Wolcnum)	(WeorDmyndum êa#h)
(ODêæt him æ#ghwylc)	(êæ#r ymbsittendra)
(ofer hronra#de)	(hy#ran scolde)
(gomban gyldan)	(êæt wæs go#d cyning)

The half-line corresponds roughly to the phonological phrase in standard phonology. We have put in parentheses to demarcate them.

Alliteration and syntax have now together given us lines and half-lines. What remains now is to divide each half-line into two verse feet which should meet some basic criteria and that should pretty much complete the scansion. At the point reached in (15), we have enough structure in the verse for the quantitative information to become useful. Thus, in deciding where to put the brackets for the prosodic words

(=verse feet), it is useful to know that each prosodic word must contain not less than 2 moras and not more than 4. Recall now that we only look at vowels. Long vowels and long diphthongs are two moras, short vowels and short diphthongs are a single mora. Projecting the quantitative information, the first two lines come out like this:

(16) Lines 1 and 2

(μ μμ) (μμ μ μ) (μ μμ) (μ μ)
(<u>hwæt we#</u>) (Ga#r-Dena) (<u>in</u> gea#R) (dagum)

(μμ μ) (μ μ) (μ μ) (μμ μ)
(êe#odcy) (ninga) (êrym ge) (fru#non)

In the second half-line of line 1, *-dagum* makes a minimal verse foot, so the brackets must go before it. In the first half-line, the first verse foot boundary must be between *we#* and *Ga#r*, since if we put it earlier, the first prosodic word will contain just one mora (*hwæt*), and if we put it later, it will contain five (*hwæt we# Ga#r*). Notice that we heed the integrity of syllables, in that we do not gratuitously split a long syllable between two verse feet. This might seem self-evident, but is in fact a constraint whose effect can be established in a couple of ways, as we shall see below. In line 2, we could divide the first half-line in two ways: (*ϖe#od*)(*cyninga*) or (*ϖe#odcy*)(*ninga*), and that brings the question of syllable integrity to the fore.

3.1 Syllable integrity

A division (*ϖe#od*)(*cyninga*) has some appeal in that it harmonizes with the morphological boundary in the middle of this compound. However, phonological markedness and the avoidance of short lines convinces us that (*ϖe#odcy*)(*ninga*) is in fact the simplest and therefore right way to divide this half-line. In the chosen scansion, the prosodic word branches to two separate syllables (17a), rather than to two moras within a syllable (17b).

(17a) (Σ Σ) (Σ Σ) (Σ Σ) (Σ Σ)
Λ I I I I I Λ I
(μμ μ) (μ μ) (μ μ) (μμ μ)
V I I I I I V I
(êe#odcy) (ninga) (êrym ge)(fru#non) correct

‘We have heard of the people-kings glory’

(17b) (Σ Σ) (Σ Σ) (Σ Σ) (Σ Σ)
\ / /\ | | | /\ |
(μμ) (μ μ μ) (μ μ) (μμ μ)
\/ | | | | | \/ |
(êe#od) (cyninga) (êrym ge)(fru#non) wrong

Even though the meter is quantitatively based, the preference is clearly for every verse foot to branch to separate syllables. Put differently, syllables should belong to single metrical positions rather than be shared between metrical positions. There is a general empirical pattern supporting this conclusion. In the first 1000 lines of *Beowulf* we find only two lines which are shorter than 8 syllables, and they contain 7 syllables. No lines are shorter than that. If syllable count didn't matter, an entire line could in principle consist of just 4 syllables with long vowels and still fulfill the quantitative minimum of 8 moras. We assume that the reason why this never happens is because it would involve multiple violations of syllable integrity, and that syllable integrity, therefore, is an important issue in OE meter.

Syllable integrity also plays a role inside the prosodic word, as we shall now show. A syllable is less often shared between metrical positions (=linguistic feet) than one would expect if variation were free. To see this, consider the logical possibilities of quantitatively canonical prosodic words.

(18) Canonical verse feet/prosodic words

(LLH)	(HL)	(LL)
(HLL)	(LH)	(HH)
(LLLL)	(LL-L)	
(LHL)	(L-LL)	

Nine of these ten verse feet respect syllable integrity within the verse foot. Only (LHL) does not. If everything were equal between these possible types, there would be a one in ten probability for each to occur. As we shall see, however, the LHL verse foot is quite rare, syllable integrity being at work within, as well as between, verse feet.

The tabulations below are all based on the first 1000 non-corrupt lines of *Beowulf*. For the sake of the calculations all text is parsed into lines, half-lines and verse feet. There are no extrametrical syllables, but some verse-feet are hypermetric.[15] 1000 lines makes 2000 half-lines and 4000 verse feet. Of these, 3881 (97%) respect

[15] After all, 1% of the lines contain more than 16 moras.

syllable integrity *between* verse feet. In the table below they are listed in order of frequency.

(19)

verse foot type	tokens
LL	1030
HL	784
LL-L	364
HLL	347
LH	341
LLH	287
L-LL	259
LLLL	244
HH	185
LHL	40
total	3881

We can see directly that LHL is the least popular verse foot type of all. It only takes up about 1% of all canonical verse feet, a tenth of what is expected if all else were equal. If we plot these quantitatively and syllable integral canonical verse feet according to their weight, we get the pattern in (19).

(20)

verse foot type	moras	tokens
LL	2	1030
HL, LH, LL-L, L-LL	3	1748
HLL, LLH, LLLL, HH, LHL	4	1103

There is a preference for verse feet containing three moras, whereas two or four moras are about equal. To make the evaluation of LHL as fair as possible, let us compare its frequency with the other four-mora types.

(21)

verse foot type	tokens	%
HLL	347	31.5
LLH	287	26.0
LLLL	244	22.1
HH	185	16.8
LHL	40	3.6
total	1103	100

The proportions change just a little, but 3.6% is still only a fifth of what would be expected. Indeed, we could narrow the comparison to just the other four-mora types that have three syllables.

(22)

verse foot type	tokens	%
HLL	347	51.5
LLH	287	42.6
LHL	40	5.9
total	674	100

Whichever way we make the calculation, the verse foot LHL is underrepresented, and so it is fair to assume that syllable integrity is a factor to reckon with within verse feet.

3.2 Other properties

Let us now scan through the next couple of lines.

(23) Lines 3 and 4

(μμ μμ) (μ μ μ μ) (μ μ) (μ μ μ)

(hu# Da#) (æêelingas) (ellen) (fremedon)

(μ μ) (μμ μ) (μ μ μ) (μμ μ)

(oft Scyld) (Sce#fing) (Sceaêena)(êre#atum)

There is only one possible placement of the verse foot boundary in the first half-line of line 3, since it is quantitatively maximal. In the second half-line, we have chosen (*ellen*)(*fremedon*) over (*ellen fre*)(*medon*). This decision can be made on the basis of lexical stress and/or word boundary. In OE, these two facts very often go hand in hand since stress generally falls on the first syllable of a word.

(24) Lines 5 and 6

(μ μ μ) (μμ μ) (μ μ μ μ) (μ μμ)

(monegum) (mæ#gêum) (meodosetla) (ofte#ah)

(μ μ μ) (μ μ) (μ μ) (μμ μ μ)

(egsode) (eorlas) (syDDan) (æ#rest wearD)

Line 5 poses no problem. The prosodic words and lexical words here correspond fully. In line 6, we find the alliterating point in the second half-line in the final prosodic word. Technically, we could put it in the first verse foot—(*syDDan æ#*)(*rest wearD*)—but that would split the word *æ#rest* for no good reason, and the alliterating syllable would not be in the beginning of the prosodic word anyway. This does seem to be the most common case (cf. the a-half-lines in the snippet we look at closely here).

The next couple of lines illustrate the case where the quantitative measure does not perfectly match the syntactic structure. If we put the boundary between the half-lines in line 7 where syntax would have it, we get a weight problem somewhere in the second half-line (marked with a star).

(25) Line 7, bad alternatives

(μμ μ) (μ μ) (μμ μ) *(μμ μ μ μμ)
(fe#asceaft) (funden) (he# êæs) (fro#fre geba#d)

(μμ μ) (μ μ) *(μμ μ μμ) (μ μ μμ)
(fe#asceaft) (funden) (he# êæs fro#) (fre geba#d)

To avoid this problem we simply shift one syllable over to the first half-line.[16]

(26) Line 7, final

(μμ μ) (μ μ μμ) (μ μμ μ) (μ μμ)
(fe#asceaft) (funden he#) (êæs fro#fre) (geba#d)

The first priority, then, is with the proper scan of quantity into the prosodic categories that the meter is built of (metrical positions, verse feet). This amounts to the claim that the 8–16 moras per line that the model predicts and 99% of Beowulf and the Edda fit is indeed relevant. It is only to be expected that syntax will not always manage to fit this structure perfectly, but will have to adjust when the occasional conflict arises.

In lines 8 and 9, things are quite straightforward.

(27) Lines 8 and 9

(μμ μ μ) (μ μ) (μ μ) (μ μμ)
(We#ox under) (Wolcnum) (WeorDmyn) (dum êa#h)

[16] Note that nothing is gained by splitting the syllable *fro#-* in two, since that would only add a gratuitous syllable integrity violation.

(μ μ μ) (μμ μ) (μμ μ) (μ μ μ)
(OᴅÊæt him) (æ#ghwylc) (<u>êæ#r</u> ymb) (sittendra)

Both these lines illustrate the case when a lexical word is split between two prosodic words. Unless we split *weorDmyndum* and *ymbsittendra*, we will not get canonically branching prosodic words as expected from (4). In *weorDmyn*)(*dum* the split has to be where it is, or there will be a non-branching prosodic word. In *ymbsittendra*, we should choose between *ymb*)(*sittendra* and *ymbsit*)(*tendra*. Our intuition is that *ymb*)(*sittendra* is right since it puts a stressed syllable -*sit*- in the head position to the left in the last prosodic word. This solution accords well with the preference for alliteration to be initial in the verse foot (=prosodic word). Note, however, that we deem this criterion secondary to binary branching and quantitative fulfillment.

(28) Lines 10 and 11

(μ μ μ) (μμ μ) (μμ μ) (μ μ)
(<u>ofer</u> hron) (ra#de) (hy#ran) (scolde)

(μ μ) (μ μ) (μ μ) (μμ μ μ)
(gomban) (gyldan) (<u>êæt wæs</u>) (go#d cyning)

In line 10, the division of the first half-line into verse feet could be made in two ways. The one given above gets the alliteration point in the middle of a verse foot (*ofer* <u>*h*</u>*ron*)(*ra#de*), but avoids a syllable integrity violation in the other candidate: (*ofer*)(*hronr*<u>*a#*</u>*de*). The latter gets the alliteration in the right place, but gets the LHL structure in the second verse foot. We will not delve further into this issue here. Ultimately it should be decided which constraint is more important, but this can only be done in a satisfactory manner with greater empirical work. This concludes the scansion of canonical lines, that is, lines which fall within the 8–16 mora window.

4. Conclusion

The main point we wanted to make in this article is that scansion of *Beowulf* is really quite determinate if we combine quantitative information with alliteration. Alliteration was seen to be an efficient way to divide the text into preliminary lines and half-lines. This yields units that are small enough for the quantitative information, viz. the mora count per verse foot, to become useful in the further scansion. Likewise, syntactic information becomes useful, but we noted that it is subordinate to prosody in meter. The subordination of syntax to prosody is at the heart of what meter is. Thus, the shifting over of a syllable or two between half-lines in order to get a decent prosodic parse is fully possible, but as with all marked measures, it will tend to be infrequent. We have also seen that the binarity of verse feet is important, and that it is preferably matched by syllable integrity in the text.

Taking the findings here a little further, it might be that we will find in other languages that alliteration has the same function as structure disambiguator in verse. The strong tendency for alliteration to be local (AABB) rather than interleaved (ABAB) (Fabb 1999) might point to a specific function of carving out metrical units. If this function of alliteration turns out to generalize beyond OE, we can predict that alliteration should occur in verse systems which are not sufficiently regulated at the lower levels (be it by syllable count, mora count or some combination of the two). That is, it would not be a coincidence that alliteration (as opposed to rhyme) occurs with meter of the Germanic type.

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Authors addresses:

Chris Golston
Department of Linguistics PB 92
California State University Fresno
Fresno, CA 93740-8001
USA
Office: (559) 278-2136
Fax: (559) 278-7299
Email: chrisg@csufresno.edu

Tomas Riad
Nordiska språk
Stockholm University
106 91 Stockholm
Sweden
Office: +46-8-16 36 38
Fax: +46-8-15 85 33
Email: tomas.riad@nordiska.su.se