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Sueno's Stone: Dating

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Introduction

The purpose of the dating programme was to attach radiocarbon dates to stratigraphically discrete stages in the formation, use or abandonment of the excavated archaeological features. It is argued elsewhere in this report that there is circumstantial evidence to relate several of these features to Sueno's Stone. The obvious attraction for radiocarbon dating is that the resulting date(s) may indicate the age of the monument in this location. It will be argued (below) that such a statement would be precisely the reverse of the proper interpretation of the date and that any interpretation must be explicitly limited to the archaeological features alone. Inferences with regard to the stone can be made but they must be quoted as inferences and be accompanied by explicit constraints.

One possible date for activity at this location can, of course, be predicted from the established date of the carving which remains the only other practical dating method. From analysis of the styles of the various carved elements there is broad agreement on the date of the carvings to about the later 10th century (Stevenson 1955, 128; Henderson 1983, 258). This date is insufficiently precise to permit the interpretation of the iconography and to attribute it to a single historical figure or event who or which may have instigated the erection. The art-historical date for the carving is sufficient, however, to provide a context of criticism for any resulting radiocarbon date. It can be claimed that it is unlikely that any burnt wooden object dated to earlier than the 8th century AD could be linked to the stone. This would be because the cross is of Northumbrian type and must post-date the putative expulsion

of Columbian monks from Pictish areas in AD 717 (Smyth 1984, 75). Whether the date for the carving of the cross or any of the other motifs is synchronous with the erection of the stone at this location is of course a problem. Some attempt was made to resolve this issue during the post-excavation work of this project, but this proved inconclusive (see Coarse Fraction Sorting in the main text).

The Radiocarbon Dating Programme

The purpose of this analysis was to identify charcoal samples that could be used as radiocarbon dating sources. The selection of a sample was governed by five criteria:-

1. the sample must contain an adequate weight of charcoal;
2. there must be no contaminating non-charcoal carbon;
3. there must be no non-native species present in the assemblage;
4. the sample must come from a stratigraphically discrete deposit with well-defined context boundaries and context interpretation must be unambiguous;
5. the taphonomy of the context must not indicate the presence of non-contemporary charcoal.

Method of Identification

Identification was undertaken using a stereoscope adapted to provide magnification up to X 190. Identifications were compared to photomicrographs (Schweingruber 1978) and to the in-house reference collection.

Sample Selection

To provide an adequate chronology of the excavated activities a large number of representative date source samples were sought. The three seasons of excavation in 1990 and 1991 produced a total of 43 discrete features which contained 86 positive contexts (accumulated sediments). From the wet sieving of routine bulk samples charcoal was recovered from 48 contexts. The charcoal fragments thus recovered range size upwards from 1 cubic millimetre. As the retrieval programme included the hand sorting of both the flot and retent fractions the retrieval of charcoal must be considered very nearly total.

The soil conditions at Sueno's stone were not totally satisfactory for taphonomic rigour, being both freely drained and also with an active worm population. It was thus conceivable that some fraction of the smaller material could cross contextual boundaries. The distribution of charcoal throughout the excavated site was established from the sieving record (Table 6, Fiche [redacted]). This distribution suggests that charcoal is concentrated towards the lower levels of the soil profile. This situation may represent active worm sorting but may also indicate that recent land-use, in particular the landscaping of the locality in the last century, has not been a significant source of charcoal.

The Results of Identification

To provide a further screen on contamination, charcoal from as many samples as possible was identified to establish the range of species present (Table 7, Fiche [redacted]). The final screen on selection was applied to obviate the possibility of contamination from small fraction charcoal derived in the context by worm action. Large fragments

of charcoal were found in only five samples, all the remainder consisted of small, often rounded, fragments. Of these five contexts, two contexts: 8 and 206, infill shallow features which form part of the southern, putative post ring. These are highly truncated vestiges of features whose original forms cannot be reconstructed with any confidence. Although no source for this charcoal can be identified, the stratigraphic ambiguities do not permit the selection of the charcoal as date sources. The remaining three samples, from Contexts 30, 46 and 103, all come from deeper contexts.

Context 30, from the original selection, represents the accumulation of a charcoal rich layer after the post-pipe has become infilled. 30 is exposed at the surface of the sub-soil and appears to be truncated. The level of the surface of gravel sub-soil is about 0.2 m beneath the tops of the, now, rotten posts of the 1857 fence. It is likely that any disturbance to the soil and consequent truncation of 0030 must predate this fence by some considerable period of time.

Context 46 represents a similar context within a smaller post-hole on the south-east of the stone. The profile of the feature strongly suggests that the post was extracted, 46 representing the infilling material within the disturbed upper half of the feature. Again, there is no obvious external source for the charcoal and given its condition it is reasonable to suggest that it was derived from some activity which was in close proximity to the site and which was virtually contemporary to the formation of the sediment.

The charcoal in this case retained the bark and the minimum diameter of the original timber is estimated to be about 0.1 m. It would be unwise to correlate post-hole diameter to actual post diameter, but in this case 0.1 m does seem less than the

expected post girth. This disparity may further suggest that the date relates to the process of feature infilling rather than the date of use of the post.

Context 103 infills a less diagnostic feature. The ambiguous nature of the feature is due to the circumstances of excavation. The feature was [illegible] excavated and the drawn profile does not reflect its full extent. It appears to [illegible] order of size as many of its neighbours and its interpretation must be in doubt.

The dating of the archaeological features could thus be derived from only two sources: 30 and 46. It should be noted that both samples are represented by only three species: 30: *Ulmus* sp. (elm), *Salix* sp. (willow), 46: *Alnus glutinosa* (alder). The willow charcoal within 30 represented only about 5% of the total number of specimens. These were removed to provide a single species sample.

In summary, five contexts were chosen to supply dates. Of these, only two (30 and 46) contained sufficient, large fraction, charcoal.

The Proposed Date Sources

Feature 5, Context 30 is proposed as a source of the date for the termination of use of a large post-hole. Feature 3, Context 46 is similarly proposed as the source of a date for the termination of use of a somewhat smaller post-hole. Although the charcoal in either case cannot be unequivocally linked to the original post, there appears to be no surviving external source and the charcoal, in both cases, must be regarded as contemporary with the formation of the context.

Interpretation

The interpretation of the dates from the Sueno's Stone excavation (Table 3) must be treated with great caution. Firstly, there is no direct, stratigraphic link between the stone and all the other archaeological deposits; the association between the stone and the main features, the post settings, is only sustained by the argument that this is the best explanation of the pattern of post-holes in Group 2.

The two dates were compared using a *Students t test* with the result that it is, statistically, very highly probable that these dates do not represent the same event. Given that the older date comes from timber with a low likelihood of residuality (ie it is almost impossible for the 0.1 m diameter alder timber to survive several hundred years after felling to be incorporated in a structure with the later timber) it is reasonable to propose that the two dates represent separate and historically disparate events.

Soil Analysis

Dr S Carter

Introduction

Forty-one routine soil samples were collected during three seasons of excavation at Sueno's Stone. All except two of these samples are from the fills of features cut into the sand and gravel subsoil adjacent to the Stone. The exceptions, F206 and F207 (Feature 42), are possible buried soils in Area 8.

Analytical methods

All samples were subjected to four analyses, using soil in a field moist condition. Soil acidity (pH) was determined in a 1:2.5 soil to distilled water mixture. Loss on ignition used c 10 g oven dry soil ignited to 400°C for four hours. Determination of phosphate used a spot test for easily available phosphate (Hamond 1983). Samples were rated on a three point scale using the time taken for a blue colour to develop following the addition of the two reagents to the sample. The scale was high (0-30 seconds), medium (30-90 seconds) and low (more than 90 seconds).

Calcium carbonate content was assessed semi-quantitatively using a simple field test and the samples assigned to the classes listed in Table 8 (Fiche [redacted]) (based on Hodgson 1976, 57):

Results

A full set of results are presented in a table at the end of this report. All samples were non-calcareous so the results of the calcium carbonate test will not be discussed further.

pH: Four samples from three features have a pH value significantly above the normal range. (Table 9)

The location of these three features (illus 4) suggests that the pH has been affected by the presence of the mortared stone foundation to the iron railings that surrounded the stone; this is an obvious source of calcium. In addition to these four slightly alkaline contexts, the pH of most contexts within the former railings is higher than the maximum value of 5.6 from a context in the group of cuts to the south. This indicates a general slight raising of pH around the monument, presumably as a result of the various uses of mortar on and around the monument.

Loss on ignition: Percentage weight loss is uniformly low with no results over 5.5 %. The two highest values, 5.2 and 5.5 %, are from contexts described as rich in charcoal (Features 8 and Features 30 respectively). There are no samples rich in uncarbonised organic matter.

Phosphate: Problems were experienced with the spot phosphate analyses; in most samples, a yellow- brown stain developed after the addition of reagent B and this tended to obscure the blue colour used to determine the test rating. As a result, some samples may have been recorded as Medium that were in fact High. The yellow-brown stain is caused by acid soluble organic matter. The samples produced a range of results, with three low, 25 medium and 13 high ratings. Samples from the

southern group of post-holes gave only medium ratings so all the low and high ratings are from the northern group, around the monument (Illus 4). The distribution of low and high ratings by feature is as follows:

Low: 17, 22, 42

High: 2, 3, 4, 18, 20, 23, 32, 33, 39

Discussion

The soil at Sueno's Stone has been classified as a freely draining podzol in the Boyndie Association (Soil Survey of Scotland, Soil Map Sheet 84, 1:63360); the parent material of the Boyndie Association is fluvio-glacial sand. Published analyses of this soil give pH values between 5 and 6, very low loss on ignition in the subsoil and low to medium amounts of easily available phosphate (Glentworth 1954, 157-8). These figures are similar to the majority of the results from Sueno's Stone but they highlight a limited number of samples that diverge from the typical values.

The variation in pH appears to result from the introduction of calcium-rich mortar to the immediate surroundings of Sueno's Stone during relatively recent conservation and display related work. Relative values for pH cannot be used as a chronological indicators as the calcium may have been leached into fills long after their formation.

The pattern in the phosphate ratings is less easily explained because the source of the phosphate is not known. The contrast between the uniform medium ratings from features south of the monument and the variable results from around the monument indicates a greater complexity of activity around the monument. The available data do not indicate the nature of the activities, other than to show that organic substances (rich in phosphate) were concentrated by it.

Conclusion

The results of the routine soil analyses (Table 10) show patterns in the pH and phosphate content of the various features at Sueno's Stone. It is not possible to relate these patterns to the functions of the features. The results from the group of post-holes south of the monument are uniform and are similar to published analyses of this soil association. This suggests little human modification of these sediments and contrasts with the very variable results from features around the monument. The somewhat prosaic conclusion to be drawn from this contrast is that Sueno's Stone has been a focus of human activity.

Macroplant Analysis

S Boardman

The wet-sieving and sorting of routine bulk samples produced a small assemblage of carbonised macroplant remains (Table 11). The cereals suggest a date(s) later than the Late Bronze Age. Oats are rare prior to the Iron Age and hulled barley becomes increasingly common from the Late Bronze Age. The other remains represent common weeds of cultivation. They are all found in association with grain in Scottish deposits. Overall, they suggest nitrogen rich, often damp ground, ie soils with good agricultural potential.

Table 4 Test pit dimensions

Test Pit Number	Topsoil Depth (cm)	Comments
1	30	level surface to iron-panned gravel sub-soil;
2	160	over deepened A- horizon, charcoal; flecked throughout; sand sub-soil;
3	45	level sub-soil to gravel surface;
4	70	turbated surface to sand sub-soil, fragments of pottery and charcoal throughout; skeleton of lamb;
5	40	level surface to gravel sub-soil;
6	43	turbated sand sub-soil surface;
7	45	turbated sand sub-soil surface;

Table 5 Artefacts

Feature	Context	Description
Ceramics		
Area 6	202	rim sherd, black fabric, wheel turned, unglazed
36	226	very abraded sherd, orange fabric, glazed
Lithics		
Area 6	201	flint, weathered core fragment
42	206	flint, honey coloured, corticated flake int, honey coloured, corticated flake

Table 6 Charcoal distribution

Types of context	context totals	% of type with charcoal
Modern contexts	64	
with charcoal:	3	5%
Probable ancient features		
lower contexts from deep features:	20	
with charcoal:	11	55%
upper contexts from deep features:	11	
with charcoal:	10	90%
contexts from shallow features:	19	
with charcoal:	17	89%

Table 7 Charcoal identification

Feature	Context	Weight	Alnus	Corylus	Quercus	Salix	Ulmus
3	0046	19.0	10				
3	0005	5.2	5	2	1	2	
5	0004	2.5	4		1		
4	0067	1.0					
5	0030	27.2				1	14
15	0008	22.3	6	2	2		
17	0103	17.1	11			1	4
33	0130	5.8	4	2			4
41	0206	7.0			10		

Identified Charcoal from Sueno's Stone

Table 8 Calcium carbonate scale

Test	CaCO3 (%)	Description
0	0.1	Non-calcareous
1	0.1-1	Non to very slightly calcareous
2	1-5	Slightly calcareous
3	5-10	Calcareous
4	10+	Very calcareous

Table 9 High soil acidity values

Context	Feature	pH
0141	32	7.1
0144	23	7.2
0146	32	7.3
0214	29	7.3

Table 10 Routine soil analysis results

Feature	Context	pH	LOI (%)	Phosphate
2	35	6.2	1.6	H
3	46	5.4	1.5	H
4	47	5.9	2.2	H
4	52	5.8	2.2	H
5	30	4.7	5.5	M
5	33	4.7	3.0	M
11	12	5.3	1.9	M
12	11	5.3	2.0	M
14	9	5.3	2.7	M
15	8.1	5.2	3.1	M
15	8.2	5.3	5.2	M
15	8.3	5.4	4.7	M
17	103	5.6	5.0	L
18	225	5.7	2.8	H
19	247	6.2	2.7	M
20	248	5.9	2.4	H
20	264	5.7	2.7	M
20	265	6.4	2.9	H
20	266	5.7	1.7	H
21	249	5.8	2.7	M
22	255	5.2	3.0	L
23	144	7.2	1.8	H
24	217	5.4	4.1	M
25	211	5.6	3.1	M
26	212	5.4	3.2	M
27	219	5.4	2.7	M
28	213	5.2	3.4	M

Feature	Context	pH	LOI(%)	Phosphate
29	214	7.3	2.9	M
30	220	5.3	4.0	M
31	228	5.5	3.9	M
32	141	7.1	1.8	H
32	146	7.3	1.0	H
33	128	5.0	2.2	H
33	130	5.0	2.1	H
33	132	4.7	4.0	H
35	124	5.0	2.9	M
36	226	5.6	2.7	M
39	123	4.9	2.2	M
39	129	4.9	3.9	H
42	206	5.4	1.6	M
42	207	5.6	1.3	L

Table 11 Identification of macroplant remains

Feature	Context	Description
5	45	*Avena* sp. (indet. oat) x 1 fragment
3	46	*Polygonum aviculare* agg. (knotgrass) x 1 *P. persicaria* L/*lapathifolium* L. (persicaria) x 1 *P.* cf. *persicaria* L. (possible persicaria) x 1 *Chenopodium album* type (fat hen) x 5 *Chenopodium/Atriplex* (goosefoot/ orache) x 1
3	50	*Chenopodium album* type x 1 *C.* cf. *album* type x 4 *Chenopodium/Atriplex* x 1
4	67	*Hordeum vulgare* L. (hulled six row barley) x 1 Indet. seed x 1

Table 12 History of illustration of the stone

Artist	Date	Description
Pont	1590?	map of Moray
Cordiner	1788	fanciful version of now eroded panels
Daniell, W	1818	seaward view showing Stone on low mound
Daniell, J	1819	drawing of the 'obelisk'
(anon)	pre1826	watercolour of leaning stone
Stewart	1832	large-scale drawing of the carved panels
(anon)	1835	boundary map of Forres
Grant	1826	pillar at Forres, engraving
Skene	1876	accurate drawing of carved faces with details (NMS Library)
(anon)	1878	photograph (DC 13944/P/CO)
Washington-Wilson	1870	photograph
	1890	photograph with metal railings
Allen	1903	photograph of panels in *Early Christian Monuments of Scotland* (Allen & Anderson 1903, Fig. 156)
(anon)	1926	photograph of excavation
(anon)	1957	IAM photograph without railings