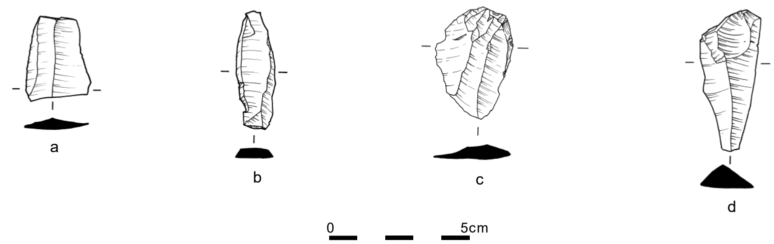
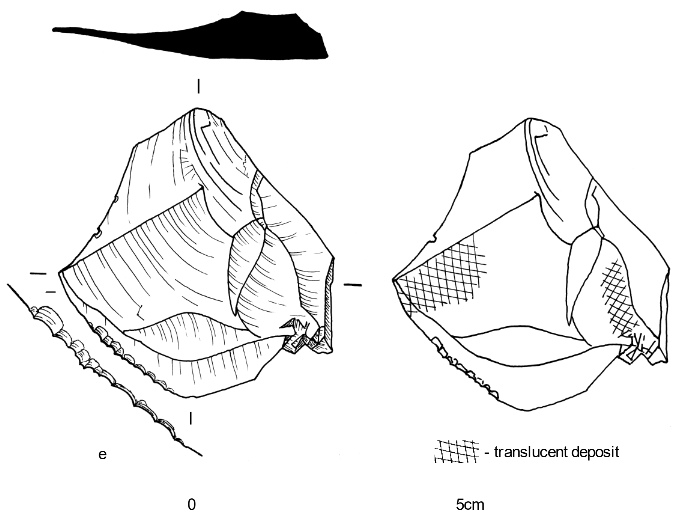
BARDSEY ISLAND / YNYS ENLLI, GWYNEDD

NPRN 422858: Henllwyn Mesolithic Finds
NPRN 424528: Archaeological Deposits at Henllwyn Eroding Coastal Isthmus.





Report on the lithic finds from Bardsey Island.

Ian Dennis, 2019

CHERISH
Newid Hinsawdd a Threftadaeth yr Arfordir
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Classifications have been adopted from previous lithic studies (Andrefsky 2006, Butler 2005, and Clark, 1960).

The flint assemblage recovered from excavations at Bardsey Island in April 2003 and May 2018 is small, comprising of a total of 5 worked flints. This includes a flint from the excavations in 2003 at Bardsey Hen. This flint was recovered from context 107, below burnt bone deposit 2 (context 113), lying directly on the top of the natural (context 108). This suggests that the flint is lying on an old buried land surface and is not associated with burnt bone deposit 2. Examination of the flint revealed fine worn down serrates on one edge (fig. 1e). This flint can therefore be classified as a microdenticulate flake. This flint tool type is usually associated with Mesolithic activity, although similar types can be found in early and late Neolithic contexts (Butler 2006, p109-111 & 130-131). A translucent deposit was also observed on the dorsal surface of this microdenticulate tool. A discussion of the analysis of this deposit appears below.

During a field survey of the coast (20-22nd May 2018), a further four flints were recovered eroding out of the coastal section on the north-western side of Henllwyn Bay (fig 1. a-d). These are described below.

a. Flint bladelet snapped at both ends (14mm x 11.88mm)
b. Small point with proximal end retouch and the point missing. (21mm x 6.88mm). This point does not appear to be flint or chert, it may be another locally sourced highly siliceous mineral.
c. Utilised flint flake, with wear and usage visible on all edges (39.89mm x 28mm).
d. Broken flint point, possibly from the end of a blade, with signs of utilisation (25mm x 10.5mm).

The small size of the worked flint assemblage is characteristic of Wales and other regions where only small quantities of natural flint occur (usually pebble flint deposited by glacial flow or rivers). It is likely that the majority of the worked flint derives from local pebble flint. The lithics from this assemblage are consistent with Mesolithic flint industries (Butler 2005), suggesting Mesolithic occupation and activity in the area.

SEM Analysis of the silica translucent deposit on the microdenticulate. Ian Dennis and Jerrod Seifert

There are two locations on the denticulate where a translucent surface deposit is visible (Fig 1, 5b). Scanning electron microscopy was used to image and determine composition. The deposit appears in two areas. Both areas were analysed to ensure the deposits were of equal composition. Areas immediately adjacent to these deposits were also examined, in order to confirm distinct compositional differences between the flint and the deposits. Six total scans were conducted, three in each area.

Results from the analysis (fig 2. and tables fig 3).

Imaging

The deposits are clearly visible under backscatter imaging (BSE-SEM), though fail to show using secondary electron imaging. This is indicative of a metal deposit. Under backscatter analysis, electrons are more sensitive to heavier elements and result in bright spots when imaged. Secondary electron (SE-SEM) analysis does not share this sensitivity to atomic mass; however, the method is very adept at displaying differences of material topography, which is why the occlusions within the flint can be seen, yet the surface deposits cannot.

Spectrum results

The composition of the deposits was determined using an energy-dispersive x-ray spectrometer in a scanning electron microscope (EDX-SEM).

Spectra 1 and 2 were taken from surface adjacent surface deposits in one area of the object. Both show tin (Sn), a heavy metal element, though in lower mass%. Additionally, spectrum 2 showed several other metals present in trace amounts. Spectrum 3 was taken from the flint, next to – but not on – the surface deposits. No heavy metallic elements were observed.

Spectra 4 and 6 show compositional results from the second area where surface deposits are observed. Again, both show tin, though in much larger concentrations than in spectra 1 and 2, as well as trace amounts of heavier metals. The large increase in tin directly correlates to a precipitous drop in observed silicon mass%. Spectrum 6, like spectrum 2, was taken adjacent to surface deposits and failed to show tin (though a trace of aluminium was observed).

Discussion

The SEM results clearly show the translucent deposits are of a different composition to the flint. The deposits are largely siliceous with a high tin level. Bardsey Island has a granitic geology (Matley, 1913), vegetation growing in areas of granitic geology show significant tin uptake from ground water. Plant processing has been shown to leave a siliceous deposit on flint (Anderson, 1980) and the high tin siliceous composition of the deposits are consistent with the use of the flint for plant processing in the local area.

Bibliography

Anderson, P.C.,1980, 'A Testimony of Prehistoric Tasks: Diagnostic Residues on Stone tool Working Edges', *World Archaeology,* Vol. 12, No. 2, Early Man: Some Precise Moments in the Remote Past, 181-194.

Andrefsky, Jr. W., 2006, *Lithics: Macroscopic Approaches to Analysis*. (Cambridge Manuals in Archaeology) Cambridge University Press: Cambridge.

Butler, C., 2005, *Prehistoric Flintwork.* The History Press: Stroud.

Clarke, J.G.D., 1960, 'Excavations at the Neolithic site at Mildenhall Suffolk', *Proceedings Prehistoric Society* 26, 202-245.

Matley, C.A, 1913, 'The Geology of Bardsey Island', *Quarterly Journal of the Geological Society,* 69, 514-527.

Müller, F.L, Cyster, L.F, Raitt, L.M, Aalbers, J. 2015. 'The effects oft in(Sn) additions on the growth of spinach plants' *Phyton,: International Journal of Experimental Botany*. 84: 461-465.

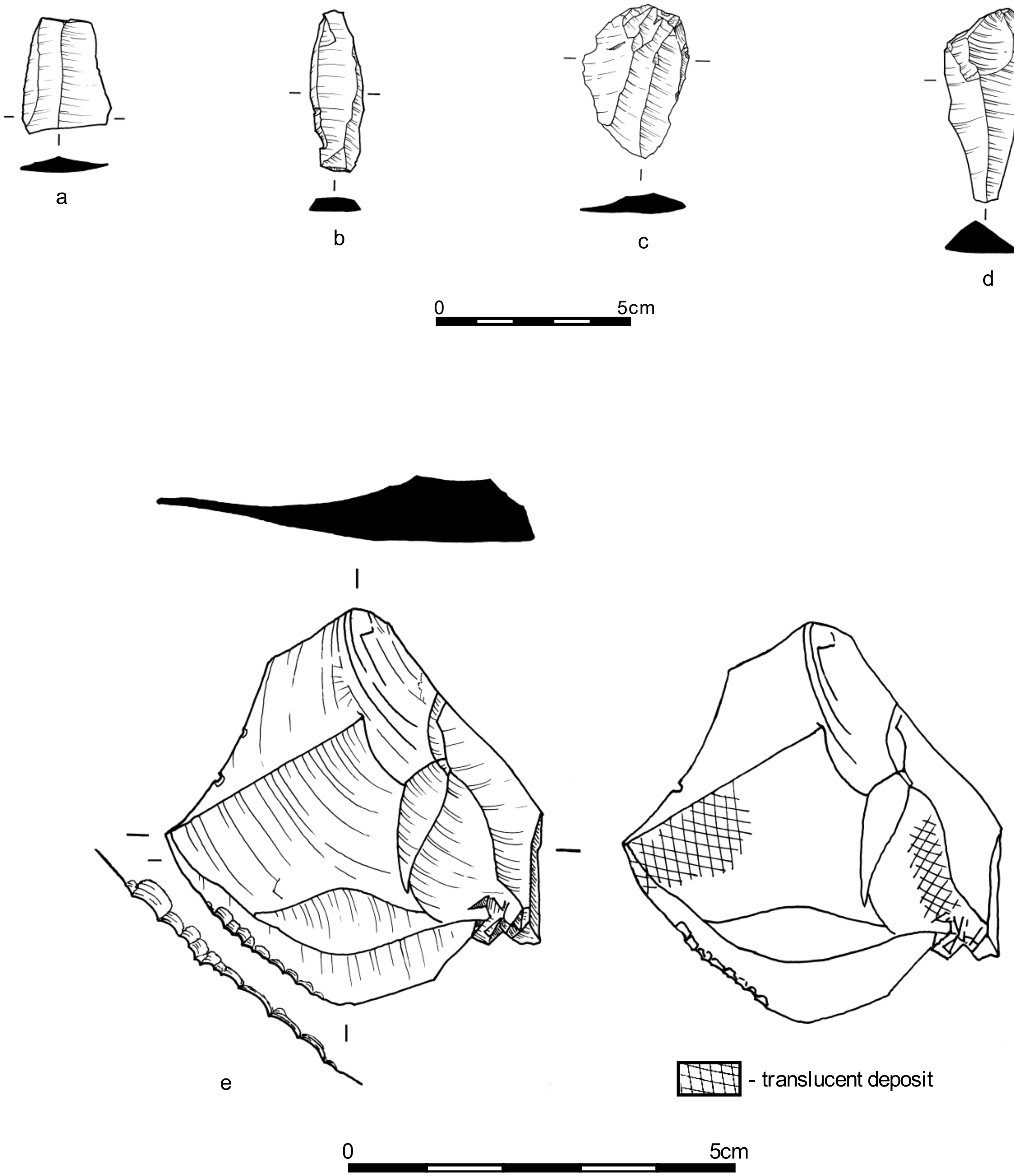

Fig.1. Lithics recovered from the Isle of Bardsey. a- Bladelet, b- Small point, c-Utilised flake, d- Broken point and e- Microdenticulate.

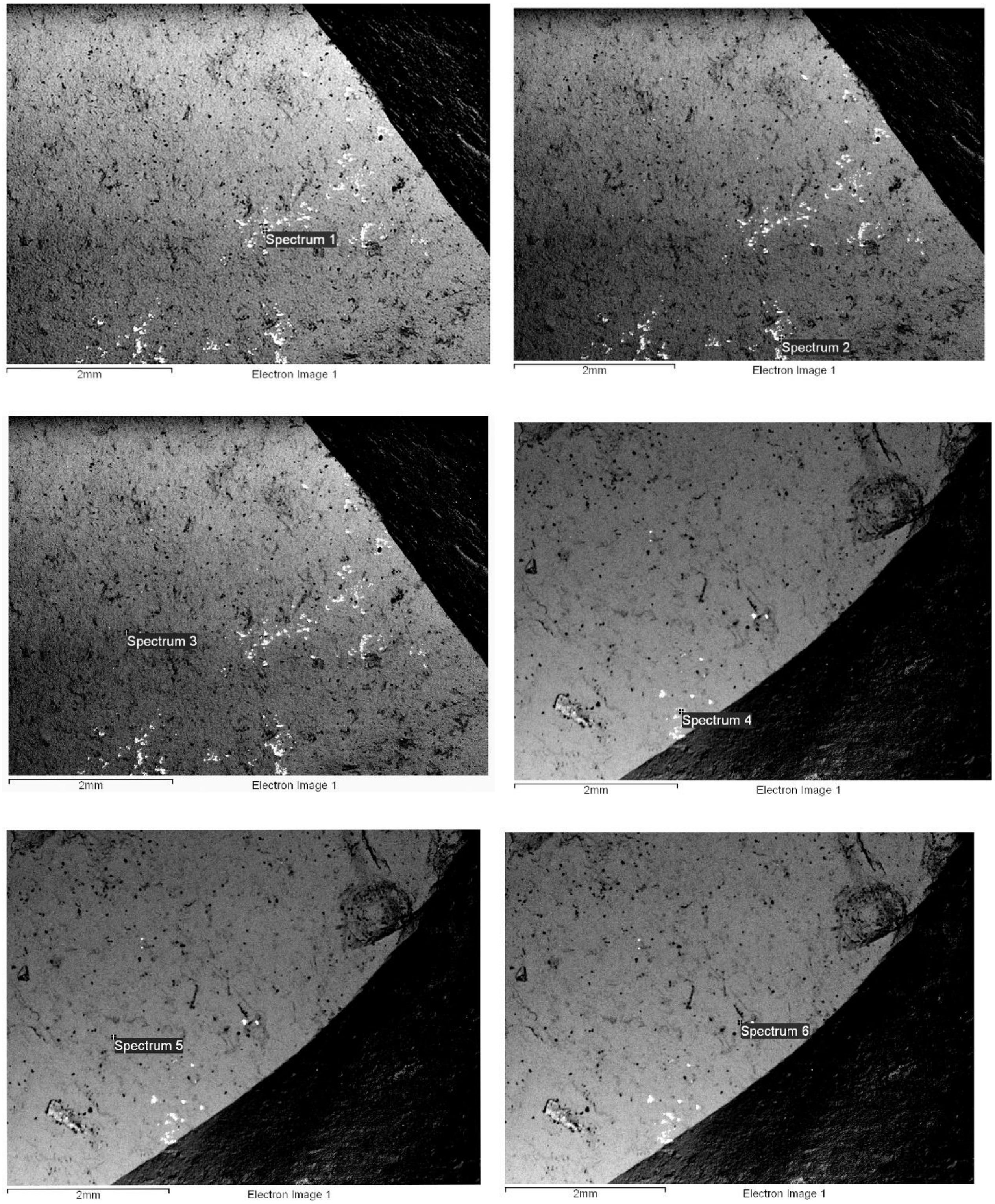

Fig. 2. Scanning electron microscopy spectrum imagery of the deposit on the flint microdenticulate.

Element	Weight%	Atomic%
C K	8.93	15.47
O K	37.17	48.34
Na K	0.49	0.45
Si K	46.63	34.55
Sn L	6.77	1.19
Totals	100	

Spectrum 1

Element	Weight%	Atomic%
C K	32.15	46.33
O K	28.29	30.6
Na K	0.89	0.67
Mg K	0.4	0.29
Al K	1.7	1.09
Si K	31.82	19.61
S K	0.23	0.12
Cl K	0.26	0.13
K K	0.75	0.33
Ca K	0.33	0.14
Ti K	0.23	0.08
Fe K	1.08	0.34
Sn L	1.86	0.27
Totals	100	

Spectrum 2

Element	Weight%	Atomic%
C K	10.89	17.65
O K	39.23	47.74
Na K	0.2	0.17
Al K	0.28	0.2
Si K	49.4	34.24
Totals	100	

Spectrum 3

Element	Weight%	Atomic%
C K	7.92	17.81
O K	28.7	48.47
Mg K	0.21	0.24
Si K	25.84	24.85
Cl K	0.26	0.2
Sn L	37.07	8.44
Totals	100	

Spectrum 4

Element	Weight%	Atomic%
C K	14.44	22.64
O K	39.37	46.36
Na K	0.2	0.17
Mg K	0.13	0.1
Al K	0.15	0.11
Si K	45.52	30.53
Cl K	0.18	0.1
Totals	100	

Spectrum 5

Element	Weight%	Atomic%
C K	2.31	12.34
N K	0	0
O K	7.01	28.05
Na K	0.35	0.97
Mg K	0.73	1.92
Al K	0.28	0.65
Si K	3.45	7.86
Ca K	1.71	2.74
Ag L	1.48	0.88
Sn L	82.68	44.6
Totals	100	

Spectrum 6

Fig. 3. Scanning electron microscopy spectrum tables.