

Constraints on terminal sounds in the inscriptions of early Scotland

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ABSTRACT

A survey was undertaken of the inscriptions from the early medieval period in Scotland in both Roman and Ogam script which have not been deciphered to the satisfaction of all scholars. It is argued that these inscriptions are linguistic in nature, implying a link between letters and sounds. The inscriptions of this period, excluding ones known to be in Latin or Old Irish, are surveyed, drawing attention to patterns in the distribution of sounds. The occurrence of sounds represented by letters in terminal positions in units of speech are contrasted with the occurrence of sounds in other environments, and it is shown that the terminal sounds conform to a constraint excluding consonantal stops. This is consistent with the behaviour of a single language, reasonably identified as Pictish, in these texts, though it is possible that there is more than one language within these undeciphered inscriptions.

INTRODUCTION

Discussion and speculation about the early medieval inscriptions of Scotland (including the Orkney and Shetland Isles) have been central to the question of what languages were spoken in this range. There have been a number of valuable surveys of monuments and artefacts containing these inscriptions; the comprehensive discussion by Macalister (1940) has been followed most recently by Padel (1980), Okasha (1985) and Forsyth (1996). Of these, Okasha covers inscriptions in variants of Roman script, while the other two describe the inscriptions in the Ogam alphabet, which make up the majority. All of these scholars have agreed that the inscriptions represent real language, but there has been no satisfactory resolution as to the classification of the language(s) used. In addition, there has been at least one well-known study suggesting that the Ogam inscriptions on Pictish monuments are non-linguistic and embody a mathematical code (Jackson 1984).

THE INSCRIPTIONS AS A TRUE LANGUAGE

The argument here assumes that the inscriptions represent a normal human language and are not encrypted (that is, the letters appear in the order of speech sounds). There is little doubt on this point in connection with the Roman-based scripts. A brief explanation (dealing first with the issue of encryption, then the linguistic nature of the sequences of letters) will be offered for the assumption that the Ogam inscriptions are a straightforward record of a language. Following this, evidence will be presented for one probable feature of the language itself. This will also have implications for understanding other repeated patterns in the inscriptions of early Scotland.

THE INSCRIPTIONS NOT ENCRYPTED

As to the question of encryption, there are reasons for thinking that the inscriptions were intended

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to be clear and are not encrypted in any way. There is the general precedent of monumental architecture. The majority of the texts concerned are inscribed on highly visible standing stones found in churchyards or other locations near known early communities. Forsyth (1996) discusses the discoveries of relatively lengthy inscriptions such as Formaston and Brodie in ancient churchyards, while the inscriptions of Golspie and Lunnasting are part of the local landscapes of monastic or other settlement sites of the period. The inscription at Brandsbutt, near Inverurie, associated with a stone circle and an ancient road to a hill fort (Forsyth 1996), can still be visited in situ in the suburban park which has grown up around it, all suggesting long-standing public exposure for this stone. In most of the ancient world, as well as more recently, monuments intended for public view included inscriptions intended to convey a clear message, at least to those who could read. The writing in itself may well have been mysterious to the illiterate. In societies contemporary to these monuments in other parts of the British Isles, memorial inscriptions are either in Latin (well-known to the clergy) or are in the native vernaculars: Old English in England, Old Irish in Ireland and the Scottish Isles, and Old Welsh in Wales. A similar generalization could be made for public monuments in Scandinavia and other parts of Europe. In the case of Scandinavia, a large part of rune-inscribed stones are commemorative monuments on the lines of those in the British Isles, often produced as collaborations between the dedicators, writers and carvers (see Elliott 1989, 31–5; Antonsen 2002, 149, 220–2) The standard inscriptional practice in the societies of the British Isles seems to have been to prefer Latin when using the Roman script, and vernaculars either in Roman script or in the indigenous alphabets of Runic or Ogam. Thus, while it is logical to conjecture that the inhabitants of early Scotland may have differed in their practices from their neighbours and used their writing in an unprecedented way, they would certainly be unique in this, and a

motivation for such secrecy in a public display is hard to see.

Furthermore, the practices displayed in the Ogam inscriptions, for example in letter-forms, placement on monuments, direction of reading and other features, are identifiable in every part of the range covered in this article, including the Northern Isles, and were part of a strong conventional tradition. This reinforces the idea that the system of writing was well-known at least within the professional spheres of scholars and stone-carvers. Indeed, a few of the inscriptions are not monumental, but are inscribed quite legibly on mobile objects, such as on the bone knife handles from Gurness (Macalister 1940) and Bac Mhic Connain (Callander 1931) and the stone spindle-whorl from Buckquoy (Forsyth 1995), all bespeaking common use of the Ogam alphabet. Thus, this also increases the likelihood that the language of at least the Ogam inscriptions is the same in all parts of the country, perhaps with dialectal variations, though it may still be doubted whether the language of the inscriptions was spoken by everyone in the country.

THE LINGUISTIC NATURE OF THE INSCRIPTIONS

As to the linguistic nature of the inscriptions, there is very direct internal evidence that these texts represent a language. For one thing, whereas the Ogam alphabet includes a row of five vowels (AOUEI), the stock of alternate vowel forms seems to increase over time in the inscriptional tradition. For example, medieval additions to the Ogam alphabet include a set of forms called *forfedá*, sg *forfid* (serving for long vowels or diphthongs), beginning with an X-like alternate letter E. These additional vowels, as well as stylistically-alternate vowel-shapes, are more common in those monuments which are judged to be later on art-historical and archeological grounds. Thus an example of earlier type is the inscription from Auquholle (Forsyth's

graphic Type Ia), which resembles an Irish-style inscription, and has no variant vowels out of a minimum of 12 letters roughly evenly divided between vowels and consonants. The inscription at Lunnasting is seemingly later (Forsyth's Type IIc). It contains 38 letters, but out of those are six 'supplementary characters' (Forsyth 1996). Though the influence of elaborated forms from manuscript tradition cannot be ruled out, the focus of these changes in the vowel category invites linguistic interpretation. These graphic changes can be explained by vowel shifts, or simply by the inscribers adjusting the alphabet acquired from Ireland to suit the features of their own language. In addition, the Ogam writers inherited orthographic practices from Irish Ogam, an alphabet clearly intended for the Irish language. For example, internal and terminal consonants are frequently doubled, for reasons which are still debated. In these ways, we see that the distinction of vowels and consonants was maintained in the Ogam of Scotland as in the Irish variety.

Furthermore, the distribution of vowels and consonants within each inscription is for the most part consistent with a normal language, with vowels forming syllabic peaks. While a complete exposition of this point would require a survey of all the inscriptions, two of the longer inscriptions will suffice to demonstrate, the ones from Formaston and Bressay [both are transcribed and discussed in Macalister (1940) and Forsyth (1996)]. The inscription at Formaston can be transcribed, with E for the X-shaped *forfid* and O for the circular *forfid*: NEHHTVROBBACCENEVV / MAQQOTALUORRH. (The slash mark represents the commencement of new line of text.) It should be noted apropos of the variation in vowel forms that the first E is the X-shaped *forfid*, and the two As also have distinct forms; the first and third Os are distinct from each other in form, and the second O is the circular *forfid*, yielding three shapes for O. If the doubled consonants are taken as single 'sounds' within the system of the language, as in Ireland, the

sequence in this inscription can be syllabified as neht-vro-ba-ce-nev-ma-qo-ta-lu-orh, with syllable sequences (where C=consonant and V=vowel) of the forms CV, CVC, CCV, VCC and CVCC – all quite pronounceable in a human language. The Bressay inscription is of good length but presents some difficulties for syllabification. The likeliest reading is: CRROSCC:NAHHTVVDDADDS:DATTRR:ANN / BENNISES:MEQQDDRROANN. The colon-like dots can be interpreted as a word-divider, about which more below. Here the consonant forms vary; the third and fourth Ds are alternate forms, and the last RR is a single character. The last O is a diamond-shaped *forfid* (a known variant of the circular *forfid*). The difficult points are VV and the second RR. It should be borne in mind that the actual sound of letter V differs between earlier and later inscriptions in the Ogam tradition. It could be used to transcribe Roman V ([w] or [u] phonetically) or the Irish [f] sound, though [v] itself is also possible. Thus a consonant with an unwritten vowel, a consonant with syllabic value, a semivowel or a vowel are all worth considering as interpretations of V. The sequence DATTRR, if we trust the word-dividers, is one word in which the R would have to be granted syllabic value, as in Modern English dialects, or else point again to an ad hoc unwritten vowel. (The word has been compared to Old Norse *dottir* 'daughter'.) With these provisions, the following syllabification can be proposed: *crosc-nah-tV-dads-da-tr-an* (or *dat-ran* by conjoining neighbouring sounds) *-be-ni-ses-meq-dro-an*, with the syllable-forms CV (possibly including C+r), CVC (possibly including the Ogam sequence TV), CCV, CVCC and CCVCC.

All of the traits bespeaking differential treatment and distribution of vowels and consonants, as well as the use of writing as a public record seem more characteristic of a language than a mathematical or other symbolic system. Altogether, given the example of the Irish use of Ogam to record statements in Irish, the inhabitants of early Scotland are likely

to have employed the alphabet for their own. And the intention of the present discussion is to produce additional evidence of the linguistic nature of these inscriptions.

If the majority of these inscriptions are in a vernacular language sharing, in the case of Ogam, a common orthography and style of letters, the best candidate in geographic terms would seem to be the Pictish language. To generalize most usefully about a common inscriptional language of unknown character will require excluding inscriptions – the Latin or Latinate ones wherever they are found as well as ones clearly in Old Irish, such as those in Argyll. [Inscriptions from Iona with the OROIT AR ANMIN ‘pray for the soul’ formula can be seen in Allen (1903, 399–400) and are ably presented by Macalister (1949).] Discussion will also be limited to those from the northern and eastern parts of Scotland which were part of the historic Pictish kingdom in the Early Middle Ages. Inscriptions from Argyll and Arran will therefore be excluded as lying too close to the core of the early Scottish kingdom. The selected group will be further broken down into a group associated with Pictish art and settlement sites and groups of less certain association or antiquity. For example, inscriptions from the Northern Isles coming from a pre-Norse context can with some confidence be classified as Pictish in provenance, though it should be emphasized this does not guarantee that the preferred inscriptional language was itself Pictish. While this approach will include inscriptions that have in the past been interpreted as in more than one language, it will give the best chance for a useful generalization about the inscriptional language of these parts of early Scotland.

EXPLORATION THROUGH SOUND CONSTRAINTS

An exploration through sound constraints may be a fruitful approach. The approach taken here is purely internal and makes no attempt,

for example, to classify Pictish or discover its affinities. In this approach it is possible to make statements about the language without committing to any identification or attempting a translation. This can be done by surveying the known inscriptions to find repeated patterns, and making generalizations (expressed either as ‘rules’ or tendencies) on that basis. This kind of generalization from internal comparison is an approach which has been fruitful in studies of poorly understood ancient languages such as Etruscan (see, for example, Adiego 2004; Bonfante & Bonfante 1983).

One area of grammar that can be explored in this way is the field of sound constraints, in the sense of statements on what sounds or classes of sounds are allowed at the beginning, at the end or internally in a word or syllable. In looking at a ‘word’ in an inscription, we are of course dependent on the writer’s own view of where word-boundaries are, and a number of these ‘words’ may be equivalent to phrases. However, when the beginning and endpoint of these units of speech are known, the sounds appearing at the boundaries can be tallied, and a summary statement made concerning whether there is no constraint and thus any sound is allowed, whether there is a clear tendency to prefer some classes of sounds over others, or whether there is a strict limitation to a class of sounds.

SURVEY OF TERMINAL SOUNDS

The discussion here of the terminal sounds of inscriptional ‘words’, will first clarify the uses of ‘terminal’ and ‘sound’ for purposes of the present treatment. ‘Terminal’ letters will be found primarily at the clear ending of complete inscriptions. Thus, for example, the Formaston inscription has two lines (see above). The first line ends at the arm of a carved cross and may discontinue merely because the carving is in the way. The second line ends at the same carving, but as there are no further letters in the inscription the last letter of this line (probably

H) can be taken as terminal for purposes of this paper, though the uncertain status of this mark as a letter will place Formaston under ‘Less Certain Terminals’, below. The Brandsbutt inscription is broken at the end and cannot confidently be said to terminate in its current state. The Bressay inscription has a clear beginning and ending, as well as word terminations shown by word-dividers, yielding a total of five, and possibly six, terminal letters – a relative wealth of data.

A small number inscriptions, all from the Northern Isles, use a colon-like double dot which also resembles a word-divider common in Runic inscriptions (Elliott 1989, 20) and which has been taken to have the same purpose, eg by Macalister (1940) and Forsyth (1996). An example is the Bressay inscription, above. Where word-dividers are used, then, the last letter before a word-divider also qualifies as a terminal letter. In these cases it is possible to distinguish which terminals in a given inscription are set off by word-dividers, and which the final letter of the text. Note will be taken of when terminal letters are doubled. As this is a conventional treatment of consonants, of uncertain application, double letters will be taken as identical to single letters for purposes of this survey.

Although the intention of this survey of inscriptions is to find terminal letters, reference will be made to ‘sounds’ in the discussion of constraints. The assumption is that when the natives of Scotland learned the Ogam alphabet, they assigned values to the letters akin to Irish. Modern transcriptions often use variations of the Irish values, though of course the precise articulations of the local language are unknown. However, in most cases in which one group of people adopt the writing system of another, the new users of the script typically apply a letter to the same phoneme or one of the same class. Through time, of course, the sounds change, and thus the phonetic value of each letter or grapheme. Given a period of graphic production of roughly 600 years (400–1000 CE), it would be surprising if there were no changes in the

language of the inscriptions. Yet the period is not so long that we would expect a complete elimination of the original sound values for the letters, or for these values to move too far from the original position to be of relevance. Nevertheless, we can only state with certainty that the inscripational language maintained the distinction of vowels and consonants through the whole period. Here I will use the most ‘neutral’ transcription favoured by Forsyth (1996), using the alphabet BLVSNHDTTCQMGG^wS^rRAOUEI, in which no precise phonetic values are attached in particular to the highly variable ‘V’, ‘Q’ and ‘S’. The vowel *forfedá* does not occur terminally and so will be of little further relevance here.

The sample considered here has been selected on the basis of provenance, though frequently the associated artwork is classified as Pictish. They are referred to by their most commonly used designations. They will first be divided according to whether or not the terminations are available for study, beginning with the Ogam inscriptions. In one set of inscriptions, the terminations are unknown due to the fragmentary nature of the material; this group will be excluded as unusable. There are other inscriptions in which terminals are uncertain for other reasons, such as reading difficulty and the theoretical problem of whether the termination of one line of text is the end of a word or not. In another set, the terminals are clearly seen; greater weight as evidence is given to this set of undoubted terminations. The other, less certain, examples will be examined for consistency with the findings on terminal sounds.

In addition, a small set of vernacular inscriptions in variants of Roman script will be included. These may or may not represent the same language as the Ogam texts, but may serve for comparison in their treatment of word-terminations. Thus, using the word ‘sounds’ in reference to letters seems justified, and this will become more relevant when the natural classes of sounds represented by these letters are discussed.

Finally, a small number of inscriptions which are only dubiously part of the sample could potentially shed light on the language. These include two Ogam inscriptions from outside of Scotland – one at Kirkmichael, Isle of Man (Macalister 1940), the other from Weeting, Norfolk (Rainbird Clarke 1952) – which have been associated with Picts in some interpretations of the archeological record, and the Greenloaning inscription, the antiquity of which is in doubt. Future work may determine whether these cases are truly relevant to the generalizations made here. The spindle whorl inscription from a Pictish context at Buckquoy belongs strictly speaking to the sample of Ogam inscriptions. Although it has been read as Old Irish (Forsyth 1995), a case could still be made for another language, and some discussion will be included here.

INSCRIPTIONS WITH UNCERTAIN TERMINALS

The following inscriptions have endings that are lost or too uncertain to be of value. These are listed in alphabetical order under their most commonly known names: Abernethy; Auquhollie (Macalister 1940, 191–2); Brandsbutt; Birsay III; Brodie; the Cunningsburgh fragments: Cunningsburgh I, Cunningsburgh II and Cunningsburgh III (sections A and C) (Macalister 1940, 217); Inchyra II (section B); Latheron; and Pool. The Ogam inscriptions on the Dupplin Cross and the second line at Altyre are unread as yet (all cited in Forsyth 1996). These, as stated above, can give no evidence of word-endings. The inscription at Logie House is circular and thus has no clearly apparent beginning and ending, and has inspired quite different readings. The inscription on the spindle-whorl from Buckquoy is also circular with an uncertain termination, and Forsyth (1995) points to the likelihood that the words in this inscription are Old Irish. The Buckquoy inscription will come up again in discussion of the set of inscriptions with uncertain terminations.

CLEAR TERMINALS

The following are inscriptions with clear terminals. The terminal letters are at the end of the whole inscription unless otherwise specified. The set of inscriptions on the Inchyra stone are numbered following the order in Wainwright (1959) and Stevenson (1958/59).

1. ACKERGILL (KEISS BAY): Most likely terminates in I.
2. ALTYRE: Terminates in S.
3. BRESSAY: Four word-dividers assure us of four terminal sounds – C (part of CC), R and two Ss. In addition, there is a terminal N (part of NN). There are two lines in the inscription, but the longer line ends close to the top of the stone. This line may thus be cut off in the midst of a single word and so must be included in the uncertain category. The shorter line terminates in N (part of NN) before an empty space at the end, and so this letter is included as terminal.
4. BURRIAN: Terminates in S.
5. CUNNINGSBURGH III (Section B): Has V as the likeliest terminal at the word-divider (Forsyth 1996).
6. INCHYRA I: Terminates in E.
7. INCHYRA II (Section A): Is on the same stone as I and III. It most likely terminates in S (Forsyth 1996).
8. LUNNASTING: Has three word-dividers, which with the end of the whole inscription gives four terminal sounds – N, N (part of NN), S and V (part of VV). The letter conventionally transcribed as V was at first equivalent to Proto-Celtic *w, later *f* in Old Irish. In bilingual Latin–Ogam inscriptions of Wales in the sub-Roman era, this letter is equivalent to Roman V. In medieval Irish manuscripts, it is transcribed F.
9. NEWTON: Ogam inscription ends in R (possibly part of a double RR).
10. SCOONIE: In N (part of NN).
11. ST NINIANS: Terminates in a letter interpreted by MacManus (1991) as S', by

others, based on medieval Irish sources, as Z or ST. (Forsyth 1996 in this case favours S'.) In the case of this letter, an ancestral Celtic sibilant was reinterpreted in later Irish manuscript tradition (MacManus 1991). Its development in Pictish remains uncertain.

Of the 11 inscriptions with clear terminals, the tally by letter is as follows:

| | | | |
|---|---|----|---|
| N | 5 | C | 1 |
| S | 5 | I | 1 |
| E | 2 | S' | 1 |
| R | 2 | V | 1 |

Total: 18 terminals

Of these 18 examples, the letters N and S account for ten. These sounds, together with the remaining ones except for C, all belong to the class of continuants, including vowels. ('Continuants' as used here refers to sounds which can be articulated continuously, and thus includes nasals, since breath escaping through the nasal cavity places nasals in a natural class with continuants strictly speaking. While 'continuant' as used by linguists is defined by the oral air stream and typically excludes nasals, my definition is consistent with the distribution of these sounds in languages discussed below.) This sample, albeit very small, suggests the provisional observation that terminal sounds tend to belong to a large but limited set and, in the broadest terms, vowels and continuant consonants are preferred. Constraints or tendencies of this kind are well-known in number of languages such as Greek (with words usually ending in vowels, nu, rho and sigma) and Italian, dominated by vowel terminals. Indeed, a page of Middle Irish will show a majority of terminations in R, S, N, E and I.

This constraint is thus consistent with an Indo-European, or even a Celtic classification, but is likewise characteristic of non-Indo-European languages like Japanese, in which vowels and the sound /n/ predominate as terminals not only of words but of syllables.

So, at first look, the transcription of the terminal letters in Pictish Ogam texts reveals a phonetic pattern consistent with a common constraint in the world's languages, though the favourable comparisons are so widespread that they can have no bearing on the category or affinity of Pictish. Likewise, the existence limits to the sounds in the terminals cannot be used to determine morphological typology, as the proposed constraint would be as valid for an inflected language such as Greek, Latin and Old Irish as for an agglutinative one like Japanese.

LESS CERTAIN TERMINALS

While the more doubtful terminals cannot serve as evidence as well as the clearly marked ones, they likewise show a preference for continuants, though less consistently. The examples with uncertain terminals are:

1. BAC MHIC CONNAIN (NORTH UIST) (knife handle): Read in one direction, seemingly terminates in T, although an additional A was perceived by Macalister (1940). Read the opposite direction, it terminates in an unknown letter at the broken end of the handle.
2. BIRSAY I: Possibly terminates in R (part of RR).
3. BIRSAY II: Has a possible word-divider following I.
4. BRESSAY (line 1): The line terminates in N.
5. FORDOUN: Terminates in N or T depending on the direction of reading.
6. FORMASTON: Terminates in R (part of RR) or, if the following mark is a letter, it is an H (preferred by Forsyth 1996). Line 1 terminates in V (part of VV). This line is blocked by the carving above it, and thus may not be a true word-termination.
7. GOLSPIE: Terminates either in R (part of RR) or N (part of NN). Allen & Anderson (1903) interpret the last letter as the S' letter.

8. GURNESS (knife handle): The inscription on one side of the handle terminates in N or I, depending on the direction of reading, the other side in S or M. Besides the uncertainty in reading direction, there can be no way to know which side of the handle is to be read first, or whether they are two discrete inscriptions, and so we are unable to say whether a word might have been interrupted at the end of a line.
9. INCHYRA III: Terminates in C or U, depending on the direction of reading.
10. WHITENESS: The surviving line terminates in R.

Of these ten inscriptions, the tally of uncertain terminal letters for four of the inscriptions in which the letters are clear (Birsay I, Bressay line 1, Formaston and Whiteness) is:

| | |
|---|---|
| R | 2 |
| N | 1 |
| V | 1 |

This short list prefers continuants, including N and R.

The positions of the terminal letters are known in the cases of Golspie and Formaston line 2. In the case of the Formaston inscription, the terminal sound is continuant, whether or not the inscription ends RR or RRH. For Golspie, either NN or RR would be quite typical, but it is uncertain whether S' would be consistent with the governing formulation without clearer knowledge of how this sound developed. Irish manuscripts present it as a Z. If the I in Birsay II is terminal it counts as a vowel. The other alternates, A/?, C/U, I/N, M/S and N/T, are due to uncertainty in the direction of reading, but whichever direction is correct, the result would be consistent with the general tendency; continuants predominate in this set, the exceptions being C and T. It should be noted that in some cases of alternates, previous readings have preferred terminal continuants. These are Inchyra III (Stevenson 1958/59; Wainwright 1959) and Gurness (Macalister 1940). In the case

of Fordoun, the normal direction of reading for this inscription would be upward, though this direction of reading would produce the unusual, but not impossible, consonant sequences RHR and CM. Macalister chose to read this downwards: this transliteration gives a more equable distribution of vowels and consonants, as well as resulting in more continuants next to the stopped TT.

Finally, in the case of the circular Buckquoy inscription, when read in the correct direction, some suggested terminals would be M, V and the X-shaped E, any of which is consistent with the tendency.

Because a majority of the letters in the Ogam alphabet stand for continuants (13 of the 21 letters BLVSNHDTTCQMGG^wS'RAOUEI and X-shaped E), the near-rule that terminals must be continuants may arguably cast the net too wide, and the observed cases be the result of chance. However, the constraint on terminal sounds stands in contrast to the occurrence of letters representing consonantal stops in the Ogam inscriptions (leaving aside the issue of whether these 'stops' were articulated as such or not). As might well be expected, consonantal stops were abundantly available in the language, but with very few exceptions do not occur terminally. B, C, Q, T, D and their doubled forms all occur, with examples in almost every one of the inscriptions chosen for this study, as well as in the excluded inscriptions. In addition, the continuant H also occurs quite frequently, yet with one possible exception from the uncertain category, is not among the terminal sounds. The inventory of stops from the inscriptions included in this study is as follows, with single consonants distinguished from graphically doubled ones. (The X-shaped letter is excluded; it is usually transcribed as a kind of E, though in some occurrences a case can be made for a consonant, perhaps P.)

1. ACKERGILL (KEISS BAY): Two Ts.
2. ALTYRE: Jackson transcribes B, DD and QQ, but his drawing seems to have an

- additional D or two, and DD where his transcription has HH.
3. BAC MHIC CONNAIN (NORTH UIST): Depending on the direction of reading, Side 1: B (?) or T, Side 2: two Cs and Q (?), or D (?) and two Qs.
 4. BIRSAY I: There is a letter that looks like B in the drawing in Jackson (1984), but he does not transcribe it this way.
 5. BRESSAY: B, C, CC, D, two DDs, $\Theta\Theta$, QQ, T and TT. The symbol Θ represents a variant of D.
 6. BURRIAN: Two Cs, CC, T.
 7. FORDOUN: Depending on the direction of reading, C (?), Q (?) and T (?) (Jackson) or, alternately, TT (Macalister).
 8. FORMASTON: BB, CC, QQ, two Ts.
 9. GOLSPIE: two Ds and QQ (or HCHC?).
 10. GURNESS: Depending on the direction of reading, T and TT, or two Qs.
 11. INCHYRA I: T and G^w.
 12. INCHYRA II: DD, TT and possibly another T or sound from the same alphabetic class (ie C, Q, or D).
 13. INCHYRA III: Depending on the direction of reading, T or C.
 14. LUNNASTING: C, CC, T, three TTs.
 15. NEWTON: DD, Q (?).
 16. SCOONIE: DD.
 17. ST NINIANS: B and QQ.
 18. WHITENESS: D.

While the stops are clearly present in these inscriptions, in only one of the certain instances (Bressay) and three of the uncertain (Fordoun, Inchyra III and Bac Mhic Connain) do they occur terminally. The three uncertain examples depend on the direction of reading. Other letters not known to occur terminally are the continuants L and O, G^w and the X-shaped letter. Thus, stops are overwhelmingly excluded from known word or phrase terminations, while continuants would seem to have been included in all parts of the Pictish ‘word’.

The lengthy inscriptions at Bressay and Lunnasting are especially relevant to this

comparison in that word-dividers establish N, R, S and V as terminals, with one instance of C, yet ten out of the alphabetic signs (single or double) in the Bressay inscription are stops, and six in the case of Lunnasting. Also note that attention has been brought (Macalister 1940; Jackson 1955) to the similarity of the discrete sequences CERROCCS (at Lunnasting, with the X-shaped E) and CROSSC (at Bressay), both set off by a word-divider. The CS and SC alternation is reminiscent of the history of the consonant cluster in OE *acsian*, which went through two metatheses, first to NE ask, then to dialectal ‘ax’. More to the point, it has been suggested that this Pictish word is a borrowing from Latin *crux*, either referring to the monuments themselves as bearing cross designs (as indeed they do), or as purely religious references. However, if *crux* is the source of these two words, it is hard to see why the Picts, with a constraint favouring S, should use C as a terminal sound at Bressay, unless SSC is simply a graphic alternate to CCS. Nevertheless, some have pointed to the existence of the Scottish Gaelic *cròsg* as a local derivative of *crux* showing the same metathesis (Jackson 1955; MacIennan 1979).

NON-OGAM INSCRIPTIONS

The constraint on terminals in favour of continuants is also consistent with what is found in the few vernacular non-Ogam inscriptions. A list of these in known scripts is:

1. FORDOUN: Terminates in N.
2. ST VIGEANS: Terminates in S. It also contains the sequence DROSTEN, followed by a dot in the next space that might be intended as a word-divider. It is usually taken as such due to the resemblance of DROSTEN to the name Drostan, attested in Irish sources, and is included here as terminating in N.
3. BARNAKILL: Terminates in N.

The NEWTON non-Ogam inscription was last declared ‘indecipherable’ by Okasha (1985, 55),

yet it need not be considered completely illegible; it contains letter-forms which can easily stand as variants of insular Roman script. There are six lines of this text. Line 5 is shorter than the others and so its last letter could qualify as a terminal. It has the shape of a miniscule I. Line 1, also shorter than the next three lines, has what appears to be a doubled consonant (T?), presumably flanked by two vowels (Padel 1972). Thus, this short line of four letters terminates in a vowel. The other lines are too uncertain as to the letters which terminate words and will not be counted in the tally. If the last letter in Line 6 is a majuscule R, it is consistent with the view put forward here.

Of the non-Ogam inscriptions, three Ns, an S and an I are confirmed. Two more I's and another vowel are possible.

Here follows a summary, the tally of terminal letters by frequency, in texts where there only one choice of letter:

The various alternate choices from the list of

terminal letter is not precisely known, but it is a vowel.

A small number of inscriptions have been culturally linked with the Picts, and if these are accepted in the future as examples of the same language, these inscriptions seem on the whole to follow the generalization about terminal sounds. An Ogam inscription at Kirkmichael, on the Isle of Man, terminates in N. An inscribed knife handle found at Weeting in Norfolk has been classed with the Bac Mhic Connain knife (Laing & Laing 1993, 20). The inscription on one side of the handle terminates in either E or U, the other side in G or S, depending on the direction of reading. There is a possible terminal stop in this example which would not greatly affect the outcome of the survey were this inscription included. In these inscriptions, the observation on the distribution of consonantal stops non-terminally also applies. Depending on the direction of reading, the Kirkmichael inscription

| | <i>OGAM Certain</i> | <i>NON-OGAM Certain</i> | <i>OGAM Less certain</i> | <i>NON-OGAM Less certain</i> | <i>Total possible</i> |
|---------------------|-------------------------|-----------------------------|------------------------------|----------------------------------|-----------------------|
| N | 5 | 3 | 1 | | 9 |
| S | 5 | 1 | | | 6 |
| R | 2 | | 2 | | 4 |
| I | 1 | 1 | | 2 | 4 |
| E | 2 | | | | 2 |
| V | 1 | | 1 | | 2 |
| C | 1 | | | | |
| S' | 1 | | | | |
| Indeterminate vowel | | | | 1 | |

less certain terminals include three possible Ns, two possible Rs and one of all other choices. The ranking of the first two sounds is notably similar to the main tally.

Some of the inscriptions rejected from the survey as having unclear terminals have an array of alternative readings consistent with the generalization as well. For example, Auquhollie offers I, E or R as admissible terminal letters. Cunningsburgh II has either S or N. Latheron's

contains C, D and DD, or else C and Q. Again depending on the direction of reading, one side of the Weeting knife handle has C and T, or D and T, the other side D, G and T, or else C, G and T.

Finally, the Roman-letter inscription from Greenloaning is included in Macalister (1940) and Okasha (1985) but is of doubtful antiquity (K Forsyth, pers comm) There are two lines of text (whose lengths are not dependent on the stone's physical dimensions) centred on the

stone's face. The first, and possibly the second, line terminates in I. If this inscription should prove to be authentic, it presents no difficulty for the thesis of this article.

INSCRIBED AND SPOKEN TERMINALS

Scholarship has so far not resolved the issue of whether the language of the inscriptions is to be identified with the Celtic language spoken in Pictland. Yet if the inscribed language is to be identified with the spoken language, the constraint on terminal sounds must be placed beside much more extensive evidence for stops as terminals in the Celtic language of Pictland.

Place-name studies have uncovered a number of Pictish words ending in stops, eg *pett* and *lanerk* (Jackson 1955; Nicolaisen 1976; Cummins 2001). Furthermore, names that occur in the list of kings terminate in all sorts of consonants, and names such as *Talorc*, *Bargoit*, *Ciniod* and others in particular show stops. These names rarely terminate in vowels. These facts by no means rule out the language(s) of the inscriptions as Celtic. Again, recall the Middle Irish predilection for continuant endings next to the personal names in isolation such as *Cormac*, *Tigernach*, *Blathnat* and *Dedad*. Many of the inscriptional terminals may have to be understood as parts of morphological markers, attached to stems which may end in stops. The variant personal name *Talorcen* next to *Talorc*, both occurring in the lists of kings, and the name *Drust* next to the inscriptional DROSTEN (Jackson 1955; Cummins 2001), may then take on added significance as possibly preserving Pictish morphology.

OTHER 'WORDS' IN THE INSCRIPTIONS

The majority of earlier work on these inscriptions (the most notable recent example being Forsyth 1996) has isolated the sequence MAQQ (often including the variant MEQQ) either as a Pictish borrowing from the Irish inscriptional MAQQI 'son' (gen) or a Pictish cognate of the same. The sequence MAQQ occurs three times, at Altyre,

Formaston, and Latheron, with MEQQ at St Ninians, a possible MAQQ or MEQQ on the Golspie stone, and a possible MAQQ on the Bac Mhic Connain knife handle. The resemblance of line five of the non-Ogam Newton inscription to MAQQI has at times been noted as well (eg Diack 1944). The sequences ending in Q may seem problematic for the distribution of terminal sounds. But again, the observation that applies to personal names may attach to these words as well – they may be considered parts of structures with additional syllables, at least from the inscriber's point of view. Alternatively, if these are cases of borrowing, the borrowed words may violate the usual tendency.

In the Bressay inscription, MEQQ is word-initial, judged on the basis of the colon-like word-divider. If the sequences MAQQ and MEQQ are all word-initial, then the immediately preceding sounds would be terminal. When these potential terminals are tallied, S for St Ninian's, VV for Formaston (if the line to the right precedes the line to the left), T for Latheron and DD for Golspie, the results are indecisive. (The terminal S in the Bressay inscription has already been counted as part of the main sample.) If the MM in –AMMAQQ of Altyre is not a double letter, then the section preceding MAQQ terminates in M. If this analysis of these parts of the inscriptions is accepted, four of the resulting terminals (two Ss, VV and M) are continuants and two (T and DD) are stops, presenting a slight contradiction to the tendency. S and V have already been established as frequently occurring terminals.

The sequence EDDARNONN (with various spellings) has also been noted by a number of investigators as a possible name, word or phrase, and occurs in the inscriptions of Scoonie, Brodie and possibly Newton. (The PIDARNOIN found in Roman letters in the Fordoun inscription is reminiscent of this sequence as well.) In fact the transcription of the complete Scoonie text is EDDARNONN, seeming to confirm this set of letters as a unit of speech. This speech-unit terminates in N and thus conforms to the constraint.

CONCLUSION

In conclusion, it is safe to suggest that, in Pictish vernacular inscriptions, terminations of words or phrases largely belong to the class of continuants. This sample may be too small to tell more clearly which sub-classes of sounds must be more frequent, much less the reasons why, or to determine answers to related questions such as whether the ratios of terminal sounds to other sounds changed over time. The constraint on terminal sounds in the inscriptional language, perhaps Pictish, is a generalization that serves to explain the shape of words found in the present body of evidence, the distribution of letters and, by implication, sounds. However, the validity of this near-rule may well be challenged on the basis of the size of the sample, and can truly be tested only by the future discoveries of other inscriptions. Given that a new inscription appears every decade or so, or is detected by new technologies and the efforts of field investigators, there is reason for hope.

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