APPENDIX A FEATURE INDICES FOR INVESTIGATIONS 3, 4, 7, 9, 11

PART 1: INVESTIGATION 3

AREA 1 (TRENCH 4)

Feature No	Identity	Contexts	Dimensions (m)	Dating evidence or finds
1004	Pit	1001, 1002, 1003	L1.23 x W1.05 x D0.74	Flint (some burnt), Grooved Ware: Late Neolithic
1005	Pit	1006, 1007, 1008	L1.14 x W1.14 x D0.77	
1009	Pit	1022, 1023	L1.18 x W0.85 x D0.39	Flint (some burnt), Grooved Ware: Late Neolithic
1010	Pit	1024, 1025	L1.14 x W1.14 x D0.35	Flint, Grooved Ware: Late Neolithic
1011	Pit	1026, 1027, 1028	L1.03 x W1.03 x D0.55	Flint (some burnt), Grooved Ware: Late Neolithic
1012	Pit	1020, 1021	L0.81 x W0.81 x D0.49	Flint, Grooved Ware: Late Neolithic
1013	Pit	1201	L0.40 x W0.33 x D0.17	Flint, Grooved Ware: Late Neolithic
1014	Pit?	-	-	
1015	Pit	1206, 1207	L0.67 x W0.67 x D0.49	Grooved Ware: Late Neolithic
1016	Pit	1203, 1204	L0.75 x W0.75 x D0.40	Grooved Ware: Late Neolithic
1017	Pit	1202, 1205	L1.38 x W1.18 x D0.70	Flint, Grooved Ware: Late Neolithic
1018	Pit	1045, 1046	L1.26 x W1.08 x D0.20	Leaf point: Neolithic?
1019	Pit?	-	-	
1029	Pit	1040	L0.81 x W0.81 x D0.22	
1030	Pit	1037, 1038, 1039	L0.74 x W0.45 x D0.12	
1031	Pit?	-	-	
1033	Pit?	-	-	
1034	Pit?	-	-	
1035	Pit?	-	-	
1036	-	-	-	
1041	Pit	1042	L1.06 x W0.80 x D0.08	
1043	Pit	-	-	
1047	Pit	-	-	
1049	Pit?	-	-	
1050	Pit	-	-	
1051	Pit	1208, 1209	L2.77 x W1.34 x D0.22	
1052	Pit	-	-	
1054	Pit	-	-	Grooved Ware: Late Neolithic
1055	Pit	-	-	
1056	Pit	-	-	
1057	Pit	1058, 1059, 1060	L0.75 x W0.75 x D0.34	
1061	Hearth?	1062	L1.39 x W0.82	
1063	Pit	1064, 1065	L0.93 x W0.93 x D0.23	Peterborough Ware: Late Neolithic
1066	Pit	1067, 1116	L0.91 x W0.91 x D0.30	
1069	Pit	1068	L0.50 x W0.45 x D0.32	Leaf butted arrowhead, Grimston Ware: Neolithic
1070	Hearth?	-	-	
1074	Pit	1072, 1073	L0.17 x W0.17	End scraper, Grooved Ware: Late Neolithic
1076	Pit	1075	L0.52 x W0.49	Flint, Grimston and Grooved Ware: Late Neolithic
1078	Pit	1077	L0.50 x W0.44	

Feature No	Identity	Contexts	Dimensions (m)	Dating evidence or finds
1079	Pit	1080	L0.44 x W0.30 x D0.14	
1081	Hearth?	1082	L2.08 x W0.98 x D 0.21	
1084	Pit	1083	L0.45 x W0.45 x D0.21	
1085	Hearth?	-	-	
1086	Pit?	-	-	
1087	Pit	-	-	
1088	Pit	-	-	
1089	Pit	-	-	
1090	Hearth/ slot?	-	-	Grooved Ware: Late Neolithic
1091	Pit	-	-	
1092	Pit	-	-	
1093	Pit	-	-	
1094	Pit?	-	-	
1095	Hearth?	-	-	
1096	Pit	-	-	Grooved Ware: Late Neolithic
1097	Pit	-	-	Grooved Ware: Late Neolithic
1098	Pit	-	-	
1099	Pit	-	-	Grooved Ware: Late Neolithic
1100	Hearth?	-	-	
1101	Pit	-	-	Grooved Ware: Late Neolithic
1102	Hearth?	-	-	
1103	Pit	-	-	
1104	Pit	-	-	
1105	Pit	-	-	Grooved Ware: Late Neolithic
1106	Pit	-	-	
1107	Pit	-	-	
1108	Pit	-	-	
1109	Pit	-	-	
1110	Burrow	-	-	
1111	Pit	-	-	
1112	Pit	-	-	
1113	Pit	-	-	Grooved Ware: Late Neolithic
1114	Pit	-	-	Grooved Ware: Late Neolithic
1115	Hearth?	-	-	
1210	Pit	1211, 1212, 1213	L0.47 x W0.47 x D0.27	Flint
1214	Pit	1215	L1.14 x W0.56 x D0.22	
1216	Pit	1217, 1218, 1219	L1.18 x W1.18 x D0.44	Flint (inc burnt), Grooved Ware: Late Neolithic
1301	Pit	1032	L1.76 x W0.98 x D0.40	Neolithic?
1303	Pit	1302	L0.51 x W0.51 x D0.27	
1305	Pit	1304	L1.50 x W1.00 x D0.50	
1307	Pit	1306	L1.19 x W1.19 x D0.40	Flint, Peterborough Ware: Late Neolithic
1309	Pit	1308	L1.42 x W1.04 x D0.20	Flint, Grooved Ware: Late Neolithic
1311	Pit	1310	L0.27 x W0.27 x D0.10	Grooved Ware: Late Neolithic

Feature No	Identity	Contexts	Dimensions (m)	Dating evidence or finds
1313	Pit	1312	L0.67 x W0.59	Flint (chert saw), Peterborough Ware: Late Neolithic
1315	Pit	1314	L1.51 x W0.85 x D0.17	
1317	Pit	-	-	
1319	Pit	1318	L0.53 x W0.53	
1321	Pit	1320	L1.07 x W0.79 x D0.37	Flint, Peterborough and Grooved: Late Neolithic
1323	Pit	1322	L0.45 x W0.45 x D0.06	

AREA 2

Feature No	Identity	Contexts	Dimensions (m)	Dating evidence, finds
2001	Pit?		L0.70 x W0.45 x D0.17	
2002	Pit?		L0.75 x W0.75 x D0.60	
2003	Spread		L0.30 x w0.30	Flint spall

PART 2 INVESTIGATION 4

(TRENCH 5)

Feature No	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
5001	Pit	5002	L0.76 x W0.76 x D0.12	U-shaped	
5004	Pit	5005, 5006	L0.96 x W0.89 x D0.28	U-shaped	Flint: prehistoric
5007	Ditch	-	-	-	
5009	Pit?	-	-	-	
5011	Scoop	5012	L0.57 x W0.47 x D0.07	U-shaped	
5013	Scoop	5014	L0.42 x W0.40 x D0.09	U-shaped	Flint, Peterborough Ware: Late Neolithic
5015	Pit	5016, 5017	L0.84 x W0.58 x D0.40	U-shaped	
5018	Pit	5010, 5020	L0.77 x W0.87 x D0.29	U-shaped	
5021	Pit	5022	L1.78 x W0.55 x D0.17	U-shaped	
5024	Pit	5023	L0.92 x W0.78 x D0.17	U-shaped	
5025	Pit	5033	L0.66 x W0.53 x D0.28	U-shaped	
5026	Pit	-	-	-	
5028	Scoop	5031	L0.56 x W0.53 x D0.05	U-shaped	
5029	Pit	5032	L0.57 x W0.61 x D0.13	U-shaped	
5035	Pit	5036	L1.30 x W0.52 x D0.11	U-shaped	Flint: Neolithic-Bronze Age
5037	Veg. pit	-	-	-	
5039	Veg. pit	-	-	-	
	Spread	5003	L0.95 xW0.50		
	Spread	5034	L0.81 x W0.26		

PART 3 INVESTIGATION 7

(TRENCH 7)

Feature No	Structure No	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
7002	12	Pit	7001	L1.23 x W0.50 x D0.19	U-shaped	
7003	12	Pit	7038	L0.77 x W0.50 x D0.13	U-shaped	

Feature No	Structure No	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
7004	12	Pit	7039	Diameter 0.64	-	
7005	12	Pit	7120	Diameter 0.56	-	
7006	12	Pit	7121	Diameter 0.76	-	
7007	12	Pit	7122	Diameter 0.69	-	
7008	12	Pit	7051, 7052	Diameter 0.64 x D0.27	U-shaped	
7009	12	Pit	7054	L1.34 x W0.95	-	
7010	12	Pit	7056	Diameter 1.09 x D0.49	-	
7011	12	Pit	7123	Diameter 0.44	-	
7012	12	Pit	7124	Diameter 0.49	-	
7013	12	Pit	7125	Diameter 0.41	-	
7014	12	Pit	7063, 7064	Diameter 1.22 x D0.71	U-shaped	
7015	12	Pit	7065	Diameter 0.82 x D0.41	-	
7016	12	Pit	7066	Diameter 0.80 x D0.41	-	
7017	12	Pit	7126	Diameter 0.94	-	
7018	12	Pit	7127	Diameter 0.88	-	
7019	12	Pit	7128	Diameter 0.83	-	
7020	12	Pit	7037	Diameter 1.08 x D0.33	U-shaped	
7021	12	Pit	7043, 7044, 7045	Diameter 0.98 x D0.48	U-shaped	
7022	12	Pit	7046, 7047	Diameter 0.90 x D0.57	U-shaped	
7023	12	Pit	7113, 7114, 7115	Diameter 1.18 x D0.46	U-shaped	
7024	12	Pit	7116, 7117	Diameter 0.78 x D0.48	U-shaped	
7025	12	Pit	7109, 7110	Diameter 0.80 x D0.38	U-shaped	
7026	12	Pit	7118	Diameter 1.05	-	
7027	12	Pit	7048	Diameter 0.76 x D0.32	U-shaped	
7028	12	Pit	7053, 7055	Diameter 0.75 x D0.30	U-shaped	
7029	12	Pit	7062	Diameter 0.69	U-shaped	
7030	12	Pit	7071	Diameter 0.89 x D0.24	U-shaped	
7031	12	Pit	7072, 7073	Diameter 0.84 x D0.31	U-shaped	
7032	12	Pit	7074, 7075	Diameter 0.96 x D0.35	U-shaped	
7033	12	Pit	7076, 7077	Diameter 0.77 x D0.24	U-shaped	
7034	12	Pit	7060, 7061	Diameter 0.95 x D0.29	U-shaped	
7035	12	Pit	7059	Diameter 1.05 x D0.29	U-shaped	
7036	12	Pit	7057, 7058	Diameter 0.99 x D0.28	U-shaped	
7050	12	Pit	7049	Diameter 0.68	-	
7067		Pit	7068	Diameter 1.34 x D0.27	U-shaped	
7069		Pit	7070	Diameter 0.35	-	
7079		Pit	7080, 7081, 7082, 7083	Diameter 0.47 x D0.61	V-shaped	
7085		Pit	7097	Diameter 0.43	-	
7086		Pit	7098	Diameter 0.73	-	
7087		Pit	7099	L2.13 x W1.64	-	
7090		Pit	7101	Diameter 0.59	-	
7092		Pit	7104	Diameter 1.19	-	
7093		Pit	7105	Diameter 1.11 x D0.44	Square	

Feature No	Structure No	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
7095		Pit	7111, 7112	Diameter 1.09 x D0.44	U-shaped	

PART 4 INVESTIGATION 9

INTERVENTION 1(E)

Feature	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
1	Pit	1002	L2.25 x W0.75 x D0.20	U-shaped	
2	Pit	1003	L1.85 x W0.85 x D0.40	U-shaped	
3	Scoop	1004	Diameter 0.30 x D0.07	U-shaped	
4	Pit	1005	L3.00 x W0.40 x D0.20	U-shaped	Flint, Grimston ware: Neolithic
5	Veg. pit	1006	Diameter 0.25 x D0.10	U-shaped	
6	Pit	1007	L2.25 x W1.50 x D0.55	U-shaped	Peterborough Ware, Grooved Ware, Beaker Vessel; Late Neolithic- Early Bronze Age
7	Pit	1008	Diameter 1.00 x D0.30	U-shaped	
8	Ditch	1009	W0.42 x D0.17	U-shaped	
9	Pit	1010	Diameter 1.60 x D0.34	U-shaped	Flint: prehistoric
10	Scoop	1011	L1.00 x W0.70 x D0.06	-	
11	Pit	1012	Diameter 0.45 x D0.10	U-shaped	
12	Pit	1013	Diameter 0.35 x D0.20	U-shaped	
13	Scoop	1014	L3.00 x W1.70 x D0.20	U-shaped	
14	Natural pit	1015, 1016	L1.40 x W0.70 x D0.10	U-shaped	
15	Burrow	1017	Diameter 1.30 x D0.16	-	
16	Burrow	1018	L0.90 x W0.45 x D0.07	-	
17	Pit	1019	L1.00 x W0.40 x D0.32	U-shaped	
18	Pit	1020	Diameter 0.70 x D0.10	U-shaped	
19	Pit	1021	L0.40 x W0.29 x D0.10	U-shaped	
20	Scoop	1022	L1.30 x W0.68 x D0.07	-	
21	Pit	1023	Diameter 0.35 x D0.27	U-shaped	
22	Pit	1024	L0.90 x W0.38 x D0.14	U-shaped	
23	Pit	1025	L1.00 x W0.45 x D0.13	U-shaped	
24	Burrow	1026	L0.32 x W0.16 x D0.13	U-shaped	
25	Pit	1027	Diameter 0.65 x D0.33	U-shaped	
26	Scoop	1028	L0.70 x W0.30 x D0.08	U-shaped	
27	Land drain	-	-	-	
28	Land drain	1043	W0.30 x D0.25	Square	
29	Land drain	-	-	-	
30	Land drain	-	-	-	
31	Ditch	1041	W0.57 x D0.20	U-shaped	
32	Pit	1029	Diameter 0.70 x D0.20	U-shaped	
33	Pit	1037, 1038	Diameter 1.00 x D0.20	U-shaped	
34	Scoop	1039	L2.50 x W0.25 x D0.10	-	
35	Land drain	1046	W0.30 x D0.10	U-shaped	
36	Pit	1040	Diameter 1.00 x D0.12	U-shaped	

Feature	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
37	Scoop	1047	L0.60 x W0.40 x D0.07	-	Flint: prehistoric
38	Pit	1048	L0.60 x W0.50 x D0.11	U-shaped	
39	Pit	1049	L1.90 x W1.14 x D0.10	U-shaped	Flint, (leaf-shaped arrowhead): Neolithic-Bronze Age
40	Pit	1050	L.1.10 x W0.66 x D0.22	U-shaped	Flint
41	Pit	1051	Diameter 0.42 x D0.12	U-shaped	
42	Veg. scoop	1052	L0.40 x W0.22 x D0.03	-	
43	Veg. scoop	1053	L0.85 x W0.64 x D0.06	-	
44	Sink hole	1054, 1055, 1056, 1057	Diameter 3.09 (depth unseen)	U-shaped	
45	Sink hole	1065, 1066, 1067, 1068, 1069	Diameter 2.25 (depth unseen)	U-shaped	
46	Sink hole	1059, 1060, 1061, 1062, 1064	L4.80 x W3.72 (depth unseen)	U-shaped	
47	Scoop	1074	L2.80 x W2.55 x D0.05	-	
48	Scoop	1073	Diameter 2.44 x D0.10	-	
49	Land drain	-	-	-	
50	Land drain	-	-	-	
51	Land drain	-	-	-	
52	Land drain	-	-	-	
53	Land drain	-	-	-	
54	Land drain	-	-	-	
55	Land drain	-	-	-	
56	Land drain	-	-	-	
57	Land drain	-	-	-	
58	Land drain	-	-	-	
59	Land drain	-	-	-	
60	Land drain	-	-	-	
61	Land drain	-	-	-	
62	Land drain	-	-	-	
63	Scoop	1071	L1.68 x W1.30 x X0.09	-	
64	Pit	1058	L1.11 x W0.79 x D0.20	U-shaped	
65	(Not used)				
66	Scoop	1070	L5.20 x W3.25 x D0.10	-	
67	(Not used)				
68	(Not used)				
69	Pit	1072	Diameter 1.40 x D1.10	U-shaped	
70	(Not used)				
71	(Not used)				
72	(Not used)				
73	Burrow	1077	L2.50 x W0.50 x D0.12	-	
74	Pit	1076	Diameter 3.60 x D0.18	U-shaped	
75	Pit	1080, 1081	L1.15 x W0.50 x D0.12	U-shaped	

Feature	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
76	Pit	1105	L1.12 x W0.80 x D0.20	U-shaped	
77	Pit	1082, 1083, 1084	L1.00 x W0.64 x D0.27	U-shaped	
78	Scoop	1106	Diameter 0.37 x D0.08	U-shaped	

INTERVENTION 1(W)

Feature	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
103	Sink hole	1124, 1156, 1157	Diameter 1.40 x D2.03	U-shaped	
104	Sink hole	1125, 1153, 1154, 1155	Diameter 1.46 x D1.02	U-shaped	
105	Sink hole	1126, 1152	Diameter 2.50 x D0.40	U-shaped	
106	Sink hole	1128	Diameter 0.60 x D0.70	U-shaped	
109	Sink hole	1129, 1158, 1159	Diameter 2.08 x D1.30	U-shaped	Flint: prehistoric
110	Land drain	1133	W0.48 x D0.21	U-shaped	
111	Land drain	1134	-	-	
112	Land drain	1135	-	-	
115	Pit	1140, 1160	Diameter 0.64 x D0.37	U-shaped	Flint, Grooved Ware (x7): Late Neolithic
116	Pit	1141	Diameter 0.32 x D0.12	U-shaped	Flint, Grooved Ware: Late Neolithic
117	Pit	1142	Diameter 0.92 x D0.37	U-shaped	Flint, Grimston Ware: Neolithic
118	Pit	1143	L0.61 X W0.46 X D0.28	U-shaped	Flint, Grooved Ware: Late Neolithic
119/165	Land drain	1144	-	-	
121	Land drain	1146	-	-	
122	Sink hole	1127	L2.74 x W1.40 x D.20	U-shaped	
123	Pit	1147, 1161	L1.40 x W1.00 x D0.30	U-shaped	
125	Scoop	1149	L1.16 x W0.50 x D0.09	-	
129	Pit	1139	L3.00 x W0.80 x D0.24	U-shaped	
130	Scoop	1162	Diameter 0.50 x D0.08	-	
131	Pit	1163	L0.70 x W0.53 x D0.19	U-shaped	Flint, Grooved Ware: Late Neolithic
132	Pit	1164	Diameter 0.40 x D0.14	U-shaped	Flint: prehistoric
133	Pit	1165	Diameter 0.40 x D0.13	U-shaped	
134	Pit	1166	Diameter 0.40 x D0.20	U-shaped	Flint scraper, Prehistoric ceramic: Late Neolithic tradition
135	Scoop	1186	L.2.00 x W1.20	-	
136	Pit	1180	Diameter 0.56 x D0.29	U-shaped	Peterborough Ware: Late Neolithic
137	Pit	1192	L1.40 x W1.13 xD0.13	U-shaped	
138	Pit	1197	L1.06 x W0.77 x D	-	
139	Pit	1194	L2.00 x W1.14 x D0.39	U-shaped	Grooved Ware: Late Neolithic
140	Pit	1196	Diameter 1.00 x D0.27	U-shaped	Flint scraper, Grooved Ware: Late Neolithic
141	Pit	1193	Diameter 0.80 x D0.30	U-shaped	Flint, stone axe, Peterborough Ware: late Neolithic
142	Pit	1195	L1.05 x W0.66 x D0.20	U-shaped	Flint scraper, Grooved Ware (x8): Late Neolithic
143	Scoop	1179	L0.50 x W0.40 x D0.08	-	Flint, Grimston Ware: Neolithic
144	Pit	1178	Diameter 0.60 x D0.17	U-shaped	

Feature	Identity	Contexts	Dimensions (m)	Profile	Dating evidence, finds
145	Pit	1177	L0.75 x W0.59 x D0.20	U-shaped	
146	Pit	1198	Diameter 0.68 x D0.18	U-shaped	
147	Pit	1199	Diameter 0.78 x D0.25	U-shaped	
148	Pit	1206, 1216	Diameter 0.90 x D0.80	U-shaped	Flint: prehistoric
149	Pit	1205	Diameter 0.84 x D0.41	U-shaped	
150	Pit	1209	Diameter 0.67 x D0.21	U-shaped	
151	Pit	1212	L4.40 x W3.12 x D0.41	U-shaped	
152	Pit	1207	Diameter 1.64 x D0.46	U-shaped	Flint: prehistoric
153	Pit	1202	Diameter 0.47 x D0.21	U-shaped	Late Neolithic pottery
154	Pit	1203	Diameter 0.44 x D0.12	U-shaped	Grooved Ware: Late Neolithic
155	Pit	1204	Diameter 0.40 x D0.14	U-shaped	Flint, Grooved Ware: Late Neolithic
156	Pit	1210	Diameter 0.60 x D0.38	U-shaped	
157	Pit	1200	Diameter 0.38 x D0.15	U-shaped	
158	Pit	1217	Diameter 0.92 x D0.24	U-shaped	Flint, Peterborough Ware: Late Neolithic
159	Pit	1176	Diameter 0.72 x D0.28	U-shaped	Flint, Late Neolithic pottery
160	Pit	1170	L1.12 x W0.83 x D0.47	U-shaped	Flint: Prehistoric
161	Pit	1218	Diameter 1.06 x D0.57	U-shaped	Flint: Prehistoric
162	Sink hole	1171, 1219, 1220	Diameter 10.00	U-shaped	Flint: Prehistoric
163	Field drain	1187	-	-	
164	Field drain	1188	-	-	
165	Field drain	1189	-	-	

PART 5 INVESTIGATION 11

(INTERVENTION 4)

Feature	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating
1		Sink hole	1000 1001 1007	L3.30 x W2.70 x (D1.00)	(U-shaped)	
2	11	Pit	1002	L2.60 x W1.80 x D0.37	U-shaped	(Roman brick)
3	11	Pit	1003	L1.94 x W1.42 x D0.22	U-shaped	
4	11	Pit	1006	L2.76 x W1.46 x D0.26	U-shaped	
5	11	Pit	1008	L2.30 x W1.43 x D0.28	U-shaped	
6		Pit	1009	Diameter2.20	n/a	
7	11	Pit	1010	L2.60 x W2.00 x D0.52	U-shaped	
8	11	Pit	1011	L2.47 x W1.40 x D0.30	U-shaped	(Torksey ware)
9		Sink hole	1012	(D2.00)	n/a	
10		Sink hole	1013 1014 1015 1016	Diameter2.70 x (D1.40)	U-shaped	
11	11	Pit	1017	L2.00 x W1.00 x D0.15	U-shaped	
12		Pit	1018	Diameter1.28 x D0.50	U-shaped	
13		Sink hole	1019 1020 1021 1022	Diameter3.74 x D1.40	U-shaped	
14	11	Pit	1023	L2.30 x W1.30 x D0.22	U-shaped	
15	11	Pit	1024	dia.1.47 x D0.20	U-shaped	

PART 6 INVESTIGATION 13 TO 16

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
NE	1		Pit	1002	L0.90 x W0.60 x D0.30	U-shaped	
NE	2		Pit	1003	L1.00 x W0.80 x D0.30	U-shaped	Bronze Age (flint)
NE	3		Pit	1004	dia.1.00 x D0.36	U-shaped	
NE	4		Pit	1005	L0.60 x W0.50 x D0.30	U-shaped	
NE	5		Pit	1006	dia.0.50 x D0.16	U-shaped	
NE	6	10	Pit	1007	L2.06 x W0.74 x D0.40	U-shaped	
NE	7	10	Pit	1008 1016	L1.76 x W0.76 x D0.52	U-shaped	
NE	8	10	Pit	1009 1017	L2.12 x W0.86 x D0.56	U-shaped	
NE	9	10	Pit	1010	L4.10 x W0.94 x D0.31	U-shaped	
NE	10	10	Pit	1011	L2.36 x W1.40 x D0.25	U-shaped	
NE	11	10	Pit	1012 1018	L2.64 x W1.52 x D0.46	U-shaped	
NE	12	10	Pit	1013 1019	L2.84 x 1.56 x D0.52	U-shaped	
NE	13	10	Pit	1014 1020	L2.26 x W1.18 x 0.44	U-shaped	
NE	14	10	Pit	1015 1021	L2.90 x W1.32 x D0.72	U-shaped	
NE	15	10	Ditch	1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1039 1040 1041 1042	L115.60 x W3.50 x D0.90	U-shaped	Neolithic (fabricator)
NE	16	10	Pit	1036 1037	L1.90 x W1.80 x 0.42	U-shaped	Grooved ware: Late Neolithic
NE	17	10	Pit	1043	L1.61 x W0.64 x D0.48	U-shaped	
NE	18	10	Pit	1044	L1.34 x W0.34 x D0.05	U-shaped	
NE	19		Pit	1045	L1.45 x W0.70 x D0.20	U-shaped	
NE	20		Ditch	1046	L24.00 x W2.00 x D0.35	U-shaped	
NE	21		Pit	1047	L1.67 x W 0.64 x D0.11	U-shaped	
NE	22		Pit	1048	L2.45 x W0.70 x D0.17	U-shaped	
NE	23		Ditch	1049 1050	L12.05 x W0.50 x D0.25	U-shaped	
NE	24		Pit	1051	dia.0.70 x D0.48	U-shaped	Modern glass
NE	25		Pit	1052	L1.64 x W0.70 x D0.14	U-shaped	
NE	26		Pit	1053	L1.60 x W0.80 x D0.17	U-shaped	
NE	27		Pit	1054	L1.16 x W0.54 x D0.15	U-shaped	
NW	28		Pit	1055	L1.57 x W1.04 x D0.30	U-shaped	
NW	29		Furrow	1056	L75.00 x W2.25 x D0.13	U-shaped	
NW	30		Scoop	1057	L1.50 x W1.10 x D0.02	U-shaped	
NW	31		Pit	1058 1061	dia.0.75 x D0.15	U-shaped	
NW	32		Pit	1059 1060	L1.40 x W0.95 x D0.20	U-shaped	
NW	33		Pit	1062	L1.62 x W1.56 x D0.22	U-shaped	
NW	34		Scoop	1034	L1.38 x W1.04 x 0.03	U-shaped	
NW	35		Scoop	1065	dia.0.85 x D0.08	U-shaped	
NW	36		Pit	1063 1066	L1.06 x W1.00 x D0.15	U-shaped	
NW	37		Pit	1067	L0.60 x W0.50 x D0.20	U-shaped	
NW	38		Pit	1068	dia.0.90 x D0.16	U-shaped	
NW	39		Pit	1069	dia.0.50 x D0.2	U-shaped	
NW	40		Pit	1070	L1.48 x W1.04 x D0.18	U-shaped	

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
NW	41		Pit	1071	L1.18 x W1.00 x D0.19	U-shaped	
NW	42		Ditch	1072	L174.00 x W1.20 x D0.25	U-shaped	
NW	43		Ditch	1073	L40.75 x W1.20 x D0.30	U-shaped	
NW	44		Ditch	1074 1077 1095 1096	L296.00 x W2.20 x D0.50	U-shaped	Medieval ceramic
NW	45		Pit	1075 1076	L1.64 x W1.52 x D0.26	U-shaped	
NW	46		Scoop	1079	L1.48 x W1.06 x D0.08	U-shaped	
NW	47		Pit	1080 1081 1082	L1.65 x W1.14 x D0.25	U-shaped	
NW	48		Pit	1083	L2.4 x W1.15 x D0.20	U-shaped	
NW	49		Pit	1084	dia.1.76 x D0.20	U-shaped	Eboracum ware: early Roman
NW	50		Veg.Pit	1085	dia.1.10 x D0.2	U-shaped	
NW	51		Veg.Scoop	1086	L1.54 x W1.40 D0.05	U-shaped	
NW	52		Scoop	1087	L0.70 x W0.50 x D0.06	U-shaped	
NW	53		Veg.Pit	1088	L1.90 x W1.38 x D0.44	U-shaped	
NW	54		Ditch	1086	L174.00 x W1.20 x D0.25	U-shaped	
NW	55		Pit	1090 1091	L1.50 x W1.10 x D0.13	U-shaped	
NW	56		Veg.Pit	1092	L3.20 x W1.70 x D0.35	U-shaped	
NW	57		Veg.Pit	1093	L1.90 x W1.44 x D0.45	Irregular	
NW	58		Pit	1094	L1.38 x W1.14 x D0.14	U-shaped	
SW	59		Pit	1097	L1.50 x W0.70 x D0.40	U-shaped	
SW	60		Scoop	1098 1099	L1.00 x W0.74 x D0.06	U-shaped	
SW	61		Pit	1100	L1.26 x W1.04 x D0.32	U-shaped	
SW	62		Pit	1101	L0.88 x W0.72 x D0.26	U-shaped	
SW	63		Pit	1102	L1.60 x W0.80 x D0.15	Stepped	
SW	64		Pit	1103	L1.00 x W0.55 x D0.22	V-shaped	
SW	65		Pit	1104 1105	L1.50 x W.05 x D0.16	U-shaped	
SW	66	4	Pit	1106 1107 1590	L1.9 x W1.7 x D0.92	U-shaped	
SW	67	4	Pit	1108 1109 1591 1592 1593 1594 1595 1596	dia.1.8 x D1.26	U-shaped	
SW	68	5	Pit	1110 1111 1455 1456 1457 1587	L1.85 x W1.78 x D1.4	Stepped	
SW	69		Pit	1112	L1.80 x W1.30 x D0.55	U-shaped	
SW	70	4	Pit	1113 1445 1446 1447 1462 1463	L1.76 x W1.68 x D1.10	U-shaped	
SW	71		Land Drain	1114	L153.00 x W0.60 x D0.16	U-shaped	
SW	72		Land Drain	1115 1116	L153.00 x W0.7 x D0.18	U-shaped	
SW	73		Pit	1117 1118	dia.1.20x D0.28	U-shaped	
SW	74		Well	1119 1120	dia.0.70		
SW	75		Veg.Pits	1167	Variable	Variable	
SW	76		Scoop	1121	dia.0.60 x D0.08	U-shaped	
SW	77	2	Pit	1122 1169	L2.54 x W1.40 x 0.40	U-shaped	(Roman amphorae, Samian, mortaria, oxidised ware)
SW	78		Scoop	1123	dia.0.60 x D0.10	U-shaped	
SW	79		Pit	1124	L1.06 x W0.46 xD0.20	U-shaped	
SW	80		Posthole	1125	dia.0.40 x D0.20	U-shaped	
SW	81		Ditch	1126	L23.00 x W0.60 x D0.25	U-shaped	

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SW	82		Ditch	1239 1240 1241 1242 1243 1244	L327.00 x W2.10 x 1.10	V-shaped	(early Roman mortaria, oxidised ware). Undiagnostic prehistoric?
SW	83		Ditch	1129	L99.00 x W0.60 x D0.25	U-shaped	
SW	84		Veg.Scoop	1127	L0.95 x W0.60 x D0.10	U-shaped	
SW	85		Pit	1128	L0.90 x W0.55 x D0.15	U-shaped	(Roman amphora, samian)
SW	86		Posthole	1130	L0.60 x W0.60 x D0.20	Stepped	
SW	87		Posthole	1131	L0.60 x W0.50 x D0.25	Stepped	
SW	88		Pit	1132	L1.40 x W0.50 x D0.25	U-shaped	
SW	89		Pit	1133	L4.02 x W1.48 x D0.55	U-shaped	(Roman amphora, samian, Eboracum ware)
SW	90	7	Pit	1134	L0.32 x W0.28 x D0.08	U-shaped	mid to Late Bronze Age?
SW	91	7	Pit	1135	dia.0.30 x D0.22	U-shaped	mid to Late Bronze Age
SW	92	7	Pit	1136 1142	dia.0.35 x D0.13	U-shaped	mid to Late Bronze Age
SW	93	7	Pit	1137	L0.50 x W0.42 x D0.11	U-shaped	mid to Late Bronze Age
SW	94	2	Pit	1138 1161	L2.75 x W1.30 x D0.45	U-shaped	(early Roman grey ware)
SW	95	2	Pit	1139 1159	L2.58 x W1.35 x D0.53	U-shaped	(Roman black burnished ware)
SW	96	7	Pit	1140	dia.0.25 x D0.15	U-shaped	mid to Late Bronze Age
SW	97	6	Pit	1141 1152 1153 1154 1155 1262 1267 1279	L2.90 x W1.80 x D0.65	U-shaped	Roman
SW	98	7	Scoop	1143	L0.35 x W0.25 x D0.05	U-shaped	mid to Late Bronze Age?
SW	99	7	Scoop	1144	L0.40 x W0.25 x D0.10	U-shaped	mid to Late Bronze Age?
SW	100	7	Scoop	1145	L0.40 x W0.25 x D0.05	U-shaped	mid to Late Bronze Age?
SW	101	6	Pit	1146 1380	L1.08 x W1.00 x D0.48	U-shaped	Roman
SW	102	6	Flue	1147 1263 1273	L0.72 x W0.45 x D0.40	-	Roman (medieval pottery)
SW	103	2	Pit	1148 1149 1158	L2.41 x W1.30 x D0.49	U-shaped	(Neolithic and Roman pottery)
SW	104		Veg.Scoop	1150 1151	L1.20 x W1.10 x D0.08	U-shaped	
SW	105	7	Scoop	1156	L0.35 x W0.28 x D0.02	U-shaped	mid to Late Bronze Age?
SW	106	7	Pit	1157 1165	dia.0.45 x D0.32	U-shaped	mid to Late Bronze Age
SW	107		Pit	1160	L0.62 x W0.44 x D0.15	U-shaped	
SW	108		Natural Scoop	1166	Variable	Variable	
SW	109	2	Pit	1162	L1.62 x W1.02 x D0.45	U-shaped	
SW	110		Pit	1163	L1.25 x W0.50 x D0.20	Irregular	
SW	111		Pit	1164	L0.80 x W0.60 x D0.10	unseen	
SW	112		natural	1168	L1.40 x W0.9 x D0.15	U-shaped	
SW	113		Veg.Pit	1170	L3.20 x W2.30 x D0.15	Variable	
SW	114		natural	1172	not recorded	not recorded	
SW	115		Veg.Pit	1173	L1.90 x W1.20 x D0.12	U-shaped	
SW	116		Ditch	1174	L25.00 x W0.20 x D0.10	U-shaped	
SW	117		Ditch	1175	L25.00 x W0.15 x D0.05	V-shaped	
SW	118		Scoop	1176	dia.0.30 x D0.07	U-shaped	
SW	119		Pit	1177 1180	L1.80 x W1.60 x D0.24	U-shaped	
SW	120		Pit	1178 1179	L1.40 x W1.04 x D0.35	U-shaped	
SW	121		Pit	1181 1182	L0.70 x W0.60 x D0.35	U-shaped	
SW	122	2	Pit	1183	L2.06 x W1.28 x D0.32	U-shaped	

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SW	123	2	Pit	1184	L2.26 x W1.24 x D0.25	U-shaped	
SW	124	2	Pit	1185	L1.94 x W0.90 x D0.40	U-shaped	
SW	125	2	Pit	1186 1187	L2.05 x W1.05 x D0.37	U-shaped	
SW	126	2	Pit	1188 1189	L2.23 x W1.15 x D0.28	U-shaped	
SW	127	2	Pit	1190 1191	L1.76 x W1.08 x D0.15	U-shaped	
SW	128	2	Pit	1192	L2.22 x W1.3 0x D0.22	U-shaped	
SW	129	2	Pit	1193 1194	L2.20 x W1.18 x D0.45	U-shaped	Neolithic Grooved ware
SW	130	2	Pit	1195 1196	L2.53 x W1.10 x D0.43	U-shaped	
SW	131	2	Pit	1197 1198	L2.52 x W1.28 x D0.40	U-shaped	
SW	132		Ditch	1199 1233 1236 1237 1238 1251 1252 1253 1254 1497 1498 1499 1500 1471 1472 1473 1474 1475 1476	L325.00 x W3.6 x D1.40	V-shaped	Late Iron Age/Roman pottery
SW	133		Ditch	1245	L109.00 x W1.3 x D0.20	U-shaped	Medieval pottery
SW	134	2	Pit	1200 1201	L2.04 x W0.98 x D0.36	U-shaped	
SW	135	2	Pit	1202 1207	L2.60 x W1.20 x D0.48	U-shaped	Late Neolithic plain ware
SW	136	2	Pit	1203 1204	L2.10 x W1.24 x D0.60	U-shaped	
SW	137	2	Pit	1205 1206	L2.52 x W1.16 x D0.58	U-shaped	
SW	138	2	Pit	1208 1209 1210	L2.30 x W1.12 x D0.50	U-shaped	
SW	139	2	Pit	1211 1212 1213	L2.65 x W1.00 x D0.48	U-shaped	
SW	140	2	Pit	1214 1215	L2.58 x W1.26 x D0.42	U-shaped	
SW	141	2	Pit	1217 1218	L2.52 x W1.06 x D0.56	U-shaped	
SW	142	2	Pit	1219 1220	L2.18 x W1.36 x D0.48	U-shaped	
SW	143	2	Pit	1221 1222 1223	L2.70 x W1.54 x D0.58	U-shaped	
SW	144	2	Pit	1224 1225	L2.93 x W1.38 x D0.58	U-shaped	
SW	145	2	Pit	1226 1227	L2.82 x W1.12 x D0.38	U-shaped	
SW	146		Ring-ditch	1228 1230 1231 1232	L11.00 x W0.40 x D0.15	U-shaped	
SW	147		Pit	1229	L1.66 x W0.90 x D0.30	U-shaped	
SW	148		Ring-ditch	1234 1235	L22.98 x W0.60 x D0.30	U-shaped	
SW	149		Ditch	1246	L44.40 x W0.70 x 0.25	U-shaped	
SW	150		Ditch	1341 1342 1343 1345 1384	L260.00 x W3.34 x 1.40	V-shaped	(post-medieval pottery - upper fill)
SW	151		Spread	-	dia.3.00 x D0.05		
SW	152		Not Used				
SW	153		same as F150				
SW	154	2	Pit	1247 1248 1249	L2.00 x W1.25 x D0.54	U-shaped	
SW	155	2	Pit	1250	L2.42 x W1.08 x D0.38	U-shaped	
SW	156	2	Pit	1255 1256 1257	L2.98 x W1.14 x D0.58	U-shaped	
SW	157	2	Pit	1264 1265 1266	L2.32 x W1.16 x D0.64	U-shaped	
SW	158	2	Pit	1259 1260 1261	L2.56 x W1.28 x D0.54	U-shaped	
SW	159	6	Wall	1258	L0.80 x W0.24 x D0.50		
SW	160	2	Pit	1268 1269	L2.62 x W1.12 x D0.46	U-shaped	
SW	161	2	Pit	1270 1271 1272	L2.61 x W1.38 x D0.58	U-shaped	
SW	162	6	Setting	1275	L0.22 x W0.15		

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SW	163	6	Setting	1276	L0.34 x W0.18		
SW	164		Pit	1277 1278	L2.05 x W1.75 x D0.40	U-shaped	(Mesolithic microlith)
SW	165	2	Pit	1280 1281 1282	L2.40 x W1.42 x D0.42	U-shaped	
SW	166	2	Pit	1284 1285 1286	L1.40 x W1.02 x D0.54	U-shaped	
SW	167	2	Pit	1291 1292	L2.05 x W1.16 x D0.52	U-shaped	
SW	168	2	Pit	1293 1294	L2.02 x W0.70 x D0.45	U-shaped	
SW	169	2	Pit	1288 1289 1290	L2.21 x W1.05 x D0.61	U-shaped	
SW	170	2	Pit	1301 1302 1303 1304	L2.72 x W1.40 x D0.70	U-shaped	
SW	171	2	Pit	1295 1296 1294	L2.26 x W1.24 x D0.84	U-shaped	
SW	172	2	Pit	1298 1299 1300	L2.40 x W1.30 x D0.34	U-shaped	(early Roman amphora)
SW	173	2	Pit	1305 1306 1307	L2.42 x W1.06 x D0.58	U-shaped	
SW	174		Ditch	1308 1309	L4.00+ x W0.50 x D0.40	U-shaped	(Roman black burnished ware)
SW	175	2	Pit	1310 1311 1312	L2.25 x W1.43 x D0.65	U-shaped	
SW	176	2	Pit	1313 1314 1315	L2.36 x W1.20 x D0.62	U-shaped	
SW	177	2	Pit	1316 1317 1318	L2.40 x W1.41 x D0.70	U-shaped	
SW	178	2	Pit	1319 1320 1321	L2.20 x W1.08 x D0.76	U-shaped	
SW	179	2	Pit	1322 1323 1324	L2.34 x W1.30 x D0.32	U-shaped	
SW	180		Pit	1325	L1.20 x.W0.86 x D0.20	U-shaped	
SW	181		Pit	1326	L1.20 x W 0.82 x D0.15	U-shaped	
SW	182		Furrow	1328	L? x W0.45 x 0.02	U-shaped	
SW	183		Furrow	1329	L? x W0.40 x 0.04	U-shaped	
SW	184		Veg.pit	1330	L1.60 x W1.00 x D0.15	U-shaped	
SW	185	2	Pit	1331 1332 1333	L2.66 x W1.24 x D0.66	U-shaped	
SW	186	2	Pit	1334 1335 1336 1337	L2.54 x W1.32 x D0.62	U-shaped	
SW	187		Scoop	1327	L1.00 x W1.00 x D0.05	Stepped	
SW	188		Furrow	1346	L178.00 x W1.35 x D0.22	U-shaped	
SW	189	2	Pit	1338 1339 1340	L2.64 x W1.50 x D0.68	U-shaped	
SW	190	2	Pit	1375 1376 1237	L2.90 x W1.50 x D0.86	U-shaped	
SW	191	2	Pit	1347 1378	L2.54 x W1.26 x D0.51	U-shaped	
SW	192	2	Pit	1349 1350 1351	L2.54 x W1.40 x D0.60	U-shaped	(early Roman mortaria)
SW	193	2	Pit	1352 1353	L2.72 x W1.72 x D0.75	U-shaped	
SW	194	2	Pit	1354 1355	L2.50 x W1.34 x D0.60	U-shaped	
SW	195	2	Pit	1356 1357 1358	L2.56 x W1.60 x D0.62	U-shaped	
SW	196	2	Pit	1359 1360	L2.82 x W1.42 x D0.56	U-shaped	
SW	197	2	Pit	1361 1362 1363	L2.58 x W1.62 x D0.61	U-shaped	
SW	198	2	Pit	1364 1365	L2.18 x W1.80 x D0.56	U-shaped	(early Roman Eboracum ware)
SW	199	2	Pit	1367 1368	L2.47 x W1.62 x D0.60	U-shaped	(Roman black burnished, grey ware)
SW	200		Pit	1369	L1.60 x W0.82 x D0.20	U-shaped	
SW	201	2	Pit	1370 1371 1372 1373 1374	L2.90 x W1.78 x D0.98	U-shaped	
SW	202	9	Well	1381 1382 1383	dia.1.90		
SW	203	4	Pit	1385 1386 1387 1437 1438 1588 1589	dia.1.88 x D1.50	V-shaped	

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SW	204	4	Pit	1388 1389 1390 1400 1402 1597 1598	dia.2.10 x D1.50	V-shaped	
SW	205	2	Pit	1391 1392	L2.72 x W1.58 x D0.81	U-shaped	(Late Iron Age/Roman grey ware)
SW	206	2	Pit	1399 1403 1404 1405 1406 1407 1408 1409 1410 1411	L2.50 x W1.50 x D1.00	U-shaped	(Roman black burnished, grey ware)
SW	207	2	Pit	1412 1413 1414 1415 1416 1417 1418	L3.25 x W1.68 x D0.94	U-shaped	
SW	208	4	Pit	1419 1420 1421 1422 1423 1424 1439	L2.20 x W1.85 x D1.58	U-shaped	
SW	209	4	Pit	1425 1426 1427 1428 1429 1599	L1.80 x W1.65 x D1.30	U-shaped	
SW	210	4	Pit	1430 1431 1432 1433 1434 1435 1601 1602 1603 1604 1605	L3.00 x W2.70 x D1.70	U-shaped	
SW	211	4	Pit	1440 1441 1442 1443 1460 1600	L3.02 x W1.64 x D1.58	U-shaped	
SW	212	5	Pit	1448 1449 1458 1459	dia.1.45 x D1.08	U-shaped	
SW	213	5	Pit	1450 1451 1452 1453 1454 1461	dia.1.90 x D2.40	Stepped	
SW	214	5	Pit	1464 1465 1466 1467 1468 1469	L1.95 x W1.84 x D1.25	U-shaped	
SW	215	5	Pit	1477 1478 1479 1480 1481	L2.25 x W2.10 x D1.80	U-shaped	
SW	216	5	Pit	1482 1483 1484 1485 1486	L2.60 x W2.40 x D1.20+	U-shaped	
SW	217	1	Pit	1488 1489 1490 1491 1496	L2.26 x W1.12 x D0.75	V-shaped	
SW	218	1	Pit	1492 1493 1494 1495	L2.65 x W1.42 x D0.90	V-shaped	
SW	219	5	Pit	1487 1501 1502 1503 1504	dia.2.40 x D1.76	U-shaped	
SW	220	8	Solution Hole	1506 1508 1515 1516 1517	L4.32 x W4.10 x D1.10	Stepped	
SW	221		Pit	1509	L0.50 x W0.45 x D0.17	U-shaped	
SW	222		Pit	1510 1511	L1.44 x W1.40 x D0.28	U-shaped	
SW	223		Veg.Pits	1512	dia.1.2 x D0.30	U-shaped	
SW	224		Solution Hole	1514 1527 1535 1536 1537	L3.82 x W3.72 x D1.20	Stepped	2 Mesolithic microliths Neolithic leaf arrowhead
SW	225		Pit	1524	L1.00 x W0.55 x D0.10	U-shaped	
SW	226	1	Pit	1518 1519 1520 1521	L2.20 x W1.30 x D0.55	V-shaped	
SW	227	1	Pit	1522 1523	L2.30 x W1.38 x D0.65	V-shaped	
SW	228	1	Pit	1525	L2.38 x W1.45 x D0.72	V-shaped	
SW	229	1	Pit	1528 1529 1530 1531	L2.35 x W1.50 x D0.75	V-shaped	
SW	230	1	Pit	1532 1533 1534	L2.72 x W1.42 x D0.81	V-shaped	
SW	231	1	Pit	1538 1539 1540	L2.45 x W1.10 x D0.60	Stepped	
SW	232	1	Pit	1541	L2.48 x W1.02 x D0.58	Stepped	

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SW	233	1	Pit	1542 1543 1544	L2.28 x W1.10 x D0.70	Stepped	
SW	234	8	Solution Hole	1545 1546 1547	dia.3.60 x D1.16	Stepped	
SW	235	1	Pit	1548 1549	L2.33 x W0.96 x D0.65	U-shaped	
SW	236	1	Pit	1550 1551	L2.06 x W0.84 x D0.52	U-shaped	
SW	237	1	Pit	1552 1553	L2.35 x W1.00 x D0.60	U-shaped	
SW	238	1	Pit	1554 1555 1556	L2.42 x W1.00 x D0.72	U-shaped	(early Roman samian)
SW	239	1	Pit	1557 1558 1559	L2.70 x W1.20 x D0.65	U-shaped	(Mesolithic microliths)
SW	240	1	Pit	1560 1561	L2.24 x W1.00 x D0.66	U-shaped	
SW	241	1	Pit	1562 1563 1564	L2.62 x W1.14 x D0.72	U-shaped	
SW	242	1	Pit	1565 1566	L2.26 x W0.84 x D0.64	U-shaped	(Mesolithic microlith)
SW	243	1	Pit	1567 1568 1569 1570	L2.90 x W1.40 x D0.95	U-shaped	
SW	244	1	Pit	1576 1577 1578 1579	L2.60 x W1.42 x D1.01	U-shaped	
SW	245	1	Pit	1580 1581 1582 1583 1584	L2.56 x W1.44 x D1.08	Irregular	
SW	246	1	Pit	1606 1607 1608	L2.12 x W0.88 x D0.56	U-shaped	
SW	247	1	Pit	1609 1610	L2.36 x W0.78 x D0.48	U-shaped	
SW	248	1	Pit	1611	L1.76 x W0.40 x D0.18	U-shaped	
SW	249	1	Pit	1612	L2.12 x W0.82 x D0.38	U-shaped	
SW	250	1	Pit	1613 1614	L2.28 x W0.76 x D0.52	U-shaped	
SW	251	1	Pit	1615 1624	L2.20 x W0.92 x D0.52	U-shaped	
SW	252	1	Pit	1616	L1.90 x W0.68 x D0.42	U-shaped	
SW	253	1	Burial	1617	L0.60 x W0.50		Iron Age (c14)
SW	254	8	Solution Hole	1618	dia.4.08	Not excavated	
SW	255	8	Solution Hole	1619	dia.3.36	Not excavated	
SW	256	1	Pit	1620	L1.86 x W0.65 x D0.38	V-shaped	
SW	257	1	Pit	1621 1622	L3.60 x W0.68 x D0.42	V-shaped	
SW	258	1	Pit	1623	L3.60 x W1.00 x D0.60	U-shaped	
SW	259	1	Pit	1625 1626 1627 1628	L2.44 x W1.40 x D0.98	V-shaped	
SW	260	1	Pit	1629 1630 1631	L2.60 x W1.30 x D0.60	V-shaped	
SW	261	1	Pit	1632 1633 1634	L2.46 x W1.20 x D0.70	V-shaped	
SW	262	1	Pit	1635 1636	L5.10 x W1.20 x D0.60	V-shaped	
SW	263	1	Pit	1637 1638	L2.10 x W1.30 x D0.86	Stepped	
SW	264	3	Ring-ditch	1644 1645	dia.17.42 x cir.54.70 x D0.60	U-shaped	Bronze Age?
SW	265	1	Pit	1639 1640	L1.8 x W1.12 x D0.62	U-shaped	
SW	266	1	Pit	1641 1648	L2.00 x W0.77 x D0.47	U-shaped	(late Iron Age/Roman pottery)
SW	267	3?	Pit	1642 1643	L1.06 x W0.83 x D0.12	U-shaped	mid to late Bronze Age
SW	268	-	natural (not a feature)	-	-	-	-
SW	269	3	Pit	1647	L0.37 x W0.30 x D0.20	U-shaped	early to middle Bronze Age
SW	270	3	Scoops	1649	dia.0.4 x D0.16	U-shaped	
SW	271	1	Pit	1650 1651	L2.80 x W1.22 x D0.67	U-shaped	

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SW	272	1	Pit	1652 1653 1654	L2.52 x W1.20 x D0.82	U-shaped	
SW	273	1	Pit	1655 1656	L2.45 x W1.25 x D0.70	U-shaped	
SW	274	1	Pit	1657 1658	L2.48 x W1.08 x D0.62	Stepped	
SW	275	1	Pit	1659 1660	L2.36 x W1.40 x D0.82	U-shaped	
SW	276	9	Well	1659 1660 1661 1663 1665	dia.0.9 x D3.75	U-shaped	Modern
SW	277	9	Well				Modern
SW	278	2	Pit	1666	L1.00 x W0.62 x D0.12	U-shaped	
SW	279	2	Pit	1667	L1.16 x W1.06 x D0.27	U-shaped	
SE	280		Ditch	1668	L9.00 x W0.90 x D0.10	U-shaped	
SE	281		Pit	1669	L0.75 x W0.50 x D0.15	U-shaped	
SE	282		Hedgeline	1670	L15.00 x W1.10 x D0.20	U-shaped	Medieval pottery
SE	283		Pit (sheep burial)	1671	L2.00 x W0.92 x D0.30	U-shaped	
SE	284		Natural scoop	1672	L1.70 x W0.78 x D0.10	U-shaped	
SE	285		Natural pit	1673	L0.60 x W0.50 x D0.13	U-shaped	
SE	286		Natural scoop	1674	L1.00 x W0.66 x D0.07	U-shaped	
SE	287		Pit	1675	L0.83 x W0.63 x D0.60	U-shaped	
SE	288		Ditch	1678	L8.00 x W1.26 x D0.20	U-shaped	
SE	289		Natural scoop	1677	L1.60 x W0.60 x D0.04	Irregular	
SE	290		Natural scoop	1698	L1.18 x W1.14 x D0.05	U-shaped	
SE	291		Natural scoop	1679	L0.92 x W0.66 x D0.10	U-shaped	
SE	292		Natural pit	1680	dia.0.65 x D0.13	U-shaped	
SE	293		Furrow	1681	L48.70 x W1.40 x 0.05	U-shaped	
SE	294		Natural pit	1682 1683	L6.59 x W3.35 x D0.28	U-shaped	
SE	295		Pit	1684 1685	L0.92 x W0.75 x D0.11	U-shaped	
SE	296		Natural scoop	1686	L1.01 x W0.54 x D0.10	U-shaped	
SE	297		Scoop	1688	L0.80 x W0.75 x D0.07	U-shaped	
SE	298		Scoop	1689	dia.0.40 x D0.03	U-shaped	
SE	299		Veg.Pit	1690	L5.56 x W3.36 x D0.40	U-shaped	
SE	300		Furrow	1691	L38.70 x W1.60 x D0.10	U-shaped	Medieval pottery
SE	301		Veg.Pit	1692	L15.40 x W2.11 x D0.25	Irregular	
SE	302		Veg.Pit	1693	L13.60 x W3.55 x D0.12	U-shaped	
SE	303		Furrow	1694	L48.70 x W1.40 x 0.05	U-shaped	Medieval pottery
SE	304		Rectilinear Ditch	1718 1719 1720 1721	L10.25 x W10.10 x D0.75	Stepped	
SE	305		Pit	1696	L1.20 x W1.12 x 0.11	U-shaped	
SE	306		Ditch	1697 1698 1699 1700 1701 1702 1703 1706 1707 1708 1709 1710 1711 1714 1715 1716 1717	L44.00 x W3.30 x D1.30	V-shaped	(early Roman, Roman mortaria, white ware, Eboracum ware)
SE	307		Rectilinear Ditch	1722 1723	L10.20 x W10.10 x D0.20	U-shaped	

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SE	308		Furrow	1712	L24.47 x W1.50 x 0.10	U-shaped	
SE	309		Veg.Pit	1713	L5.30 x W2.90 x D0.25	U-shaped	
SE	310		Veg.Pit	1724	L5.05 x W2.50 x D0.25	U-shaped	
SE	311		Hedgeline	1725	L104.20 x W1.20 x D0.22	U-shaped	Medieval/post medieval?
SE	312		Veg.Pit	1726	L1.27 x W0.66 x D0.15	U-shaped	
SE	313		Veg.Scoop	1727	dia.1.00 x D0.09	U-shaped	
SE	314		Veg.Pit	1728	L6.11 x W1.65 x D0.15	U-shaped	
SE	315		Veg.Pit	1729	L3.38 x W1.14 x D0.22	U-shaped	
SE	316		Pit (horse burial)	1730 1731 1732 1733	L2.93 x W2.65 x D0.61	U-shaped	late Iron Age (C14)
SE	317		Veg.Pit	1734 1735	L16.95 x W7.10 x D0.50	Stepped	
SE	318		Veg.Pit	1736	L2.25 x W0.70 x D0.14	Irregular	
SE	319		Furrow	1737	L86.40 x W1.10 x D0.08	U-shaped	
SE	320		Rectilinear Ditch	1757 1758	L7.48 x W6.47 x D0.42	U-shaped	
SE	321		Furrow	1739	L75.60 x W1.25 x 0.10	U-shaped	
SE	322		Pit	1740	L0.88 x W0.85 x D0.22	U-shaped	
SE	323		Hedgeline	1741	L4.00 x W0.87 x D0.25	U-shaped	
SE	324		Veg.Pit	1742	L1.16 x W0.56 x D0.13	U-shaped	
SE	325		Veg.Pit	1743	L2.22 x W0.56 x D0.13	U-shaped	
SE	326		Veg.Pit	1744	L1.40 x W1.00 x D0.21	U-shaped	
SE	327		Veg.Pit	1745	L1.31 x W0.96 x D0.18	U-shaped	
SE	328		Veg.Pit	1746	L1.40 x W0.52 x D0.16	U-shaped	
SE	329		Furrow	1747	L69.50 x W0.85 x D0.15	U-shaped	
SE	330		Veg.Pit	1748	L2.68 x W2.10 x D0.15	U-shaped	
SE	331		Veg.Pit	1749	L2.71 x W1.06 x D0.20	U-shaped	
SE	332		Veg.Pit	1750	L1.87 x W1.07 x D0.15	U-shaped	
SE	333		Veg.Pit	1751	dia.0.60 x D0.30	U-shaped	
SE	334		Veg.Pit	1752	L2.26 x W0.90 x D0.18	Irregular	
SE	335		Pit (burial)	1753 1754	L1.90 x W0.60 x D0.40	U-shaped	Iron Age (C14)
SE	336		Ditch	1755 1759	L26.48 x W1.10 x D0.30	U-shaped	Grimston?: Neolithic
SE	337		Rectilinear Ditch	1756	L7.48 x W6.45 x D0.40	U-shaped	
SE	338		Veg.Pit	1760	L1.42 x W0.72 x D0.25	U-shaped	
SE	339		Veg.Scoop	1761	L1.00 x W0.52 x D0.07	U-shaped	
SE	340		Veg.Pit	1762	L2.07 x W0.92 x D0.52	U-shaped	
SE	341		Furrow	1763	L61.00 x W0.80 x D0.15	U-shaped	
SE	342		Ditch	1764	L30.00 x W1.10 x D0.22	U-shaped	Medieval pottery
SE	343		Veg.Pit	1765	L1.36 x W0.76 x D0.36	U-shaped	
SE	344		Veg.Pit	1766	L1.51 x W0.91 x D0.15	U-shaped	
SE	345		Veg. pit	1767	dia.1.05 x D0.14	U-shaped	
SE	346		Veg.Pit	1768	L1.63 x W0.64 x 0.25	Irregular	
SE	347		Test Pit	1769	L1.00 x W1.00 x D0.22		
SE	348		Test Pit	1770	L1.00 x W1.00 x D0.27		
SE	349		Test Pit	1771	L1.00 x W1.00 x D0.25		
SE	350		Test Pit	1772	L1.00 x W1.00 x D0.34		
SE	351		Test Pit	1773	L1.00 x W1.00 x D0.56		

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SE	352		Test Pit	1774	L1.00 x W1.00 x D0.24		
SE	353		Test Pit	1775	L1.00 x W1.00 x D0.34		
SE	354		Test Pit	1776	L1.00 x W1.00 x D0.44		
SE	355		Test Pit	1777	L1.00 x W1.00 x D0.38		
SE	356		Test Pit	1778	L1.00 x W1.00 x D0.30		
SE	357		Test Pit	1779	L1.00 x W1.00 x D0.27		
SE	358		Test Pit	1780	L1.00 x W1.00 x D0.34		
SE	359		Test Pit	1781	L1.00 x W1.00 x D0.27		
SE	360		Test Pit	1782	L1.00 x W1.00 x D0.33		
SE	361		Test Pit	1783	L1.00 x W1.00 x D0.25		
SE	362		Test Pit	1784	L1.00 x W1.00 x D0.32		
SE	363		Test Pit	1785	L1.00 x W1.00 x D0.64		
SE	364		Test Pit	1786	L1.00 x W1.00 x D0.31		
SE	365		Test Pit	1787	L1.00 x W1.00 x D0.32		
SE	366		Test Pit	1788	L1.00 x W1.00 x D0.25		
SE	367		Test Pit	1789	L1.00 x W1.00 x D0.29		
SE	368		Test Pit	1790	L1.00 x W1.00 x D0.30		
SE	369		Test Pit	1791	L1.00 x W1.00 x D0.28		
SE	370		Test Pit	1792	L1.00 x W1.00 x D0.30		
SE	371		Test Pit	1793	L1.00 x W1.00 x D0.25		
SE	372		Test Pit	1794	L1.00 x W1.00 x D0.28		
SE	373		Test Pit	1795	L1.00 x W1.00 x D0.25		
SE	374		Test Pit	1796	L1.00 x W1.00 x D0.25		
SE	375		Test Pit	1797	L1.00 x W1.00 x D0.30		
SE	376		Test Pit	1798	L1.00 x W1.00 x D0.28		
SE	377		Test Pit	1799	L1.00 x W1.00 x D0.25		
SE	378		Veg.Pit	1800 1801	L2.66 x W1.30 x D0.50	U-shaped	
SE	379		Veg.Pit	1802 1803	L2.32 x W1.28 x D0.45	U-shaped	
SE	380		Ditch	1804	L35.00 x W0.80 x D0.13	U-shaped	
SE	381		Ditch	1805	L33.00 x W0.85 x D0.15	U-shaped	
SE	382		Veg.Pit	1806	L1.80 x W1.30 x D0.32	Irregular	
SE	383		Ditch	1807	L38.00 x W0.75 x D0.43	Irregular	
SE	384		Land Drain	1808	L64.00 x W0.30 x D0.30	U-shaped	
SE	385		Land Drain	1809 1810	L36.80 x W0.20 x D0.30	U-shaped	
SE	386		Veg.Pit	1814	L1.40 x W0.82 x D0.15	U-shaped	
SE	387		Veg.Pit	1815	dia.1.20 x D0.20	U-shaped	
SE	388		Furrow	1816	L25.00 x W1.40 x D0.04	U-shaped	
SE	389		Furrow	1817	L41.20 x W1.40 x D0.09	U-shaped	
SE	390		Furrow	1818	L78.80 x W1.8 x D0.12	U-shaped	
SE	391		Furrow	1819	L22.50 x W0.80 x D0.03	U-shaped	
SE	392		Furrow	1820	L10.00 x W0.52 x D0.02	U-shaped	
SE	393		Furrow	1821	L46.25 x W1.10 x D0.04	U-shaped	
SE	394		Hedgeline	1822	L84.85 x W1.00 x D0.20	U-shaped	
SE	395		Ditch	1824	L232.00 x W1.05 x D0.35	Irreguar	
SE	396		Veg.Pit	1824	dia.0.72 x D0.10	Irregular	
SE	397		Veg.Pit	1825	L1.60 x W0.72 x D0.15	U-shaped	

Intervention	Feature No.	Structure	Identity	Contexts	Dimensions (m)	Profile	Dating material
SE	398		Veg.Pit	1826	L2.00 x W1.20 x D0.25	U-shaped	
SE	399		Veg.Pit	1827	L2.70 x W1.10 x D0.30	U-shaped	
SE	400		Veg.Pit	1828	L2.30 x W1.10 x D0.20	U-shaped	
SE	401		Veg.Pit	1829	L2.50 x W1.30 x D0.25	U-shaped	
SE	402		Veg.Pit	1830	L2.50 x W1.40 x D0.25	U-shaped	
SE	403		Veg.Pit	1831	L4.10 x W1.80 x D0.20	Irregular	
SE	404		Veg.Pit	1832	L4.20 x W0.30 x 0.20	Undercut	
SE	405		Veg.Pit	1833	L4.40 x W1.20 x D0.30	U-shaped	
SE	406		Veg.Pit	1834	L0.70 x W0.50 x D0.13	U-shaped	
SE	407		Veg.Pit	1835	dia.2.80 x D0.30	Irregular	
SE	408		Posthole	1836	dia.0.25 x D0.10	U-shaped	
SE	409		Posthole	1837	L0.70 x W0.55 x D0.20	Irregular	
SE	410		Posthole	1838	L0.45 x W0.40 x D0.20	U-shaped	
SE	411		Furrow	1839	L25.60 x W1.40 x D0.15	U-shaped	
SE	412		Pit	1840 1841	dia.1.20 x D0.32	U-shaped	
SE	413		Test Pit		L2.00 x W1.00 x D0.40		
SE	414		Ditch	1843	W0.4 x D0.3	U-shaped	
SE	415						
SE	416		Hedgeline	1844	W0.4-0.9 x D 0.15	Irregular	
SE	417		Culvert	1845 1846 1849	W0.35 x D0.3	Irregular	
SE	418						
SE	419						
SE	420		Ditch	1850	W1.35 x D0.65	V-shaped	
SE	421		Culvert	1851 1852 1853	W0.9 x D0.6	U-shaped	
SE	422		Ditch	1849	W1.0 x D0.4	Irregular	
SE	423		Gully	1860	L14 x W0.4m x D0.15	U-shaped	
SE	424		Veg.pit	1861	L3.2 x W1.3 x D0.4	Irregular	
SE	425		Veg.pit	1862	dia 1.3m x D0.15m	Irregular	
SE	426		Well	1863, 1864, 1865	L2.4 x W2.1	Unseen	
SE	427		Pit?	1866	L1.5 x W1.5 x D0.2	U-shaped	

PART 7 INVESTIGATION 17 to 19

Feature No	Investigation No	Identification	Description
1	Investigation 17, 19 (Intervention 7, 8)	Mound	Oval mound (geological), orientated NE-SW
2	Investigation 17, 19 (Intervention 7, 8)	Mound	Irregular mound, orientated N-S
3	Investigation 17, 19 (Intervention 7, 8)	Mound	Irregular mound
4	Investigation 17, 19 (Intervention 7, 8)	Linear earthwork	Linear earthwork, along E edge of intervention
5	Investigation 17, 19 (Intervention 7, 8)	Linear earthwork	Linear earthwork, orientated N-S
6	Investigation 17, 19 (Intervention 7, 8)	Hollow	N-S hollow at S end of intervention

Feature No	Investigation No	Identification	Description
7	Investigation 17, 19 (Intervention 7, 8)	Hollow	Sub-circular hollow
8	Investigation 17, 19 (Intervention 7, 8)	Hollow	Circular hollow
9	Investigation 17, 19 (Intervention 7, 8)	Hollow	Circular hollow

(INTERVENTION 8)

Feature No	Identity	Contexts	Dimensions	Profile	Dating evidence
1	Channel	1001	W3.0 x D0.20	U-shaped	natural?
2	Veg.pit?	1003	W1.30 x D0.30	Irregular	
3	(Not used)	-	-	-	-
4	Sondage	1005	L2.00 x W1.00 x D0.50	-	-
5	Sondage	1008	L3.50 x W1.25 x D0.38	-	-
6	Sondage	1010, 1011, 1012	L5.20 x W1.40 x D0.65	-	-

APPENDIX B STRUCTURE INDEX

PART 1 INVESTIGATIONS 7 and 15

Structure No	Investigation No	Feature Nos	Identification	Description	Dating
1	Investigation 15 (Intervention 5SW)	217, 218, 226, 227, 228, 229, 230, 231, 232, 233, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 256, 257, 258, 259, 260, 261, 262, 263, 265, 266, 271, 272, 273, 274, 275 (253)	Pit alignment (with burial)	43 pits aligned NW-SE Burial (F253) in top of F251	Late Iron Age burial (C14)
2	Investigation 15 (Intervention 5SW)	77, 94, 95, 103, 109, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 134, 135, 136, 137, 138, 140, 141, 142, 143, 144, 145, 154, 155, 156, 157, 158, 160, 161, 165, 167, 168, 169, 170, 171, 172, 173, 175, 176, 177, 178, 179, 185, 186, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 201, 205, 206, 207, ?278, ?279	Pit alignment	65 pits aligned NW-SE	
3	Investigation 15 (Intervention 5SW)	264, 269, 270 (267?)	Ring ditch	uninterrupted circular ditch with an external diameter of 17.20m and internal diameter of 15.60m. Urned cremation burial towards centre (F269), inhumation outside ditch (F267)	Early to mid-Bronze age (cremation), Mid- to late Bronze age inhumation (C14)
4	Investigation 15 (Intervention 5SW)	66, 67, 70, 203, 204, 208, 209, 210, 211	Pit alignment	9 pits aligned NNW-SSE	
5	Investigation 15 (Intervention 5SW)	65?, 68, 212, 213, 214, 215, 216, 219	Pit alignment	7 pits aligned NNW-SSE (parallel to S4)	
6	Investigation 15 (Intervention 5SW)	97, 101, 102, 159, 162, 163	Drying oven	Drying oven, comprising stoking pit, oven, flue, oven structure and two postholes	Roman
7	Investigation 15 (Intervention 5SW)	90, 91, 92, 93, 96, 98, 99, 100, 105, 106 (148)	Cremation group	Group of cremations, possibly the remains of a small cemetery, and potentially focussed around ring ditch (F148)	Late Bronze Age (C14)
8	Investigation 15 (Intervention 5SW)	220?, 224, 234, 254, 255	Pit alignment (solution holes?)	5 large pits aligned NNE-SSW (possibly natural)	
9	Investigation 15 (Intervention 5SW)	202, 276, 277	Well	well, with wooden frame	modern (18th to 19th century)
10	Investigation 15 (Intervention 5SW)	6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18	Pit-ditch alignment	Length of pit-ditch alignment running ESE, turning northwards before ending at edge of peat. N one found to N of peat	

Structure No	Investigation No	Feature Nos	Identification	Description	Dating
11	Investigation 11 (Intervention 4)	2, 3, 4, 5, 7, 8, 11, 14, 15	Pit alignment	9 pits aligned NNE-SSW. North end of pits terminates at break of slope, where ground falls away to former lake. To S, pits disappear under Flask lane (possible related to S10)	
12	Investigation 7 (Trench 7)	7002, 7003, 7004, 7005, 7006, 7007, 7008, 7009, 7010, 7011, 7012, 7013, 7014, 7015, 7016, 7017, 7018, 7019, 7020, 7021, 7022, 7023 ,7024, 7025, 7026, 7027, 7028, 7029, 7030, 7031, 7032, 7033, 7034, 7035, 7036, 7050, 7095	Pit alignment	Alignment of pits running NE-SW, north end has slight return in northerly direction, possibly continues S towards North Henge	

APPENDIX C LITHIC REPORTS

Peter Rowe

PART 1 NOSTERFIELD 1991-1996 LITHIC REPORT

1.0 INTRODUCTION

The assemblages collected from 4 fieldwork interventions in 1991, 1994, 1995 and 1996, consists of a total of 650 lithic items (Appendix 1). A breakdown of the lithic material by intervention is presented in Table 1.

Table 1 Quantities of flint by intervention.

Year	Quantity	Notes
1991	6	
1994	2	Natural pebbles from sieving
1995	590	All but 9 examples from excavated contexts
1996	7	1 piece unstratified

The majority of the lithics come from the 1995 season of excavation and are from contexts associated with an early to late Neolithic complex of cut features principally pits. Given that the majority of the material is from the 1995 intervention this report will consider the collection as a whole and unless otherwise noted all comments relate to the 1995 collection.

2.0 RAW MATERIAL

2.1 COLOUR

The raw material is relatively homogenous in colour and with the exception of 6 red/brown items consists in the main of brown-grey-black pieces often with a range of different shades within one piece. The flint becomes opaque on finer flakes and chippings and is of a good quality with few flaws or fossils. This homogeneity is particularly apparent from context 1096, the cut of a Neolithic pit. Here 340 pieces found in a concentration towards the north end of the pit fit this range of flint colour and may be derived from the same parent source or even nodule.

At least one piece from the assemblage demonstrates re-use of a previously knapped source material. In this case a scraper demonstrates a highly ground and polished surface (Context 1072, the upper fill of a late Neolithic cut) (Figure 1). This surface could not have been applied to the artifact itself due to the pressure involved which would truncate a thin flake. The polish is not unlike that seen on flint axes of the Neolithic period and this doubled with the use of the écaille or split pebble technique to manufacture the flake suggest that a spent flint axe was knapped to produce flakes. The écaille technique is typical of industries using small pebbles as source material (Norman 1977, 4-6) or in this case re-use of a flint axe.

2.2 CORTEX

There is an extremely low incidence of any cortex on the items from the site with 516 pieces have no remaining cortex whether exterior or interior. The incidence of cortex on an item rarely covers more than 25% of its surface area (12 examples in the range 25-70% surface area cover). These examples consist of larger pieces of debitage and primary/secondary flakes. There are 6 examples of chips of pure cortex all of which come from context 1096.

Where cortex is present it is generally cream/brown in colour and thin in section. There are no examples of soft chalky cortex with the examples present having a solid matrix. The cortex present, even on the few larger items, has evidence of previous removal scars so that glacial transportation of the material cannot be ascertained as no original surfaces remain.

2.3 NATURAL PEBBLES

There are 6 very small natural pebbles from the collection (less than 20mm square). Two of these pieces are the examples from the 1994 sieving. The natural pebbles present are not suitable for knapping due to their size and quality and are present on the site as gravel erratics.

2.4 CHERT

There are 4 pieces of chert in the assemblage all of which are deliberately knapped though not further worked. The cherts all vary in character and have marked differences in colour and inclusions.

2.5 PATINA

Only 8 items from the collection have any patina development, 3 examples come from the 1991 intervention and 1 from the 1996 intervention. Of the examples from the 1995 excavation one is unstratified with two of the remaining three pieces from context 1096. No trends in patina development can therefore be discerned amongst the assemblages.

2.6 POST DEPOSITION

The material is extremely well preserved with little post depositional damage such as edge chipping, snapping or abrasion. A small number of pieces have minute amounts of surface gloss consistent with movement in a sandy/dry matrix (Harbord 1996, 20). Post depositional thermal damage is only evident on once piece, this being a pot lid (S.F. 3, Context 5014) consistent with thermal expansion from cold to warmer conditions. The pot lid refits within a corresponding crater on the surface of a flake (S.F. 2, Context 5014) which shows signs of pre-depositional burning.

3.0 TECHNOLOGY

The flint has been classified in the first instance into its basic natural or knapped form irrespective of further working, i.e. scrapers based on flake blanks are included in the statistics for flakes. Table 2 sets out the incidence of the varying forms at the site.

Table 2 Quantities of flint by natural or knapped type

Type	**Quantity per year**				**Total Quantity**	
	91	**94**	**95**	**96**	**Total**	**(%)**
Blades (inc. pieces of)	0	0	1	20	21	3.5
Debitage (irregular shattered pieces)	0	0	1	311	312	51.5
Flakes (inc pieces of)	6	0	4	255	265	43.8
Natural pieces (inc pot lids)	0	2	1	4	7	1.2
Total	6	2	7	590	605	100

No cores are present at the site. This may suggest that cores were removed to be further worked or that the method of working left little structural evidence of the parent nodule, i.e. it became completely smashed. The large amount of irregular debitage at the site may suggest this as set out below in Table 3.

Table 3 Summary of debitage

Debitage size	Quantity	Percentage
>0mm<5mm	35	11.2
>5mm<10mm	78	25.0
>10mm<15mm	88	28.2
>15mm<20mm	60	19.2
>20mm<25mm	31	10.0
>25mm<30mm	12	3.8
>30mm<35mm	5	1.6
>35mm<50mm	3	1.0
Total	**312**	**100**

The debitage was graded by taking its maximum dimension on a grid incremented in 5mm steps. The majority of the debitage falls under 25mm in maximum dimension. The general small size of the waste suggests that preliminary knapping took place elsewhere.

3.1 FLAKES AND BLADES

Flake production outnumbers blade production at the site in the ratio of 13:1. Blades are classified in this instance as parallel sided pieces with a length:breadth ratio of greater than or equal to 2:1. Other struck pieces falling below this ratio which are flat in section are characterised as flakes. The majority of the struck pieces at the site have prominent bulbs of percussion and retain a large portion of core platform indicating the use of hard hammers. Approximately 10% of the assemblage is soft hammer struck and suggests that in the main the industry was driven by the production of thick flakes prepared by direct percussion with a hard hammer.

Two core face trimming flakes were noted in the collection with the flakes removed across the face of the core at 90 degrees to the striking platform.

In one instance the écaille technique has been used to prepare a flake (Context 1072, Figure 1) with a downward direct percussion blow with a hard hammer removing the flake. The force of the blow was then carried back through the flake resting on an anvil to produce inverse ripples at its distal end.

The blades at the site range in length from 15mm to 84 mm and represent many different stages in core reduction. The blades are not particularly gracile and include thick examples of 3-5 mm. Flakes at the site have a major range in size from two conjoining pieces from the 1991 collection at 92 x 90 x 19 mm to minuscule examples of small chipped flakes which may represent platform preparation.

3.2 BURNING

Twenty eight pieces from the collection show various degrees of thermal damage by burning. There does appear to be a correlation between burnt pieces and context with the 20 burnt examples originating from just 8 contexts (1004, 3 pieces; 1022; 1026; 1027, 8 pieces; 1072; 1075, 6 pieces; 1217, 6 pieces and 5014, 2 pieces which refit). However in all cases there are at least 50% more flints unburnt along with those burnt, i.e. there are no discrete areas which would appear to contain only burnt items. It is not uncommon however for flint to remain unaltered in small hearths and fires. All but two of the contexts (1004 & 5014) producing burnt flints had other evidence of burning such as reddened stones or charcoal. Other than one example of a lightly burnt broken scraper (Context 1027) the burnt examples are all waste flakes and debitage.

3.3 WORKED PIECES

Fifty-two pieces in the assemblage have been modified into or demonstrate use as tools. The figures include pieces which have light edge damage as the integrity of the collection suggests little post deposition and excavation damage. Table 4 sets out the tool types at the site.

Table 4 Quantities of worked flints

Tool type	**1991**	**1995**	**1996**	**Total quantity**
Arrowhead	0	2	1	3
Miscellaneous retouch	1	3	0	4
Scraper	0	19	1	20
Serrated pieces	1	2	1	4
Utilised blade	0	5	0	5
Utilised flake	2	16	0	18
Total	4	47	3	52

Scrapers are the dominant tool type amongst the assemblage with 20 examples. The scrapers at the site take a variety of forms from basic trimmed edge flakes (Figure 1) to well worked teardrop shaped end and edge scrapers (Figure 2). Scrapers are generally based upon flake blanks and usually form fairly gracile example (Figure 3) although thicker more robust examples are present (Figure 4). Of the 20 scrapers all but two are made on flakes with the other two based upon suitable large blanks of debitage (Figure 5). A characteristic thumbnail scraper was collected from the 1995 excavation from an unstratified context (Figure 6).

The scraping technology at the site appears to have been well utilised with four truncated examples or pieces of broken scrapers present. One truncated example representing the distal end of the original scraper has been blunted along the broken edge to allow its reuse (Figure 7).

Retouch is used in a more ad hoc manner to create tools but this is limited amongst the assemblage and when used simply trims flakes to useful edges (Figure 8).

Retouch is used more regularly to serrate edges with examples from 1991, 1995 and 1996. One of the examples from 1995 is based upon a blade of a Borrowdale volcanic series rock and would have made an extremely robust sawing edge tool (Figure 9).

Many flakes and blades have been utilised without further working, having chipped or otherwise utilised edges. This is particularly the case on pieces with thin edges (Figure 10) and those which in general could be used for cutting and slicing functions (Figure 11).

There are three arrowheads from the assemblages, two from the 1995 excavation and one from the 1996. A small arrowhead was recovered from context 1068 (Figure 12). The arrowhead is leaf butted and forms a very precise triangular point which shares close affinities with barbed and tanged examples. A leaf shaped bifacially worked point was found in the fill of pit 1018 (Figure 13). This finely worked piece is made from a grey/white flint which is out of character with the principal brown/grey component of the assemblage. The third example of a possible projectile point (Figure 14) comes from the 1996 excavation (S.F. 1). The piece is based on a triangle of honey coloured flint with bifacial working along the edges of two sides of the triangle. The third side has been trimmed but not further thinned by bifacial working and may have been hafted as a chisel ended arrowhead. Alternately the invasiveness of the retouch on the other edges of the piece may argue that its is an unfinished leaf shaped example.

4.0 CHRONOLOGY

The flint recovered from the site came from excavated contexts dated to the Early and Late Neolithic, principally by ceramic assemblages of Grimston, Grooved and Peterborough Wares. There are no diagnostic elements amongst the lithic assemblage which would suggest a date earlier than the Neolithic period. The flaking style with hard hammer direct percussion would fit a date from the early Neolithic onwards.

The small leaf butted arrowhead from context 1068 would correlate with an early Neolithic date as is suggested by the Grimston pottery from this feature although leaf shaped projectiles can also occur in Bronze Age contexts (Green 1983, 33).

The leaf point from pit 1018 appears to be the only item of material culture from the feature. Again it is suggested that this finely worked flint would suit a date in the Neolithic period although closer affiliation with the ceramic industries cannot be tested in this case.

Chisel arrowheads have been documented in association with Grimston Ware and also later Neolithic contexts but do not appear to date any later than the first half of the second millennium B.C. (Green 1980, 113-114).

The flake from a polished stone axe (Figure 1) would again suggest a date from the early Neolithic. However as this represents the reuse of an item the piece must act as a *post quem* association. The Woodlands style pottery for the context suggests a later Neolithic date.

The use of a volcanic stone of the Borrowdale series, (often used for the manufacture of axes), for the formation of a saw (Figure 9) in association with Fengate and Grooved ware would suggest a late Neolithic date for context 1312, the fill of a pit.

The accurate dating of scraping tools is problematic given their continuity throughout prehistory and their varied uses which means variation can be as much a function of purpose as chronology (Young 1987, 57-58). The invasiveness of the retouch on the majority of items would suggest a date later than the Mesolithic although this remains to be tested. The mixture of end and end scrapers are a common component of Neolithic-Bronze Age assemblages . The thumb nail scraper from an unstratified context is a common element of Early Bronze Age assemblages (Edmonds 1995, 141) although not exclusively so.

5.0 CONCLUSIONS

The assemblage with its predominance of scraping tools suggests that domestic processing was carried out or is otherwise represented at the site. The majority of the lithics are waste flakes and chippings characteristic of secondary knapping and trimming. There are no cores suggesting that they were either removed from the site or that the knapping debris was removed from elsewhere for burial.

Arrowheads are present at the site which would traditionally suggest hunting activities. However given the nature of the deposition of the items, unused in pits, alternate interpretations such as purposeful deposition in a ritual context are plausible.

The majority of the flint appears to be fairly homogenous in raw material characteristics. Given the small size of many of the pieces and lack of cortex it is not possible to suggest whether the flint comes from a glacial origin (boulder clays/river gravels/beaches) or from a mined source.

Without exception the tools at the site are concurrent with its use in the early and late Neolithic periods.

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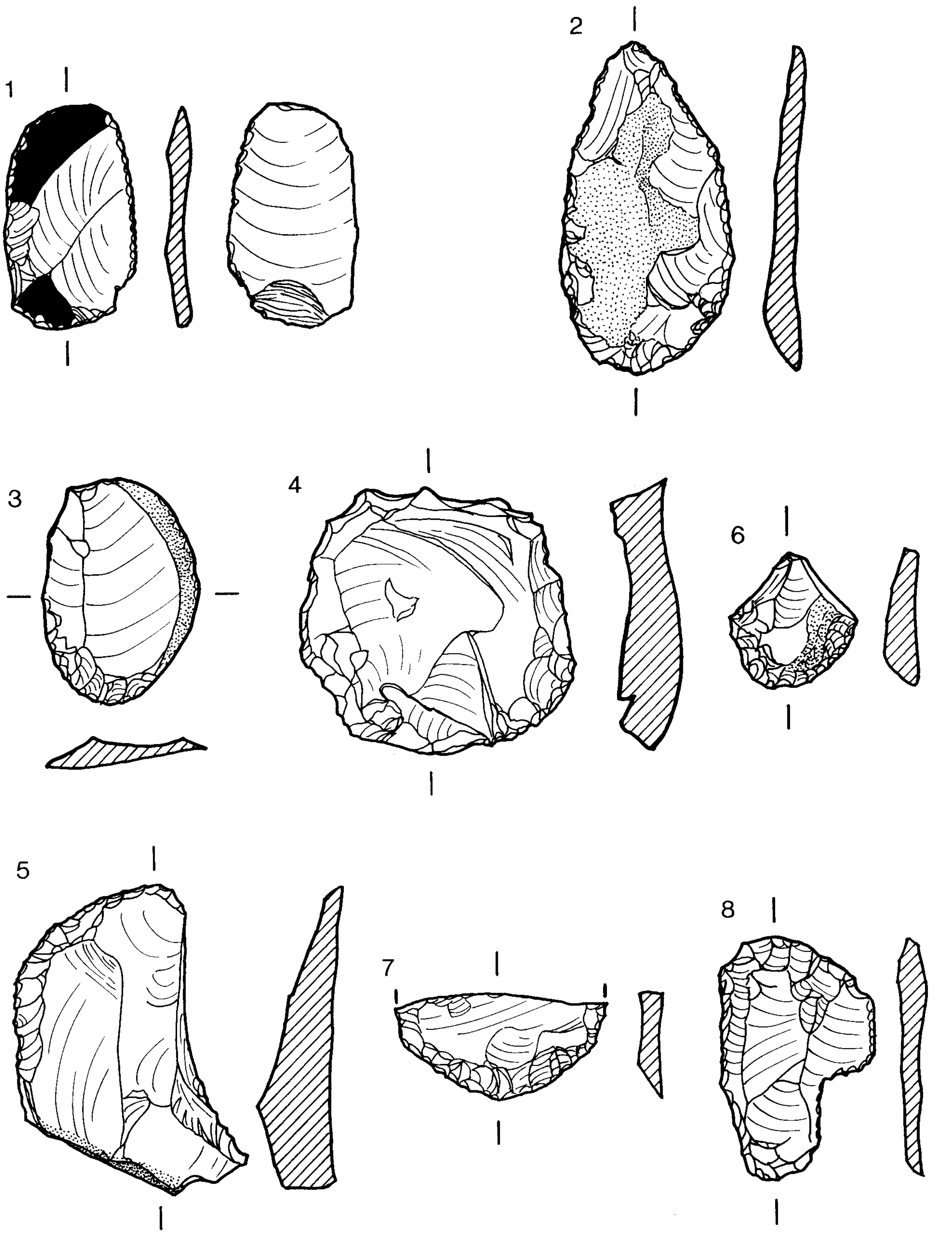
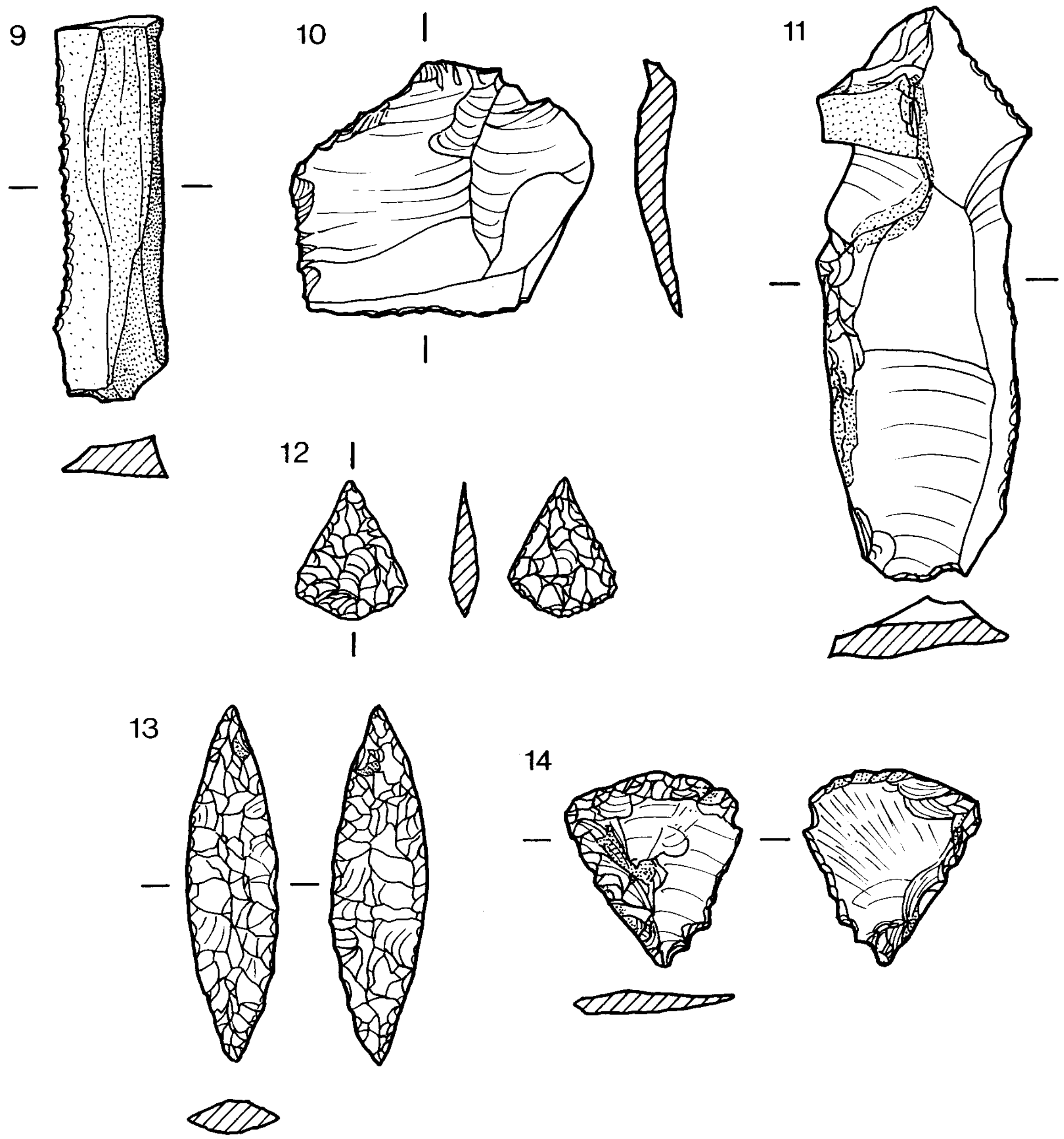


Figures 1-8 1 - edge and end scraper (C1072), 2 - edge and end scraper (C1320), 3 - edge and end scraper (C1211) 4 - edge and end scraper (C1024), 5 - scraper (C1024), 6 - thumbnail scraper (unstratified), 7 - broken scraper (C1217) 8 - retouched and trimmed flake (unstratified) (SCALE 1:1)



Figures 9 - 14 9 - Volcanic serrated blade (C1217), 10 - chipped flake (C1096), 11 - utilised blade (C1308), 12 - leaf butted arrowhead (F1069, C1068), 13 - leaf shaped point (C1046), 14 - chisel ended arrowhead (1996, SF1) (SCALE 1:1)

APPENDIX 1 LITHIC CATALOGUE

Catalogue abbreviations:

SITE INFORMATION

Y	Year
Cno	The context number of the find
S.F.	The Small Find number of the item

RAW MATERIAL

F. Col.	The colour of the raw material / or ? = Unknown BL = Black BR = Brown G = Grey P = Pink
Cort.	The amount of cortex present on a piece expressed as a percentage (%)
C. Col.	The colour of the cortex where present BR = Brown CR = Cream
Patina	The colour of any patina followed by the percentage (%) of surface affected. G = Grey W = White WMOT = White - mottled

TECHNOLOGY

Type	The primary form of the item irrespective of further working. B = Blade BD = Blade Distal BM = Blade Mid BP = Blade Proximal D = Debitage (followed by size grading in 5 mm increments) F = Flake IB = Irregular burnt piece NAT/PEBBLE = natural pebble
Interp.	Interpretation of function of piece RET = Retouched USE = Utilised piece (may be followed by ? when unsure) Free text descriptions allowed e.g. SCRAPER
Work	To indicate type of working and where

AE = All edges
BAT = Battered
LE = Left edge (when viewing dorsal surface)
PF = Pressure flaked
RE = Right edge (when viewing dorsal surface)
RET = Retouch
May be followed by ? when unsure

L
B Length, breadth, width. Dimensions given in millimetres (mm).
W

Bulb The knapping technique used to remove a flint
H = Hard Hammer
S = Soft Hammer
SHTD = Piece shattered from a strike elsewhere on the flint.
? = undetermined
REM = removed

Burnt Indicate whether the piece is burnt with a Y(es) or (N)o

Damage Record damage as ANC(ient) or MOD(ern). Indicate which edge.

Notes Free text e.g. CHERT

Nosterfield Lithics

SITE INFO.			RAW MATERIAL				TECHNOLOGY									
Y	CNo	Q	F. Col.	Cort.	C. col.	Patina	Type	Interp.	Work	L	B	W	Bulb	Burnt	Damage	Notes (re-fits)
91	/	1	BR-G	30	CR-BR	0	F	RET	LE RE	92	90	15	H	N	N	Refits below
91	/	1	BR-G	5	CR-BR	0	F	USE	LE RE	92	60	19	H	N	N	Refits above
91	/	1	BR-G	0	/	W 95	F	USE?	LE?	77	70	12	H	N	Y MOD	
91	/	1	BR-G	2	CR-W	0	F	/	/	51	53	10	H	N	N	
91	/	1	BR-G	5	CR	CR 95	F	/	/	60	40	8	H	N	N	Gloss
91	/	1	BR-G	5	G	G 100	F	SERRATED	LE RE	49	40	8	H	N	N	Gloss
95	602	2	BR-G	0	/	0	NP	/	/	/	/	/	/	N	N	V. small np
95	1003	1	G	2	CR	/	B	SERRATED	LE RE	62	15	4	H	N	N	
95	1003	1	BR-G	0	/	0	F	RET	LE RE	36	39	12	H	N	N	
95	1003	1	BR-G	0	/	0	F	/	/	18	11	3	S	N	N	
95	1004	1	?	/	/	0	D<10	/	/	/	/	/	SH	Y	N	
95	1004	1	G	/	/	0	D<10	/	/	/	/	/	SH	N	N	
95	1004	1	R	/	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1004	1	G	/	/	0	D<20	/	/	/	/	/	SH	Y	N	
95	1004	1	?	/	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1004	1	G	/	/	0	D<25	/	/	/	/	/	H	Y	N	
95	1004	1	G-BR	0	/	0	D<30	/	/	/	/	/	SH	N	N	

SITE INFO.			RAW MATERIAL				TECHNOLOGY									
Y	CNo	Q	F. Col.	Cort.	C. col.	Patina	Type	Interp.	Work	L	B	W	Bulb	Burnt	Damage	Notes (re-fits)
95	1004	1	G-BR	/	/	0	D<30	/	/	/	/	/	SH	N	N	
95	1004	1	GR-W	0	/	0	F	/	/	20	20	5	H	N	N	Chert
95	1004	1	BR	30	CR	/	F	/	/	25	15	3	H	N	N	
95	1014	1	G-BR	5	W	0	F	SCRAPER	LE RE	42	36	9	H	N	N	
95	1020	1	BR	/	/	0	D<25	/	/	/	/	/	H	N	N	
95	1020	1	G	/	/	0	F	/	/	32	33	9	H	N	N	Blade scars
95	1020	1	B-BR	/	/	0	F	TOOL	EDGE	10	30	5	?	ANC	N	Butt end
95	1022	1	BR-G	5	CR-BR	0	D<15	/	/	/	/	/	SH	N	N	
95	1022	3	BR-G	0	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1022	1	?	0	/	0	D<30	/	/	/	/	/	/	Y	N	
95	1022	1	G-BR	/	/	0	D<30	/	/	/	/	/	H	N	N	
95	1022	1	BR-B	0	/	0	D<35	/	/	/	/	/	H	N	N	
95	1022	1	BR-G	10	CR-BR	0	D<40	/	/	/	/	/	H	N	N	
95	1022	1	BR-G	10	/	0	F	USE	RE	26	18	3	S	N	N	
95	1022	1	BR-G	0	/	0	F	USE	RE	40	26	6	H	N	N	
95	1022	1	BR-G	15	CR-BR	0	F	USE	LE	50	32	10	H	N	N	
95	1022	1	BR-G	0	/	0	F	/	/	39	20	6	H	N	N	
95	1022	1	G	0	/	0	F	/	/	31	22	5	H	N	N	
95	1022	1	G	0	/	0	F	CORE TRIM	/	27	18	8	H	N	N	B. scars
95	1022	1	BR-B	0	/	0	F	/	/	37	25	5	H	N	N	
95	1022	1	BR-B	0	/	0	F	USE?	RE?	22	15	4	H	N	N	
95	1022	1	BR-B	0	/	0	F	/	/	23	15	3	H	N	N	
95	1023	1	G	0	/	0	B	/	/	36	11	3	H	N	N	
95	1024	2	BR-B	0	/	0	D<20	/	/	/	/	/	H	N	N	
95	1024	1	BR-B	0	/	0	D<30	/	/	/	/	/	H	N	N	Poss. core?
95	1024	1	BR-B	0	/	0	D<35	/	/	/	/	/	H	N	N	
95	1024	1	G-BR	5	CR	/	D<50	SCRAPER	LE	48	50	15	H	N	N	Edge
95	1024	1	G-BR	0	/	/	F	SCRAPER	AE	45	51	13	H	N	N	End & edge
95	1024	1	B	0	/	/	F	SCRAPER	LE RE	24	36	8	H	N	N	End & edge
95	1024	1	BR-B	0	/	0	F<30	/	/	/	/	/	H	N	N	
95	1025	1	BR-B	0	/	0	D<30	/	/	/	/	/	H	N	N	
95	1026	1	BR	40	CR	0	D<25	/	/	/	/	/	SH	N	N	
95	1026	1	BR	/	/	0	D<30	/	/	/	/	/	SH	Y	N	Therm?
95	1026	1	G	/	/	0	F	/	/	32	31	7	H	N	N	
95	1027	2	G-BR	0	/	0	D<10	/	/	/			SH	N	N	
95	1027	3	?	0	/	0	D<10	/	/	/	/	/	SH	Y	N	
95	1027	4	BR-G	0	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1027	2	?	0	/	0	D<15	/	/	/	/	/	SH	Y	N	
95	1027	1	BR-G	0	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1027	1	G-BR	70	CR	0	F	/	/	29	34	8	H	N	N	
95	1027	1	BR-G	0	/	0	F	/	/	24	16	4	S	N	N	
95	1027	1	BR-G	0	/	0	F	CORE TRIM	/	18	29	7	H	N	N	90 to plat
95	1027	1	BR-G	0	/	0	F	/	/	23	12	5	H	N	N	Trim prox end
95	1027	1	G	0	/	0	F	/	/	22	25	5	H	N	N	
95	1027	1	BR-G	0	/	0	F	CORE TRIM	/	22	36	7	H	N	N	90 to plat

SITE INFO.			RAW MATERIAL				TECHNOLOGY									
Y	CNo	Q	F. Col.	Cort.	C. col.	Patina	Type	Interp.	Work	L	B	W	Bulb	Burnt	Damage	Notes (re-fits)
95	1027	1	BR-G	0	/	0	F	USE	RE	21	12	3	H	N	N	
95	1027	1	BR	0	/	/	F	SCRAPER	AE	17	26	4	H	Y	ANC	Thermal dam.
95	1027	3	G-BR	0	/	0	F<10	/	/	/			S	N	N	
95	1027	4	G-BR	0	/	0	F<15	/	/	/			S	N	N	
95	1027	2	?	0	/	0	F<20	/	/	/	/	/	S	Y	N	
95	1027	1	B	0	/	0	NP	/	/	/	/	/	SH	N	N	
95	1032	1	G-BR	0	/	0	D<30	/	/	/	/	/	SH	N	N	Term dam
95	1046	1	G	0	/	/	F	POINT	AE	52	14	5	PF	N	N	Leaf biface
95	1052	1	GR-B	0	/	0	D<10	/	/	/	/	/	H	N	N	
95	1052	3	GR-B	0	/	0	D<20	/	/	/	/	/	H	N	N	
95	1052	1	GR-B	0	/	0	D<25	/	/	/	/	/	H	N	N	
95	1052	1	GR-B	5	CR	0	F	/	/	30	24	5	H	N	N	
95	1052	1	BR-B	0	/	0	F	USE	LE RE	34	28	5	H	N	N	
95	1052	1	BR-B	0	/	0	F	/	/	32	15	5	H	N	N	
95	1054	1	GR-B	0	/	0	F	/	/	27	19	3	SH	N	N	
95	1054	1	GR-B	10	CR	0	F	/	/	25	26	10	H	N	N	
95	1068	1	GR-B	0	/	0	B	/	/	43	11	4	H	N	N	
95	1068	1	GR-B	0	/	0	B	/	/	30	15	4	S	N	N	
95	1068	1	BR-B	/	/	0	B	/	/	15	7	2	O	N	N	
95	1068	1	GR-B	0	/	0	D<20	/	/	/	/	/	H	N	N	Chert
95	1068	1	BL-G	0	/	0	D<30	/	/	/	/	/	H	N	N	
95	1068	1	GR-B	5	CR	0	F	/	/	26	21	5	H	N	N	
95	1068	1	BR	0	/	/	F	ARROW	AE	17	17	4	PF	N	N	
95	1072	2	BR-G	0	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1072	1	?	0	/	0	D<20	/	/	/	/	/	SH	Y	N	
95	1072	2	BR-G	0	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1072	1	BR-G	0	/	0	D<25	/	/	/	/	/	SH	N	N	
95	1072	1	BR-B	50	CR	0	D<35	/	/	/	/	/	SH	N	N	
95	1072	1	BR-BR	0	/	/	F	SCRAPER	LE RE	39	23	5	H	N	N	Use of anvil
95	1073	1	BR	25	BR	0	B	/	/	18	10	2	S	N	N	
95	1073	1	G-BR	/	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1073	1	G-BR	5	CR	0	F	/	/	27	25	8	H	N	N	
95	1073	1	G-BR	5	CR	0	F	/	/	15	21	4	H	N	N	
95	1073	1	BR-G	/	/	0	F	/	/	30	17	3	H	N	N	
95	1075	1	G	0	/	0	D<10	/	/	/	/	/	SH	N	N	
95	1075	3	G?	0	/	0	D<15	/	/	/	/	/	?	Y	N	
95	1075	2	G?	0	/	0	D<20	/	/	/	/	/	?	Y	N	
95	1075	1	?	0	/	0	F	/	/	21	12	1	H	Y	N	
95	1075	1	G	0	/	0	F	/	/	18	16	3	H	N	N	
95	1075	1	BR-B	0	/	0	F	/	/	22	18	6	H	N	N	
95	1096	1	?	0	/	W 100	B	/	/	18	9	2	S	?	N	Pot lid
95	1096	1	BR-B	0	/	0	B	USE	LE	32	11	4	S	N	N	
95	1096	1	?	0	/	G 100	BD	/	/	17	11	2	H	POT LID	N	
95	1096	7	G-BR	0	/	0	D<05	/	/	/	/	/	H	N	N	
95	1096	28	BR-B	0	/	0	D<05	/	/	/	/	/	H	N	N	
95	1096	1	/	100	CR	0	D<10	/	/	/	/	/	H	N	N	

SITE INFO.			RAW MATERIAL				TECHNOLOGY									
Y	CNo	Q	F. Col.	Cort.	C. col.	Patina	Type	Interp.	Work	L	B	W	Bulb	Burnt	Damage	Notes (re-fits)
95	1096	16	BR-B	0	/	0	D<10	/	/	/	/	/	H	N	N	
95	1096	35	BR-B	0	/	0	D<10	/	/	/	/	/	H	N	N	
95	1096	1	/	100	CR	0	D<10	/	/	/	/	/	H	N	N	
95	1096	6	BR-B	0	/	0	D<10	/	/	/	/	/	H	N	N	
95	1096	1	G	0	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1096	3	/	100	CR	0	D<15	/	/	/	/	/	H	N	N	
95	1096	14	BR-B	0	/	0	D<15	/	/	/	/	/	H	N	N	
95	1096	4	BR-B	0	/	0	D<15	/	/	/	/	/	H	N	N	
95	1096	33	BR-B	0	/	0	D<15	/	/	/	/	/	H	N	N	
95	1096	1	G	0	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1096	1	/	100	CR	0	D<20	/	/	/	/	/	H	N	N	
95	1096	1	G	0	/	0	D<20	NP?	/	/	/	/	H	N	N	Chert
95	1096	6	BR-B	0	/	0	D<20	/	/	/	/	/	H	N	N	
95	1096	19	BR-B	0	/	0	D<20	/	/	/	/	/	H	N	N	
95	1096	1	G	0	/	0	D<20	/	/	/	/	/	H	N	N	
95	1096	2	/	100	CR	0	D<25	/	/	/	/	/	H	N	N	
95	1096	2	BR-B	0	/	0	D<25	/	/	/	/	/	H	N	N	
95	1096	1	BR-B	0	/	0	D<25	/	/	/	/	/	H	N	N	
95	1096	2	/	100	CR	0	D<25	/	/	/	/	/	H	N	N	
95	1096	4	BR-B	0	/	0	D<25	/	/	/	/	/	H	N	N	
95	1096	1	G	50	CR	0	D<25	/	/	/	/	/	H	N	N	
95	1096	1	G	0	/	/	D<25	/	/	/	/	/	H	N	N	Blade scars
95	1096	1	G	5	CR	0	D<30	/	/	/	/	/	H	N	N	
95	1096	2	G	50	CR	0	D<35	/	/	/	/	/	SH	N	N	
95	1096	1	G	0	/	0	F	USE	LE	36	45	8	H	N	N	Gloss
95	1096	1	B	10	CR	0	F	USE	RE	29	50	5	H	N	N	
95	1096	1	G	5	CR	0	F	/	/	45	28	5	H	N	N	
95	1096	1	G	0	/	0	F	/	/	22	20	4	H	N	N	
95	1096	1	BR-B	0	/	0	F	/	/	37	24	5	H	N	N	
95	1096	1	BR-B	0	/	0	F	/	/	38	19	6	H	N	N	
95	1096	11	BR-B	0	/	0	F<10	/	/	/	/	/	H	N	N	
95	1096	27	BR-B	0	/	0	F<10	/	/	/	/	/	H	N	N	
95	1096	5	/	100	CR	0	F<10	/	/	/	/	/	H	N	N	
95	1096	2	BR-B	0	/	0	F<10	/	/	/	/	/	H	N	N	
95	1096	13	BR-B	0	/	0	F<15	/	/	/	/	/	H	N	N	
95	1096	8	BR-B	0	/	0	F<15	/	/	/	/	/	H	N	N	
95	1096	22	BR-B	0	/	0	F<15	/	/	/	/	/	H	N	N	
95	1096	15	BR-B	0	/	0	F<20	/	/	/	/	/	H	N	N	
95	1096	1	BR-B	0	/	0	F<20	B. SPALL	/	22	5	3	H	N	N	
95	1096	1	G	0	/	0	F<20	/	/	/	/	/	H	N	N	
95	1096	1	BR-B	0	/	0	F<20	/	/	/	/	/	H	N	N	
95	1096	15	BR-B	0	/	0	F<20	/	/	/	/	/	H	N	N	
95	1096	3	BR-B	0	/	0	F<25	/	/	/	/	/	H	N	N	
95	1096	1	G	0	/	0	F<25	/	/	/	/	/	H	N	N	
95	1096	5	BR-B	0	/	0	F<25	/	/	/	/	/	H	N	N	
95	1096	1	BR-B	0	/	0	F<30	/	/	/	/	/	H	N	N	

SITE INFO.			RAW MATERIAL				TECHNOLOGY									
Y	CNo	Q	F. Col.	Cort.	C. col.	Patina	Type	Interp.	Work	L	B	W	Bulb	Burnt	Damage	Notes (re-fits)
95	1096	3	BR-B	0	/	0	F<5	/	/	/	/	/	H	N	N	
95	1096	3	G	50	CR	0	NP	/	/	/	/	/	H	N	N	
95	1097	2	BR-B	0	/	0	D<20	/	/	/	/	/	H	N	N	
95	1097	1	BR-B	0	/	0	D<25	/	/	/	/	/	SH	N	N	
95	1097	1	BR-B	0	/	0	D<30	/	/	/	/	/	SH	N	N	
95	1097	1	BR-B	0	/	0	F	USE	LE	20	17	3	H	N	N	
95	1097	1	BR-B	0	/	0	F	USE?	LE?	32	15	3	S	N	N	
95	1097	1	G	0	/	/	F	SCRAPER	LE RE	44	34	7	H	N	N	
95	1097	1	BR-B	0	/	0	F<15	/	/	/	/	/	S	N	N	
95	1097	1	BR-B	0	/	0	F<20	/	/	/	/	/	S	N	N	
95	1099	1	G-BR	0	/	0	D<15	/	/	/	/	/	S	N	N	
95	1103	1	G	0	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1105	1	BR-G	10	CR-BR	0	B	USE	LE	53	22	5	H	N	N	
95	1105	1	BR-G	0	/	0	B	USE	LE	25	12	2	S	N	N	
95	1105	1	BR-G	5	CR-BR	0	F<30	/	/	/	/	/	SH	N	N	
95	1114	1	BR-G	0	/	0	B	/	/	29	12	4	H	N	N	
95	1114	1	BR-G	0	/	0	F	SCRAPER	LE RE	26	29	6	H	N	ANC	Snap
95	1114	1	BR-G	0	/	0	F	/	/	23	46	5	H	N	N	
95	1114	1	BR-G	0	/	0	F	/	/	18	23	5	S	N	N	
95	1114	1	BR-G	0	/	0	F	/	/	36	25	9	S	N	N	
95	1114	1	BR-G	0	/	0	F	/	/	30	16	3	S	N	N	
95	1114	1	BR-G	0	/	0	F	/	/	24	21	4	S	N	N	
95	1114	1	BR-G	10	CR	0	F	USE	RE	50	28	6	H	N	N	
95	1114	1	BR-G	0	/	0	F	/	/	25	22	6	H	N	N	
95	1114	1	BR-G	0	/	0	F	/	/	45	20	3	S	N	N	
95	1114	1	BR-G	0	/	0	F	/	/	35	30	5	S	N	N	
95	1114	1	G	10	CR	/	F	SCRAPER	LE RE	40	36	11	H	N	N	End & edge
95	1114	1	G	10	CR	/	F	SCRAPER	AE	48	45	15	H	N	N	End & edge
95	1201	1	G	/	/	0	B	/	/	20	10	3	S	N	N	
95	1201	1	BR	/	/	0	B	/	/	18	9	2	H	N	N	
95	1201	1	BR-R	/	/	0	B	/	/	18	7	3	H	N	N	
95	1201	1	BR	5	CR	0	F	/	/	15	14	5	H	N	N	
95	1201	1	BR	70	CR	0	F	/	/	28	16	4	H	N	N	
95	1201	1	BR-G	0	/	/	F	RET	LE	27	24	9	H	N	N	
95	1202	3	BR-B	0	/	0	D<15	/	/	/	/	/	H	N	N	
95	1202	3	BR-B	0	/	0	D<20	/	/	/	/	/	H	N	N	
95	1202	1	BR-B	0	/	0	D<25	/	/	/	/	/	H	N	N	
95	1211	3	BR-B	0	/	0	D<10	/	/	/	/	/	SH	N	N	
95	1211	3	BR-B	0	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1211	2	BR-B	0	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1211	1	BR-B	0	/	0	D<25	/	/	/	/	/	SH	N	N	
95	1211	1	BR-B	0	/	0	F	USE	RE	31	16	4	H	N	N	
95	1211	1	BR-B	0	/	0	F	/	/	26	16	3	H	N	N	
95	1211	1	BR-B	0	/	0	F	/	/	32	29	3	H	N	N	
95	1211	1	BR-B	0	/	0	F	/	/	25	26	5	H	N	N	
95	1211	1	BR-B	5	CR	/	F	SCRAPER	END	39	28	7	H	N	N	End

SITE INFO.			RAW MATERIAL				TECHNOLOGY									
Y	CNo	Q	F. Col.	Cort.	C. col.	Patina	Type	Interp.	Work	L	B	W	Bulb	Burnt	Damage	Notes (re-fits)
95	1211	2	BR-B	0	/	0	F<25	/	/	/	/	/	S	N	N	
95	1217	1	BR-B	0	/	0	BD	USE	RET	18	13	5	H	N	N	
95	1217	1	BR-G	0	/	0	BM	/	/	/	/	/	SH	N	N	
95	1217	3	BR-B	0	/	0	D<10	/	/	/	/	/	SH	N	N	
95	1217	1	?	0	/	0	D<10	/	/	/	/	/	SH	Y	N	
95	1217	6	BR-B	0	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1217	3	?	0	/	0	D<15	/	/	/	/	/	SH	Y	N	
95	1217	3	BR-B	0	/	0	D<20	/	/	/	/	/	SH	N	N	
95	1217	1	?	0	/	0	D<20	/	/	/	/	/	SH	Y	N	
95	1217	4	BR-B	0	/	0	D<25	/	/	/	/	/	SH	N	N	
95	1217	1	?	0	/	0	D<25	/	/	/	/	/	H	Y	N	
95	1217	1	BR-B	0	/	0	F	/	/	25	16	5	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	16	11	2	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	30	26	6	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	23	16	3	S	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	27	29	5	H	N	N	
95	1217	1	BR-B	0	/	0	F	USE	RE	33	25	6	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	30	23	7	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	25	40	7	H	N	N	Gloss
95	1217	1	BR-B	0	/	0	F	/	/	31	24	6	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	23	32	4	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	24	29	9	H	N	N	
95	1217	1	BR-B	20	CR	0	F	/	/	23	26	5	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	15	26	4	H	N	N	
95	1217	1	BR-B	0	/	0	F	/	/	15	22	3	S	N	N	
95	1217	5	BR-B	0	/	0	F<15	/	/	/	/	/	H	N	N	
95	1217	2	BR-B	0	/	0	F<20	/	/	/	/	/	H	N	N	
95	1217	1	R	0	/	/	FD	SCRAPER	AE	18	36	5	H	N	N	
95	1218	1	G	/	/	W 50	D<20	/	/	/	/	/	SH	N	N	
95	1306	1	BR-G	/	/	0	B	/	/	39	14	3	S	N	N	
95	1306	2	BR-G	/	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1306	1	G	0	/	0	D<25	/	/	/	/	/	SH	N	N	
95	1306	1	BR-G	/	/	0	D<25	/	/	/	/	/	SH	N	N	
95	1306	1	BR-G	30	CR	0	D<30	/	/	/	/	/	SH	N	N	
95	1308	1	BR-G	5	W	/	B	USE	LE	84	30	10	H	N	N	
95	1308	1	BR-B	0	/	0	D<10	/	/	/	/	/	SH	N	N	
95	1308	1	BR-B	0	/	0	D<15	/	/	/	/	/	SH	N	N	
95	1308	1	BR-B	0	/	0	D<45	SCRAPER	LE	58	20	7	H	N	N	
95	1308	1	BR-B	0	/	0	F	/	/	20	22	4	H	N	N	
95	1308	1	BR-B	0	/	0	F	/	/	20	11	4	H	N	N	
95	1312	1	G	0	/	/	B	SERRATED	RE	57	15	5	H	N	N	Chert saw
95	1312	1	B	0	/	0	F	/	/	27	28	5	H	N	N	Chert
95	1320	1	BR-B	10	CR	0	D<20	/	/				SH	N	N	
95	1320	1	BR-B	0	/	0	F	/	/	42	25	7	H	N	N	
95	1320	1	BR	0	/	0	F	USE	LE	28	23	4	H	N	N	
95	1320	1	BR	40	CR	/	F	SCRAPER	AE	57	30	5	H	N	N	Teardrop end

SITE INFO.			RAW MATERIAL				TECHNOLOGY									
Y	CNo	Q	F. Col.	Cort.	C. col.	Patina	Type	Interp.	Work	L	B	W	Bulb	Burnt	Damage	Notes (re-fits)
95	2003	1	G	0	/	0	D<10	/	/	/	/	/	SH	N	N	
95	U/S	2	BR-B	5	CR	/	D<25	/	/	/	/	/	SH	N	N	
95	U/S	1	BR	5	BR	/	D<25	SCRAPER	?	/	/	/	H	N	N	Part of scraper
95	U/S	1	G-BR	0	/	/	F	SCRAPER	RE	60	39	14	S	N	N	Edge
95	U/S	1	G	0	/	W 30	F	RET	LE RE	42	27	7	S	N	N	Edge
95	U/S	1	BR-R	0	/	/	F	USE	LE RE	34	21	6	H	N	N	
95	U/S	1	BR-B	0	/	/	F	/	/	16	15	2	H	N	N	
95	U/S	1	BR	0		/	F	SCRAPER	AE	30	30	9	H	N	N	End & edge
95	U/S	1	BR	0		/	F	SCRAPER	AE	25	21	11	H	N	N	End & edge
95	U/S	1	BR	0		/	F	SCRAPER	AE	24	21	8	H	N	N	End
96	5005	1	W?	0		/	D<10	/	/	/	/	/	?	N	N	
96	5014	1	G	0		/	F	/	/	14	25	4	H	N	N	
96	5014	1	R	40	CR	/	F	/	/	40	29	8	H	Y	N	Flake fits sf 2 (S.f.3)
96	5014	1	R	10	CR	/	POT LID	/	/	/	/	/	NAT	Y	N	Pot lid from sf3 (S.f.2)
96	5036	1	P-R	0		/	B	SERRATED	RE	45	18	5	H	N	N	
96	5036	1	BR	0		/	F	ARROW	AE	29	24	4	H	N	N	(S.f.1)
96	U/S	1	BR	0		W 100	F	SCRAPER	LE	30	20	6	H	N	N	

PART 2 NOSTERFIELD 1998, LITHIC REPORT
Peter Rowe

1.0 INTRODUCTION

A small assemblage of 15 knapped flints was recovered from the 1998 season of excavation at Nosterfield. The raw material type is in keeping with the more numerous samples from earlier excavations. There is a further knapped flake of chert. The material is again very well preserved.

2.0 TECHNOLOGY

Table 1 below sets out the components of the assemblage by basic knapped form irrespective of further working.

Table 1 Quantities of flint by natural or knapped type

Type	Quantity	Percentage
Blades (inc. pieces of)	3	20
Debitage (irregular shattered pieces)	3	20
Flakes (inc. pieces of)	9	60
Natural pieces (inc. pot lids)	0	0
Total	15	100

The figures from this sample are not statistically significant given the small volume of material. Both blade and flake working is evident as was noted from the earlier assemblages. There is again an absence of cores suggesting that knapping took place off-site or in discrete areas of the site.

2.1 FLAKES AND BLADES

Flake production outnumbers blade production by a ratio of 3:1. The majority of the pieces have large bulbs of percussion suggesting the use of hard hammers. Use of softer hammer material such as antler or bone is also represented.

Two pieces of blade from context 1049 were found to conjoin to form a complete example. The blade is fairly robust and is broken laterally across its crest. The clean nature of the break and the lack of subsequent patination mean that the break could be ancient or modem.

One of the flakes from context 1005 is the only burnt example from the collection.

2.2 WORKED PIECES

Four of the pieces in the collection have light edge damage or light retouching demonstrating use. These are a robust blade from context 1000, the distal part of the broken blade from context 1049, and two flakes from context 1050. The limited nature of the working on the pieces suggests that they were expediently produced tools for craft activities or food preparation.

A single leaf shaped arrowhead is the only example of a fully worked item in the assemblage (Figure 1). The arrowhead was recovered from context 1049. The item is bifacially worked and is both leaf shaped at the butt and the tip. It is of particular interest as parts of both surfaces not removed by pressure flaking retain a blue-grey patina. The artefact has evidently been knapped from a patinated flake which may have been on site for centuries prior to its reuse for the production of the arrowhead. This re-use of earlier waste material was noted amongst the previously excavated material.

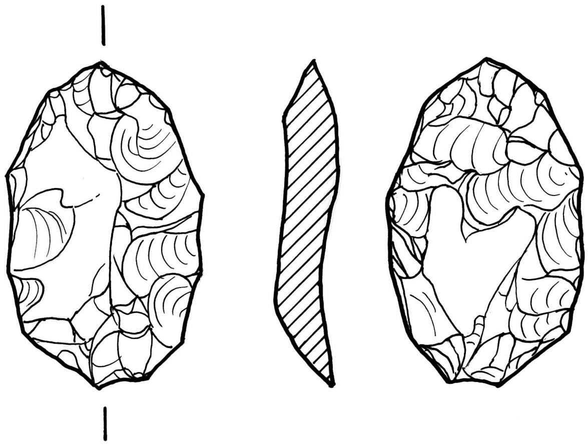


Figure 1 Flint arrowhead (F39 C1049): Scale 2:1

3.0 CHRONOLOGY

The present assemblage lends little to the typological dating of the site. The leaf-shaped arrowhead can be dated to the earlier Neolithic period and is typical of Grimston Ware assemblages. Leaf shaped projectiles are however also documented from Bronze Age contexts (Green 1984, 33). The arrowhead is based on a blank formed by an earlier flake suggesting a depth in the chronology of the site.

4.0 CONCLUSION

The limited assemblage is in keeping with the larger collections recovered in previous excavations (Rowe 1998).

Bibliography

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Rowe, P. 1998. Nosterfield 1991, 1994-1996. Flint Report. (Unpublished report for Blaise Vyner, Heritage and Arts.)

PART 3 NOSTERFIELD 1999-2003: LITHIC REPORT

Peter Rowe

1.0 INTRODUCTION

1.1 Lithic material was been recovered from five interventions at Nosterfield between 1999 and 2003. A summary of the material is presented in Table 1.1.

Table 1.1 Quantities of flint by intervention

Intervention No.	Notes	Quantity
1	Mainly from excavated contexts	77
2	Surface finds from field of Intervention 1	53
4	A single natural pebble of black chert	1
5	Mainly from excavated contexts	299
6	Surface finds from fieldwalking from field of Intervention 5	18
8	Topsoil finds from evaluation trenching	6
	Total	**454**

1.2 This report considers lithics from Interventions 1 and 2 together as they are a fieldwalked and excavated assemblage from the same field. A similar approach has been taken with Interventions 5 and 6 for the same reason. The lithic item from Intervention 4 requires no further comment and the material from Intervention 8 is considered separately (see Appendices 1 to 3).

1.3 The entire assemblage has been catalogued using Microsoft Excel. The full flint catalogue is available with the site archive.

2.0 INTERVENTIONS 1AND 2

2.1 GENERAL CHARACTER

2.1.1 Raw material

With the exception of 6 pieces of black chert and 4 flakes of volcanic tuff all of the items are flint. The flint is very homogenous in character and other than two red pieces consists of grey or light brown items often with a range of different shades within one piece. The flint becomes opaque on finer flakes and is of a good quality with few flaws or fossils. Very few items have any cortex. When this is present it is worn from glacial or wave action and extremely thin in section.

2.1.2 Post-deposition damage

The material from Intervention 1 is extremely well preserved with little post depositional damage such as edge chipping, snapping or abrasion. Although the material from Intervention 2 shows few obvious signs of damage it is possible that the topsoiling of the site has caused some damage.

Very few pieces amongst the collection have any patina development. Only 9 items, excluding burnt pieces, have any patina development. One piece (Int. 2, S.F. 12) has become patinated in antiquity and the patina subsequently broken by further knapping.

2.1.3 Burning

Eighteen pieces from the collection show various degrees of thermal damage by burning. There is no correlation between burnt pieces and context i.e. there are no discrete areas that contain a preponderance of burnt items. Other than one example of a heavily burnt thumbnail scraper (Int. 2, S.F. 19) the burnt examples are all waste flakes and debitage.

2.2 TECHNOLOGY

The flint has been classified into its basic natural or knapped form irrespective of further working, i.e. scrapers based on flake blanks are included in the statistics for flakes. Table 2.1 sets out the incidence of the varying forms from Interventions 1 and 2.

Table 2.1 Interventions 1 and 2: Quantities of flint by natural or knapped type

	Quantity by Intervention			**Percentage by Intervention**		
Type	**1**	**2**	**Total**	**1**	**2**	**Total**
Blades (inc. pieces of)	9	9	18	12	17	14
Cores (inc. pieces of)	0	1	1	0	0.7	0.7
Debitage (irregular shattered pieces & burnt waste)	25	9	34	32.5	17	26
Flakes (inc. pieces of)	43	34	77	55.5	64.3	59.3
Natural pieces (inc. pot lids)	0	0	0	0	0	0
Total	**77**	**53**	**130**	**59**	**41**	**100**

2.2.1 Debitage

Non-burnt debitage accounts for just over a quarter of the lithics from Interventions 1 & 2. Debitage is defined here as angular chunks which are the product of knapping but served no purpose as artefacts in themselves. The debitage was graded in size by taking its maximum dimension on a grid incremented in 5mm steps. The results of the grading are shown in Table 2.2.

Table 2.2 Interventions 1 and 2: Quantity of debitage by graded size

Debitage size	**Quantity**	**Percentage (%)**
>10mm<15mm	4	16.6
>15mm<20mm	3	12.6
>20mm<25mm	10	41.6
>25mm<30mm	2	8.3
>30mm<35mm	1	4.2
>35mm<40mm	2	8.3
>40mm<45mm	1	4.2
>45mm<50mm	0	0
>50mm<55mm	1	4.2
Total	**24**	**100**

The majority of the debitage falls under 25mm in maximum dimension although there are a small proportion of larger pieces present.

2.2.2 Cores

A single core of grey/brown flint (Int. 2, S.F. 22) was recovered during the fieldwalking exercise. This is a fragment struck from a larger piece perhaps as a rejuvenation flake. A core platform renewal flake is also present amongst the field walked assemblage (Int. 2, S.F. 32). A burnt fragment from context 1166 (S.F. 22) may be a shattered piece from a heated core.

2.2.3 Blades and Flakes

Flake production outnumbers blade production at the site in the ratio of 4:1. Blades are classified here as parallel-sided pieces with a length:breadth ratio of greater than or equal to 2:1. Other struck pieces falling below this ratio which are flat in section are characterised as flakes.

There is a good deal of variance within the blade assemblage. The blades range in length from 9mm to 56mm and vary in thickness from 2mm to 5mm. The small collection shows little in the way of further modification. There are however six fragments of blades, comprising two proximal ends and four distal ends, which indicate some degree of secondary blade working.

Flakes at the site have a major range in size from a large opaque brown piece of particularly good quality flint (Int. 2, S.F. 36) measuring 45mm x 60mm x 8mm to smaller examples of small chipped flakes, e.g. a small chip 8mm x 8mm x 2mm (Int. 1, context 1195) which may represent platform preparation.

Whereas many of the flakes have been removed by direct percussion with a hard hammer the opposite is true of blades. In all cases it appears that indirect percussion or use of soft hammers has been employed to ensure maximum control over the thickness of the finished blade.

2.3 TOOLS

Thirty pieces in the assemblage have been modified to form tools. The figures include pieces with light edge damage although those recovered during Intervention 2 should be treat with caution given their retrieval following topsoiling. Table 2.3 sets out the tool types at the site.

Table 2.3 Interventions 2 and 3: Quantities of worked flints

Tool Type	**Int 1**	**Int 2**	**Total Quantity**
Projectile	0	1	1
Miscellaneous retouch	2	0	2
Scraper	4	5	9
Borer	1	0	1
Utilised blade	2	1	3
Utilised flake	7	7	14
Total	**16**	**14**	**30**

2.3.1 Projectile points

There is a single projectile point (Int. 2, S.F. 16). This is a small bifacially worked point produced on a thick flake with a ridged dorsal surface which retains remnants of cortex. This piece could be classified as a crude leaf arrowhead but at 10mm thick is not typical of this sort of artifact.

2.3.2 Scrapers

Scrapers are the most common worked lithic artifact. Scraper types are summarised in Table 2.4.

Table 2.4 Interventions 1 and 2: Scraper classifications

Scraper Type	**Find Nos.**	**Quantity**
Simple retouched flakes	Int. 1, S.F. 25, 32 and 33	3
Elongated symmetrical end and edge scrapers	Int. 1, S.F. 32; Int. 2, S.F. 27 and 44	3
Thumbnail/button scrapers	Int. 2, S.F.'s 15, 19 and 55	3
Total		**9**

The simplest form of scraper from these interventions are struck flakes with retouch around all but the proximal end.

More developed forms are also present. These are based upon elongated flakes with a greater sense of symmetry applied in their manufacture. One example (Int. 2, S.F. 2) has a distal end with retouch at a 70-degree angle with much lighter retouch at the edges. The proximal end is of particular interest as there is evidence of grinding producing a rounded edge around the perimeter of the striking platform. This scraper class includes a robust example based on a particularly thick flake (Int. 1, S.F. 32).

The final scraper types present are thumbnail or button scrapers based on small, thick sub-circular flakes. One of these is particularly tactile with a concavity in its dorsal surface that forms a suitable cradle for the users thumb-end when held (Int. 2, S.F. 15).

2.3.3. Utilised pieces

There are a number of pieces which have evidence of damage along the edges occasioned by light trimming or through use. These are usually based on flakes (e.g. Int. 2, S.F. 36) although useful cutting edges have also been utilised on suitable blades. In one case the proximal end and edges of a wide flat blade (Int. 1, S.F. 31) have been reworked with some fairly haphazard retouch.

2.3.4 Miscellaneous worked pieces

A single borer or piercing tool (Int. 1, S.F. 32) was identified amongst the assemblage. This is based upon a suitably shaped spoke of debitage. The end of the piece is blunted and polished through use

2.3.5 Stone axe

Four stone flakes (S.F. 48) from Intervention 1 refit to form an almost complete stone axehead missing only its butt end. The axe has split along its length into four flakes of fairly equal thickness. The axe is 89mm long in its present state, 58mm wide at its widest and 33mm thick. The cutting edge has been sharpened on occasion causing a slight loss of symmetry

The raw material is a grey volcanic tuff which could be narrowed down to source, potentially Cumbria, North Wales or Scotland, by thin section analysis.

It is possible that the axehead has been shattered purposefully. However its fracture seems to emanate from the missing end making this interpretation uncertain. There are some slightly darker patches on the surface of the axe that may be soot residue suggesting that the axe may have been heated perhaps to aid its destruction.

Following deposition the surfaces of two of the flakes have taken on a dull brown patina whereas the other two flakes are unaffected. The axe has a number of lines of weakness on the surface manifesting as hairline cracks meaning that care is needed in packaging and handling the item.

3.0 INTERVENTIONS 5 AND 6

3.1 GENERAL CHARACTER

3.1.1 Raw material

The raw material is very similar to that from Interventions 1 and 2. It is again very homogenous with the majority of pieces being grey or light brown, often with a range of different shades within one piece. There are a number of pieces of creamy cherty flint which were found in concentration in context 1277, the upper backfill of a pit. Again, very few items have any cortex. When this is present it is worn from glacial or wave action and extremely thin in section. Chert is also present with 25 pieces of a grey-black material. There are two fragments of siliceous sandstone from context 1061 (Int. 5, S.F.s 11 and 12) which are probably natural. There is a further non-flint item from context 1341 (S.F. 21). This is an unidentified burnt stone or ceramic that has begun to slag on one of its surfaces.

3.1.2 Post-deposition damage

There are a number of pieces with modern damage. This is limited to several pieces with chipped edges and two snapped pieces which are detailed in the catalogue. Other then these examples there are few obvious signs of attrition following deposition.

3.1.3 Burning

There are only five burnt pieces from Intervention 5 and a further 2 from Intervention 6. There is no correlation between burning and context with three of the pieces from Intervention 5 being from unstratified contexts. A piece from the fieldwalked collection has being highly fired and its surface has become glazed (Int. 6, S.F. 14).

3.2 TECHNOLOGY

The knapped character of the assemblage has been defined as in section 2.1 above.
Table 3.1 sets out the incidence of the varying forms from Interventions 5 and 6.

Table 3.1 Interventions 5 and 6: Quantities of flint by natural or knapped type

	Quantity by Intervention			Percentage by Intervention		
Type	**5**	**6**	**Total**	**5**	**6**	**Total**
Blades (inc. pieces of)	49	1	50	16.4	5	15.8
Cores (inc. pieces of)	10	0	10	3.4	0	3.2
Debitage (irregular shattered pieces and burnt waste)	118	7	125	39.4	39.5	39.4
Flakes (inc. pieces of)	113	10	123	37.8	55.5	38.8
Natural pieces (inc. pot lids)	9	0	9	3	0	2.8
Total	**299**	**18**	**317**	**100**	**100**	**100**

3.2.1 Debitage

Non-burnt debitage accounts for almost 40% of the lithics from Interventions 5 and 6. The debitage was again graded in size. The results of the grading are shown in Table 3.2 below.

Table 3.2 Intervention 5 and 6: Quantity of debitage by graded size

Debitage size	Quantity	Percentage (%)
>10mm<15mm	50	43.5
>15mm<20mm	27	23.5
>20mm<25mm	12	10.5
>25mm<30mm	13	11
>30mm<35mm	8	7
>35mm<40mm	3	2.5
>40mm<45mm	0	0
>45mm<50mm	1	1
>50mm<55mm	1	1
Total	**115**	**100**

As with Interventions 1 and 2 the majority of the debitage falls under 25mm in maximum dimension although there are a small proportion of larger pieces present.

3.2.2 Cores

Eleven cores are present from the excavated assemblage of Intervention 5. Table 3.3, below, summaries the core classification for the site.

Table 3.3 Core classification

Platform type and number in brackets	Single (1)	Opposed (2)	At right angles (2)	At right angles and opposed (3)	Irregular (3)	TOTAL
Quantity	8	1	1	1	1	9

The dominant core type is single platform (e.g. S.F. 67). These are all quite small examples with a maximum face length being 49mm. There is a single core with two opposed platforms (Int. 5, S.F. 19). The incidences of cores with three platforms are less common. There is one example with two opposed platforms and a third at right angles (Int. 5, S.F. 29). There is also a more irregular core with three main platforms (Int. 5, S.F. 52). Both of these multi-platform examples are black chert rather than flint.

3.2.3 Blades and Flakes

Flake production outnumbers blade production at the site in the ratio of 2.5:1. Blades and flake classification are as defined in 2.2.3.

The blade collection consists of small examples varying on average between 10mm and 40mm in length. The blades range in length from 9mm to 56mm and vary in thickness from 2mm to 5mm. There is good evidence for secondary blade working with twenty-two fragments of blades, comprising nine proximal ends, eight distal ends, and five mid sections. Many of the blades have been modified with edge use or retouch (see 3.3.1 and 3.3.3).

Flakes at the site range in size from medium sized flakes, rarely exceeding 40mm in maximum dimension, to smaller chips which are less than 10mm wide.

A mixture of hard and soft hammer percussion has been used to removed flakes from their cores. However in almost all cases it appears that indirect percussion or use of soft hammers has been utilised to minimise the thickness of blades produced.

3.3 TOOLS

Forty-eight pieces in the assemblage have been modified into or used as tools. The figures include pieces with light edge damage, although those pieces collected during Intervention 6 should be treated with caution given their collection following topsoiling. Table 3.3 sets out the tool types at the site.

Table 3.3 Intervention 5 and 6: Quantities of worked flint

Tool type	**Int. 5**	**Int. 6**	**Total quantity**
Projectile	6	0	**6**
Miscellaneous retouch	3	1	**4**
Scraper	4	1	**5**
Fabricator	1	0	**1**
Utilised blade	9	1	**10**
Utilised debitage	1	1	**2**
Utilised flake	24	3	**27**
Total	**48**	**7**	**55**

3.3.1 Projectile points

The projectiles at the site consist of five microliths and one leaf shaped arrowhead, all from Intervention 5. The microliths are all later Mesolithic, geometric, narrow blade examples. There are two scalene triangles (S.F. 19 and S.F. 30), a backed blade (S.F. 30) and two obliquely blunted points (S.F. 36, S.F. 38). There is a single microburin that was recovered from an unstratified context (S.F. 71).

A single leaf-shaped arrowhead was recovered from Intervention 5, context 1514. This is missing its tip but is otherwise in good condition. The break across the tip has a fresh appearance revealing an interior colour several shades lighter than the outside suggesting a modern fracture. The arrowhead is pressure flaked across the entire face on one side only.

3.3.2 Scrapers

There are only a small number of scrapers given the size of the assemblage. There are three small scrapers based upon squat flakes. One is a simple end scraper with invasive retouch (Int. 5, S.F. 49). This scraper shares similarities with the thumbnail examples from Intervention 2 in the invasiveness of the retouch but is not as circular. These three small scrapers include a much squatter and robust example perhaps for heavier duty work (Int. 5, S.F. 56). Finally there is a primary flake with end and edge retouch (Int. 6, S.F. 4) although part of its left edge missing.

There is a very gracile piece with a knife like edge and invasive retouch forming a scraping edge from context 1003 (Int. 5, S.F. 1). This has been made on a large blank of high quality translucent brown flint and considerable investment has been made in it manufacture.

3.3.3 Utilised pieces

There are a good number of pieces which have evidence of damage along the edges occasioned by light trimming or through use. Pieces with modified edges include blades, flakes and suitable chunks of debitage (e.g. Int. 6, S.F. 12). In one instance edge glossing was noted on a utilised flake (Int. 5, S.F. 29). There is an interesting flake from context 1513 (Int. 5, S.F. 29;) that has been modified to form a steeply retouched scraping tool.

The majority of utilised pieces are for scraping or cutting functions. There is however one piece of debitage with a retouched drill like end (Int. 5, Context 1684).

3.3.4 Miscellaneous worked pieces

There is a single example of a fabricator amongst the assemblage (Int. 5, S.F. 3). This large ridged blade has battered, well worn edges and one particularly abraded end. The item has a smoothed, well-worn feel that gives the impression that it has had a long service.

3.4 SPATIAL ANALYSIS

In terms of spatial analysis there are few apparent trends. One feature (No. 164, context 1277), a pit from Intervention 5, produced 125 flints, only three of which were worked. The material consisted of waste flakes and debitage along with a single opposed platform core. The raw material from this feature was principally a pale cream Yorkshire Wolds flint. It is possible that the majority of this material was reduced from the same parent nodule. The microlith from this context is a brown flint and is probably not originally associated with the knapping debris.

4.0 INTERVENTION 8

4.1 GENERAL CHARACTER

A small collection of six items was recovered during trial trenching in Intervention 8. The raw material is consistent with that from the previous interventions (see above). Only one piece is burnt. The assemblage consists of two blades, including one with edge use, two unmodified flakes, a piece of debitage and a microlith (Int. 8; S.F. 3). The microlith is an obliquely blunted point of the late Mesolithic period based on a narrow blade of creamy flint.

5.0 DISCUSSION

5.1 RAW MATERIAL

The raw material from all of the interventions is relatively homogenous being characterised by grey and brown flint. The most likely sources are eastern coast beach flint or eroding deposits from local tills or gravels. There is a smaller sample of creamy-grey pieces amongst the assemblage that demonstrate the characteristics of 'Wolds' flint. The various chert samples from the site are likely to be local in origin and are typically associated with sources in the Pennines.

5.2 CHRONOLOGY

The majority of the flints from the assemblages can shed little light on site chronology. The bulk of the tools are simple flakes or blades with some degree of edge use. These items were probably produced for a variety of activities throughout prehistory and then discarded with little ceremony.

The earliest materials present are the microliths and microburin from Interventions 5 and 8. These geometric forms all date to the later Mesolithic period. One of the microliths from Intervention 5, is a narrow blade, retouched on both sides. It is narrow and almost rod-like suggesting a date of the very later or terminal Mesolithic. The contexts from which the microliths were recovered suggest that all these finds are residual.

The crude projectile point from Intervention 1 and the leaf-shaped arrowhead from Intervention 5 are both early Neolithic innovations although such projectiles can also occur in Bronze Age contexts (Green, 1984, p. 33).

The fabricator from Intervention 5 fits an earlier or later Neolithic date. These enigmatic tools were probably used for working materials such as leather. It has also been suggested that they may have been used as 'strike-a-lights' (Edmonds, 1995, 41).

Stone axes such as that from the backfill of a small scoop in Intervention 1 became common from the onset of the Neolithic. The perhaps purposeful destruction of the axe is paralleled at the Mayburgh henge near Penrith, Cumbria.

Dating of scrapers is more problematic. This type of tool was the mainstay of the stone tool kit for several millennia and it is difficult to assess the subtle differences between different styles in terms of chronology.

The scrapers from Intervention 1 and 2 have been broken down in to three basic categories. The simple edge retouched pieces could have been produced at any time during prehistory as expediency demanded. This is also true of the smaller scrapers from Interventions 5 and 6. There are three scrapers from Interventions 1 and 2 based on elongated flakes with end and edge retouch. These scrapers have been manufactured with a good deal of symmetry in mind. This symmetry and use of end and edge retouch has been suggested as characteristic of Later Neolithic scraping tools (Edmonds, 1995, 96).

The three thumbnail or button scrapers from Intervention 2 form a class of artifact that appears in the early Bronze Age and are a common feature of Beaker associated assemblages. Stray find 49 from Intervention 5 probably also fits this date.

5.3 DISCUSSION

The lithic material from the current Nosterfield Interventions is consistent with exploitation of this area throughout prehistory. Evidence for Mesolithic material was absent from the earlier seasons of work in the early 1990's (Rowe, 1998). The small collection of microliths along with a microburin adds a new dimension to the emerging picture of the landscape in early prehistory. Other tools types at the site including a stone axe, scrapers, a fabricator and a leaf shaped arrowhead demonstrate this human presence till at least the early Bronze Age.

The material present few opportunities to comment on specific activities or use of discrete parts of the site. Many of the finds are unstratified and those from Interventions 2 and 6 are from surface collections. What is apparent is that there is a full suite of tool types present along with cores and debitage to suggest on site use, production and maintenance of tools.

Bibliography

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APPENDIX 1

Nosterfield Quarry 1999 Lithic catalogue: Interventions 1 & 2

SITE INFO.				RAW MATERIAL				TECHNOLOGY									
Int	**F**	**C**	**SF**	**F. Col.**	**Cort**	**C. col.**	**Patina**	**Type**	**Interp.**	**Work**	**L**	**B**	**W**	**Bulb**	**Bu**	**Dam**	**Notes**
1	134	1166	22	?	0		W100	IB<25						S	Y	N	Core fragment
1	148	1206	23	?	0		W100	BD			34	15	4	?	N	N	
1	160	1170	24	?	0		W100	F	USE?	RE?	32	22	8	H	Y		Too damaged to be sure of use
1	160	1170	24	?	INT 5	CR	W100	IB<40							Y		Heavily fired
1	140	1196	27	?	0		W100	F			30	24	7	S	Y	N	Surface gloss
1		1204	29	?	0		W100	IB<40						?	Y	ANC	Pot lids
1	118	1143	31	?	0		W80	F			28	22	6	?	Y	N	
1	142	1195	32	?	0		W100	IB<40						PL	Y	N	
1	116	1141	36	?	0		W100	IB<20						SH	Y	N	
1	116	1141	36	?	0		W100	IB<35						H	Y	N	
1	117	1142	38	?	0		W100	D<25						?	N	N	
1	131	1163	39	?	0		W100	IB<25						?	Y	N	
1	141	1193	47	?	0		W100	F			20	14	2	S	N	N	
1	141	1193	47	?	0		W100	IB<45						?	Y	N	
2			13	?	0		G-P100	BD			12	11	2	S	Y	N	
2			19	?	0		0	F	SCRAPER	E&E	25	27	12	H	Y	N	Heavily fired B. Age thumbnail
2			20	?	0		W100	F			10	10	2	S	Y	N	
2			26	?	20	CR	W100	IB<20						SH	Y	N	
2			56	?	0		W100	IB<20						?	Y	N	
1		1171	25	BR	0		0	BP			10	11	2	S	N	N	
1	159	1176	26	BR	0		0	F			16	17	2	S	N	N	
1		1173	30	BR	5	CR	0	F			31	20	8	H	N	N	
1	118	1143	31	BR	0		0	B	RET	PROX	56	18	5	S	N	N	Black bands in flint
1	118	1143	31	BR	0		W80	D<15						S	N	N	
1	118	1143	31	BR	0		W80	D<15						S	N	N	
1	118	1143	31	BR	5	CR	0	F			18	12	2	S	N	N	
1	118	1143	31	BR	10	CR	0	F			44	20	7	H	N	N	
1	142	1195	32	BR	10	CR	0	D<25						H	N	N	
1	142	1195	32	BR	0		0	D<40						SH	N	N	
1	142	1195	32	BR	0		0	F			23	20	4	S	N	N	
1	142	1195	32	BR	0		0	F			8	8	2	S	N	N	
1	142	1195	32	BR	50	CR ROLL	0	FP			26	36	8	H	N	N	
1		1214	34	BR	0		0	F	PF		18	16	2	S	N	N	PF platform prep.
1		1214	34	BR	0		W10	F	USE	END	31	22	3	?	N	ANC	Snapped
1		1214	34	BR	20	CR	0	D<30						H	N	N	
1		1214	34	BR	10	CR	0	F			33	22	4	S	N	N	
1	152	1207	42	BR	0		0	F			20	22	6	H	N	N	

SITE INFO.				RAW MATERIAL				TECHNOLOGY									
Int	**F**	**C**	**SF**	**F. Col.**	**Cort**	**C. col.**	**Patina**	**Type**	**Interp.**	**Work**	**L**	**B**	**W**	**Bulb**	**Bu**	**Dam**	**Notes**
1	141	1193	47	BR	5	CR	0	F	USE	RE	53	45	16	H	N	N	
2			3	BR	0		0	F			18	22	6	H	N	N	Unusual striking platform
2			4	BR	0		0	F	USE?	LE	25	26	5	S	N	N	
2			5	BR	0		0	F			24	8	2	H	N	N	
2			7	BR	0		0	BD			15	11	3	S	N	N	
2			8	BR	5	CR	0	BP			16	13	4	S	N	N	Evidence of platform preparation
2			11	BR	0		0	B	USE?	RE	35	9	3	S	N	MOD	
2			12	BR	0		W40	F			26	17	4	H	N	N	Reuse - break in patina
2			15	BR	5	CR	0	F	SCRAPER	E&E	22	23	12	H	N	N	Bronze age - thumbnail
2			16	BR	30	G	0	F	PROJ POINT	PF	42	18	10	H	N	N	Poss. Projectile point. Small spear like tip
2			17	BR	0		0	F			16	9	2	S	N	N	
2			18	BR	0		0	F			12	27	2	S	N	MOD	Broken into 3 pieces
2			21	BR	0		0	F			37	24	5	H	N	N	Chert. From bibolar core
2			23	BR	0		0	B			18	8	2	S	N	N	
2			23	BR	0		0	F			20	14	2	S	N	N	
2			24	BR	10	CR	0	F			30	35	8	H	N	N	
2			25	BR	0		0	D<25						SH	N	N	
2			27	BR	0		0	F	SCRAPER	E&E	35	15	10	H	N	N	Ground prox. End. Elongated flake. Later neo?
2			28	BR	0		0	B			27	8	2	S	N	N	
2			29	BR	0		G50	F			20	12	5	H	Y	N	
2			30	BR	10	CR	0	F			11	8	3	S	N	N	
2			33	BR	35	CR	0	F			26	18	7	H	N	N	
2			36	BR	0		0	F	USE?	LE? RE	45	60	8	H	N	N	
2			39	BR	5	CR	0	F			15	20	4	H	N	N	
2			42	BR	0		0	F			23	12	3	S	N	N	Ground surface?
2			43	BR	0		0	F			16	11	3	S	N	N	
2			43	BR	0		0	F			16	11	3	S	N	N	
2			45	BR	5	CR	0	F	USE?	RE	20	11	3	S	N	N	
2			46	BR	50	G	0	F			20	20	3	?	N	N	
2			47	BR	5	CR	0	D<40						SH	N	N	
2			50	BR	0		0	F	USE?	LE	15	20	3	H	N	N	
2			51	BR	0		0	F			21	10	3	H	N	N	
2			52	BR	0		0	D<20						H	N	N	

SITE INFO.				RAW MATERIAL				TECHNOLOGY									
Int	**F**	**C**	**SF**	**F. Col.**	**Cort**	**C. col.**	**Patina**	**Type**	**Interp.**	**Work**	**L**	**B**	**W**	**Bulb**	**Bu**	**Dam**	**Notes**
2			57	BR	5	CR	0	B			25	8	3	S	N	N	
2			58	BR	5	CR	0	D<25	USE?	END				H	N	N	
2			32	BR-R	0		0	D<25	CORE TRIM					S	N	N	
1	160	1170	24	G	0		0	B			35	11	5	S	N	N	
1		1171	25	G	0		W5	F	SCRAPER	LE RE	41	25	9	?	N	N	Ad hoc scraper
1	140	1196	27	G	5	CR	0	B	USE	LE RE	46	13	5	S	N	N	
1	140	1196	27	G	0		0	D<25						?	N	N	Chert
1	140	1196	27	G	0		0	F			55	42	10	?	N	N	
1	109	1129	28	G	0		0	D<35						?	N	N	Chert
1	142	1195	32	G	5	W	0	F	SCRAPER	E & E	54	35	14	H	N	N	END & EDGE SCRAPER
1	142	1195	32	G	0		0	F	SCRAPER	RE	27	20	8	?	N	Y	BROKEN
1	142	1195	32	G	0		0	D<20	USE	END				?	N	N	POLISHED END
1	142	1195	32	G	0		0	F	USE	LE	27	35	9	S	N	N	
1	142	1195	32	G	0		0	F	USE	LE	31	19	5	S	N	N	
1	142	1195	32	G	0		0	F	USE	RE	29	19	3	S	N	N	
1	142	1195	32	G	5	W	0	F	USE	RE	41	26	6	S	N	N	
1	142	1195	32	G	0		0	B			36	14	4	S	N	N	
1	142	1195	32	G	0		0	D<15						SH	N	N	
1	142	1195	32	G	0		0	D<25						?	N	N	
1	142	1195	32	G	5	CR	0	D<25						SH	N	N	
1	142	1195	32	G	0		0	D<30						SH	N	N	
1	142	1195	32	G	0	CR	5	F			35	19	4	S	N	N	
1	115	1140	33	G	0		0	F	SCRAPER	E & E	46	36	7	S	N	N	
1	115	1140	33	G	0		0	D<20						?	N	N	
1	115	1140	33	G	5	CR	0	F			31	18	7	H	N	N	
1	115	1140	33	G	0		0	F			25	25	7	H	N	N	Hinge termination
1	161	1218	35	G	0		0	D<15						SH	N	N	
1	161	1218	35	G	0		0	D<25						H	N	N	Chert
1	161	1218	35	G	0		0	F			35	40	11	H	N	N	Chert
1	116	1141	36	G	0		0	B			9	2	1	S	N	N	Poss. Burin spall/not convinced
1	116	1141	36	G	0		0	D<25						S	N	N	
1	116	1141	36	G	0		0	F			11	7	2	S	N	N	
1	116	1141	36	G	25	CR	0	F			12	8	2	S	N	N	
1	132	1164	37	G	0		0	F			26	28	6	H	N	N	
1	143	1179	40	G	0		W95	F			18	23	5	H	Y	N	
1	158	1217	41	G	0		0	FP	USE	LE	56	70	11	H	N	N	Chert
1	141	1193	48	G	0		0	F	AXE FRAG		75	46	13	SH	N	N	All axe frags
1	141	1193	48	G	0		0	F	AXE FRAG		90	54	13	SH	N	N	refit
1	141	1193	48	G	0		0	F	AXE FRAG		80	55	15	SH	N	N	

SITE INFO.				RAW MATERIAL				TECHNOLOGY									
Int	**F**	**C**	**SF**	**F. Col.**	**Cort**	**C. col.**	**Patina**	**Type**	**Interp.**	**Work**	**L**	**B**	**W**	**Bulb**	**Bu**	**Dam**	**Notes**
1	141	1193	48	G	0		0	F	AXE FRAG		65	45	8	SH	N	N	
2			2	G	0		0	F	USE?	RE	26	25	8	H	N	N	
2			14	G	0		W95	B			25	11	4	S	N	N	
2			22	G	5	CR	0	CORE 1			28	30	12	H	N	N	Frag. From core
2			31	G	0		0	F			24	12	3	S	N	N	
2			44	G	0		0	F	SCRAPER	E&E	36	22	6	H	N	N	Crude. Elongated flake Neo?
2			48	G	0		0	B			19	7	2	S	N	N	
2			49	G	0		0	FD	USE?	END	26	18	6	H	N	N	
2			53	G-BR	0		0	D<45						H	N	N	Frost damage
1	118	1143	31	GR	0		BR30	F	RET	LE	39	18	5	H	N	N	
1	118	1143	31	GR	5	CR	0	B			42	6	3	S	N	N	
1	118	1143	31	GR	0		0	F			25	26	6	H	N	N	
1	118	1143	31	GR	0		0	F			21	16	2	S	N	N	
1	118	1143	31	GR	5	W	0	F			28	22	6	H	N	N	
1	118	1143	31	GR	50	CR	0	FP			38	36	7	H	N	N	
2			55	GR	25	CR	0	F	SCRAPER	E&E	18	24	10	H	N	N	Crude thumbnail
2			1	G-W	0		0	D<55						H	N	N	
2			6	G-W	0		0	F			28	16	4	H	N	N	
2			9	G-W	0		0	F			27	30	4	H	N	N	Fossil void
2			10	G-W	0		0	F			26	28	5	H	N	N	
1	142	1195	32	R	0		0	BD	USE	RE	30	19	4	S	N	N	Notch

APPENDIX 2

Nosterfield Quarry 1999-2003 Lithic catalogue - Interventions 4, 6 & 8																		
SITE INFO.					**RAW MATERIAL**				**TECHNOLOGY**									
Y	Int	FNo	CNo	SF	F Col	Cort.	C. col.	Patina	Type	Interp.	Work	L	B	W	Bulb	Bu	Dam	Notes
99	4	13	1019	3	G-BL	0		0	D<50	NP?					?	N	N	Chert
00	6			18	BR	15	CR	W90	BD	USE?	LE?	24	11	5	?	N	Y	Snapped across patina
00	6			10	?	0		W100	D<15						SH	N	N	
00	6			5	BR	0		0	D<20	USE	LE				SH	?	ANC	Thermal damage
00	6			15	BR	5	CR	0	D<25						H	N	N	Thermal damage
00	6			2	G	40	ROLL	0	D<30						H	N	N	Chert
00	6			12	GR	0		0	D<40	RET	LE				H	N	N	
00	6			1	G	0		0	F	LEAF BLANK?	AE	25	21	3	S	N	N	
00	6			3	BR	0		0	F			30	32	10	H	N	N	
00	6			4	BR	35	ROLL	0	F	SCRAPER	E & E	28	20	6	H	N	ANC	
00	6			6	BR	0		0	F	USE?		31	22	5	S	N	N	V. light edge

SITE INFO.					RAW MATERIAL				TECHNOLOGY									
Y	Int	FNo	CNo	SF	F Col	Cort.	C. col.	Patina	Type	Interp.	Work	L	B	W	Bulb	Bu	Dam	Notes damage
00	6			7	?	0		W100	F			15	15	3	S	N	N	
00	6			8	BR	0		W95	F	USE	LE	26	20	5	H	N	N	
00	6			9	BR	20	CR	0	F			18	15	6	H	N	N	
00	6			11	BR	5	CR	0	F			23	12	4	H	N	N	
00	6			16	BR	0		0	F			25	15	5	H	N	N	
00	6			13	BR	0		W50	IB<15						?	Y	N	
00	6			14	?	0		G100	IB<20						?	Y	N	Thermal gloss
00	6			17	BR	50	ROLL	0	PF			18	25	4	S	N	N	
03	8		1002	3	?	20	CR	W100	B			42	14	3	S	Y	N	
03	8		1002	3	G	10	CR	0	B	USE	LE	42	18	7	H	N	N	
03	8		1002	3	?	0		W100	BD	MICRO LITH	RE	22	9	3	S	N	N	
03	8A		1000	1	BL	0		0	D<35						?	N	N	Chert
03	8		1002	3	BR	15	CR	0	F			30	19	5	H	N	N	
03	8		1002	3	BR	0		0	F			43	21	6	H	N	N	

APPENDIX 3

Nosterfield Quarry 2000-2003 Lithic catalogue Intervention 5

SITE INFO.					RAW MATERIAL				TECHNOLOGY									
Y	**Q**	**FNo**	**CNo**	**SF**	**F Col**	**Cort.**	**C. col.**	**Patina**	**Type**	**Interp.**	**Work**	**L**	**B**	**W**	**Bulb**	**Bu**	**D**	**Notes**
02	1	150	1341	21	BR-R	0		0	Not flint						N/A	?	N	Non flint - slag?
00	1	2	1003	1	BR	0		0	F	SCR	E & E	38	78	9	REM	N	N	Bronze Age
00	1	15	1023	2	BR-R	0		0	F	USE	LE	36	16	5	REM	N	MOD	Prox end snapped
00	1	15	1024	3	?	0		BR100	B	FAB	ALL	82	22	14	H	N	N	Mesolithic
00	1	15	1029	4	G	0		0	F			14	27	4	H	N	N	
00	1	15	1030	5	BR	20	CR	0	F	USE	LE RE	22	19	5	S	N	N	
00	1	26	1053	6	G	0		0	B			26	13	3	S	N	N	
02	1	72	1116	7	B	0		0	F	USE	LE RE	29	21	5	S	N	N	
02	1	72	1116	7	?	0		W100	B			24	12	2	S	N	N	
02	1	120	1179	8	BR-R	0		0	F	USE	RE	23	12	3	S	N	N	
02	1	129	1193	9	G			0	TP<110						H	N	MOD	Chert chunk
00	1	28	1055	10	BR	5	CR	0	F	RET	PROX	31	18	5	REM	N	N	Prox end modified to a point
01	1	31	1061	11	G	0		0	NP			23	13	6	?	N	N	Silicieous sandstone
01	1	31	1061	12	BR	0		0	NP - F			58	22	8	?	N	MOD	Silicieous sandstone
00	1	31	1061	13	BR	0		0	F			22	10	2	S	N	N	

SITE INFO.					RAW MATERIAL				TECHNOLOGY									
Y	**Q**	**FNo**	**CNo**	**SF**	**F Col**	**Cort.**	**C. col.**	**Patina**	**Type**	**Interp.**	**Work**	**L**	**B**	**W**	**Bulb**	**Bu**	**D**	**Notes**
01	1	44	1074	14	B	0		0	D<40	USE	END	36	37	13	H	N	N	Black chert
02	1	131	1197	15	?	50	CR	W100	F			38	45	12	H	N	N	
02	1	131	1197	15	G	0		W90	F	USE	LE RE	25	12	5	S	N	N	
02	1	132	1199	16	BR	0		W90	B	USE	LE RE	36	12	3	S	N	N	
02	1	132	1199	16	BR	0		W90	D<20						S	N	N	
02	1	132	1199	16	G	0		0	D<20						?	N	N	
02	1	132	1199	16	BR	0		0	BP	USE	LE RE	26	14	3	S	N	N	
02	1	142	1219	17	BR	5	CR	0	F	USE	RE	26	36	6	H	N	N	
02	1	145	1226	18	G	0		0	BP	USE	LE RE	25	10	3	S	N	N	
02	24	164	1277	19	G-W	0		0	D<10						SH	N	N	
02	21	164	1277	19	G-W	0		0	D<15						SH	N	N	
02	12	164	1277	19	G-W	0		0	D<20						SH	N	N	
02	5	164	1277	19	G-W	0		0	D<25						SH	N	N	
02	5	164	1277	19	G-W	0		0	D<30						SH	N	N	
02	1	164	1277	19	G-W	0		0	D<35						SH	N	N	
02	1	164	1277	19	CR	0		W100	IB<10						SH	N	N	
02	1	164	1277	19	CR	0		0	F			6	6	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			7	5	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			6	5	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			7	6	1	S	N	N	
02	1	164	1277	19	CR	0		0	F			8	4	1	S	N	N	
02	1	164	1277	19	CR	0		0	F			19	16	6	H	N	N	
02	1	164	1277	19	G-W	0		0	F			15	24	6	H	N	N	
02	1	164	1277	19	CR	0		0	F			20	14	3	S	N	N	
02	1	164	1277	19	CR	0		0	F			25	13	3	S	N	N	
02	1	164	1277	19	CR	0		0	F			32	12	4	S	N	N	B. scars
02	1	164	1277	19	CR	0		0	F			43	18	5	H	N	N	B. scars
02	1	164	1277	19	CR	0		0	D<25						H	N	N	Chert
02	1	164	1277	19	CR	0		0	F			35	21	10	H	N	N	
02	1	164	1277	19	CR	0		0	F			17	16	3	S	N	N	Chert
02	1	164	1277	19	CR	0		0	F			6	6	S	S	N	N	
02	1	164	1277	19	CR	0		0	F			18	11	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			30	18	2	S	N	N	
02	1	164	1277	19	CR	0		0	F	RET	LE	34	14	4	S	N	N	B. scars
02	1	164	1277	19	BR	0		0	BM	MICROLITH		16	5	2	S	N	N	Late Meso.
02	1	164	1277	19	CR	0		0	D			15	25	4	S	N	N	
02	1	164	1277	19	CR	0		0	BD			12	6	2	S	N	MOD	Chipped
02	1	164	1277	19	G-B	0		0	B			18	8	2	S	N	N	

SITE INFO.					RAW MATERIAL				TECHNOLOGY									
Y	**Q**	**FNo**	**CNo**	**SF**	**F Col**	**Cort.**	**C. col.**	**Patina**	**Type**	**Interp.**	**Work**	**L**	**B**	**W**	**Bulb**	**Bu**	**D**	**Notes**
02	1	164	1277	19	CR	0		0	F			30	12	3	H	N	N	
02	1	164	1277	19	CR	0		0	F			22	12	4	H	N	N	
02	1	164	1277	19	CR	0		0	F			35	20	6	H	N	N	
02	1	164	1277	19	CR	0		0	B			12	5	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			16	8	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			18	6	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			11	14	2	H	N	N	
02	1	164	1277	19	CR	0		0	BD			20	12	4	S	N	N	
02	1	164	1277	19	CR	0		0	CORE 2			56	32	35	S	N	N	
02	1	164	1277	19	CR	0		0	F			20	8	3	S	N	N	
02	1	164	1277	19	CR	0		0	F			17	6	4	H	N	N	
02	1	164	1277	19	CR	0		0	F			24	16	7	S	N	N	
02	1	164	1277	19	CR	0		0	F			34	22	8	H	N	N	
02	1	164	1277	19	CR	0		0	F			16	9	4	S	N	N	
02	1	164	1277	19	CR	0		0	F			14	17	6	H	N	N	
02	1	164	1277	19	CR	0		0	F			11	12	3	H	N	N	
02	1	164	1277	19	CR	0		0	F			30	20	7	H	N	N	
02	1	164	1277	19	CR	0		0	F			10	6	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			16	15	5	S	N	N	
02	1	164	1277	19	CR	0		0	F			12	13	4	H	N	N	B. scars
02	1	164	1277	19	CR	0		0	F			21	20	3	S	N	N	
02	1	164	1277	19	CR	0		0	F			32	10	5	H	N	N	
02	1	164	1277	19	CR	0		0	B			10	6	2	S	N	N	
02	1	164	1277	19	G	0		0	BD			12	9	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			14	29	4	S	N	N	
02	1	164	1277	19	CR	0		0	F			20	12	2	S	N	N	
02	1	164	1277	19	CR	0		0	F	USE	LE	25	20	8	H	N	N	
02	1	164	1277	19	CR	0		0	F			15	11	3	S	N	N	B. scars
02	1	164	1277	19	CR	0		0	BP			10	9	2	H	N	ANC	
02	1	164	1277	19	CR	0		0	F			17	12	3	S	N	N	
02	1	164	1277	19	CR	0		0	F			22	16	8	H	N	N	
02	1	164	1277	19	CR	0		0	F			17	8	2	S	N	N	
02	1	164	1277	19	CR	0		0	F			12	8	3	S	N	N	
02	1	164	1277	19	CR	0		0	F			10	16	1	S	N	N	
02	1	189	1338	20	G	0		0	F	USE	LE	24	12	2	S	N	N	
02	1	150	1341	21	?	0		G100	IB<20						H	N	N	
02	1	150	1341	21	?	0		W100	NP<50						N/A	N	N	
02	1	150	1343	22	BR	0		W50	D<25						SH	N	N	
02	1	190	1376	23	G	0		W50	NP<15						N/A	N	N	
02	1	190	1376	23	BR	50	G	0	D<20						?	N	N	
02	1	205	1391	24	G	0		W100	NP<30						N/A	N	N	SF 24 conjoin
02	1	205	1391	24	G	0		W100	NP<35						N/A	N	N	SF 24 conjoin
02	1	219	1504	25	G	0		0	F			27	21	10	H	N	N	

SITE INFO.					RAW MATERIAL				TECHNOLOGY									
Y	Q	FNo	CNo	SF	F Col	Cort.	C. col.	Patina	Type	Interp.	Work	L	B	W	Bulb	Bu	D	Notes
02	1	220	1506	26	G	0		0	F			29	20	8	H	N	N	Chert. B. scars
02	1	220	1506	26	B	0		0	F			14	15	2	H	N	N	Chert. B. scars
02	1	220	1508	27	?	0		W100	D<35						SH	N	N	
02	1	220	1508	27	G	0		0	F			16	18	3	S	N	N	
02	1	222	1510	28	?	0		W100	F			22	10	2	S	N	N	
02	1	222	1510	28	B	0		0	F			28	14	4	H	N	N	Chert
02	1		1513	29	?	0		W100	D<20						SH	N	N	
02	2		1513	29	G	25	CR	W90	D<35						SH	N	N	
02	1		1513	29	G	0		0	CORE 1						SH	N	N	
02	1		1513	29	G	0		0	CORE 1			25	37	20	S	N	N	
02	1		1513	29	B	0		0	CORE 3			25	27	22	S	N	N	Chert
02	1		1513	29	G	0		0	F	RET	END	26	16	8	H	N	N	
02	1		1513	29	G	0		0	F	USE	RE	39	19	7	H	N	N	
02	1		1513	29	G	0		W80	F			25	35	12	H	N	N	
02	1		1513	29	BR	0		0	F	USE	LE RE	21	36	8	H	N	N	
02	1		1513	29	B	0		0	F			26	10	3	S	N	N	Chert. Circular fossil
02	1		1513	29	G	0		W90	F	USE	LE RE	34	16	5	H	N	N	
02	1		1513	29	G	0		0	F	USE	RE	24	16	4	S	N	N	Point
02	1		1513	29	G	0		0	F	USE	LE	35	18	4	H	N	N	Edge gloss
02	1		1513	29	G	5	CR	0	B	USE	LE RE	34	8	2	S	N	N	
02	1	224	1514	30	?	0		W100	IB<30						SH	N	N	
02	1	224	1514	30	B	0		0	D<50						SH	N	N	Chert
02	3	224	1514	30	G	0		W50	D<20						SH	N	N	
02	1	224	1514	30	B	0		0	F			34	12	4	H	N	N	Chert
02	1	224	1514	30	B	0		0	F			11	12	2	S	N	N	
02	1	224	1514	30	G	0		0	F			19	14	3	S	N	N	
02	1	224	1514	30	G	0		0	F	LEAF ARROW		30	20	4	S	N	ANC	Neo.Broke n Tip
02	1	224	1514	30	G	0		0	F			45	20	6	H	N	MO D	
02	1	224	1514	30	?	0		W100	F	USE	LE RE	30	13	4	H	N	N	
02	1	224	1514	30	G	0		W90	BM	MICRO LITH		15	5	2	S	N	N	Meso.
02	1	224	1514	30	G	0		0	BM	MICRO LITH		18	5	2	S	N	N	Meso.
02	1	320	1515	31	B	0		0	D<25						H	N	N	Chert
02	1		1526	32	B	0		0	D<35						H	N	N	Chert
02	1	224	1527	33	?	0		W100	B			32	9	3	S	N	N	
02	1	224	1527	33	?	0		W100	F			15	9	4	S	N	N	
02	1	224	1527	33	?	0		W100	F			20	11	5	S	N	N	

SITE INFO.					RAW MATERIAL				TECHNOLOGY									
Y	Q	FNo	CNo	SF	F Col	Cort.	C. col.	Patina	Type	Interp.	Work	L	B	W	Bulb	Bu	D	Notes
02	1	224	1527	33	?	0		W100	F			15	13	4	S	N	N	
02	1	224	1527	33	?	0		W100	B			19	10	3	S	N	MOD	
02	1	234	1545	34	G	0		W80	D<15						SH	N	N	
02	1	234	1545	34	B	0		0	D<35						SH	N	N	Chert
02	1	234	1545	34	BR	50	CR	0	BP			5	9	2	S	N	N	
02	1	234	1545	34	G-BR	0		0	F			43	26	10	H	N	N	Chert
02	1	234	1545	34	G-BR	0		0	F			34	23	12	H	N	N	Chert
02	1	234	1545	34	G	0		0	BP			12	8	2	S	N	N	
02	1	234	1545	34	G	0		0	B			26	11	4	S	N	N	Chert
02	1	234	1546	35	CR	100	CR	0	F			34	18	6	H	N	N	
02	1	234	1546	35	B	0		0	F			26	15	3	S	N	N	Chert
02	1	239	1557	36	G	0		0	B	MICROLITH	LE	26	7	3	S	N	N	Meso.
02	1	240	1560	37	BR	0		0	F			20	12	4	S	N	N	
02	1	242	1565	38	G	0		0	B	MICROLITH		21	5	2	S	N	N	Meso.
02	1	244	1576	39	G	0		0	D<20						SH	N	N	
02	1	244	1576	39	?	0		G100	IB<15						SH	N	N	
02	1	244	1576	39	BR	0		0	BD			13	11	2	S	N	N	
02	1	245	1582	40	G	0		0	D<20						SH	N	N	
02	1	245	1582	40	BR	0		0	B			11	6	1	S	N	N	
02	1	245	1580	41	?	0		W100	D<20						SH	N	N	
02	1	245	1580	41	G	0		W80	D<35						H	N	N	
02	1	245	1580	41	?	30	CR	W100	F	USE	RE	20	17	5	H	N	N	
02	1	245	1580	41	G	0		0	F	USE	LE	26	21	5	H	N	N	
02	1	245	1580	41	G	0		0	F	USE	RE	16	17	4	H	N	N	
02	1	245	1580	41	G	0		W95	F			8	8	2	S	N	N	
02	1	245	1580	41	G	0		W95	BP			12	11	2	S	N	N	Refits with below
02	1	245	1580	41	G	0		W95	BM			8	10	2	S	N	N	Refits with above
02	1	260	1629	42	?	0		W100	F			24	12	4	S	N	N	
02	1	263	1637	43	G	0		0	B			31	9	3	S	N	N	
02	1	265	1639	44	?	0		W100	BD			22	11	3	S	N	N	
02	1	264	1644	45	G	10	G	W90	D<25						H	N	N	
02	1	264	1644	45	G	0		W95	D<30						H	N	N	
02	1	130	1996	46	BR	5	BR	0	F			16	13	6	H	N	N	
02	1			47	G	10	CR	0	CORE 1			40	22	18	S	N	N	
02	1			47	G	10	ROLL	0	D<20						?	N	N	
02	1			48	BR	0		W20	F			26	18	6	H	N	N	Reuse patina cut by scars
02	1			49	G	5	CR	0	F	SCRAPER	E & E	21	25	8	H	N	N	
02	1			50	G	0		0	BD	USE	END	22	15	4	S	N	N	
02	1			51	G	0		0	CORE 1			40	30	20	H	N	N	

SITE INFO.					RAW MATERIAL				TECHNOLOGY									
Y	Q	FNo	CNo	SF	F Col	Cort.	C. col.	Patina	Type	Interp.	Work	L	B	W	Bulb	Bu	D	Notes
02	1			52	B	0		0	CORE 3			38	30	22	S	N	N	Chert
02	1			53	G	15	CR	W95	CORE 1			40	32	25	S	N	N	
02	1			54	G	0		0	B			40	11	4	S	N	MOD	
02	1			54	G	0		0	B			20	8	2	S	N	N	
02	1			55	G	0		0	D<30						H	N	N	
02	1			56	BR	10	CR	0	F	SCRAPER	E & E	28	27	15	SP	N	N	
02	1			57	G	0		W80	B			32	13	6	H	N	MOD	
02	1			58	?	0		W100	F	USE	LE	27	20	4	S	N	N	
02	1			59	BR	0		W80	D<15						SH	N	N	
02	1			60	BR	0		0	F	USE	LE RE	18	12	3	S	N	N	
02	1			61	G	0		0	B			29	10	7	S	N	N	
02	1			62	G	0		0	B	USE	LE	26	9	4	H	N	N	
02	1			63	G	30	CR	0	D<55						SH	N	N	
02	1			64	BR	0		0	F			15	7	2	S	N	N	
02	1			65	BR	0		0	F	USE	RE	21	22	5	S	N	N	
02	1			66	?	0		W100	B			19	6	2	S	N	N	
02	1			67	BR-GR	0		0	CORE 1			42	35	22	S	N	N	Chert
02	1			68	?	0		W100	F			42	32	7	S	N	MOD	
02	1			69	G	25	CR	W80	D<30						SH	N	N	
02	1			70	?	5	CR	W100	D<30						SH	N	N	
02	1			70	G	0		0	F	USE	LE RE	26	48	8	H	N	N	
02	1			70	BR	10	CR	0	CORE 1			44	30	17	S	N	N	
02	1			70	B	0		0	F			25	13	5	H	N	N	Chert
02	1			71	B	0		0	D<15						SH	N	N	Chert
02	2			71	?	0		W100	D<20						H	N	N	
02	1			71	?	0		W100	D<25						H	N	N	
02	2			71	?	0		W100	D<30						H	N	MOD	
02	1			71	?	0		W100	BD			13	8	2	S	N	N	
02	1			71	BR	0		W95	F			12	8	2	S	N	N	
02	1			71	?	0		W100	F			11	11	2	S	N	N	
02	1			71	BR	0		W80	F			22	13	4	S	N	N	
02	1			71	BR	0		0	F	USE	LE	26	14	5	H	N	N	
02	1			71	BR	0		0	B	USE	LE RE END	24	11	3	S	N	N	
02	1			71	?	0		W100	F	MICRO BURIN	RE	15	10	4	S	N	N	Meso. Poss microburin
02	1			71	?	0		W100	BP			15	10	2	S	N	N	
02	1			71	?	0		W100	CORE 1			49	30	20	S	N	N	
02	1			72	G	15	CR	W90	F			18	15	5	H	N	N	

SITE INFO.					RAW MATERIAL				TECHNOLOGY									
Y	**Q**	**FNo**	**CNo**	**SF**	**F Col**	**Cort.**	**C. col.**	**Patina**	**Type**	**Interp.**	**Work**	**L**	**B**	**W**	**Bulb**	**Bu**	**D**	**Notes**
02	1			72	G	0		W90	B			32	12	4	S	N	N	
02	1			72	?	0		W100	BP			30	12	3	S	N	N	
02	1			72	G	0		W90	BP			26	16	5	S	N	N	
02	1			72	G	0		0	B	USE	LE RE	22	8	3	S	N	N	
02	1			73	BR	0		0	D<30						SH	N	N	
02	1			73	?	0		W100	F	USE	LE RE	25	36	6	S	N	N	
02	1			73	?	0		G100	BM			12	10	3	S	N	MO D	Refits with below
02	1			73	?	0		G100	BD			8	10	3	S	N	MO D	Refits with above
02	1			139	BR	0		0	NP<5						N/A	N	N	
02	1			140	G	0		W90	F			24	19	3	H	N	N	
02	1			141	G	0		W90	D<20						SH	N	N	
03	1	278	1666	201	?	0		G100	IB<20						SH	N	N	Chert
03	1	278	1666	201	BR	0		0	F			29	36	8	H	N	N	Chert
03	1	304	1721	210	?	0		W100	NP<20						N/A	N	N	
03	1	306 B	1709	211	BR	0		0	F	USE	RE	24	20	6	S	N	N	
03	1	306 A	1697	212	BR	0		0	B			34	12	5	S	N	MO D	Edge chips
03	1	295	1604	500	BR	10	CR	0	F			42	16	3	S	N	N	
03	1	295	1604	500	BR	24	CR	0	D<35	USE	END	41	10	8	SH	N	N	Awl/borer
03	1	295	1604	500	BR	30	CR	0	F			30	15	4	S	N	N	
02	1	234	1545	34	?	0		G100	F			22	20	8	H	Y	N	
02	1			54	?	0		W100	B	?	?	35	13	2	S	Y	N	
02	1			71	?	0		0	IB<15						?	Y	N	
02	2			71	?	0		0	IB<20						?	Y	N	
02	1			71	?	0		G100	B	USE	LE RE	22	8	5	S	Y	N	

APPENDIX D CERAMIC REPORTS

Blaise Vyner

PART 1 NEOLITHIC POTTERY FROM NOSTERFIELD

1.0 INTRODUCTION

The assemblage appears to span the Neolithic period and comprises Grimston, Peterborough and Grooved wares. The majority of the sherds are small and preclude the reconstruction of complete vessels. A number of fabrics is present, but since these are very similar in content individual differences are most likely to reflect the individualities of particular vessels rather than significant differences in chronology or source. Fabric difference between particular vessels, however, may well be functionally and/or symbolically significant.

2.0 TREATMENT

In the fabric descriptions supplied hyphenated colours indicate the variation in colour expected from poorly controlled firing conditions, the first colour being that most in evidence. Grit sizes are expressed as small (>3mm) and medium (4-6mm), large (6-9mm), and very large (<10mm). Distinctive particles smaller than 0.02mm are described as dust. No thin section analysis has been done and identification has been using a 10× lens.

While the desirability of more detailed presentation of prehistoric ceramics in terms of form and function (Cleal 1992, 302-3) is recognised, the fragmentary nature of many assemblages, not least this one, often precludes the application of these approaches in that rim diameter, vessel height and volume are not usually knowable. In the catalogue entries square brackets denote a pit or other feature number, while standard brackets denote their fill number.

Sherds have been assigned to individual fabric types, and where possible, individual vessels have been identified. Diagnostic sherds have been illustrated and this material is separately packed in boxes marked 'D' in green. All the material has been re-packed following examination and identification by fabric and vessel. The pottery has been assessed for conservation needs and all significant sherds in friable or otherwise weak fabrics have been consolidated. The laboratory record cards are included with the pottery and conserved pottery is stored in boxes marked 'C' in red. The drawn material is also that which is most appropriate for display.

3.0 POTTERY FABRICS

Although the pottery from Nosterfield spans a considerable period of the Neolithic, with a number of chronologically and stylistically distinct elements, there are considerable similarities in fabric. Virtually all the material contains the same suite of filler grits, although proportions vary from vessel to vessel. A distinctive feature of the fabrics is a considerable number of cavities from which an angular grit has leached. The cavities vary in size from very small through to large, in the latter instance the surviving fabric is considerably weakened through the loss of the grits combined with low original firing temperatures. Geological examination reveals traces with the characteristics of gypsum, which is suggested to have been the original grit.

Angular fragments of grey-white 'cherty limestone' - effectively chert - are another major constituent of the pottery fabrics, with mica and quartz forming a smaller element. Smaller rounded quartz sands may have been present in the clay matrix, rather than being deliberately added. Fragments of carbon-rich mudstone are occasionally present, while there also appear to be occasional fragments of re-used 'grog', or previously fired clay.

Variations of the fabric have been noted and allow the sub-divisions described below, but these show relatively little variation in basic constituents between Grimston style of the earlier Neolithic, and the later Peterborough Fengate and Grooved Ware. Significantly, sherds of the only Peterborough Mortlake style vessel from the site are in a variant fabric (Pe4), distinguished by the presence of igneous grits and fragments of feldspar.

It may be significant, in terms of activity at the site and in the neighbourhood, that the constituents of the main suite of fabrics are all available within a radius of between 16 and 19 km of Nosterfield, although, of course, they could have come from further afield. Grits for the granite tempered Mortlake style vessel, if not the vessel itself, derive from the Pennine uplands to the west of the site.

Taking into account the post-depositional degeneration of the pottery a high level of potting skill is evident throughout. In general the finished vessels are better made than pottery of the middle Bronze Age and Iron Age from the region. Of particular note are some sherds of Grooved Ware in Woodlands style, where a fine clay body has been burnished before firing.

Table 1 Distribution of pottery by feature

Feature	Fill	Vessel no.	Type	Weight
		24	GW1	25
		12	GW6	50
		13	GW2	40
1004	1001	22	GW2	10
	1002	14	GW8	80
		12	GW6	50
	1003	21	GW5	35
1009	1022	25	GW2	130
	1023	31	GW3	30
	1024	15?	GW3	90
1010			GW3	35
	1025		GW4	10
	1026		GW3	90
1011	1027	15	GW3	370
		16	GW4	5
1012	1020		GW3	15
1013	1201		GW3	35
1015		15	GW3	60
1016	1203		GW2	10
1017	1202	17	GW5	230
		18	GW4	5
1054		14	GW8	30
		20	GW6	25
1063	1064		?Pe	20
1069	1068	1	Grimston	10
		4	Grimston	100
1074	1072	17	GW5	25
		26	GW2	5

Feature	Fill	Vessel no.	Type	Weight
	1073	27	GW7	5
		28	GW2	5
	1075	2	Grimston	15
1076		3	Grimston	50
		31	GW3	25
1090			GW3	45
1096			GW6	10
1097		?13	GW2	35
1099			GW2	5
1101			GW2	10
1105		23	GW2	50
1113		29	GW9	20
1114		30	GW1	25
1216	1217	19	GW8	105
	1218		GW3	10
	1306	5	Fengate	480
1307		6	Fengate	695
		7	Fengate	1440
		8	Fengate	220
1309	1308		GW3	15
1311	1310		GW3	15
1313	1312	9	Fengate	25
		10	Fengate	x
1321	1320	15	GW3	10
		11	Mortlake	115

GRIMSTON STYLE

The pattern of distribution of Neolithic activity and associated pottery in Yorkshire has, perhaps more than any other period of the past, remained unchanged over many years. Newbigin's map (1937, pl. 18) has continued fairly accurately to represent the known distribution of earlier Neolithic pottery. The pottery assemblage from Nosterfield, on the north bank of the Ure, taken in conjunction with that recently excavated from Marton-le-Moor, between the rivers Nidd and Swale, some 18km to the south (Manby 1996, Tavener 1996), is therefore important, the more so since it derives from the Vale of Mowbray, an area where significant sites have until now not been joined by ceramic assemblages.

FORM AND FABRIC

Sherds from four Grimston style vessels were found in two pits, 1069 and 1076. The fabric is of the same general type as the majority of the vessel fabrics found at Nosterfield, characterised by numerous small to medium-sized cavities from leached grits, with variable amounts of small chert fragments and some quartz sands. Vessel 2 is unusual in having been fired oxidised orange-brown on both internal and external surfaces. With the exception of one bag-shaped vessel (vessel 4), the vessel profile was not recoverable, although the raised cordon on one vessel (vessel 1) might well have followed a carination.

The quantity of Grimston style pottery from Nosterfield is not sufficient to allow much discussion. Vessel forms appear to be plain bowls, although no substantial profile is recoverable. Rims are plain and everted, and the assemblage lacks the sharp everted and rolled forms seen at Marton-le-Moor. Vessel walls are thin, between 5 and 8mm, and comparable with those from the finer series of vessels from Marton-le-Moor (Manby 1996). There appear to be similarities, too, between the fabric of the Nosterfield pottery and that of the finer vessels from Marton-le-Moor, although the latter assemblage is marked by sandstone and Pennine grit fillers (ibid).

CONTEXT AND ASSOCIATIONS

The Grimston style pottery from Nosterfield derives from the fill of two pits only, 1069 and 1076. Only a small amount of the lithic material from the site is chronologically diagnostic (Rowe 1998); of the contexts which contained Grimston style pottery, the fill of pit 1069, context 1068, produced a leaf-shaped arrowhead and a few flint flakes. The small amount of material does not encourage extended discussion, although it should be noted that the presence of carinated pottery here and at Marton-le-Moor (Manby 1996) extends the distribution of carinated Grimston bowls to sites, suggested to have been restricted to mortuary sites (Herne 1988, 19) to sites which do not have an overt mortuary function.

CHRONOLOGY

In the absence of any radiocarbon dates to provide an absolute chronology for the Nosterfield pottery comparison has to be made with other sites within the region. Again, the Marton-le-Moor site is useful in that a date has been obtained for the thin-walled (Series 1) Neolithic vessels which compare with those from Nosterfield. This is calibrated to 3900 - 3800 BC (OXA-5581), somewhat earlier than the series from Street House cairn, which varies from 3120±50 (BM2061N) to 2770±50 cal BC (BM1969N) and relates to activity which is probably contemporary with the deposition of the pottery (Manby 1996; Vyner 1988, 199).

In east Yorkshire and its region it would seem that the Grimston style bowl, either carinated or bag-shaped, is current during the first half of the fourth millennium BC. On the evidence from Marton-le-Moor and the more distant Scottish site of Balfarg (Cowie 1993, 65-75), heavier vessels with coarser fabrics and applied lugs are in use, alongside the finer vessels, by the mid-fourth millennium. It is not currently clear how long either type remained current, although Manby suggests that relatively soon after this time the Series 1 vessels go out of use, while ultimately the Series 2 vessels develop into Towthorpe Ware (Manby 1996). The absence of thick-walled vessels from Nosterfield may therefore be chronologically significant, perhaps indicating a reduction of activity in the area around the mid-fourth millennium cal BC.

PETERBOROUGH WARES

Fragments of an estimated six Peterborough Ware vessels are present in the assemblage, the majority of the material deriving from parts of two vessels in the fill of a pit, 1307. The vessels are characterised by thick walls and large grits, probably a necessary manufacturing and firing corollary.

FORM AND FABRIC

Pe1 Thick walled, chert grits, fine clay matrix with quartz dust. Vessels 5, 6, 10.

Pe2 Thick walled, numerous cavities of all sizes, coarse clay matrix with quartz dust. Vessels 7, 8.

Pe3 As above, with few or no cavities. Vessel 9.

Pe4 Thick walled, coarse fabric with small to medium quartz, feldspar and mica fragments and medium to large and very large (13 by 9 by 9mm) angular granite grits. Wall thickness typically 17mm. Vessel 11.

Most of the Peterborough Ware is in the Fengate style: two vessels, with a single flake from a probable third, vessel 10, have straight sides with T-shaped rims and well-executed incised decoration. Two vessels have more obvious collars, one roughly formed with external incised decoration, another represented by a single sherd which has external incised decoration and a series of U-shaped incised grooves on the interior.

A single vessel, 11, with dumb-bell impressions, probably from the use of bird or other bone, appears to belong to the Mortlake style. The vessel contains igneous grits which could have been obtained locally from a glacial deposition.

As with the Grimston style pottery, the assemblage has some parallels with somewhat larger assemblage of pottery from Marton-le-Moor, but these tend to be in terms of decorative traits rather than vessel form. The T-shaped rim of the well-crafted Nosterfield vessels 5 and 6 is noted as absent from the Marton-le-Moor assemblage (Manby 1996), but does find some similarities in the assemblage from Carnaby Top Site 19 on the Yorkshire Wolds (Manby 1975, fig. 13, 5), and in the less well finished material from Sawdon Moor, on the south slope of the North Yorkshire Moors (Manby 1995, 42-3). The absence of sherds with overt Rudston characteristics contrasts with pottery in the somewhat larger Peterborough Ware assemblage recently recovered from the site at Catterick Racecourse, on the River Swale, 19km to the north (Vyner 1996), where it was apparently associated with mortuary activities. However, the relatively few assemblages available for study, even within the wider region, make it difficult to know whether variation in construction and decoration should be ascribed to chronology, function, or cultural association.

Impressed cord decoration is hardly seen at Nosterfield, although there are some poorly defined indentations which may have been formed by this method. Fingernail impressions are commonly found, but the overwhelming use of incised decoration using stick, bone, or flint is notable.

Table 2 Decorative motifs on Nosterfield Peterborough ware

<table>
<tr><th>vessel</th><th>fabric</th><th>incised</th><th>impressed</th><th>fingernail</th><th>style</th><th>no. of contexts</th></tr>
<tr><td>5</td><td>1</td><td><</td><td></td><td>/</td><td>F</td><td>1</td></tr>
<tr><td>6</td><td>1</td><td><</td><td>|</td><td></td><td>F</td><td>1</td></tr>
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CONTEXTS AND ASSOCIATIONS

Peterborough Ware occurs in the fill of three pits, 1307, 1313, and 1321. Peterborough ware in Fengate style was not associated with any other styles of pottery, but the fill of pit 1321, containing the Mortlake style sherd, also contained a sherd of Grooved Ware which is probably part of vessel 15. Again, the lithic associations are unhelpful so far as chronology is concerned. Of the principal context producing Peterborough pottery, pit 1307 produced only flakes, while a saw in volcanic Borrowdale stone was present in the fill of pit 1313 (Rowe 1998).

CHRONOLOGY

Again, the Marton-le-Moor site has produced a range of radiocarbon dates relevant to the Nosterfield assemblage. Since they are derived from carbonised hazelnuts they may be somewhat older than the associated potsherds, but the range through the second part of the fourth millennium cal BC is a potential indication of the currency of this material (Manby 1996), as well as a further confirmation of the likely contemporaneity of Mortlake and Fengate styles (Gibson 1995, 30).

GROOVED WARES

The assemblage of Grooved Ware from Nosterfield contains vessels in Woodlands and Durrington Walls style. The total weight of Grooved Ware from Nosterfield is 1580gm. While it is a smaller assemblage than those recently recovered from Marton-le-Moor (3044gm) or Roecliffe (2899gm), with which regional comparison is best made (Manby 1996), it is particularly important because the continuing archaeological investigation of Nosterfield and the nearby henges offers the potential for viewing the assemblage within the broader context.

The Grooved Ware vessels from Nosterfield, as from other Yorkshire sites, were recovered from pits and are for the most part represented by only small numbers of sherds, and on occasion by only one or two (Table 3). The minimum number of vessels represented is nine in Woodlands style and 12 in Durrington Walls style, with total weights respectively of 300g and 1280g. The higher weight of the Durrington Walls style pottery reflecting the slightly coarser fabric as well as the greater number of vessels. The predominance of Durrington Walls style Grooved Ware at this site is typical of the relative distributions of Grooved Ware styles in northern England (Manby forthcoming).

Table 3 Relative quantities of Grooved Wares at Nosterfield

	Woodlands style		**Durrington walls style**	
vessel	**sherds**	**weight**	**sherds**	**weight**
12			11	105gm
13			10	70gm
14			15	110gm
15			25	530gm
16			1	5gm
17			14	255gm
18			1	5gm
19			7	105gm
20			5	25gm
21			5	35gm
22			2	10gm
23			4	50gm
24	4	25gm		
25	35	130gm		
26	1	5gm		
27	1	5gm		
28	1	5gm		
29	5	25gm		
30	3	25gm		
31	4	55gm		
TOTAL	**59**	**300gm**	**95**	**1280gm**

FORM AND FABRIC

GW1 Thin walled, numerous cavities from small leached grits (and medium for vessel 4), very similar to Grimston. Contains occasional traces of 'grog'. Vessels 4, 12, 24.

GW2 Medium walled, small to medium chert grits, small to medium cavities with remnant white material which is probably gypsum, mica dust in fabric, which can be very fine. Vessels 13, 16, 18, 25, 28.

GW3 Thick walled, numerous small to medium chert grits, some small cavities, quartz dust in the clay matrix. Vessels 15, 23, 31.

GW4 As GW2, but with no obvious cavities. Vessel 16.

GW5 Thick-walled, numerous small, medium and large cavities create a friable fabric, a few obvious irregularly shaped small white grits probably gypsum, some small clear quartz grains. Vessel 17.

GW6 Thin-walled version of GW5. Vessels 20, 30.

GW7 Fine smooth fabric with quartz and pink rose quartz sands, and perhaps some grog. Vessel 27.

GW8 As GW2, but with small white grits, perhaps gypsum. Vessels 14, 19.

GW9 As GW3, but with medium wall thickness. Vessel 22.

Table 4 Nosterfield Grooved Ware: correlation of fabric and style

GW Fabric	Durrington Walls	Woodlands
1		24
2	13, 22, 23	25, 26, 28, 29
3	15	
4	16, 18	
5	17	
6	12, 20	30
7		27
8	14, 19	

The Grooved Ware is typical of the Woodlands and Durrington Walls styles (Table 3). The Woodlands style (Wainwright and Longworth 1971, 238-40) is generally found in small assemblages widely if thinly distributed between Orkney and Wessex. The Nosterfield vessels are all fragmentary and in general do not allow the original form of the vessels to be reconstructed. As usual with the Woodlands style, internal decoration is confined to the rims. External moulded cordons are relatively common and there appears to be a direct correlation between quality of the vessel fabrics and the extent and intricacy of decoration. Vessels 20 and 27 have particularly fine fabrics, the former has notching on alternate cordons as seen at Marton-le-Moor (Manby 1996) and on Yorkshire Wold sites at Carnaby Top Site 12 and Flamborough Hartondale (Manby 1974). The undulating cordon with linking motif on vessel 20 is reminiscent of Marton-le-Moor Gw22 (Manby 1996), while vessel 28 has an applied decorative pellet on the rim interior in the style also seen on that site.

Vessels in the Durrington Walls style (Wainwright and Longworth 1071, 240-42) are again largely fragmentary. Vessels generally have thicker walls and a somewhat coarser fabric than those in Woodlands style. They include some without evident decoration. Raised cordons and patterns of incised lines are the most common decorational traits seen at Nosterfield; the assemblage is generally similar to that from Roecliffe (Manby 1996).

CONTEXT AND ASSOCIATIONS

Grooved Ware occurred in conjunction with other pottery styles in only one instance, pit 1321, which also contained a Peterborough Mortlake sherd. Grooved Ware in both Durrington walls style and Woodlands style occurred in only two contexts, pits 1004 and 1054. Other contexts appear to contain either Durrington Walls style or Woodlands style pottery. Taken with the fact that some vessels, especially Woodlands style pottery, were represented by single or only a few sherds, this suggests that selective deposition was taking place. Beyond noting the characteristic presence of scrapers in association with Grooved Ware, the lithic assemblage is not enlightening.

CHRONOLOGY

Nosterfield provides no internal dating evidence for the Grooved Ware assemblage: on the evidence from Marton-le-Moor and Roecliffe, North Yorkshire, and other sites, Woodlands style material is suggested to belong to the latter part of the fourth millennium cal BC, while Durrington walls style may have a somewhat later currency, in the first half of the third millennium (Manby 1996).

GENERAL DISCUSSION

The Nosterfield pottery assemblage derives from a series of shallow pits located some 1km north-east of the northernmost of the Thornborough henges. In general terms the features are similar to those at other sites in the region that produce Neolithic pottery assemblages, and there is little to suggest that the presence of the nearby henge has a significant influence on the nature of the assemblage. Unlike the major henges of Wessex, which have produced distinctive concentrations of Grooved Ware, excavations at Yorkshire henges have been notably poor in finds of any kind, especially pottery. Thus limited excavations at the Thornborough henges in 1952 retrieved only a single Neolithic-type sherd from above the cursus (Thomas 1955, 437) and excavations in the ditch terminal of the southern henge in 1996 revealed no pottery at all. At Ferrybridge, a henge adjacent to the River Aire some 60km to the south, the assemblage comprised only a few sherds of Grimston style pottery, probable Towthorpe Ware, and Peterborough Ware (Vyner 1997). It cannot therefore be said that Yorkshire henges produce distinctive pottery assemblages, Grooved Ware or otherwise, indeed, on current evidence it would seem that they do not.

On the other hand it cannot safely be assumed that the known Yorkshire Grooved Ware assemblages derive from occupation sites, since the majority of assemblages derive from pit groups and only at Hartendale, Flamborough, is there an association with a putative structure (Manby 1974, 70). However, at Willington, Derbyshire, a group of structures interpreted as houses was associated with an assemblage of Grooved Ware (Wheeler 1979). A number of sites on the Wolds comprise pits, generally of the same scale as those found at Nosterfield, which Manby has suggested are evidence for occupation in an area where attrition of the surface chalk has removed shallower features and hearths (Manby 1975, 47-8). An assemblage with Clacton style Grooved Ware characteristics appears to have been associated with activity preceding the construction of an early Bronze Age burial mound at Green Howe, North Deighton, and could conceivably have been related to earlier ritual activity (Manby 1971). At Low Caythorpe, East Riding, Peterborough Ware was retrieved from two of 14 pits in a boundary alignment, and thus may have been associated with ritual rather than domestic activity. Grooved Ware was also recovered from a group of six pits (1020), at least three of which appear to have been contemporary (Abramson 1996, 6-9).Unfortunately at Caythorpe as elsewhere, the extent and associations of the pit group are unclear.

Table 5 Relative proportions of pottery by weight, minimum number of vessels and sherd count. Sherd count includes all sherds over around $150mm^2$; recently divided pieces are counted as one.

	minimum number of vessels	sherd count	number of contexts	weight
Grimston style	4	17	2	200gm
Peterborough wares	6	62	4	1780gm
Grooved ware: Durrington Walls	7	97	12	1305gm
Grooved ware: Woodlands	5	58	9	275gm

All the pottery from Nosterfield derives from pits of varying size and depth, but seldom greater than 1m across or 0.80m deep. The two pits containing Grimston style pottery are slightly smaller than the average, but there seems little to distinguish them from pits containing Peterborough Ware and Grooved Ware.

There is little mixing of pottery types between pits, suggesting that they were not open for any length of time, a suggestion supported by the generally unabraded state of the sherds. Pit 1069 contained Grooved Ware and Peterborough Fengate pottery, but Peterborough Ware was only associated with Grooved Ware in one instance, pit 1321, where a Mortlake sherd was present with Grooved ware of probable Durrington Walls style.

An extensive area has been excavated at Nosterfield and the spatial distribution of pits containing pottery is of some interest. Not all the excavated pits contained pottery; of 76 pits on the excavation plan, 28 contained pottery. Spatially there seems little to distinguish pits that contain pottery from those that do not. It is noticeable, however, that the two pits containing Grimston style pottery, pit 1069 and pit 1076, are situated close to the southern end of the excavated area. Pits containing Peterborough Ware are also relatively restricted in their distribution; pit 1069 (again) and 1321 being at the southern end of the site and pit 1307 at its centre.

The pits containing Grimston and Peterborough pottery are all relatively marginal to the pits which contain Grooved Ware. Pit 1307 is especially notable in being located at the centre of the excavated area in a largely ‘empty’ area. Activity associated with the deposition of Grimston pottery seems to have been concentrated at the southern end of the site, while that associated with Peterborough pottery was extended into the central part of the excavated area.

Activity connected with the deposition of Grooved Ware appears to have intensified but polarised to north and south within the excavated area. The central space, some 70m wide, was occupied by only a few features, the most significant ceramically being pit 1307, which appears not to have had any other distinguishing features.

While it is quite possible that chronologically distinct areas of Nosterfield site remain to be investigated, on the present evidence there is nothing to indicate continuous activity from the period of deposition of Grimston style pottery through to more concentrated activity involving the use of Fengate, Mortlake and Grooved Ware. Whether the absence of Beaker pottery from Nosterfield is chronologically or functionally significant has yet to be established.

With very few exceptions the Nosterfield pottery is manufactured using clays and grits which could have been obtained within a 16 to 19km radius of the site and therefore might have been made very locally. That very local manufacture is at least a possibility is suggested by the fact that Grooved Ware from Low Caythorpe, Humberside, contained fillers obtainable within 2km of the site (Manby 1996a, 44).

Acknowledgements

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APPENDIX 1 CATALOGUE OF POTTERY

Vessel 1

Jar with plain everted rim, mid-grey surfaces and fabric, numerous small and medium chert grits, and cavities from which small and medium grits have leached, wall thickness 9mm. A single plain rim sherd and a small body sherd with a pinched raised cordon, similar in profile to a vessel from North Carnaby Temple Site 11 (Manby 1975, fig. 3, 17). Grimston style. Wt 10g. [1069] (1068)

Vessel 2

Jar, external and internal surfaces and fabric buff-brown, small to medium angular cavities from leached out grits, a few small to medium chert grits. Wall thickness 7mm. No evident decoration. Grimston style. Wt 15g. [1076] (1075)

Vessel 3

Jar, external and internal surfaces dark terracotta-brown to dark grey, cavities where small grits have leached out, the fabric otherwise smooth and somewhat laminated. Wall thickness 6mm. Simple plain everted rim, no evident decoration; striations on the lower interior are probably from manufacture. Grimston style. Wt 50g. [1076] (1075)

Vessel 4

Jar, surfaces and fabric dark grey varying to orange-grey. Numerous cavities from small and medium leached grits, occasional small chert grits and some quartz sands present. Wall thickness usually 5mm, but extending to 10mm at the rim. A large plain rim and shoulder sherd shows this to be a plain vessel with a bag-shaped profile. Grimston style. Wt 100g. [1069] (1068)

Vessel 5

Jar, surfaces orange-brown, fabric similarly orange-brown. Fine well-made smooth fabric with mica dust and some very small chert grits. The chief characteristic is the presence of numerous cavities left by the solution of medium, large and very large grits - some up to 10 by 5 by 6mm - with a few smaller cavities. Typical wall thickness 12mm, base thickness 20mm. Pe1. Fragments of the rim survive (20%) with a similar proportion of body sherds and the base.

Decoration comprises filled triangles of incised lines on the rim surface, the rim upper surface has a chevron of impressed short strokes, below which is a concentric band of oblique strokes above double concentric lines. The rim external surface edge has a single row of near vertical fingernail impressions. The vessel body has been wholly covered with at least seven rows of fingernail impressions. Peterborough Fengate style. Wt 480g. [1307] (1306)

Vessel 6

Jar, external surfaces brown-orange, internal surface varying from brown-orange to dark grey, fabric orange-brown to dark grey. Clay matrix similar to that of vessel 5, but less fine. Cavities remain from the solution of small to medium angular grits. Numerous medium to large angular chert grits. Typical wall thickness 16mm. Pe1.

The rim upper surface is decorated with filled triangles, the design made up with short impressions. The rim interior has three concentric rows of short impressions above two impressed concentric lines. The rim external edge has a single row of diagonal varying to vertical fingernail impressions. The jar body has a seemingly haphazard covering of short vertical impressions - perhaps made with one or more unevenly edged wood or bone implements. The vessel decoration and style is very similar to that of the more finely made vessel 5. Peterborough Fengate style. Wt 695g. [1307] (1306)

Vessel 7

Jar, external surface varying from dark reddish-brown to grey-brown, internal surface dark grey, fabric varying from between the surface colours. The clay matrix seems similar to that of vessels 5 and 6, with mica dust and cavities from the solution of small, medium and large grits. Wall thickness 14mm. Pe2. The vessel has been poorly fired, resulting in much spalling and disintegration. There are a few medium to large angular chert grits and a few medium siltstone flakes.

The rim comprises a large collar which has two rows of impressed scores, or perhaps incisions, a single sherd with finger nail impressions suggests that the motifs alternated. Traces of indentation on the rim bead may represent a row of very short impressions. The body has been covered with what appears to be fingernail scoops set about 10mm apart. Peterborough Fengate style. Wt 440g. [1307] (1306)

Vessel 8 (not drawn)
Jar, fragment with external surface mid-brown, interior surface dark grey and dark grey fabric, the clay matrix similar to vessels 5 and 6, though less well made. Grits comprise medium and large angular chert fragments, with a few very small to large cavities from former grits. Typical wall thickness 14mm. Pe2. The single rim fragment seems to be a wodge of reddish clay from which the neighbouring material has spalled. The rim fragment has a chevron of fingernail impressions on its only surviving, upper, surface. The vessel body is covered with closely spaced rows of fingernail impressions. Peterborough Fengate style. Wt 125g. [1307] (1306)

There are additionally, unattributable sherds from vessels 7 and 8, total wt 220g. [1307] (1306)

Vessel 9
Jar, external and internal surfaces and fabric dark grey. The clay matrix has quartz dust and contains mixed small limestone grits. Wall thickness 13mm. Pe3. A rim fragment has internal decoration comprising concentric curved grooves, the exterior has oblique short deep incisions along the rim top, below that a chevron of longer incisions. The body has further rows of incisions. Peterborough Fengate style. Wt 25g. [1313] (1312)

Vessel 10 (not drawn)
Flake of rim interior, surfaces brown-grey, dark grey fabric, mixed small quartz and limestone grits. Pe1. Traces of incised chevron decoration. Peterborough Fengate ware. Wt n/a. [1313] (1312)

Vessel 11
Jar, external surface dark brown-dark grey, internal surface and fabric dark grey. Coarse fabric with small to medium quartz, feldspar and mica fragments and medium to large and very large (13 by 9 by 9mm) angular igneous grits - suggested to be either a microgranite or quartz dolerite, the latter perhaps more likely. Wall thickness typically 17mm. Pe4. Body decoration comprises apparently haphazard dumb-bell-shaped impressions, perhaps made with a bone, the interior has striations probably caused during forming the unyielding fabric. Peterborough Mortlake ware. Wt 115g. [1321] (1320)

This context also contained a few sherds of Grooved Ware, perhaps part of vessel 15. Wt 25g.

Vessel 12
Group of sherds with surfaces and core orange, numerous angular chert grits, some decaying, and cavities from lost small to large grits, wall thickness 9mm. GW6. Decoration comprises grooved lines, including part of a filled lozenge. Although the fabric is similar to vessel 24, both decoration and firing is different. Grooved Ware, Durrington Walls style. Wt 50g. [1004]

Additional 50g in [1002]

Vessel 13
Jar, represented by three sherds, external surface grey-brown, internal surface dark grey, fabric dark grey. Numerous small and medium igneous grits and cavities from leached out small to medium grits. Wall thickness 9mm. GW2. Decorated with

grooved horizontal and converging lines. Grooved Ware, Durrington Walls style. Wt 40g. [1004]

Vessel 14
Jar, external and internal surfaces grey-brown, fabric dark grey with small to medium igneous grits, quartz dust in the clay matrix, which has only sparse very small cavities. Wall thickness 6mm. GW8. Plain rim with no sign of decoration on the surviving sherds. Grooved Ware, Durrington Walls style. Wt 50g. [1004] (1002)

Vessel 15
Jar, external surface varying from dark grey to brown-orange and orange, internal surface dark grey, fabric varying from dark grey to orange. Numerous small and medium quartz sands, some igneous sands and small cavities from the leaching of grits. Wall thickness 11mm. GW3. The plain rim has horizontal and vertical raised cordons creating an open panel effect. The one visible junction has an impression. Carbonised accretions on the interior wall. Grooved Ware, Durrington Walls style. Wt 370g. [1011] (1027)

A single body sherd in the same fabric, and probably from the same vessel, has traces of a raised cordon. The context also contained Peterborough material. A single sherd of vessel 15 also occurs in [1321] (1320) Wt 10g.

Vessel 16
Jar rim represented by a single rim sherd, external surface brown-grey, internal surface dark grey, fabric dark grey-brown. Smooth fabric with no obvious grits. Wall thickness 8mm GW4. Decoration on the rim interior comprises shallow horizontal or converging cord impressed lines, on the outside there are broad but indistinct impressions which may have been formed with cord. Grooved Ware, Durrington Walls style. Wt <5g. [1011] (1027)

Vessel 17 (not drawn)
Jar, external surfaces dark grey, internal surface and fabric dark grey. Numerous small, medium and large angular cavities, a few small irregular ?gypsum fragments remain. Wall thickness 14mm. GW5. A single sherd has traces of a raised vertical cordon, while another has traces of a grooved line, presumed to be evidence of a filled panel. Grooved Ware, Durrington Walls style. Wt 230g. [1017] (1202).

Base sherds and other fragments, external surface brown-orange, internal surface dark grey, fabric colour varying between the two, cavities from numerous missing grits, a few remaining possible gypsum fragments. May be part of vessel 17. Wt 25g. [1074] (1072)

Vessel 18
Single small sherd, external surface and fabric brown-orange, internal surface spalled, fine fabric. GW4. Decorated with a raised cordon which has a neat impressed cord decoration on its centre surface. Grooved Ware, Durrington Walls style. Wt <5g. [1017] (1202)

Vessel 19
Jar, external surface varying from dark brown to orange-brown, internal surface dark grey, fabric variably grey-orange. Numerous small and medium cavities from leached grits, a few small possible gypsum fragments remain. Wall thickness 11mm. GW8. Simple plain rim with no decoration on the surviving body sherds. Carbonised accretions on the interior of the rim and base. Grooved Ware, Durrington Walls style. Wt 105g. [1216] (1217)

Vessel 20
Rim fragments, surfaces and fabric dark grey, small cavities from leached out grits, a few small probable gypsum grits remaining. Wall thickness 6mm. GW6. The thin rim has a neat internal bevel, and its exterior has a series of concentric grooves. Body sherds have raised cordons, including a junction between horizontal and vertical cordons which has two

impressed grooves. Grooved Ware, Durrington Walls style. Wt 60g. [1054]

Vessel 21 (not drawn)
Body sherds with dark grey surfaces and fabric, numerous small, medium and large cavities from leached out grits, wall thickness 10mm. GW5. Three sherds have incised grooves, one with deep, perhaps fingernail, impressions. Grooved Ware, Durrington Walls style. Wt 35g. [1004] (1003)

Vessel 22 (not drawn)
Two sherds, external surface brown-terracotta, internal surface dark grey-terracotta, fabric dark grey. Clay matrix has quartz dust and small to medium chert fragments, wall thickness 7mm. GW2. One sherd has a fragment of decoration comprising short (4mm) diagonal impressions. Grooved Ware, Durrington Walls style. Wt 10g. [1004[(1001)

Vessel 23
Group of sherds, exterior surface orange-brown, interior varying from brown to orange, mixed small, medium and large angular chert grits, small to medium cavities, and quartz sands, fabric probably GW3. One sherd has traces of a filled triangle of short impressions, seemingly not made with cord, but perhaps using wood or bone. Grooved Ware, Durrington Walls style. Wt 50g. [1105]

Vessel 24
Jar, a few sherds with external and internal surfaces brown-grey, fabric dark grey. A honeycomb of cavities remains from the leaching of numerous small to large grits. Wall thickness 8mm. GW1. Plain upright rim; traces of external converging raised plain cordons. Grooved Ware, Woodlands style. Wt 25g. [1004]

Vessel 25
Jar, external surface brown-dark grey, internal surface dark grey, fabric varying between the two colours. A few small to medium igneous grits and some very small quartz sands, wall thickness typically 9mm. GW2. The vessel has been poorly fired and most of the body sherds have lost their internal surface. Plain rim with no decoration. A single body sherd has traces of two converging raised cordons, while a lower wall sherd has traces of impressed possible fingernail decoration. Grooved Ware, Woodlands style. Wt 130g. [1009] (1022)

Vessel 26
Rim fragment, external surface brown-grey, internal surface dark grey, fabric varying between the two colours. Fabric matrix has some quartz dust, small to medium mudstone and shale grits. GW2. Plain interior, but variable fabric thickness suggests an external horizontal cordon below the narrow rim. Grooved Ware, Woodlands style. Wt <5g. [1074] (1072)

Vessel 27
Rim, surfaces buff-brown, fabric dark grey, cavities where small and medium angular grits have leached out, a few small to medium shale grits remain. Wall thickness 8mm. GW7. The rim interior has a groove just below the top, the exterior has four raised cordons, with alternating impressed decoration. Grooved Ware, Woodlands style. Wt <5g. [1074] (1073)

Vessel 28
Rim sherds. External surface reddish brown, fabric brown-terracotta, internal surface mostly spalled. GW2. Internal surface has an applied piece with four short vertical ridges, the exterior has a horizontal groove below which are three converging raised cordons, the middle one plain, the flanking ones with short vertical impressions. Below the cordons are traces of diagonal grooves. Grooved Ware, Woodlands style. Wt <5g. [1074] (1073)

Vessel 29 (not drawn)
Jar, external surface mid-brown, internal surface dark grey, fabric varying between the two colours. Wall thickness 6mm.

GW9. Grooved Ware, Woodlands style. Wt 20g. [1113]

Vessel 30

Jar, external surface brown-grey, internal surface and fabric dark grey. The clay matrix has quartz dust and small to medium cavities from leached grits. Wall thickness 8mm. GW6. The rim fragment has two concentric internal grooves, the rim exterior has two grooves, below which is a plain rib and a further pair of grooves. Tiny fragments have traces of a raised cordon and converging raised cordon, while one body sherd has impressions made by a spatula or similar implement. Grooved Ware, Woodlands style. Wt 25g. [1114]

Vessel 31 (not drawn)

Jar, surfaces and fabric dark brown-dark grey, small to medium igneous grits, a few small to medium cavities from vanished grits. Wall thickness 12mm. GW3. One sherd has traces of converging raised cordons, another has a few irregular indentations, but most of the pieces are fragmentary. Grooved Ware, Woodlands style. Wt 30g. [1009] (1023)

Part of a base may be from the same vessel. Wt 25g. [1076] (1075)

Group of sherds, 6+frags, one fragment may have part of a raised cordon. GW3, perhaps part of vessel 15. Wt 90g. [1010] (1024)

Few sherds, 2+frags, GW4. Wt 10g. [1010] (1025)

Group of sherds, 4+frags, GW3. Wt 35g. [1010] (1024)

Single small rim sherd, damaged, GW3. Wt 5g. [1011] (1026)

Sherds, 2+frags, GW3 F6. Wt 15g. [1012] (1020)

Sherds, 2, GW3, one with shallow grooves. Wt 35g. [1013[(1201)

Sherds, 2, GW3, one with raised plain cordon on exterior and carbonised accretion on interior. Appears to be part of vessel 15. Wt 60g. [1015]

Sherd, GW2. Wt 10g. [1016] (1203)

Rounded lump of ?Peterborough Ware, Pe2, or perhaps simply a piece of baked clay. Wt 20g. Similar fired clay pellets were present in pit containing Grooved ware at Marton-le-Moor, North Yorkshire (Manby 1996). [1063] (1064)

Group of sherds, 5+frags, GW3. Wt 45g. [1090]

Fragments of GW6. Wt 10g. [1096]

Group of 7 sherds +frags, GW2, from a plain-rimmed jar, perhaps vessel 13. Wt 35g. [1097]

Sherd +frags, GW2. Wt 5g. [1099]

Single abraded sherd, GW2. Wt 10g. [1101]

Sherd +frags, GW3. Wt 10g. [1216] (1218)

Sherds, 3+frags, GW3. Wt 15g. [1309] (1308)

Sherds, 2, GW3. Wt 15g. [1310] (1311)

POTTERY FROM EXCAVATIONS IN 1996

A group of small sherds and fragments from a vessel of which little indication of form or decoration survives. External surface dark brown/dark grey, the interior spalled away, fabric dark grey. Traces of narrow impressed, probably twisted cord, decoration. Fabric probably Pe1, an identification supported to some extent by the decoration. Wt >10g NON96.2 5014.

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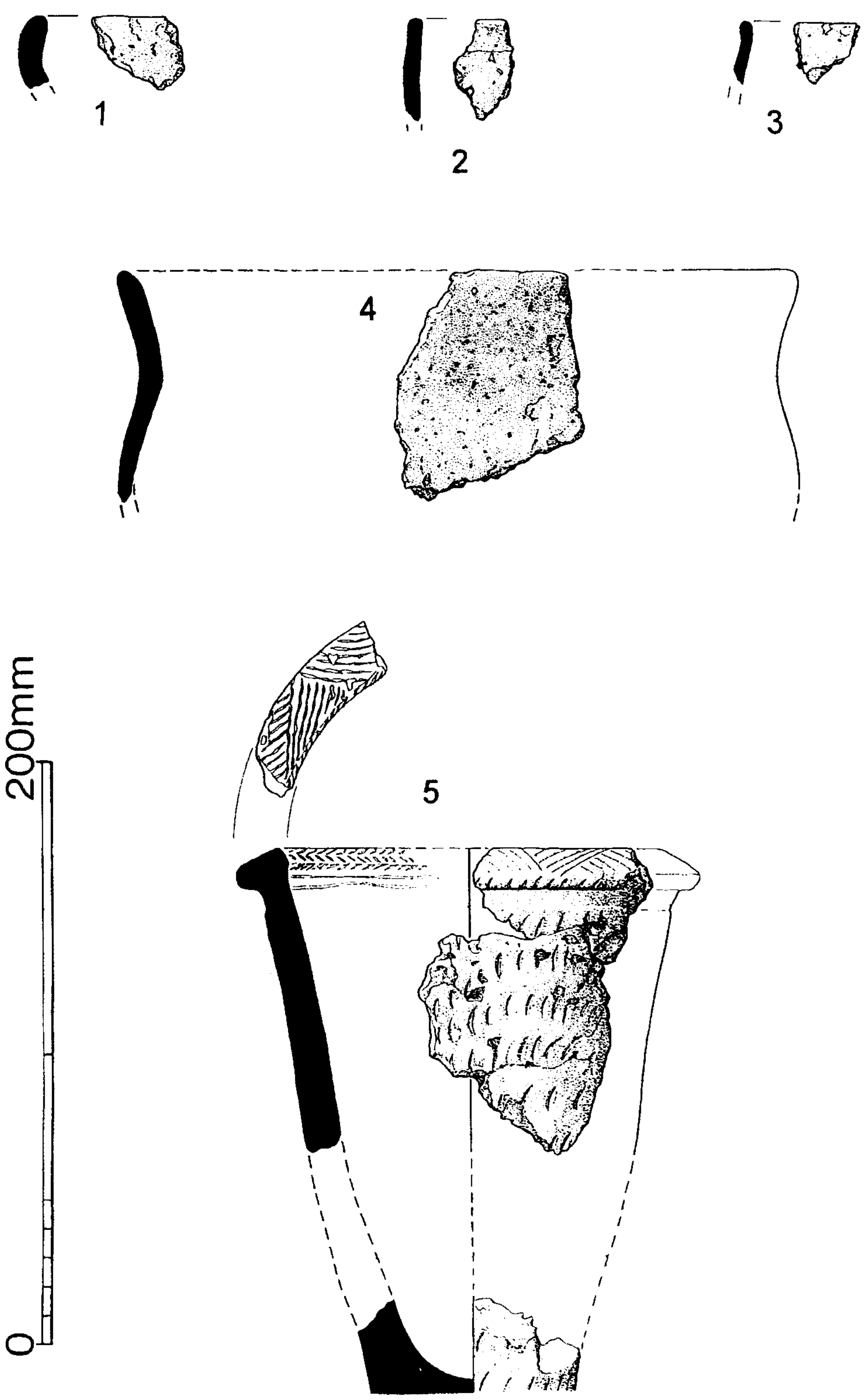

Figure 1 Nosterfield pottery: 1 - 4 Grimston ware, 5 - Peterborough ware, Fengate style

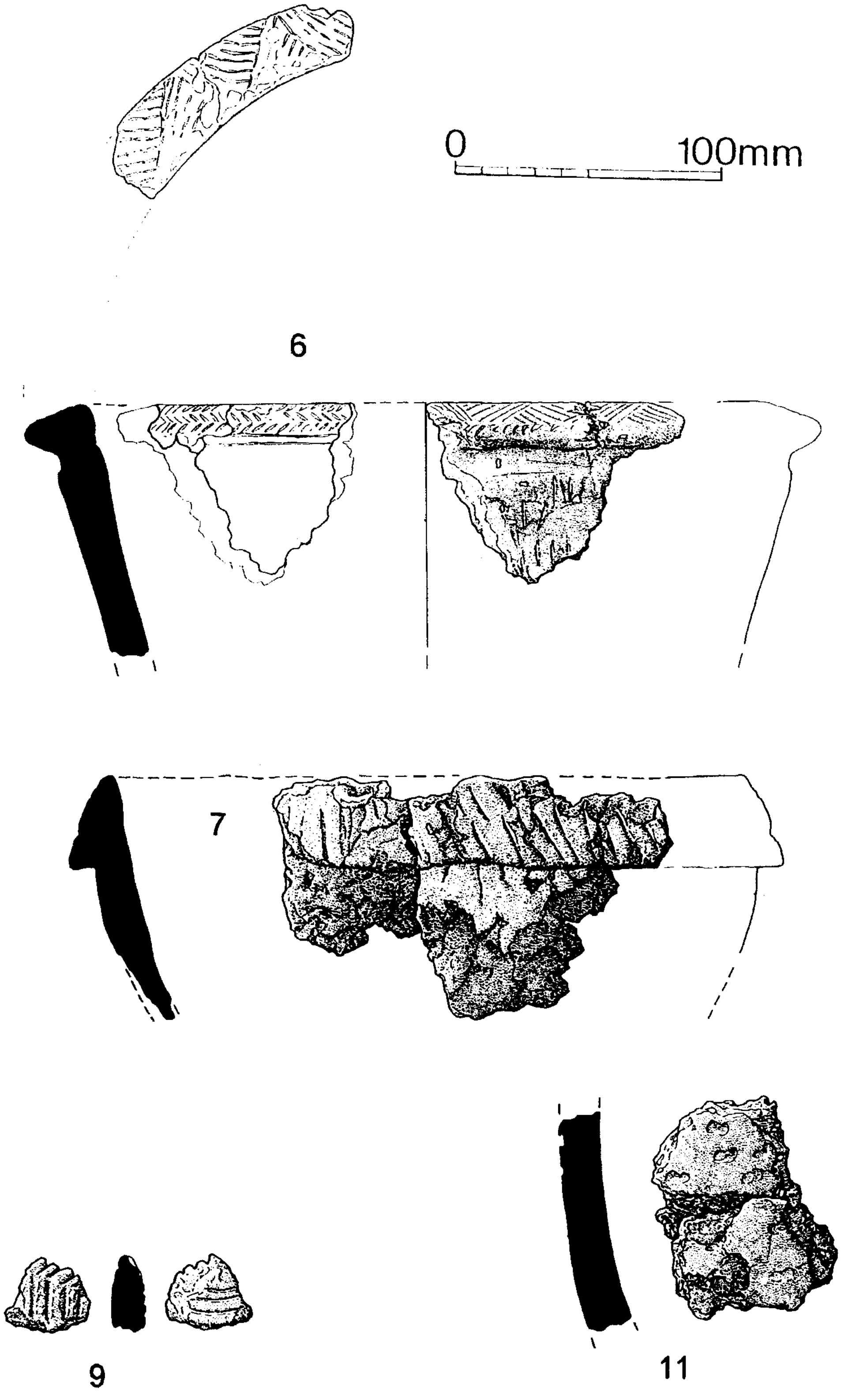

Figure 2 Nosterfield pottery: 6 - 9, Peterborough ware, Fengate style; 11 - Peterborough ware, Mortlake style

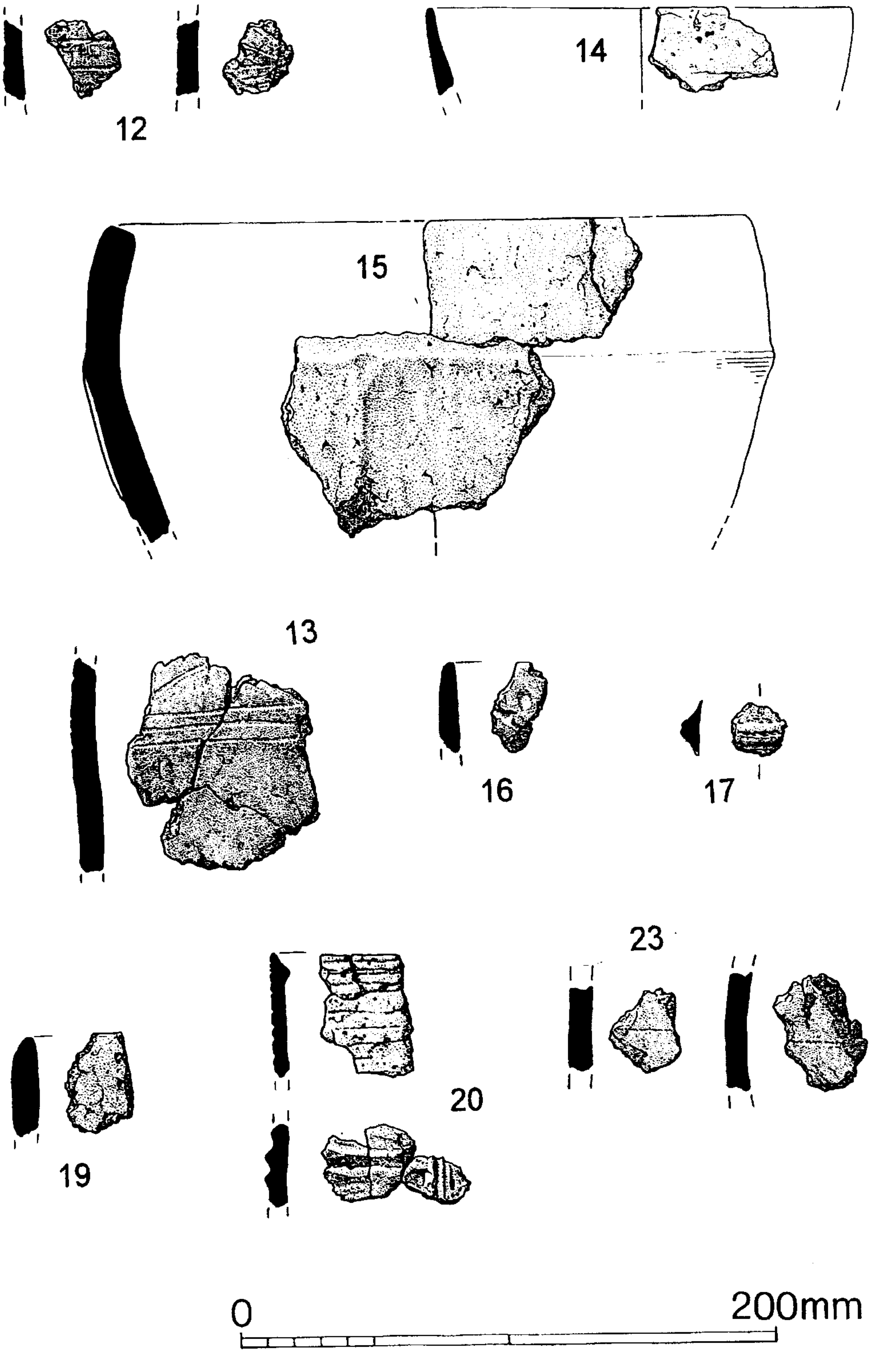

Figure 3 Nosterfield pottery: 12 - 23, Grooved ware, Durrington Walls style

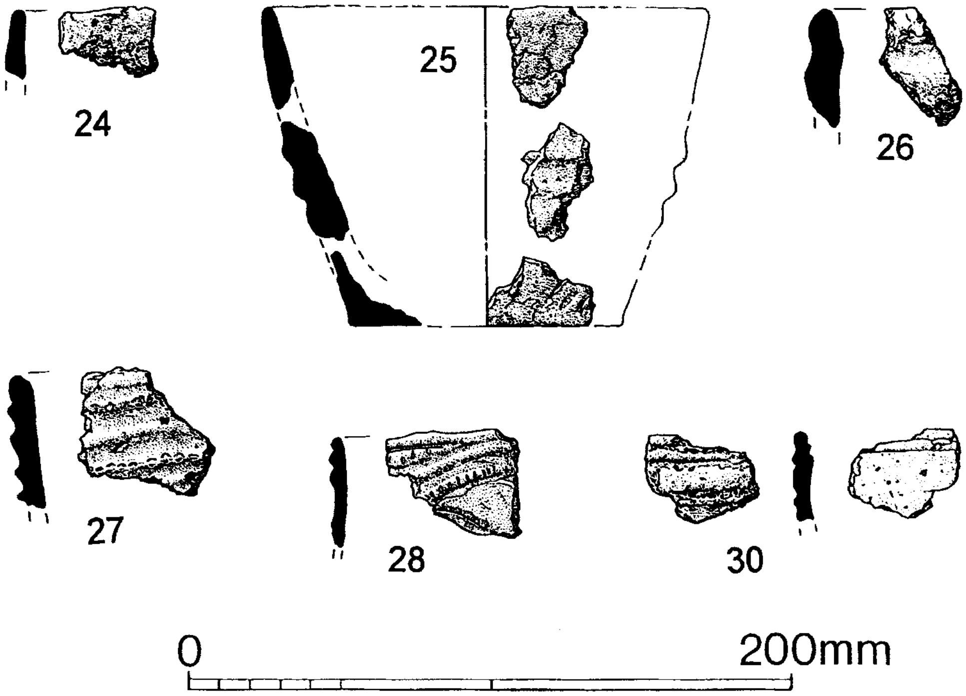

Figure 4 Nosterfield pottery: 24 - 30, Grooved ware, Woodlands style

PART 2: EARLY PREHISTORIC POTTERY FROM NOSTERFIELD 1998

Blaise Vyner

1.0 INTRODUCTION

Prehistoric pottery was retrieved from two contexts, C1005 and C1007. The material derives from two distinct chronological horizons, C1005 producing early to middle Neolithic pottery, context C1007 producing pottery of later Neolithic and early Bronze Age style.

2.0 TREATMENT

In the fabric descriptions supplied hyphenated colours indicate the variation in colour expected from poorly controlled firing conditions, the first colour being that most in evidence. Grit sizes are expressed as small (>3mm) and medium (3-6mm). Distinctive particles smaller than 0.02mm are described as dust. The later Neolithic and early Bronze Age sherds were washed in order to clarify the detail of fabric and decoration, but in view of the friable nature of the early Neolithic pottery only a few sherds of this material were washed. No thin section analysis has been done and identification has been using a 10x lens. Given the limited representation of a small number of vessels with widely varying chronologies quantification by weight has not been considered helpful, instead the minimum number of vessels has been suggested on the basis of fabric, form, and decoration where present. None of the pottery has been the subject of conservation.

3.0 THE POTTERY

3.1 GRIMSTON WARE

All the pottery from context C1005 comprises sherds from Grimston style bowls, or, in all likelihood, a single bowl. The external surface is mid-brown in colour, the internal surface is dark grey and the fabric also dark grey. The surfaces have numerous small angular cavities from which grits have leached, the remaining grits comprise only a few grains of mica and rare sub-rounded quartz grains. Wall thickness varies from 4 to 6 mm. A total of 17 sherds over 10^2 mm in size is present, together with a few smaller fragments, all plain body sherds. The total sherd weight is 100 gm, representing probably less than 10% of a single vessel.

In contrast to the Grimston Ware previously reported upon from Nosterfield, this pottery does not have the white residues of limestone/chert, suggesting that the leached grits may have been a purer calcite.

3.2 LATER NEOLITHIC OR EARLY BRONZE AGE POTTERY

Context C1007 produced a total of eight sherds representing vessels in several late Neolithic or early Bronze Age traditions.

Peterborough Ware: Single body sherd from a jar, buff-brown external surface, dark grey internal surface, dark grey core, with numerous small and medium angular quartz grits, the clay matrix containing angular quartz grains. Wall thickness variable, typically 9 mm. Decorated with two rows of fingernail impressions. A second sherd in a similar fabric has occasional impressions from the end of a small (2 mm diameter) stick or the like.

Grooved Ware (probable): Four small fragments, probably from different vessels, but all in a similar fabric, have orange brown external surfaces and dark grey internal surfaces and fabrics. Small to medium angular calcite grits, while a few grains of quartz are present and, in one sherd, a few chert grits. Wall thicknesses vary from 7 to 8 mm. No decoration is evident. In the absence of diagnostic features it is difficult to assign these few sherds to any particular style, but their wall thickness is similar to that of the Grooved Ware vessels previously excavated at Nosterfield (Vyner 1998).

Beaker: Two sherds from the same vessel, one of the sherds noticeably more abraded than the other. External surface reddish-brown, internal surface and fabric dark grey, the fine sandy fabric has grains of mica, small limestone grits and medium sized pieces of grog. Wall thickness 8mm. Decoration comprises a zone of short diagonal impressions flanked above and below by a single comb-impressed line. Above that are two converging lines of comb impressions.

4.0 COMMENTARY

It may be noted that while the Grimston Ware fabric has numerous calcitic grits which had leached out leaving the usual 'corky' appearance, calcitic grits in the Grooved Ware had not dissolved, reflecting either a shorter period of deposition, different context characteristics, or a combination of both factors.

Although very small, this assemblage is interesting in two respects. Firstly, the earlier Neolithic Grimston Ware and the later Peterborough Ware and probable Grooved Ware closely reflect the pottery previously found in earlier excavations at Nosterfield. Secondly, the Beaker sherds add a further, and chronologically slightly later, dimension to that assemblage, underlining still further the similarities between the Nosterfield pottery assemblage and that from Marton-le-Moor, between the rivers Nidd and Swale, some 18km to the south, where Grimston Ware, Peterborough Ware and Grooved Ware was also joined by a small amount of Beaker (Manby 1996). Beyond this, the regional context for this material has been presented in the earlier report on pottery from Nosterfield.

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PART 3: POTTERY FROM ARCHAEOLOGICAL EXCAVATIONS AND WATCHING BRIEFS AT NOSTERFIELD 1999-2002

Blaise Vyner

1.0 INTRODUCTION

Excavations and watching briefs undertaken at Nosterfield over the period 1999-2002 have recovered a relatively large assemblage of prehistoric pottery which augments the material found during previous work (Vyner 1999). The present assemblage confirms an intensity of activity during the later Neolithic and indicates continued use of the area during the middle Bronze Age. Pottery of the earlier Bronze Age, which has been recovered from the area in small quantities during previous archaeological work, is not present in this assemblage.

2.0 TREATMENT

In the fabric descriptions provided hyphenated colours indicate the variation in colour expected from poorly controlled firing conditions, the first colour being that most in evidence. Grit sizes are expressed as small (<3 mm) and medium (3-6 mm), and large (6-9 mm). Distinctive particles smaller than 0.02 mm are described as dust. As a general guide, grit quantities have been described in relation to the estimated average number of pieces visible per 100 mm square: occasional (1 or less), few (2), many (3 to 4) and numerous (5 or more). Sherd weights have been rounded to the nearest 5g. No thin section analysis has been done and identification has been made using a 100× microscope. Quantification excludes fragments with a total surface area of less than around 100^2 mm.

3.0 CERAMIC RANGE AND CHRONOLOGY

The majority of the pottery belongs to the later Neolithic period, with a small quantity which may be assigned to the middle Bronze Age.

3.1 NEOLITHIC POTTERY

Nosterfield is one of a growing number of locations in the northern part of the Vale of York where the surviving earthwork monuments have been joined by pits and other cut features which have produced assemblages of Neolithic pottery (Manby 1999, 57). Grooved Ware from locations along the Ure at the southern end of the Vale of Mowbray, at Nosterfield and Marton-le-Moor, have now been joined by finds of Woodlands style from the Scorton area in the Swale valley to the north of Catterick (T Manby pers.comm.).

A small proportion of the pottery comprises thin-walled (walls between 6 and 7 mm thick) vessels with plain near-upright or everted rims. The limited number of sherds and their small size precludes certainty, but it appears that this material is undecorated. This pottery belongs to the Grimston Ware tradition, which extends from the earlier Neolithic. Better known from a scatter of sites in eastern Yorkshire (Manby 1975), Grimston Ware style pottery has been recovered from previous excavations at Nosterfield. Grimston Ware carinated bowls are in use from the beginning of the fourth millennium BC, although they may have been restricted to ceremonial functions (Manby et al 2003, 47), only later being adopted for domestic use. There is no evidence that any of the vessels from Nosterfield is carinated, and it may be that these vessels are relatively late in the Grimston Ware tradition and that their currency overlapped with that of the Grooved Ware.

The greater part of this assemblage comprises later Neolithic Grooved Ware pottery, a notable feature of previously excavated assemblages from Nosterfield (Vyner 1999). This style of pottery has been the subject of recent review (Manby 1999) and there is at present little that can be added to that discussion. The assemblage contains mostly small sherds which preclude the reconstruction of vessel profiles and the recovery of the complete decorative patterns. It is therefore difficult to assign the pottery to the Grooved Ware component styles - Clacton, Woodlands or Durrington Walls - always assuming that the region has not developed its own variants. The range of decoration present here is dominated by incised undulating lines and horizontal furrowed cordons, although some infilled grooved panels are also visible, together with raised plastic cordons - although whether horizontal or vertical is unclear. Grooved lines are not a diagnostic feature, but the absence of whipped cord decoration argues against the presence of any quantity of Durrington Walls style pottery, while the absence of point decoration suggests that Clacton style material is also not a significant presence. The conclusion is that this material belongs mostly to the Woodlands style or a variant of that, as is clearly indicated by a rim sherd with Woodlands style plastic decoration (C1036 F16).

There is currently no internal dating information for any of the pottery, however, Manby has pointed out the early range of dates for Grooved Ware from Marton-le-Moor, which extends from 3200 BC to 2800 BC (Manby 1999, 68).

A small amount of Peterborough Ware is also present in the assemblage. This material derives principally from two contexts. (C1180 F136 sf12 and C1214 sf2). The sherds are all small and damaged and there is little that may be said beyond noting their presence. Pottery of this kind is only sparsely distributed across lowland Yorkshire, and its relative absence is emphasised by the recovery of Grooved Ware in increasing quantities.

3.2 BRONZE AGE POTTERY

A small component of the assemblage comprises fragments of barrel-shaped and open jars, many without diagnostic features. A common characteristic is an association with small quantities of cremated bone, and there are some similarities with vessels which are generally assigned to the middle Bronze Age, between 1550 and 1150 cal BC (Manby et al 2003, 64-65).

4.0 DISTRIBUTION OF CERAMICS ON SITE

The Neolithic pottery all derives from the fill of pits and other cuts which appear to be non-structural. This provenance is typical for domestic assemblages of Neolithic date within the region (Manby *et al* 2003, 47), and at present is interpreted as an indicator of settlement activity with a domestic bias within which ritual was no doubt strongly embedded.

A small assemblage of pottery of apparent middle Bronze Age date derives from a series of pits which may represent the remains of a cremation cemetery, these features are loosely associated with a small ring ditch (F148) which may have surrounded a small burial mound, perhaps the original focus for the burial activity.

5.0 NOS99 INTERVENTION 1

C1140 F115 SF8

At least seven Grooved Ware vessels are represented by rim sherds, but since all the rims bear incised decoration, and a quantity of body sherds have raised plastic decoration, it is likely that the actual number of vessels represented is greater - perhaps twelve. Body sherds suggest that incised decoration comprised mostly sets of two or three undulating lines, although the presence of filled lattices is indicated on a fragment of wall base. Furrowed cordons seem also to have been employed in undulating sets of two, three or four, with no evidence for knots or other applied decoration on the sherds present. The rim sherds are all small, none being larger than 40x35mm, and no significant profiles of vessels can be reconstructed.

Vessel surface colours range from brown-purple through to orange-brown, suggesting poorly controlled firing to a relatively low temperature. Vessel fabrics are all similar, having contained variable quantities of angular grits which have leached out leaving a friable matrix. Other grits appear to have been incorporated by accident rather than design, and comprise occasional mudstone and quartz grits.

1 Vessel 1
Jar, plain interior, wall thickness 11 mm, incised grooves on the rim exterior. Grooved Ware

2 Vessel 2
Jar, wall thickness 9 mm, plain interior with raised bevel, two incised grooves around the exterior. Grooved Ware

3 Vessel 3
Jar, wall thickness 8 mm, plain rim with raised cordon on interior, two shallow incised grooves around the exterior. Grooved Ware

4 Vessel 4
Jar, wall thickness 10 mm, deep groove on rim upper edge, two deep incised grooves undulating around the exterior. Grooved Ware

5 Vessel 5
Jar, wall thickness 7 mm, raised bevel on rim interior, shallow groove around the exterior. Grooved Ware

6 Vessel 6
Jar, similar to vessel 5, but with a plain interior surface. Grooved Ware

7 Vessel 7
Jar, wall thickness 9 mm, interior rim edge bevelled, deep incised groove around the exterior. Grooved Ware

C1141 F116 SF5
Also from this context two undiagnostic sherds and two pieces of ceramic which may derive from a hearth.

8 Jar, exterior surface buff-terracotta, interior surface buff, fabric dark grey, cavities from which occasional large and medium-sized, and numerous small, angular gypsum grits have leached, occasional small milky quartz and mudstone grits, wall thickness 12 mm, incised grooves apparently set in groups of four undulating lines. Grooved Ware

C1142 F117 SF15
9 Jar, rim sherd (1 sherd plus fragment) in fabric similar to a vessel in F336 (A), and thus perhaps Grimston Ware tradition.

C1143 F118 SF10
10 Jar, body sherds (2 sherds plus fragments), re-brown surfaces, dark grey core, many mixed medium and occasional large mudstone grits, typical wall thickness 7 mm, external surface abraded but a furrowed cordon is visible. Grooved Ware

C1148 SF6
55 Jar, brown-grey exterior surface, dark grey interior surface, dark grey fabric, cavities from which numerous small and medium-sized, and a few large, calcareous grits have leached, occasional small rounded milky quartz sands, typical wall thickness 10 mm. Sharply everted plain rim with a rounded edge, no visible decoration on the sherds present. Neolithic, but uncertain style and date

C1163 F131 SF3
Four vessels are represented in the assemblage from this context, all Grooved Ware.

11 Jar, globular form, surfaces brown-grey, fabric dark grey, hard smooth fabric with a few mixed small and medium-sized quartz and mudstone grits, wall thickness 7 mm (18 sherds plus fragments), plain inverted rim. Neolithic, uncertain style

12 Jar, brown-grey exterior surface, dark grey interior surface and fabric, many small and a few medium-sized cavities from which calcitic grits have leached, wall thickness 9 mm (1 sherd), on the exterior a series of incised undulating grooves similar to vessel 1 in F142. Grooved Ware

13 Jar, terracotta-brown surfaces, dark grey fabric, occasional angular medium-sized mudstone grits, wall thickness 7 mm (1 sherd), slightly everted rim with small external bead. Perhaps Grimston Ware

14 Jar, exterior and interior surfaces dark grey, fabric dark grey with numerous small quartzitic grits and a few angular quartz sands (5 sherds plus fragments), everted rim with small external bead. Perhaps Grimston Ware

C1166 F134 SF17

15 Ceramic fragments (6 sherds), perhaps not a vessel, buff-orange surfaces and fabric, fine sandy fabric with occasional cavities from which variously sized calcareous grits have leached, wall thickness variable from 4 to 7 mm, indeterminate shape, but perhaps a plaque.

C1167 SF21

16 Jar, small sherd (1 sherd) from a medium-walled vessel.

C1173 SF19

17 Jar, fragment of a thin-walled vessel.

C1176 F159 SF18

18 Ceramic fragments.

C1179 F143 SF7

19 Jar, sherd (1 sherd) with exterior and interior surfaces dark grey, fabric dark grey, numerous small and a few medium-sized cavities from which calcareous grits have leached, some remaining decayed gypsum fragments, typical wall thickness 7 mm, long flared everted rim with variably formed small external bead, no decoration present. Grimston Ware tradition

20 Jar, (30 sherds plus fragments) brown-grey exterior surface, dark grey interior surface, dark grey fabric, numerous small and occasional medium-sized milky quartz and quartzitic grits, occasional small mica chunks, typical wall thickness 8 mm, everted plain rim. Grimston Ware tradition

C1180 F136 SF12

Sherds from two Peterborough Ware vessels are present from this context.

21 Jar, buff-brown exterior surface, dark grey interior surface, dark grey fabric with many medium-sized and large angular quartzitic grits, typical wall thickness 12 mm (5 sherds plus fragments), decorated with rows of indistinct sub-rectangular impressions. Peterborough Ware

22 Jar, exterior surface dark grey, interior surface dark brown, fabric dark grey, many small and medium-sized angular mudstone grits, typical wall thickness variable between 6 and 10 mm (9 sherds plus fragments), short everted rim with a row of indentations following the outer edges of the rim surface, a shoulder sherd has rows of diagonally-set

impressions perhaps made with bird bone. Peterborough Ware

C1193 F141 SF9

23 Jar, a few sherds (3 sherds plus fragments) from a vessel similar to or the same as vessel 2 in C1194. Peterborough Ware

C1194 F139 SF4 (vessel 1)

57 Jar, orange-brown exterior surface, grey-orange interior surface, dark grey fabric, cavities from which numerous small and medium and large calcareous grits have leached - the cavities are fewer and shallower on the interior surface, typical wall thickness 8 mm. Plain everted rim, no visible decoration on the sherds present. Grimston Ware

C1194 F139 SF4 (vessel 2)

58 Jar, brown exterior surface, dark grey interior surface, dark grey fabric, cavities from which numerous small and medium and a few large calcareous grits have leached - the cavities are fewer on the exterior surface, typical wall thickness 10 mm. Plain everted rim, burnished exterior surface, no visible decoration on the sherds present. Probably Grimston Ware

C1194 F139 SF4 (vessel 3)

59 Jar, dark grey exterior surface, dark grey interior surface, dark grey fabric, cavities from which numerous small and medium and a few large calcareous grits have leached - the cavities are fewer on the exterior surface, typical wall thickness 11 mm. Plain everted rim, burnished exterior surface, no visible decoration on the sherds present. Grimston Ware

C1195 F142 SF1

Eight Grooved Ware vessels are represented, mostly by single rim sherds, while the context contains a range of damaged body sherds not readily attributable to any specific vessel (51 sherds plus fragments). Fabrics are all similar, with many small and a few medium-sized cavities from which gypsum grits have leached, other grits comprise occasional small quartz and milky quartz fragments and occasional small and medium-sized mudstone fragments, there is mica dust in the clay matrix.

24 Vessel 1

Jar, grey-brown interior and exterior surfaces, fabric grey-brown, wall thickness 10 mm, plain upright rim with incised cordon on the exterior. Grooved Ware

25 Vessel 2

Jar, similar colours to vessel 1, wall thickness 10 mm, upright rim with a furrowed cordon on the interior, three furrowed cordons around the exterior. Grooved Ware

26 Vessel 3

Jar, similar colours to vessel 1, thin-walled vessel with typical wall thickness 5 mm (2 sherds), upright rim with intersecting lattice of grooves on the exterior. Grooved Ware

27 Vessel 4

Jar, similar colours to vessel 1, wall thickness 11 mm, upright rim with two furrowed cordons, furrowed cordon on rim exterior. Grooved Ware

28 Vessel 5
Jar, similar colours to vessel 1, wall thickness 9 mm, traces of a furrowed cordon on the rim interior, two deeply furrowed cordons on rim exterior. Grooved Ware

29 Vessel 6
Jar, exterior surface brown-terracotta, interior surface mid-brown, fabric dark grey-brown, wall thickness 10 mm, rim has internal raised bevel, rim exterior has four horizontal grooves. Grooved Ware

30 Vessel 7
Jar, pink-orange surfaces and fabric, wall thickness 9 mm, raised bead on outer edge of rim. Grooved Ware

31 Vessel 8
Jar, brown-orange exterior surface, grey-orange interior surface, dark grey fabric, friable fabric with many cavities, wall thickness typically 12 mm, raised cordon on rim interior. Grooved Ware

C1196 F140 SF11

32 Jar, a few abraded sherds (4 sherds plus fragments) of formerly calcite-gritted ware, similar to vessel 1 in C1194. Grooved Ware

C1202 F153 SF13

33 Ceramic fragments.

C1203 F154 SF14

34 Jar, small sherds (3 sherds) from a medium-walled jar, similar to vessel in F142. Grooved Ware

C1203 F154 SF14

35 Jar, sherd (1 sherd) with groove, similar to vessel from F142. Grooved Ware

C1204 F155 SF20

36 Jar, sherd (1 sherd plus fragment) from medium-walled vessel similar to vessel in F142, grooved decoration. Grooved Ware

C1214 SF2

This context contains small amounts of pottery from what appear to be three vessels, all Peterborough Ware.

37 Vessel 1
Jar, dark grey exterior surface, brown-grey interior surface, dark grey fabric with occasional small and medium-sized cavities, occasional small angular milky quartz grits, a row of diagonal slashes on the interior of the rim, herring bone slashes along the rim upper surfaces, external rolled bead.

38 Vessel 2
Jar, dark brown exterior, dark grey interior, dark grey fabric, dense fabric with occasional mixed small sands, the exterior has a horizontal raised cordon with a row of deep finger-nail impressions to either side. Eight sherds plus fragments may belong to this vessel - or partly to another, since all but one is plain.

39 Vessel 3
Jar, grey-orange exterior, dark grey interior, dark grey fabric with numerous large and medium-sized angular milky quartz grits (4 sherds), the interior of one sherd has two ‘maggot’ impressions made using thick cord.

C1217 F158 SF16

40 Jar, sherds (2 sherds) from a thin-walled vessel, similar to sherds in C1214.

6.0 INTERVENTION 2 (walkover of Intervention 1 area)

This small assemblage contains little diagnostic material apart from a sherd of Peterborough Ware (SF54). The remaining material, however, also appears to belong to the Neolithic period, with a few pieces from thin-walled (6-7 mm) plain bowls with quartz grits (SF 34, 38 and 59) in the tradition of Grimston Ware, fragments of slightly thicker-walled (9 mm) vessel with mudstone grits (SF 40 and 41), and pieces of more substantial (average wall thickness 10 mm) soft-fired fabric which may be Grooved Ware (SF 35 and 37). Similar material was recovered in larger quantities from excavated contexts in this area.

SF34

41 Jar (3 sherds), dark grey fabric, numerous small and medium-sized angular milky quartz grits, mica dust in the clay matrix. A thin-walled vessel. Grimston Ware style

SF35

42 Jar, (2 sherds plus fragments) from a similar vessel to SF37 below. Traces of impressed decoration, perhaps made with a comb. Grooved Ware

SF37

43 Sherds from a thick-walled vessel, exterior surface brown-orange, soft dark grey fabric and interior surface, a few small mudstone grits, no trace of decoration. Probably Grooved Ware

SF38

44 Ceramic fragment from a thin-walled vessel, mid-grey fabric with occasional small angular milky quartz grits. Grimston Ware style

SF40

45 Ceramic fragment from a medium-walled vessel, surfaces brow-red, mid-grey fabric with numerous mixed angular mudstone grits. Probably Grooved Ware

SF41

46 Ceramic scrap, similar fabric to SF40. Probably Grooved Ware

SF54

47 Body sherd, medium-walled vessel, exterior surface brown-grey, interior surface brown, fabric dark grey, occasional angular quartz grits, occasional cavities from which small calcareous grits have leached, occasional medium-sized pieces of mudstone. Part of a single row of indistinct rectangular impressions - made perhaps using a reed - is visible. Peterborough Ware

SF59

48 Plain rim and fragments of a thin-walled vessel, dark grey surfaces and fabric, numerous small milky and clear quartz and other sands, occasional small mica plates. Grimston Ware style

7.0 INTERVENTION 5

Conservation of the fabric prior to examination of the pottery from this intervention makes identification difficult.

C1135 F91

49 Urn, barrel-shaped, exterior surface buff-brown, interior surface buff-grey, fabric mid-grey, many medium-sized angular cavities from which gypsum grits have leached, occasional small and medium-sized angular pieces of grog or ceramic. Plain, slightly everted, rim with a single shallow line of cord impression below the outer edge. This vessel has some similarity with an open dish from Rudston Wold (Manby 1980, 324, fig. 8.2). Middle Bronze Age

C1036 F16

50 Jar, sherds and fragments probably from the same vessel, exterior surface mid-brown, interior surface terracotta, fabric dark grey, occasional small quartz grits and occasional medium-sized mudstone fragments, the rim sherd has indentation - perhaps finger-nail - in the rim upper and a cordon with applied knots surface above a raised horizontal cordon. A body sherd has raised bosses or the beginnings of a cordon. This is a Grooved Ware vessel in Woodlands style (Manby.1999, 60-64). >From a pit close to a pit alignment, but not necessarily associated with the alignment.

C1136 F92

51 Urn, fragments of the lower part of a vessel only, exterior surface grey-buff, interior surface dark grey, fabric dark grey, occasional small and medium-sized cavitied from which calcitic grits have leached - with a few surviving, many mixed small and medium-sized grits, mudstone grits. Traces of an indentation at the base of the wall probably reflect manufacture rather than decoration. Middle Bronze Age

C1137 F93

52 Urn, fragment of base, buff-brown external surface, dark grey interior surface and fabric. Numerous angular mixed grits which are perhaps chert or a mineralised vein rock. Base diameter around 180 mm, no other detail present. Probably middle Bronze Age

C1140 F96

53 Urn(s), fragments from the lower part of what appears to be two distinct vessels, one of which has been placed within the other. The outer vessel has buff-mid-brown exterior and interior surfaces, with a dark grey fabric, conservation has made it difficult t identify grits, but there appears to be numerous medium-sized mudstone grits. The vessel has been poorly fired and a narrow segment of the lower wall, some 110 mm wide, survives. This vessel appears to have been charged with a deposit of cremated bone, of unknown quantity, before the second vessel was placed within it.

54 The second vessel is very similar in colour and construction, except that parts of its outer surface have been fired to a dull red colour. Although it might at first appear that the fragments represent just one vessel which has collapsed, the presence of fragments with base angle resting upon the remains of the cremation suggest that this cannot be the case, and that a second vessel was placed within a first. It is thought that the complete base which is present belongs to the second vessel. Probably middle Bronze Age

C1157 F106

56 Urn, bucket-shaped vessel, exterior and interior surfaces dark brown, the vessel is complete and had been the subject of conservation prior to examination, hence detail of the fabric is not clear, although it appears to be tempered with quartz and other sands and occasional angular medium-sized mudstone grits. Height 110 mm, base diameter 115 mm, rim diameter 160 mm, typical wall thickness 15 mm. The vessel is undecorated and appears to have been slab rather than coil constructed. This vessel would appear to belong to the middle Bronze Age, to which a few bucket-shaped vessels from North Yorkshire may be assigned (Manby 1980, 317-19). Similar to a vessel from Stanghow Moor, Cleveland (Manby 1980, fig. 5.12; Atkinson 1863).

C1755 F336 (A)

60 Jar, (12 plus fragments) exterior surface brown-grey, interior surface dark grey, fabric dark grey, numerous small angular milky quartz grits, typical wall thickness 8 mm, no rim form or decoration present. Perhaps Grimston Ware tradition

C1755 F336 (B)

61 Jar, sherds (18 plus fragments) from a soft fired vessel, exterior surface mid-brown, interior surface dark grey, fabric grey-brown, numerous small and medium sized milky and clear quartz and quartzitic grits, occasional small and medium-sized water-rolled silt pebbles, the grits are most visible in the fabric and interior surface, wall thickness variable between 9 and 11 mm - there may be sherds from two vessels here, no visible decoration. Neolithic, uncertain style

C1240 F82 SF130

62 Single sherd of plain pottery, fine sandy fabric. Date and style uncertain

C1263 F102 SF133

63 Two fired clay fragments from a hearth or oven.

C1137 F93

64 A few fragments (>5 mm) of ceramic, unidentified. F93 C1137 SF177 Associated with middle Bronze Age pottery and probably of that chronological horizon

PIT ALIGNMENT F145-F190

C1202 F135 SF129

65 Two sherds plain pottery.

C1206 F137 SF135

66 Two fragments of thick-walled pottery or ceramic, unidentifiable.

C1219 F141 SF134

67 Fragments, unidentifiable.

C1256 F156 SF132

68 Fragments, unidentifiable.

C1288 F169 SF136

69 Ceramic scrap, perhaps a deformed sherd but more likely to be from the base of a hearth or oven.

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PART 4 POTTERY FROM NOSTERFIELD 1999
Blaise Vyner

Intervention 4 F8 C1011

Single rim sherd of Torksey or Torksey-type Ware. The known production source is the Lincolnshire town, although other kilns may have existed. Found in urban assemblages from York, and in east Yorkshire, this fabric does not appear to be widely distributed in assemblages from North Yorkshire. Datebale to the 10th to 11th century.

PART 5: ASSESSMENT OF THE ROMAN AND LATER POTTERY FROM NOSTERFIELD

Barbara Precious and Alan Vince

One hundred and sixty-five sherds of pottery, representing no more than 128 vessels and weighing 1.860kg from a watching brief at Nosterfield Quarry, North Yorkshire, carried out by Field Archaeology Specialists were submitted for identification and assessment.

The pottery consists of a group of Romano-British date and a small number of medieval and later sherds. The Roman material is moderately abraded but includes several groups of sherds from the same vessel (sherd families). It is likely that the occupation which gave rise to this debris was situated on or close to the site. By contrast, the medieval and later sherds are smaller, more abraded and include no cross-fitting sherds. It is likely that these came onto the site with manure and that the settlement they originated in could be some distance from the site, although two small sherds (one broken into three post-burial) were recovered from occupation features – a well and a pit/kiln complex (Features 202 and 102 respectively).

1.0 DESCRIPTION

ROMAN

The Roman pottery fabrics were recorded according to the system employed at York (Table 1. 1993; 1997).

One hundred and forty-seven sherds of Romano-British pottery were recovered from the excavations. Ninety-five of these were greywares of various sorts (a number of which appear to have been made at York, Eboracum wares) but there were also sherds of amphora, mortaria and samian ware. In total, 22 sherds were imported, 15 came from other British provinces, 7 were of York origin and the remaining 103 were of unknown but probably northern origin.

Table 1

cname	Narrow cname	Imported	Regional industries	Unknown British?	York	Total
AP25	Amphorae	10				10
B0	Grey B.			5		5
B0?	Grey B.			5		5
B1	BB1		14			14
B2	BB2		1			1
B6	BB2			68		68
E1?	Ebor				3	3
G0	Grey			13		13
G1?	Grey				1	1
M0	Mortaria			6		6
M3-6?	Mortaria				2	2
M14	Mortaria		1			1
O0	Misc. Oxid			4		4
P0	‘White’			2		2
S1?	SGS	1				1
S2?	LMDV samian	1				1

cname	Narrow cname	Imported	Regional industries	Unknown British?	York	Total
S3	CGS	7				7
S3?	CGS	3				3
W1	Ebor white				1	1
Total		**22**	**15**	**103**	**7**	**147**

Although a number of the imported sherds did come from sherd families, there were still 15 separate vessels represented and so this high non-local and imported pottery frequency cannot be explained as being an accident of recovery.

The amphora sherds are all of Dressel 20 type (AP25). This type was produced in southwest Spain and used mainly for the transportation of olive oil.

The black burnished wares include unidentified examples (B0), Dorset Black-Burnished ware (BB1, York B1), and Black-Burnished ware 2 (BB2, York B2 and B6). B2 is the wheelthrown BB2 fabric produced in Essex and Kent.

Only one standard Ebor ware (E1) was tentatively identified but two of the mortaria sherds (M3-6?) and one white-slipped vessel (W1?) were found. This suggests that the site relied on other, more local, sources for its coarse cooking pottery but still acquired finer vessels from York.

Fourteen sherds of unidentified greyware (G0) and one sherd of a local greyware of a type found at York (G1) was tentatively identified.

Six unidentified sherds of mortaria were recovered (M0). These should be submitted to a specialist (Kay Hartley) for identification if the material is to be published.

There were four sherds of miscellaneous oxidized wares (O0) and two sherds of whiteware (P0).

The samian wares include one example of a South Gaulish samian (S1) form Dr18/31, one extremely abraded sherd, possibly from the Les Matres de Veyre factory, 7 positively-identified sherds of a Central Gaulish samian ware decorated form Dr37 and 3 possible examples, one from a dish and two from a form Dr18/31 vessel. The samian ware should also be examined by a specialist should the material be published.

The range of vessel forms present (Table 2) indicates a wide range of functions, using in food preparation and storage (amphora, jars and mortaria) and serving (Flagons, Samian ware, dishes and beakers). The latter vessels are mainly imported and the former mainly local although examples of regionally imported jars are present. There is, however, an absence of bowls, which are normally a common element in Roman pottery assemblages throughout the Roman occupation.

Table 2

FORM	Broad class	Imported	Regional industries	Unknown British?	York
18/31	Samian	1			
37	Samian	6			
AP25	Amphora	5			
D	Dishes	1	1		

FORM	Broad class	Imported	Regional industries	Unknown British?	York
DF	Dishes			1	
F	Flagons			1	
J	Jars			8	2
JC	Jars		3	59	
K	Beakers			`	1
M	Mortaria		`	4	

The Roman pottery indicates a settlement in which food was prepared and served in the Roman manner and this probably indicates that the users were Romanised natives or perhaps members of the administration. Whether there was a difference in pottery supply or use between these two groups would require further research.

The date of the occupation is broadly-speaking late 1st to early 3nd century but there are only 19 sherds which come from contexts which do not also contain early 2nd-century or later wares. These contexts are 1084, 1138, 1199, 1239, 1298, 1349, 1365, 1554, 1698 and 1995. Only one of these contexts produced more than a single sherd (1239) and it is very likely that these contexts too date to the early to mid 2nd century but contained assemblages which are too small to contain the diagnostic, datable types.

A single sherd of Les Matres de Veyre samian ware was found. This factory was in operation c.100-120 AD but its products may have continued to be stockpiled and sold much later. The Central Gaulish samian ware dates to 120 AD or later and is present in several contexts. A number of contexts contain either BB1 or other burnished wares, assumed to be influenced by the fashion for BB1 and therefore of similar starting date. These wares first appear in northern England in the Hadrianic period. In total, the following contexts produced pottery dating to the 2nd century or later: 1122, 1128, 1133, 1139, 1148, 1149, 1309, 1367, 1399, 1513 and 1715.

The latest datable type present is a sherd of Mancetter/Hartshill mortaria, a wall-sided mortaria of early 3rd century date. There are no sherds of Dales ware, Calcite-tempered wares, Nene Valley colour-coated wares, Crambeck wares or any other types which might be expected if occupation continued into the later 3rd and 4th centuries.

MEDIEVAL

Eleven sherds of medieval pottery were found. All are small and abraded. They include sherds of wheelthrown gritty wares, tempered with fragments of Millstone Grit sandstone and its constituents, North Yorkshire whiteware, either from the Brandsby kilns or other industries using the white-firing clays which outcrop around the borders of the North Yorkshire Moors, a possible sherd of Tees Valley ware, produced somewhere on the south side of the Tees valley, and a sherd of Humber ware, made from a silty clay somewhere in the Humber wetlands. It is unlikely that any of these sherds are earlier than *c.*1150 whilst most are likely to be high or late medieval (i.e. later 13th to 15th centuries).

POST-MEDIEVAL

Three sherds of post-medieval pottery were found. One of these, an untempered red earthenware, might be a fragment of tile rather than pottery (PMX). Another is a lead-glazed red earthenware with a white internal slip, of the type produced in northeast England in the 18th and 19th centuries (SUND). The third is a sherd of Reversed Cistercian ware. This type was a minor product of industries such as that at Wrenthorpe where small cups decorated with applied brown clay and covered internally and externally with a thick lead glaze were produced alongside the standard Cistercian ware types, which have a red-firing body and are decorated with white applied slip. The type is of 16th to early 17th-century date.

ASSESSMENT

The Roman pottery comes from a settlement of early 2nd to 3rd century date which may have its origins in the later 1st century, although this is doubtful. The range of wares and forms present suggests that the users cooked and served their food in a Roman manner and there is little evidence for the use of handmade 'native' wares (apart from a sherd from context 1391). It is possible that occupation was present on the site before this date but that the occupants continued to use the same pottery types as they had in the Iron Age. The mould-makers stamp on the samian ware bowl is comparatively rare and the sherd should be sent to Ms B. Dickinson, who is compiling a National Corpus of samian stamps. The unidentified mortaria and the decorated samian ware, however, only require specialist identification if the collection is to be published since they might aid closer dating and provide more information on pottery supply.

The medieval and later pottery from the site is small and abraded and seems to span a long period of time with no apparent chronological concentrations. This is consistent with the pottery coming onto the site with manure and six of the sherds were found in the backfill of furrows, including the Reversed Cistercian ware sherd.

Context	Period	Nosh	NoV	Weight	cname	Broad cname	Broad source	Narrow cname	Form	Description
1001	LMED	1	1	10	HUM				JUG/JAR	GLAZED; BH JOHN
1001	MED				ZDATE					POSTRO
1074	MED	1	1	5	NORTHERN GRITTY				JUG	BS GLAZED
1074	MED				ZDATE					POSTRO
1084	EROM				ZDATE					CP1B-2
1084	EROM	1	1	2	E1?	EBOR	York	Ebor	K	BS; INDENTED
1122	ROM				ZDATE					CP1B-2
1122	ROM				ZDATE					CP2A-2B
1122	ROM				ZZZ					SAM FAB AS REST 37
1122	ROM				ZZZ					SHOW MORT K HARTLEY
1122	ROM	3	2	222	AP25	AMPH	Imported	Amphorae	AP25	BSS; EFAB
1122	ROM	2	1	23	B6	BURNISHED	Unknown British?	BB2	DG1	RIM GIRTH BASAL BS
1122	ROM	1	1	31	M0	MORTARIA	Unknown British?	Mortaria	M	BS; WHT FAB MIX QZITE TRITS
1122	ROM	1	1	103	M0	MORTARIA	Unknown British?	Mortaria	ME	RIM UPPER WALL; Q? TRITS; AS
1122	ROM	1	1	18	M0	MORTARIA	Unknown British?	Mortaria	ME	RIM;Q? TRITS;AS
1122	ROM	1	1	2	O0	OXID	Unknown British?	Misc. Oxid		FRAG
1122	ROM	1	1	19	S3	SAMIAN	Imported	CGS	37	BS OVOLO
1122	ROM	1	1	12	S3	SAMIAN	Imported	CGS	37	BS SAME FAB; DIFF OVOLO
1122	ROM	2	1	9	S3?	SAMIAN	Imported	CGS	18/31?	RIMS UPPER WALL
1122	ROM	1	1	5	S3	SAMIAN	Imported	CGS	D	BS
1128	ROM				ZDATE					CP2A-2B
1128					ZZZ					SAM FAB AS REST 37
1128	ROM	1	1	22	AP25	AMPH	Imported	Amphorae	AP25	BS

Context	Period	Nosh	NoV	Weight	cname	Broad cname	Broad source	Narrow cname	Form	Description
1128	ROM	1	1		S3	SAMIAN	Imported	CGS	37	BS; BODY NAME STAMP
1133	ROM				ZDATE					CP2A-2B
1133	ROM				ZZZ					SAM FAB AS REST 37
1133	ROM	3	1	13	AP25	AMPH	Imported	Amphorae	AP25	BSS FRAGS
1133	ROM	1	1	2	E1?	EBOR	York	Ebor	J or K	BS
1133	ROM	1	1	2	S2?	SAMIAN	Imported	LMDV samian		FRAGS SURFS NR LOST
1133	ROM	1	1	15	S3	SAMIAN	Imported	CGS	37	BS OVOLO
1138	EROM				ZDATE					CP1B-2
1138	EROM				ZDATE					CP2
1138	EROM	1	1	40	G0	GREY	Unknown British?	Grey	DF	RIM LWR WALL; SOOT/TAR EXT
1138	EROM	1	1	6	G0	GREY	Unknown British?	Grey	J	BASE CF G1 YORK; THIN
1138	EROM	2	2	9	G0	GREY	Unknown British?	Grey	J	BS CF G1 YORK; THIN
1138	EROM	1	1	42	G0	GREY	Unknown British?	Grey	J	BS LARGE JAR; CF G1 YORK
1139	ROM				ZDATE					CP2A-2B
1139	ROM				ZZZ					SAM FAB AS REST 37
1139	ROM				ZZZ					SHOW MORT K HARTLEY
1139	ROM	2	1	6	B0	BURNISHED	Unknown British?	Grey B.	JC	BSS
1139	ROM	4	1	22	B1	BURNISHED	Regional Industries	BB1	DFL	RIM BSS BURNT OXID
1139	ROM	7	1	31	B1	BURNISHED	Regional Industries	BB1	JC	RIM BSS
1139	ROM	1	1	4	B2	BURNISHED	Regional Industries	BB2	D	BS
1139	ROM	1	1	16	M0	MORTARIA	Unknown British?	Mortaria	M	BS; WHT FAB MIX QZITE TRITS
1139	ROM	1	1	15	S3	SAMIAN	Imported	CGS	37	BS OVOLO
1139	STONE	1	1	1	STONE					FLAKE; WORKED?
1147	MED	1	1	2	NORTHERN GRITTY				JAR	ID?
1147	MED				ZDATE					POSTRO
1148	ROM				ZDATE					CP2A-2B
1148	ROM				ZZZ					SAM FAB AS REST 37
1148	ROM				ZZZ					SHOW MORT K HARTLEY
1148	ROM	1	1	3	B6	BURNISHED	Unknown British?	BB2	JC	RIM FRAG
1148	ROM	11	1	122	B6	BURNISHED	Unknown British?	BB2	JC	RIMS BSS
1148	ROM	1	1	18	M0	MORTARIA	Unknown British?	Mortaria	M	BS MIX R Q TRITS

Context	Period	Nosh	NoV	Weight	cname	Broad cname	Broad source	Narrow cname	Form	Description
1148	ROM	2	1	7	S3	SAMIAN	Imported	CGS	37	RIMS SAME FAB AS REST 37S AS
1149	ROM				ZDATE					CP2-3
1149	ROM				ZZZ					FLOT RES; CREMATION
1149	ROM	2	1	18	B0	BURNISHED	Unknown British?	Grey B.	DD?	BASES
1199	LIA/EROM				ZDATE					PREH?-RO
1199	LIA/EROM	1	1	3	G0	GREY	Unknown British?	Grey	J	BASE FINE SILTY; LIGHT WEIGHT
1199	LIA/EROM	1	1	1	O0	OXID	Unknown British?	Misc. Oxid		FLAKE; TILE?
1199	STONE	1	1	12	STONE?					FRAG PUMICE?; POSS PREH POT
1239	EROM				ZDATE					CP1B-2
1239	EROM				ZZZ					SHOW MORT K HARTLEY
1239	EROM	1	1	91	M0	MORTARIA	Unknown British?	Mortaria	M	BASE; QUARTZITE TRITS
1239	EROM	1	1	25	M3-6?	MORTARIA	York	Mortaria	ME	RIM; EBOR? SAME FAB AS REST
1239	EROM	1	1	11	O0	OXID	Unknown British?	Misc. Oxid	F	BS DK GREY CORE FRIABLE
1245	MED	1	1	4	NORTHERN GRITTY				JUG	BS ROULETTED/COMB
1245	MED				ZDATE					POSTRO
1298	EROM				ZDATE					CP1-2
1298	EROM				ZZZ					DR20 ONLY
1298	EROM	3	1	177	AP25	AMPH	Imported	Amphorae	AP25	BSS FRAG; EFAB
1309	ROM				ZDATE					CP2
1309	ROM	2	1	2	B1	BURNISHED	Regional Industries	BB1	JC	BSS FRAG; EFAB
1341	PMED	1	1	5	SUND				BOWL	WHITE SLIPPED INT; MOTTLED BROWN GLAZE; LATE 18TH/19TH
1341	PMED				ZDATE					POSTRO
1349	EROM				ZDATE					CP1B-2
1349	EROM				ZZZ					SHOW K HARTLEY
1349	EROM	1	1	111	M3-6?	MORTARIA	York	Mortaria	ME	SPOUT; EBOR? SAME FAB AS
1365	EROM				ZDATE					CP1B-2B
1365	EROM	1	1	20	E1?	EBOR	York	Ebor	J	BASE FAB ID EBOR; PROB CP1
1367	ROM		1		ZDATE					CP2A
1367	ROM				ZZZ					SMASHED VESSEL

Context	Period	Nosh	NoV	Weight	cname	Broad cname	Broad source	Narrow cname	Form	Description
1367	ROM	54	54	252	B6	BURNISHED	Unknown British?	BB2	JC	RIMS BSS; EXT ABRADED
1367	ROM	1	1	11	G0	GREY	Unknown British?	Grey	J	BS CF G1 YORK; THIN
1391	LIA/EROM				ZDATE					I AGE - CP1
1391	LIA/EROM	1	1	5	G0	GREY	Unknown British?	Grey	B or D	BS SMOOTH INT
1391	LIA/EROM	2	1	25	G0	GREY	Unknown British?	Grey	J	BSS HANDMADE
1399	LIA/EROM				ZDATE					CP2A-B
1399	ROM	1	1	34	B0	BURNISHED	Unknown British?	Grey B.	JC	BS SURFS LOST
1399	ROM	5	1	26	B0?	BURNISHED	Unknown British?	Grey B.	JC	BSS SURFS LOST
1399	ROM	1	1	23	G0	GREY	Unknown British?	Grey	DG1	RIM LWR WALL; SOOT/TAR EXT
1399	ROM	2	1	12	G0	GREY	Unknown British?	Grey	J	BSS
1513	ROM				ZDATE					CP2
1513	ROM	1	1	6	B1	BURNISHED	Regional Industries	BB1	JC	BS; SHLDR
1554	EROM				ZDATE					CP1B-2A
1554	EROM				ZZZ					SAM ONLY
1554	EROM	1	1	10	S1?	SAMIAN	Imported	SGS	18/31	RIM BASE
1641	LIA/EROM	1	1	3	FCLAY					FRAG QUARTZITE
1641	LIA/EROM				ZDATE					PREHIST?
1670	MED	3	1	0	MEDLOC				JUG	
1691	MED	3	1	0	MEDLOC				JUG	
1694	MED	1	1	0	MEDLOC				JUG	
1698	EROM				ZDATE					XP2+
1698	EROM	1	1	8	G1?	GREY	York	Grey	J	BS SHLDR GROOVE CF EBOR
1705	ROM	1	1	30	M14		Regional Industries	Mancetter Hartshill	MW	RIM GIRTH; BLK TRITS
1715	ROM				ZDATE					CP1-2
1715	ROM				ZDATE					CP2
1715	ROM				ZZZZ					FAB EBORISH; W1
1715	ROM	2	1	1	P0	'WHITE'	Unknown British?	'White'	K	BSS
1715	ROM	1	1	33	w1?	EBOR	York	Ebor white	F1	BASE; WHT SLIP UNDER BASE
1725	MED	1	1	0	TVW?				JUG	
1725	PMED	1	1	0	REVERSED CSTN				CUP	APPLIED BROWN CIRCULAR PAD

Context	Period	Nosh	NoV	Weight	cname	Broad cname	Broad source	Narrow cname	Form	Description
1764	MED	1	1	0	MEDLOC				JUG	SLIGHTLY SAGGING BASE; INTERMITTENT THUMBING
1995	EROM				ZDATE					CP2+
1995	EROM	1	1	10	O0	OXID	Unknown British?	Misc. Oxid	J or K	BS FINE SILTY FAB NOT EBOR
US	MED	1	1	27	NYMM				JUG PLAIN BASE	US
PMED	1	1	23	PMX					?	MIGHT BE A FLAT ROOF TILE OR BASE OF A LARGE JAR?' FABRIC LOOKS POST MED

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APPENDIX E ENVIRONMENTAL REPORTS

PART 1: NOSTERFIELD, NR. RIPON: THE CHARRED PLANT REMAINS

J.P. Huntley, University of Durham

1.0 INTRODUCTION

Archaeological work was undertaken by Tom Gledhill for Mike Griffiths Associates on a potential gravel extraction site near to the Dishforth henges in North Yorkshire (centred upon NGR SE3573). Several series of pits were uncovered. These ranged considerably in depth and extent and Neolithic pottery was recovered from some of them. This consisted of mostly Fengate ware but with some early Grimston ware and later Durington Walls sherds. In general the upper fills were the ones containing charcoal and finds whilst the lower fills were mostly sterile. The excavator suggested that this represents deliberate backfilling with later subsidence and settling allowing slumping which was itself either filled deliberately or by material blowing around. There was, apparently, no evidence for the primary function of the features.

Bulk samples were taken and three have been processed in order to evaluate the potential in terms of determining the nature of the features.

2.0 THE SAMPLES

Three bulk samples (each approximately 10 litres) were processed using manual flotation with flots and residues retained upon 500µ mesh. After drying the flots were sorted for their plant remains and the residues scanned for biological and artefactual material.

The samples produced moderate sized flots (50-100ml) of silty charcoal fragments and a few modern roots. The charcoal was mainly from large trees although was in small pieces only. No twiggy material was recorded. Oak was clearly present but the majority was from diffuse-porous species such as alder, hazel or birch. No heather fragments were recorded. Context 1217 (sample 22) produced a fragment of barley grain, a fragment of either apple or pear fruit and 2 fragments of hazelnut shell. Context 1007 (sample 4) produced 1 hazelnut fragment and context 1306 (sample 15) 1 fragment of cereal grain, probably barley, 1 fragment of apple/pear pip and 6 fragments of hazelnut.

These remains are typical of Neolithic deposits in Britain and closely parallel the results from the excavations at the nearby Marton-le-Moor site (Huntley 1995). Indeed, the two sites are sufficiently close to suggest that they may represent a single, large and possibly disparate usage site, one dares not say settlement since no evidence for housing has yet been recovered. Of the 84 samples from Marton-le-Moor only 11% contained cereals/fruit (other than nut shell) and of these only 2 samples contained any quantity of cereals. It is therefore important to at least process and scan as much material from as many contexts as possible in order to find the relatively few which have statistically significant amounts of material present. It is therefore recommended that the remaining 20 (ish) samples from Nosterfield are processed. Given that there are spatial patterns in the pits, or pit groups, it may be that areas of ‘more’ activity can be determined. This was certainly the case at Marton-le-Moor. This would provide more evidence to target a better defined research programme since it seems likely that the gravel extraction will expand, due to continuing A1 improvements.

This part of North Yorkshire clearly has evidence for substantial Neolithic activity witness the numerous henges and standing stones within even 5km of this site. Equally, cereal usage is high, albeit in a limited number of contexts. What is needed is evidence for the settlements that, surely, must have been associated with all of this activity. By extensive sampling programmes the nature of cereal waste and weed assemblages should provide an indication of whether these cereals were, indeed, locally grown or whether the grains were brought in with people who, perhaps, used tentage of some sort for short-term, temporary settlement only.

References

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PART 2: REPORT ON THE SEDIMENT STRATIGRAPHIES OF THREE SHAFTS FROM NOSTERFIELD

Deborah. J. Long and Richard Tipping, Department of Environmental Science, University of Stirling

Summary of Findings

Detailed semi-quantitative sediment-stratigraphic data are presented for three deep (2.5-2.8m) shafts closely grouped at Nosterfield sand-and-gravel quarry.

The morphological and sedimentological data support the archaeological interpretation of these shafts as anthropogenic in origin.

The sediments and infilling processes are complex and different between each of the shafts, allowing a relative sequence for the formation and infilling of the shafts to be suggested.

Two of the shafts (F44 and F45) clearly contained standing water, probably during use. The shafts are assumed to have served as water-sources. The third shaft (F46) has no evidence for standing water, but is thought to have ceased to function very soon after its excavation.

Sediments at critical depths for defining (i) the ages of formation and (ii) close to the end of sediment infilling are organic-rich and should be able to define the time-span covered by the deposits.

INTRODUCTION

Three features (F44 - F46 inclusive) in the Nosterfield (NON 98) sand and gravel quarry were sampled on the 25th September 1998. This report describes the subsequent laboratory analyses, which focused on detailed semi-quantitative sediment-stratigraphic description in order to define the possible modes of formation of these features and the processes of sediment infilling. Features F44, F45 and F46 were identified during excavation as probably of anthropogenic origin, and sediment-stratigraphic description was designed to explore this possibility. An anthropogenic origin is confirmed as most likely, and the complex processes of sediment infilling are seen as resulting from a combination of recutting, probably whilst the shafts were in use, and post-use sediment accumulation.

We present a suggested relative chrono-sequence for the formation and infilling of these features derived from these descriptions. The report also defines the depths of critical sediment samples recommended for AMS 14 C dating, and details the significance of these assays in characterising the dates of sediment infilling

In addition a sediment description of a 25.0cm monolith taken from the marl/peat boundary within the lacustrine deposit adjacent to F44-F46 is presented. Radiocarbon dating of the peat immediately above this sedimentological boundary is recommended, which will allow us to establish the age of terrestrialisation of the former lake and its relation to F44-F46.

METHODS

The three features discussed in this report had been partially excavated prior to the sampling described here on September 25th 1998. Attempts to section the sediment fills, prevented by a high groundwater-table, made sampling with corers a little difficult. Nevertheless, all cores taken can be related to site and Ordnance Datum, levelled by Electronic Distance Measurer.

The sediment fills at and below the groundwater table were sampled using a 1.Om long, 6.Ocm internal diameter Russian peat-corer, samples placed in clean plastic guttering, labelled and wrapped in plastic. Monolith tins of 50.Ocm length had already been sampled in the overlying sediment fills; these were returned with the cores to Stirling University for sediment description.

Cores and monolith tins are stored in a refrigerator at 40C to prevent fungal growth. Sediments were cleaned in the laboratory, and sediment-stratigraphic descriptions carried out according to the conventions of Troels Smith (1 955). This is a semi-quantitative objective descriptive method designed to produce a full, consistent and universally applicable appraisal of discrete sediment units (deposit elements).

Troels-Smith descriptions are presented in Tables 1-5. In the text simpler but less precise descriptions of the sediments are used.

Colours of sediments were described using Munsell Color Charts on moist sediment under artificial light.

SEDIMENT STRATIGRAPHIES

The three features are described and interpreted in numerical order. Observations made during archaeological excavation on feature morphology prior to sediment sampling are incorporated. Sediment stratigraphies are described from base up, e.g. in the order of deposition.

F44

F44 is the easternmost of the group of three features, closest to the former lake margin. Cut into the underlying gravel, F44 had a near-circular planform c. 3m in diameter, the uppermost fill lying at 39.50m). A shallow basin-like feature rapidly changes below c. 50cm to a steep- or vertical-sided shaft a little less than 3m wide.

The uppermost loamy inorganic fills (8055 and 8054) contain considerable quantities of modern pottery and are interpreted by the excavator as fills to level the depressions. Below these recent loamy fills is context 8056, described by the archaeologist as a pure peat. This and the underlying context 8057 were sampled by 50.Ocm monolith tin, and two overlapping Russian core samples in lower sediments, at the centre of the shaft. The lowermost Russian sample probably reached gravel but a 15.Ocm nose-cone prevents sampling of these basal sediments. The total depth of fill recorded in samples is 241.Ocm (Table 1); the base of the fill is probably 15.Ocm lower or at an altitude of 36.53m OD.

The basal fill (241-229cm) is an unstratified organic-rich clay with sand grains and common small rounded stones. Coarse components probably derive from the sides of the shaft, but the intimate mix of clay and amorphous organic matter suggests deposition and mixing in water. An abrupt boundary to overlying clay occurs at 229cm. Nearly a metre of completely minerogenic, structureless clays (although varying in particle-size from clay to silty clay) were deposited to 138cm. A well-humified peat at 191-195cm (Table 1) is clearly a discrete lens with a sharp boundary within the clay. Small rounded stones are rare. The clay is almost certainly a product of settling-out in standing water. During this period the stability imposed by a high groundwater table and equal pore-water pressure within the gravel and shaft may have prevented slumping of the shaft sides. Despite the abundance of minerogenic sediment in the shaft it is likely that the adjacent contemporary ground surface was vegetated because the sediment fill is largely limited to the clay-sized fraction of 'soil'. Sediment was probably sorted before deposition, possibly by a complete vegetation cover.

An organic-rich clay deposited between 138-134cm is oxidised, and is overlain by a similarly iron-rich sandy gravel (134-127cm). The gravel is very probably a collapse feature from the shaft sides, oxidised above the contemporaneous water level, and the underlying peaty clay may also be derived by shaft-edge collapse. Overlying these slumped sediments are a series of well-humified peats and well-defined clay lenses with sharp boundaries between 127 and 11Ocm, suggestive of intermittent though probably rapid infilling or of fluctuating water levels within the shaft: the peats probably formed on the wet surface of former sediments and are *in situ; the* clays may have sedimented out in ponds on the peat surfaces or be derived from slope-wash, representing single small-scale erosion events.

Above this is a thick well-humified structureless peat (110-72cm), probably that identified in excavation as context 8057, and a wood-rich peat between 72 and 60cm, it is not clear if these wood fragments are *in situ.* Finally, extending to context 8056 is an *in situ* peat of varying humification in which sedge remains (Cyperaceae), including *Phragmites,* are seen in poorly humified parts. These less decayed peats are felted, retaining the original sub-horizontal structure. This peat accumulated with no slumping or recognisable slope-wash activity. However, the uppermost 10 or so cm are severely disturbed by recent earthworm activity.

F45

F45 is cut into gravel, the surface at around 39.50m OD. The feature is more neatly circular than F44, 2.2m wide and with little evidence for the surface horizons to be wider than the shaft. Archaeological excavation to around 60cm showed a sequence of shallow loamy and stony fills at the surface in the centre of the shaft (contexts 8066 and 8065) to 20cm depth, containing modern pottery. These are interpreted as fills to level the surface as at F44. Beneath these recent inorganic fills are a series of peat deposits (contexts 8067, 8068) sampled in the centre of the shaft by 50.Ocm monolith tin and two overlapping Russian cores. The total depth of fill sampled is 281.Ocm, as at F44 the Russian core probably grounded on underlying gravel but could not sample it, and the base of the shaft is estimated to reach 36.99m OD.

The basal sediment sequence (281-189cm) is an organic-rich clay with discrete thin pure clay bands. It is comparable to the basal sequence at F44 and probably represents mixing of mineral material with *in situ* amorphous organic matter in standing water. However, well-humified peats are also present and *Phragmites* stems are preserved, and if *in situ,* which is most likely, these peats formed in short periods when the water level was lowered. Wood fragments occur at 257-260cm, and may be inwashed. Small rounded stones are present, but in general there is little evidence for shaft-collapse or major erosional events. Between 227-221 cm a structureless silty clay was deposited in standing water, probably quite rapidly and suppressing organic matter production, but coarse particles were not inwashed. The silty clay is oxidised, probably indicating its derivation from a soil surface.

Above 189cm is 23cm of structureless and highly humified *in situ* peat formed under stable conditions, but above 166cm peat formation is interrupted by the deposition of discrete clay lenses. These clay bands probably represent the sorting of eroded soils by a complete vegetation cover and the washing into the shaft of only the finest particles, they may represent individual storm events and the setting-out of sediment following temporary flooding of the shaft. Recorded in excavation are a series of sandy silt slumps in the surface horizons (context 8069), predating peat infilling the top of the shaft, these may relate to this period of soil inwashing.

These intermittent but probably rapidly deposited sediment fills continue to 119cm, when minerogenic sediment inwashing ceases and structureless well-humified *in situ* peats accumulate. As at F44 the humification state of this final pure organic fill varies, and less decayed parts contain *Phragmites* (Cyperaceae) stems, preserved in growth position (i.e. vertically) above 50cm.

F46

The surface of this feature lies at 39.93m OD, furthest from the lake margin. This is a distinctive funnel-shaped feature, over 4m wide at the surface, with a steep edge to the shaft at the east, a more bowl-shaped slope at the west. The shaft commences about 70cm below the present surface, and is assumed to be steep or vertical. The top of the funnel was excavated and seen to be infilled with context 8059, a crumbly dark brown loam rich in modern debitage, and context 8060, a discrete layer of pebbles and gravel extending across the depression. These contexts are interpreted as deliberate fills above the shaft, although the absence of artefacts in context 8060 is problematic in this regard.

Beneath these in section is an organic-rich loam (context 8061) that grades into the underlying black peat of context 8062. These contexts were sampled by 50.Ocm monolith tin in the centre of the shaft, and two overlapping Russian cores obtained deeper sediments. With the assistance of a JCB bucket the otherwise intractably stiff sediments were sampled and the Russian corer was able to demonstrate coarse gravels beneath the shaft fill. Samples were obtained to a depth of 250.Ocm but the contact between gravel and basal fill is at 223.Ocm or 36.92m OD.

The fill is very uniform, and comprises 215.Ocm of highly organic, well-humified *in situ* peat with rare herbaceous and woody remains visible. Accumulation appears to have been continuous. There is no evidence for mineral components and the diffuse contacts between peat units suggest undisturbed accumulation without wall collapse or minerogenic infilling. Minerogenic sediment is virtually absent until the admixed loam of context 8061, above 8.Ocm depth. Seen to be lining the sides of the shaft in excavation are sandy silts (context 8064), but these inwashed or slumped deposits predate all the peat infill of this shaft.

MARL/PEAT BOUNDARY (FIND NO. 14)

The altitude of this sequence is at 39.23m OD, not significantly different to the ground surfaces at F44-F46. The monolith tin was sampled through *in situ* lacustrine and fen deposits where undisturbed sediments are closest to F44, around 75m away to the north-east. Marls are recorded from very close (within 15m) to F46, however. The proximity of open-water sediments to the shafts leads to questions concerning their contemporaneity, to be resolved through ^{14}C dating (below).

The horizontally colour-laminated marl is clearly an *in situ* lacustrine deposit rich in calcium carbonate. A well-defined transitional unit to the overlying peat is indicated by thin laminae and bands of alternately deposited mari and organic matter, before a well-humified structureless terrestrial peat replaces lacustrine sediment.

DISCUSSION

(1) Probable Mode of Formation of F44-F46

The steep sides to these features are indicative of deliberate cuts into the gravel substrate. The abrupt boundary between gravel and well-humified peat at F46 also indicates that this is not a natural feature: these shafts are clearly anthropogenic in origin. It is not known whether the shafts were dug to their maximum depth at one time or in a more piecemeal fashion because the shafts could not be half-sectioned. It can be suggested that re-cutting or emptying of the sediment fill occurred during use in one shaft, F44 (below).

The sediments demonstrate that two shafts, F44 and F45, at one time contained standing water. This cannot be demonstrated for F46 although it is argued that this is because this shaft, dug last, became redundant through a drop in groundwater level before water-lain sediments could form. It is likely that all three shafts were intended to contain water. However, whether these were wells intended for human consumption of water is uncertain: the amount of clay sedimented out in F44 in particular indicates that the water in the shafts was at least periodically very muddy; further analyses will be required to define water quality from, for example, particle-size and diatom analyses.

The three shafts are cut to approximately the same altitude: F44 = 36.53m OD; F45 = 36.99m OD; F46 = 36.92m OD. These differences in altitude are not considered significant. At their fullest depths these shafts were probably dug to reach a groundwater table at roughly the same depth. However, current data cannot establish the original groundwater level: pollen and aquatic macro-plant analyses will help here. Sedimentological data indicate that during infilling the groundwater table varied, with some clay-rich fills probably indicating standing water, and well-humified peats suggesting drier conditions, although many of these sediment fills may not relate to use of the shafts (below).

The observation that all the shafts were cut to broadly the same depth does not necessarily imply that the shafts were dug at the same time because groundwater levels may have remained stable for long periods. However, the close grouping of these shafts suggests that one was visible or known when others were sunk. Equally, this close grouping might imply that not all shafts functioned at the same time, and that some shafts went into disuse before others.

(2) The Relative Chronology of Sediment Inkling

Non-contemporaneous use of the shafts is suggested by the very different stratigraphies of the sediment fills at each shaft. These major contrasts are interpreted here as representing different modes of sediment formation occurring at different times. This relative chronology is speculative and makes assumptions that are currently untestable.

F44 and F45 have comparable sediment infills at the base of the two shafts. Depositional conditions were of standing water where *in situ* organic matter, amorphous but perhaps derived from micro-faunal and floral components in addition to plant growth, was intimately mixed with clays being washed into the shafts by storm events and soil erosion around the shafts; small-scale slumping of shaft edges also occurred. Initial depositional conditions were comparable between these features which might suggest contemporaneous use of the shafts. In F45 this sequence of intermixed clays, organic matter and peat continues until replacement by *in situ* peat, and there is no indication that deposition was interrupted. The simplest interpretation is that F45 simply filled with water-lain sediments before these were replaced by peats.

At F44 this basal sequence is truncated. The abrupt boundary between the basal units and overlying clays is interpreted as the result of recutting, or an attempt to empty out the sediments accumulating in the shaft. The purely minerogenic clays and silty clays within F44 are not seen at F45. F45 was seemingly not re-cut; no attempt at rejuvenating the function of the shaft is indicated. So although F44 and F45 may initially have been dug at the same time, F45 was not cleaned out, and may have been abandoned before F44.

The clays of F44 are water-lain sediments, deposited when minerogenic input was much greater than at any time during the infilling of F45. This is a second reason for suspecting that F45 was infilled before F44. The source of these large thicknesses of clays in F45 is not presently clear. The sediments are assumed to derive by slopewash from gravelly soils, but sediment-sorting through the trapping of coarse particles by a complete vegetation cover, even of grasses, would seem necessary to explain the very fine particles being deposited in this shaft. The abundance of clays suggests that soil erosion, by wind, perhaps, as much as by water, was much more prevalent than during the infilling of F45. Reasons for this could relate to an intensification of settlement or land-uses around the shafts, closer proximity of these activities to the shafts, or to climate change to increasing storminess or lower groundwater tables. Evidence is recorded for only one episode of re-cutting at F44, and eventually peat accumulated in the shaft.

The peat sequences in the upper parts of F44 and F45 are interpreted as representing post-use phases of sediment infilling; it is difficult to see these shafts functioning as sources of water when the sediment indicates only moist terrestrial conditions.

F46 is astonishingly different in its absence of water-lain sediments. The basal fill of this shaft is a well-humified peat which at F44 and F45 is interpreted as an indicator of abandonment. It is difficult to see this peat as anything other than a post-use indicator here also. The absence of water-lain sediments may be interpreted in several ways:

- the function of this shaft was different to F44 and F45, but morphologically these three shafts are strikingly similar;
- water-lain sediments formed during use were removed by a re-cutting episode, after which the groundwater table fell rendering the shaft non-functional;
- similar but simpler, groundwater fell after initial excavation but before the shaft could contain water.

Given that both F44 and F45 clearly contained water at some time, either of the latter two explanations for the sequence at F46 would most reasonably imply that F46 was dug later than the other two shafts, close in time to abandonment of the features.

(3) Relation of F44-F46 to the Lake Sediments

Discussion of the role of groundwater fluctuations in the use and abandonment of these shafts necessitates evaluation of the lacustrine sediments only tens of metres to their east and north. A marl lake certainly existed at some time in the Holocene period, and this was replaced by terrestrial peat. It is assumed here that if the shafts were dug to seek water, the lake had by then ceased to exist. This is not demonstrable from existing stratigraphic relations but can be established by ^{14}C dating.

RADIOCARBON DATING

Radiocarbon dating is necessary to establish:

a) the ages of the three shafts F44-F46,
b) the duration of their infilling,
c) possibly differences in the periods of use of the three shafts and
d) the temporal relation between the lacustrine sediment sequence and those in the shafts.

Objectives (a), (b) and (d) are readily attainable. Objective (c) is less clear-cut. the sequence of use and sediment infilling within F44-F46 is a relative one, and all of these changes may have occurred over time periods too short to be resolved by ^{14}C dating.

The sequences in these shaft sediments have a very high potential for resolution by ^{14}C dating. The sequence is complex, and in time it may prove necessary (and will be easily achievable) to define for each of the shafts the following changes:

(1) a *terminus post quem* age for initial excavation of each shaft;
(2) a *terminus ante quem* age for re-cutting in F45;
(3) the ages of homogeneous peat-formation, possibly indicating the disuse of each shaft-,
(4) palaeo-hydrological and palaeo-ecological changes;
(5) the ages of cessation of peat-growth at the tops of the shafts.

Such a dating programme is ambitious, and here it is recognised that the fundamental concern at present is to bracket the time periods represented by the shaft deposits (Points (1) and (5)).

TERMINUS POST QUEM AGES FOR INITIAL EXCAVATION OF EACH SHAFT

In situ organic sediments are recorded from the basal sediments of each of the shafts. In F44 and F45 these are pond-sediments with organic contents estimated to between 10-20% (F44) and >75% (F45). In these deposits there is a possibility of some organic matter being reworked from surface soils by shaft-edge collapse, but this is thought to be negligible. In F46 the basal fill is a highly organic (*c.* 80-90%) *in situ* peat.

AGE/S OF CESSATION OF PEAT-GROWTH AT THE TOPS OF EACH SHAFT

The topmost peats within the monolith tins have evidence of drying, probably through 19th century drainage and bioturbation.

However, below c. 20cm from the top of each sequence the peat is moist, with good plant preservation and no evidence of bioturbation. Assays from these localities will provide very secure age-estimates close to the age of cessation of peat infilling.

THE AGE OF THE MARL/PEAT BOUNDARY

A ^{14}C assay is also requested on the terrestrial peat immediately above the marl described in Find no. 14, providing a *terminus post quem* date for the terrestrialisation of the former lake. Identification of the precise depth within the peat would be defined after laboratory analyses for loss-on-ignition, $CaCo_3$ content and pH to avoid the possibility of hard-water contamination.

DATING

AMS ^{14}C techniques will need to be employed because of the paucity of available sediment. 'Beta Analytic Inc.', Miami, Florida can process the results in between 14 and 50 days of receipt of samples. Currently seven assays would be required.

CONCLUDING REMARKS

It should be stressed that the interpretations derived from these sediment-stratigraphic data are not conclusive and that the reconstruction attempted here is only one possible sequence of events. However, this reconstruction is supported by the limited evidence available to date and provides a testable model for future work. AMS ^{14}C radiocarbon dating of six assays from tops and bottoms of the shafts is feasible and would place these sediment infills into a broad temporal context.

The potential of the deposits described in this report is very great in enabling a detailed temporal reconstruction of landscape change. Depending on the broad age-ranges established from this recommended dating programme and their relevance to existing archaeological finds in the region, further analyses might be encouraged. These would include further ^{14}C dating to refine the sequence further (above), together with sedimentological analyses to define more precisely the depositional mechanisms, and palaeoecological analyses (pollen; diatoms; plant macro-remains) to define the local vegetation and land-use history, water depths and water quality at times during sediment infilling.

References

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Table 1 Detailed sediment stratigraphy of F44

Site	Sediment depth(cm) unit	Sediment (m OD) unit depth	Sediment unit	Troels-Smith description	Colour	Notes
F44:mi	38686	39.1	Well-humified peat	Strf.0; humo.4; Sh4; Ga+; Gs+; Gg (maj)+; Dl+; Dh+; TI+;Th+	7.5YR2.5/1	
	38704	38.98	Cyperaceae peat	Strf.0;lim.sup.0; humo.4; Sh2; D1+; Dh1; TI+; Th1	7.5YR2.5/1	Felted peat
	19-28	38.89	Well-humified peat	Strf.0; lim.sup.0; humo.4; Sh4; Ga+; Gs+; Gg (maj)+; Dl+; Dh+; Tl+;Th+	7.5YR2.5/1	
	28-32	38.85	Well-humified peat	Strf.0; lim.sup.1; humo.4; Sh4; As+; Dl+; Dh+; TI+; Th+	7.5YR 3/1	
	32-49	38.68	Well-humified peat	Strf.0; lim.sup.0; humo.4; Sh4; D1+; Dh+; Tl+; Th+; (Phrag)	7.5YR2.5/1	

Site	Sediment depth(cm) unit	Sediment (m OD) unit depth	Sediment unit	Troels-Smith description	Colour	Notes
F44:ci	49-56	38.61	Cyperaceae peat	Strf.0; lim.sup.0; humo.2; Sh1; Dh3; D1+; Th+; (Phrag)	2.5YR2.5/3	
	56-60	38.57	Missing	Missing		
	60-72	38.45	Wood peat	Strf.0; humo.2; Dh2; T12; Th+; Sh+	7.5YR2.5/2	Large root present
	72-110.5	38.06	Well-humified peat	Strf.0; lim.sup.1; humo.3; Sh3; Dh1; Dl+; Dg+; Th+; (Phrag)	7.5YR 2.5/1	
	110.5-111	38.06	Clay	Strf.2; lim.sup.4; As4; Ag+; Dh+; (mica)	10YR 4/2	
	111-112.5	38.04	Well-humified peat	Strf.0; lim.sup.4; humo.4; Sh4; Dh+; Th+	7.5YR2.5/1	
	112.5-113.5	38.03	Clay	Strf.1; lim.sup.4; humo.4; As4; Ag+; Sh+; (mica)	10YR 3/2	
	113.5-127	37.9	Well-humified peat	Strf.0; lim.sup.4; humo.3; Sh4; D1+; Dh+; Th+	7.5YR2.5/2	
F44:cii	127-134	37.83	Sandy gravel	Strf.0; lim.sup.1; Gs4; Ga+; Gg(Maj)+; Gg(min)+	l0YR 4/4	Oxidation
	134-138	37.76	Peat with clay	Strf.0; lim.sup.0; humo.4; Sh2; Asi; Gsl; Ga+; Th+	10YR 4/4 &7.5YR 2.5/1	Oxidation in mineral component
	138-145	37.72	Clay	Strf.0; lim.sup.0; humo.4; As3; Sh1; Ga+; Th+	10YR 4/2 &7.5YR 2.5/1	
	145-1 50	37.6	Clay	Strf.0; lim.sup.0; humo.4; As3; Sh1; Ga+; Gs+; Gg(maj)+; Gg(min)+	10YR 3/2	
	150-191	37.19	Clay	Strf.0; lim.sup.0; humo.4; As2; Gal; Sh1; Gg(maj)+; Gg(min)+; Dl+;Th+	10YR3/1	
F44: ciii	191-195	37.15	Well-humified peat	Strf.0; lim.sup.4; humo.4; Sh4; D1+; Dh+; Th+	7.5YR2.5/1	Discrete Sh inclusions
	195-199	36.98	Silty clay	Strf.0; lim.sup.1; As3; Ag1; Ga+	2.5Y 4/2	
	199-216	36.96	Clay	Strf.0; lim.sup.1; As4	2.5Y 4/2	
	216-218	36.94	Silty clay	Strf.0; lim.sup.1; As3; Ag1; Ga+	2.5Y4/2	
	218-220	36.91	Clay	Strf.0; Iim.sup.1; As4	2.5Y 4/2	
	220-223	36.85	Silty clay	Strf.0; lim.sup.1; As2; Agi; Gal; Gg(min)+	2.5Y4/2	
	223-229	36.81	Clay	Strf.0; lim.sup.1; As4	2.5Y4/2	
	229-234	36.75	Clay with peat	Strf.0; lim.sup.1; humo.4; As3; Shi; Ag+; Ga+;Gg(maj)+; Gg(min)+;Dl+; Th+	2.5Y 2.5/1	Quartz.
	234-239	36.71	Clay	Strf.0; lim.sup.1; As4	2.5Y 4/2	Clay inclusion
	239-241	36.68	Clay with peat	Strf.0; lim.sup. 1; humo.4; As3; Shi; Ag+; Ga+; Gg(maj)+; Gg(min)+;Dl+; Th+	2.5Y 2.5/1	Quartz

Table 2 Detailed sediment stratigraphy of F45

Site	Sediment depth (cm) unit	Sediment (m OD) unit depth	Sediment unit	Troels-Smith description	Colour	Notes
F45:mi	37999	39.32	Well-humified peat	Strf.0; humo.4; Sh4; DI+; Dh+; Th+; Gg(min)+	2.5YR 2.5/1	
	14-50	39.18	Cyperaceae peat	Strf.0; lim.sup.0; humo.3; Sh3; Dh1; DI+; (Phrag; mica)	5YR 2.5/1	Vertically bedded phrag
F45:ci	50-60	38.82	Missing	Missing		

Site	Sediment depth (cm) unit	Sediment (m OD) unit depth	Sediment unit	Troels-Smith description	Colour	Notes
	60-100.5	38.72	Well-humified peat	Strf.0; humo.4; Sh3; Dh1; Ag+; Ga+; Gg(min)+; DI+; Th+ (Phrag)(rhizopod)	7.5YR 2.5/1	
	100.5-115	38.32	Wood peat	Strf.0; humo.3; Sh2; Dl2; Dh+; Th+	7.5YR 2.5/1	
	115-119	38.17	Missing	Missing		
	119-129	38.03	Well-humified peat	Strf.0; humo.3; Sh4; As+; DI+; Dh+; Th+	7.5YR 2.5/1 &7.5YR4/4	
F45: cii	129-166*	38.12	Peat with clay	Strf.1; lim.sup.0; humo.4; Sh2; As1; Ag1; Ga+; DI+; Dh+; Th+	10YR4/1 & 7.5YR 2.5/2	Table 2
	166-189	37.75	Well-humified peat	Strf.0; lim.sup.0; humo.4; Sh4; Ag+; Gg(min)+; Dh+; Th+	7.5YR 2.5/1	
	189-221	37.52	Peat with clay	Strf.0; lim.sup.0; humo.4; Sh2; As2; Ga+; Gs+; Gg(maj)+; DI+; Dh+;Th+	7.5YR 2.5/1 & 10YR 4/6	Discontinuou s lenses
F45: ciii	221-227	37.2	Silty clay	Strf.O; lim.sup.3;As3; Agi; Ga+; Gg(maj)+; Dh+;(mica)	10YR 4/2	Oxidation
	227-281*	37.14	Well-humified peat with clay bands	Strf.0; lim.sup.1; humo.4; Sh4; As+; Ag+; Ga+; Gg(min)+; Gg(maj)+;DI+; Dh+ (Phrag)	7.5YR 3/1	Wood piece: 257-260cm Table2

Table 3 Detailed sediment stratigraphy of F46

Site	Sediment depth (cm) unit	Sediment (mOD) unit depth	Sediment unit	Troles-Smith description	Colour	Notes
F46:mi	38564	39.21	Peat with clay	Strf.0; humo.4; As2; Sh2; Gg(min)+;Dh+;Th+	7.5YR 3/1	Table 4
	8-50	39.13	Well-humified peat	Strf.0; lim.sup.0; humo.4; Sh4; Dl+; Dh+; Tl+	2.5YR 2.5/1	
F46:ci	50-150*	38.71	Well-humified peat	Strf.0; humo.4; Sh4; Dl+; Dh+; Tl+; Th+	7.5YR 2.5/1	Table 4
F46:cii	150-196	37.71	Well-humified peat	Strf.0; humo.4; Sh4; Dl+; Dh+	10YR 2/1	
	196-209	37.25	Missing	Missing		
	209-221.5	37.12	Well-humified peat	Strf.0; humo.4; Sh4; Dl+; Dh+	10YR 2/1	
	221.5-223	36.92	Fine gravel	Strf.0; lim.sup.1; Gg(min)3; Gg(maj)1; Ga+; Gs+		Mixed geologies
	223-242	36.73	Coarse gravel	Strf.0; lim.sup.0; Gg(maj)3; Gg(min)1; Ga+; Gs+		Mixed geologies
	242-250	36.65	Coarse gravel	Strf.0; lim.sup.0; Gg(min)3; Gg(maj)1; Ga1; Gs+		Mixed geologies

Table 4 Additional stratigraphic details at F44, F45 and F46

Site	Sediment unit depth (cm)	Sediment unit depth (mOD)	Sediment unit/ feature	Troels-Smith description
F44	2		Contamination	Modern contamination
	4 and 10		Earthworms	
F45	129-133		Peat	Strf.0; lim.sup.1; humo.4; 5h4; As+; Ga+; DI+; Dh+; Th+
	133-136		Clay inclusion	Strf.0; lim.sup.1; As2; 5h2; Ag+; Ga+; Gg(maj)-'-; DI+; Dh+;Th+
	143-143.5		Clay inclusion	As above
	145.5-145.5		Clay inclusion	As above
	147-147.5		Clay inclusion	As above

Site	Sediment unit depth (cm)	Sediment unit depth (mOD)	Sediment unit/ feature	Troels-Smith description
	149-153		Clay inclusion	As above
	156-156.5		Clay inclusion	As above
	158-160		Clay inclusion	As above
F45	38600		Discontinuous clay bands	Strf.0; lim.sup.0; As4; Ag+; Ga+; Gg(min)+; Gg(maj)+; (mica & quartz). Oxidation.
	268-268.5			
	275-279			
F46	15-16		Root?	
	36		Wood piece	
	44		Hazelnut fragment	
F46	7		Clay inclusion	Strf.0; lim.sup.0; As3; Ag+; Gal; Gg(min)+
	7-11		Mineral inwash	Strf.0; lim.sup.0; Ga4; As+; Ag+; Gg(min)+
	11		Wood piece	
	16		Wood piece	
	34		Wood piece	
	54		Wood piece	
Find.14	22-24		Dh inclusion	Discrete inclusion with oxidation
	17-24		Earthworm burrow	8 mm wide burrow, lined with Th, Dh, Sh

Table 5 detailed sediment stratigraphy of F46

Site ref	Sediment unit depth (cm)	Sediment unit depth (mOD)	Sediment unit	Troels-Smith description	Colour	notes
Find. 14	38625	39.23	Well-humified peat	Strf.0; humo.4; 5h4; Dh+; Th+; Gg(min)+	7.5YR 2.5/1	
	38695	39.13	Transition	Strf.4; lim.sup.0; humo.4; Lc3; Shi; DI+;Th+	7.5YR2.5/1, l0YR 4/2	
	38700	39.11	Marl	Strf.4; lim.sup.0; Lc4; DI+; Dh+; Th+; Sh+	l0YR 4/2 & l0YR 6/4	
	15-25	39.08	Marl	Stfr.2; lim.sup.0; Lc4; Dh+; Th+; Sh+	2.5YR 7/3	Dh inclusion

Figure 1 Nosterfield F44

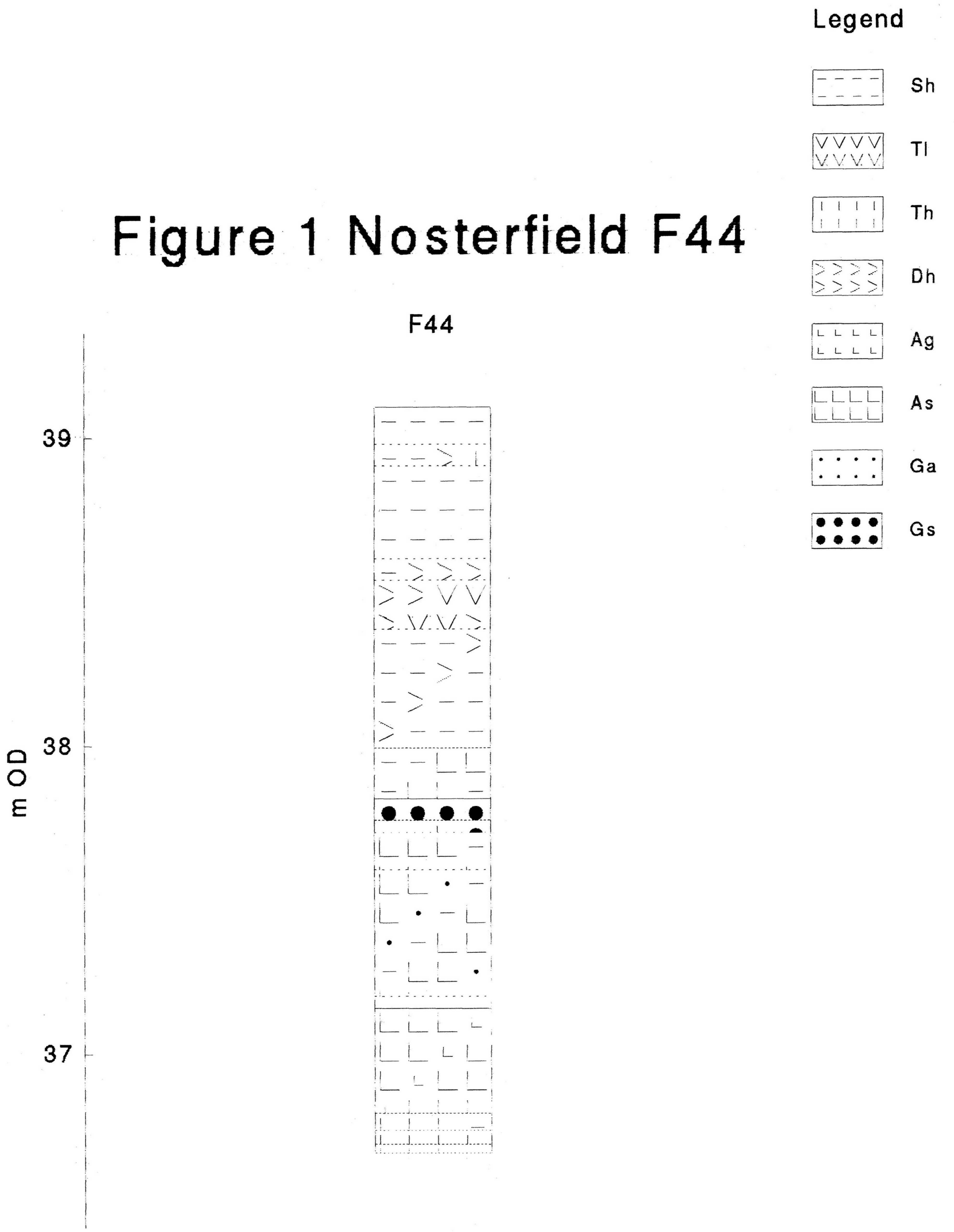


Figure 2 Nosterfield F45

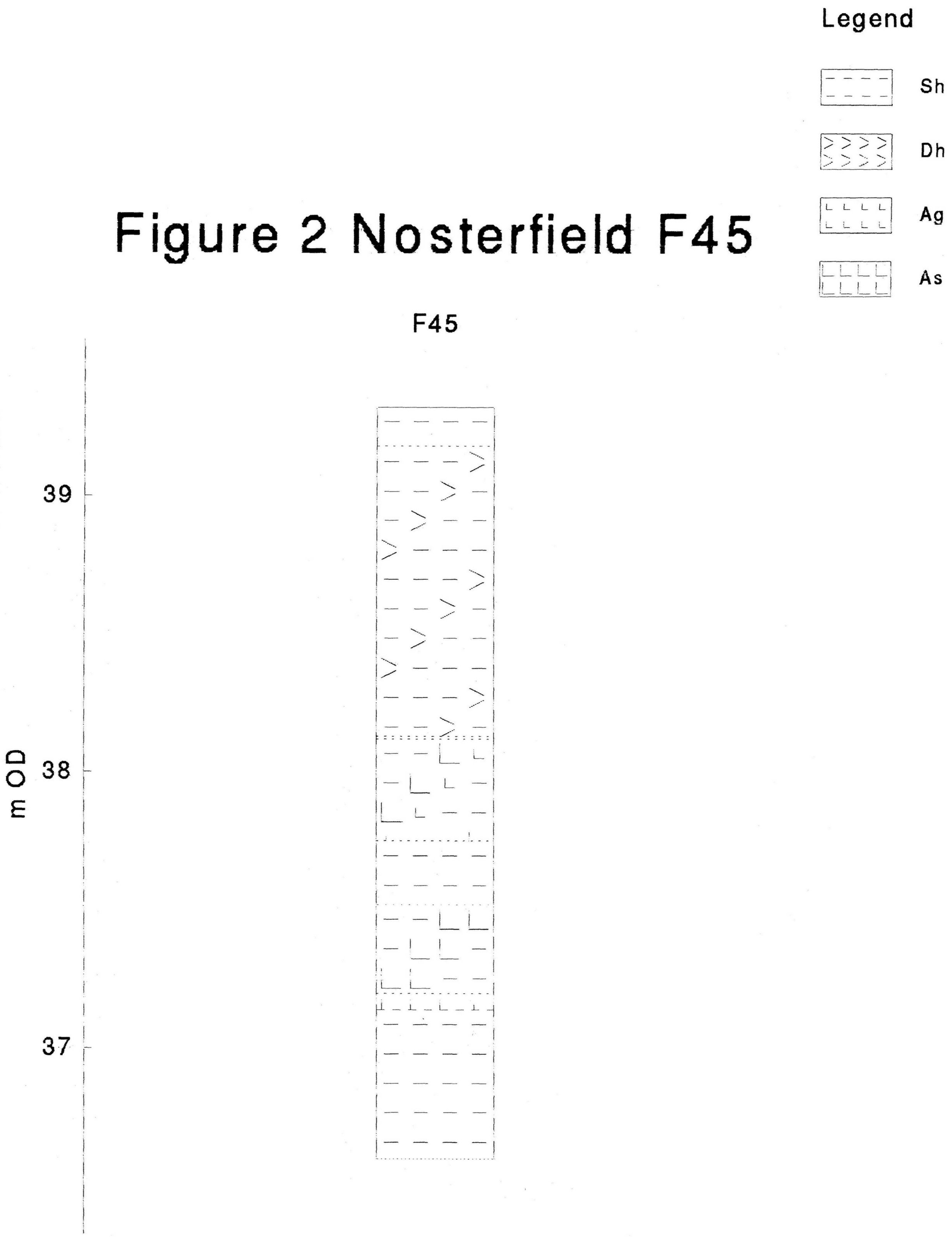
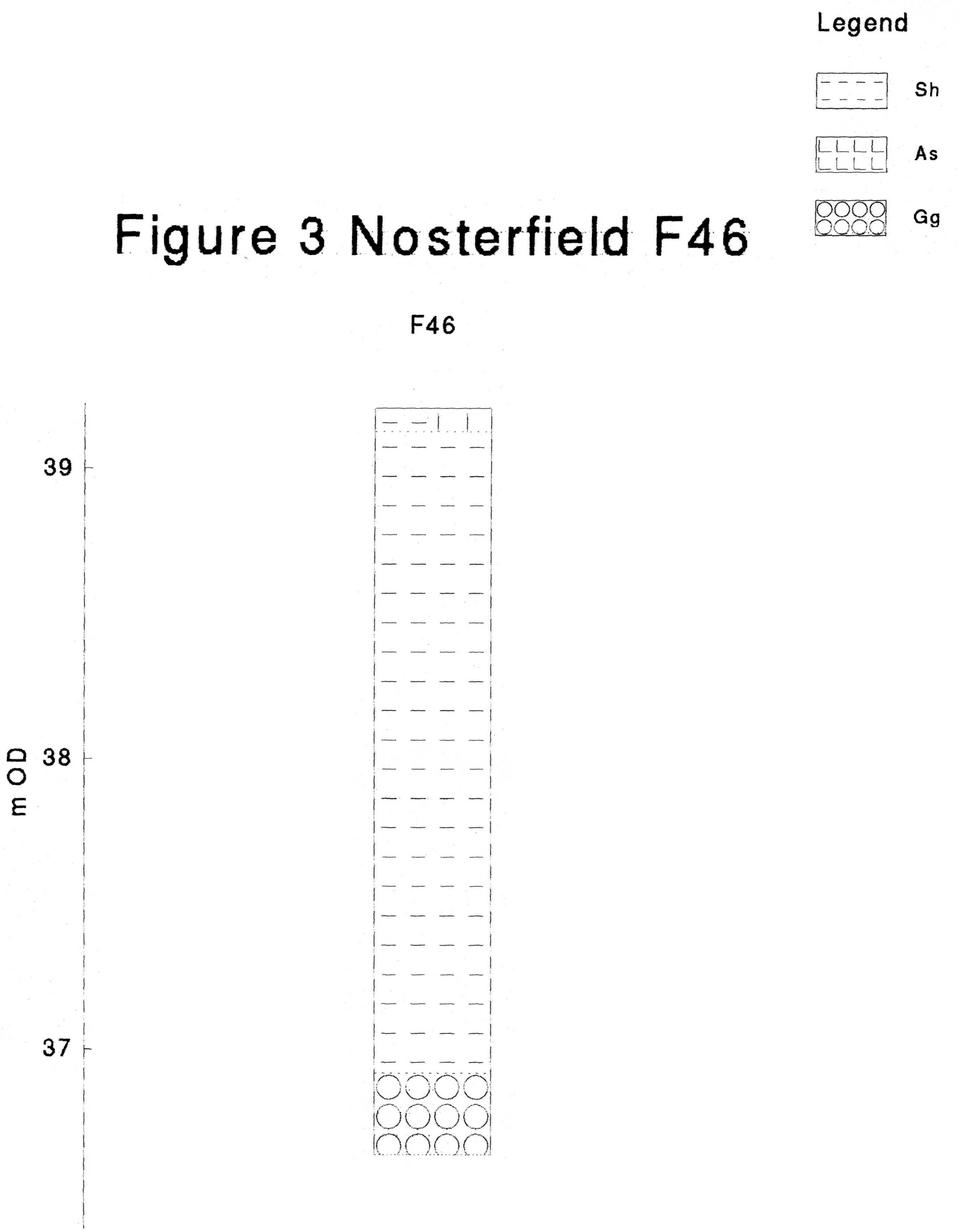


Figure 3 Nosterfield F46



PART 3: REPORT ON COMPLETION OF C14 DATING FOR SEDIMENTS FROM F44-F46 AND FIND 14

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Summary

- The results of C14 dating from the bases and 'tops' of F44, F45, F46 and Find 14 are presented.
- F44, F45 and F46 began receiving organic sediment at separate times in the Devensian Lateglacial and in the early Holocene.
- The C14 assay from Find 14 shows the lake to have been replaced at the dated site in the early Holocene.
- There are no grounds for rejecting the C14 assays, although there is potential for 'hard water' error making the C14 assays 'old'.
- A test of the C14 assays through biostratigraphic correlation is recommended as an immediate measure.
- If correct, the C14 assays suggest that F44 - F46 are natural features caused through collapse of subterranean structures, and they are not now seen as anthropogenic features.
- C14 assays from the highest points in the stratigraphies of F44 - 46 show that stratigraphic integrity is maintained until the later prehistoric period.
- The small sizes of these features and their longevity provide an exceptional and exceedingly rare opportunity for fine-detailed, spatially precise reconstructions of Holocene environmental change that can be linked securely to the archaeological record at Nosterfield.

1.0 INTRODUCTION

On 30th April 2000 the case for and up-to-date costs of commercial C14 dating of seven sediment samples from F44-46 and Find 14 were presented. Samples for C14 dating were submitted to Beta Analytic Inc. (Florida) on the 17th May 2000. This report will (a) present the results of these assays, received on July 5th 2000, (b) discuss the significance of the assays for interpretation of the sequence, (c) evaluate the significance of these sediments in relation to archaeological and palaeo-environmental records, (d) recommend additional analyses that should be undertaken following this construction of chronologies and (e) advise on costs for this.

2.0 C14 SAMPLES

Sediments from the monoliths and cores from F44, 45 and 46 had previously been identified (Long and Tipping 1998) as sufficiently organic for C14 dating. The samples were submitted were:

F44	Core III	239-240.0cm
	Monolith I	0.0-1.0cm
F45	Core III	280.0-281.0cm
	Monolith I	0.0-1.0cm
F46	Core II	219.0-220.0cm
	Monolith I	8.0-9.0cm

The sediment sequence from Find 14, a 25.0cm monolith sample, had to be analysed further to define (a) organic content and (b) carbonate content. Data are not presented here, but this work defined a depth within the tin of 9.0cm (39.1 Sm OD) when organic content by loss-on-ignition rose over 4.0cm from 10% to 73% and carbonate content, also by loss-on-ignition (Tipping: 30th April 2000) fell from 53% to 3%. This is regarded as a reliable indicator of the transition from calcareous marl to peat, and a 1.0cm slice at 9.0-10.0cm was submitted for C14 dating.

3.0 C14 ASSAYS AND INTERPRETATIONS

The assays reported by Beta Analytic Inc. are given in Table 1. Samples were assayed by standard AMS treatment.

C14 assays from the basal organic sediments at F44, 45 and 46 all indicate that the predominantly organic sediment infills of these features began to accumulate in the Devensian Laterglacial or early Holocene. There is no correlation between feature depth and age. F44 seemingly began to receive sediment at the end of the Lateglacial Interstadial (Beta-143455), F45 at the end of the Loch Lomond (Youger Dryas) Stadial (Beta-143456) and F46 within the early Holocene (143457). There is no evidence available to question these assays, although uncertainties arise over sources of carbonate within the sediment introducing ‘hard water error’. The sites lie on Magnesian limestone at depth, and the gravels surrounding the features contain Carboniferous limestone clasts. Pre-treatment by two acid washes (Beta Analytic Inc. pers. comm.) removes free carbonate but cannot isolate carbonate preserved within plant fragments which would induce ‘ageing’ errors. The only guides currently available are the ä^{13}C contents of assays, and these do not indicate contamination. Tests of the C14 dating results using palynological data are suggested below, but there is currently no reason to reject these assays.

There is no stratigraphic significance to the series of dates on the highest organic sediments in each feature. The tops of the features have undergone weathering, pedogenesis and mineralisation. These assays measure the ages of the youngest peats that have remained unaltered by soil-formation, and this can be expected to be dependent on original peat thicknesses within the features and differential processes of ancient and recent truncation and drainage. These assays do not measure the ages at which peat-infilling ceased: this cannot be known. There is no pattern to the C14 ages but one is not expected. F44 loses stratigraphic ‘integrity’ in sediments younger than the late Bronze Age (Beta-143453); F45 in sediments younger than the mid-late Iron Age; F46 has no reliable stratigraphy after the early Bronze Age. Again there are at present no grounds for rejecting these assays.

The single assay from Find 14 dates the earliest occurrence of terrestrial (fen) peat over lake sediment (marl). This contact is sedimentologically conformable with alternating bands of marl and peat. The peat is of early Holocene age (Beta-143458).

Table 1

Feature	Depth	Altitude	Sediment	Wet wt. (g)	Lab no.	C14 age±1σ	δ^{13}C	Calib age BC*
F44	239-240.0cm	36.66mOD	Peat	1.87	Beta-143455	11140 ± 60	-26.2	11005-10960
	0.0-1.3cm	39.10mOD	Organic clay	2.92	Beta-143453	3110 ± 30	-28.2	1405-1260
F45	280.0-281.0cm	37.52mOD	Organic silt	2.36	Beta-143456	10180 ± 60	-26.2	10370-9605
	0.0-1.0cm	39.32mOD	Peat	1.92	Beta-143452	2330 ± 40	-29.0	395-200
F46	219.0-220.0cm	36.88mOD	Peat	1.05	Beta-143457	8900 ± 50	-27.4	8220-7780
	8.0-9.0cm	39.13mOD	Peat	1.66	Beta-143454	3930 ± 40	-28.1	2470-2210
Find 14	9.0-10.0cm	39.15mOD	Peat	1.68	Beta-143458	9380 ± 50	-28.4	8705-8440

*calibration: INTCAL98 (Stuiver 1998)

3.1 TEST OF THE C14 ASSAYS

A test of the veracity of the C14 dates is recommended as an urgent measure. For this the sediments infilling F45 will be pollen-analysed rapidly (‘skeletal’ counts of 150 total land pollen) at 4.0cm intervals between 281.0cm and 200.0cm (20 subsamples). The base of this sequence is C14 dated to the earliest Holocene. The lowermost sediments should, then, contain a clearly identifiable pollen sequence depicting the postglacial migration of tree taxa from before 10000 and 7000 C14 BP (Birks 1989). Regional biostratigraphic correlations will confirm or refute the C14 dating of the base of this sequence.

4.0 INTERPRETATION OF THE FEATURES

The features are distinctive in their circularity and their high depth:diameter ratios. The features are presumed also to have near-vertical sides, although this was not demonstrated from excavation or probing. The shapes of the features allowed the suggestion that these were anthropogenic features, and on a gravel substrate, that they may have been wells.

This interpretation is rejected here. Although not conclusive in itself, the ages of the basal sediments infilling the features suggests an anthropogenic origin to be unlikely. They can still be of anthropogenic (Late Upper Palaeolithic and early Mesolithic) origin, but their antiquity and variation in age of formation probably preclude this. The 'deliberate' cuts in the gravels argued for in the November 1998 report must be challenged, and it is likely that the major product of collapse was the wide funnel-shaped entrances to the shafts, which were considered late in the sequence in earlier interpretations.

The features are probably natural features within the already-formed fluvioglacial gravels bordering the River Ure. Their origin is thought to lie as small collapse features within the gravels as a result of cavern-collapse in underlying limestones. This interpretation can explain the circularity of the features, and their close concentration may reflect the collapse over time of one large cavern. The interpretation does not wholly explain the depth and narrowness of the shafts but these may be determined by the nature of the collapse beneath. There appears to be no discernible environmental trigger for the collapse. The C14 dates show that collapse occurred over *c.*3000 cal. years in a range of climatic conditions. There are insufficient data to argue more than that the timing of separate collapses is governed by chance. Alternative explanations of origin are rejected on morphological or geomorphological grounds. The features are not periglacial in origin; nor can they be scours induced by flowing water.

Collapse is assumed to be followed closely in time by sediment accumulation. Sediment fills recorded in the report of November 1998 (Long and Tipping) are quite variable, though all indicate deposition in water-lain (pond) or waterlogged (peat) environments. Rates of sediment accumulation must have been highly variable, and no attempt is made here to interpolate ages between the basal and top C14 dates in the fills. The sequences may indeed, over this long a period, contain depositional hiatuses.

However, the C14 dates allow some appreciation of the variations in sediment fills. In F44 between 229-138cm is a structureless minerogenic clay which may now be seen as a product of deposition within the Younger Dryas Stadial (11000-10000 C14 BP). Such minerogenic sediments are absent at both F45 and F46 which formed at the beginning of and within the Holocene and were infilled with much more organic sediment.

The lake adjacent to the features was 'terrestrialised' in the early Holocene. Although this C14 date correlates with evidence elsewhere in NW Europe for a marked phase of aridity and lake-level fall (Tipping 1996), little can be said with confidence on this from a single assay. No further work is recommended at this site since the lacustrine history is not relevant to the archaeological record.

5.0 POTENTIAL OF THE SEQUENCES FOR PALAEOENVIRONMENTAL AND ARCHAEOLOGICAL RECORDS

If the test of the C14 dates (above) confirms the antiquity of the basal assays, as is anticipated, then the features have received organic sediments for a very considerable period. Although hiatuses are perhaps likely they are not detectable from current measures, and broadly these features contain sediments from before the earliest Mesolithic to, at F45, the late Iron Age. This changes the potential of these features for archaeological and palaeoenvironmental interpretation, from their being seen as single-period records to near-complete prehistoric sequences, but it does not reduce their significance.

The infills of these features represent quite exceptional sediment records of landscape change and human activity which can be defined through the use of palaeoecological techniques. The most important aspect of these features for such interpretations is, curiously, their small diameter: the shafts are <3m across. What makes these sites exceptional requires a diversion to state-of-the-art concerns in the key palaeoecological technique, pollen analysis (palynology). Of over-riding importance in current work is the need to define landscape change at spatial scales relevant to human populations. Most pollen diagrams do not do this because the size and type of pollen site (large lakes or large peat-bogs) mean that pollen originates from very large, vague and unspecified sources kilometres away. The current failure to establish close links between vegetation change, human impacts and archaeological records is partly because the sizes of landscapes we each measure are different. Pollen analysts have learnt to refine the spatial resolution (pollen source area) of sites such that, in simple terms, basin diameter provides a good estimate of the scale of landscape being depicted: the smaller the pollen site, the smaller the area depicted.

The Nosterfield features will in wooded conditions have received pollen from 50-70m around the features. To be able to state this using empirical models indicates the power that this control provides. At sites like these we can operate at a scale where human beings become part of the landscape. Woodland disturbance, the use of fire, clearance, settlement and agriculture all become tangible and linked to archaeological records and chronologies. Scales of activity can be defined, and the ecological consequences of human activities explored. Such sites are exceptionally rare and this cannot be stressed enough.

This spatial precision was always the real palaeoecological value of the sites, but we had not appreciated the huge timespan covered by the deposits. Given continuity of sediment accumulation, it is possible to understand the Neolithic finds at Nosterfield, as we hoped, but also now to define earlier, Mesolithic, impacts and later prehistoric developments.

In the next section different approaches to environmental reconstruction are briefly reviewed and recommended. Here I review the needs to analyse all three sediment fills. The three features at Nosterfield cover essentially the same time-span, and all the features reflect the same small pollen source area. There is no advantage to analysing the three sediment fills. The choice of site is determined by (a) the interests of the investigation. (b) timespan covered by the sediments and (c) complexity and information content of the sediments. F44 contains Devensian Lateglacial sediments. Although interesting in themselves, the concern of the work is to explore environmental changes related to the archeological record from the area, which is entirely of Holocene age, and so analysis of F44 is not recommended. F45 represents the longest sequence of sediments, reaching to the mid-late Iron Age before the stratigraphy is disrupted, much younger and more complete than F46. Palaeoecologists often seek the simplest sediment sequences to provide undisturbed contexts, but the most interesting work comes from complex sequences which link ecological, geomorphic, hydrological and archaeological change: F45 provides the best context for this. F45 is recommended for full analysis.

5.1 PALAEOENVIRONMENTAL ANALYSES RECOMMENDED ON THE FILL OF F45

281.0cm of sediment spans the time from the earliest Holocene to the late Iron Age. The sediments were initially formed in standing water with clays and bands of amorphous organic matter. Later peats are on occasions interbedded with standing-water clays (Long & Tipping: 30th November 1998), and there is clearly a complex relation between the water-table, peat growth and sediment inwashing. The following analyses are seen as cost-effective yet comprehensive approaches to the integration of palaeo-environmental data. Costs are considered in the next and final section.
X-ray analysis of the cores: X-ray analysis has become an important non-destructive technique for defining the complexity

of macro- and micro-scale sediment stratigraphies. These are often not visible. The complexity of the sequence at F45 suggests that much subtlety will emerge from X-ray analysis, and this is indispensable to defining the changes in depositional environments, defining the subsampling positions of palaeoecological samples and their interpretation.

X-ray analysis will be undertaken at the purpose-built facility at the British Geological Survey in Edinburgh. The time taken is 3.0 days for preparation of samples and photography. Materials are charged at £90.00 per exposure, and the three cores and one monolith may require three exposures at different settings to obtain maximal clarity.

Image analysis of X-ray photographs: X-ray exposures can be further interpreted by quantitative measures of the light-dark contrasts on X-ray plates by computer-driven image analysis. The University of Stirling has this facility. Quantification of X-ray patterns should define similar deposits and depositional conditions, and refine sedimentological interpretations. This application is novel and experimental, but is rapid and non-destructive. 2.0 days are allotted to this with equipment/consumable costs waived.

Magnetic Susceptibility: contrasts between mineral and organic sediments are further defined by differences in ferromagnetic iron minerals, and this is measured by volumetric magnetic susceptibility on intact cores (the technique is non-destructive) on a Bartington Instruments MS meter. 1.0 day is needed.

Further work on magnetic properties can refine source areas for inwashed sediment (topsoils; subsoils; substrates; imported (e.g. non-local) material) if volumetric measurements suggest sensitivity in the signal. This work will use the mineral residues after loss-on-ignition, so is destructive. This will require 5.0 days work at the Chemistry Department, University of Edinburgh, with equipment/consumable costs waived.

Sediment Properties by Loss-on-Ignition: the first destructive technique will be the definition of (a) water content by oven-drying at 1050C for 8 hours, (b) organic contents by loss-of-ignition after furnacing at 5500C for 4 hours and (c) carbonate content by further furnacing at 9500C for 2 hours on 2.0cm thick subsamples (140 samples). These are needed to characterise depositional environments. The techniques are routine and will be performed by technical staff over 5.0 days.

Geochemical Analyses: Inwashed sediments are derived from the immediate surroundings of the site and will retain evidence of the rates of soil development and deterioration. Standard laboratory X-ray diffraction analyses of Ca, Al, K and Fe will be obtained on mineral bands to define these. Mound 40 analyses may be needed, undertaken by technical staff.

Pollen Analyses: pollen analyses to understand vegetation change, woodland disturbance, clearance and agricultural practices need not be defended, but pollen data on aquatic and wetland taxa will also define the presence-absence of standing water and water-depth. Measures of pollen concentrations allows insights into rates of sediment accumulation too subtle to be defined by further C14 dating (below). Associated analyses of pollen preservation can identify water-table fluctuations and periods when the shaft dried out. Analyses of microscopic charcoal provide extraordinary insights into fire regimes within undisturbed and anthropogenically altered landscapes. Counts of sulphide spherules produced in anoxic environments allow an understanding of water-quality and depth.

These separate and independent analyses come as a package: all are extracted from the same microscope slides. The delicate sediment slices sampled for pollen analysis (<0.5cm thick slices) mean that decisions of temporal resolution have to be made; broadly, how often do you subsample the time-sequence - at decadal intervals or at coarser levels? This of course affects the time, labour and costs. This estimate is difficult because it presupposes the patterns to emerge from the analyses. Natural woodland dynamics need to be examined at time-intervals of 150-200 years; post-Mesolithic activities are perhaps best analysed at 50-75 year intervals (e.g. 1-3 human generations) in order to establish settlement continuity/change; Mesolithic signals can, however, be missed at this temporal resolution.

These estimates have determined the estimates of numbers of subsamples. Between the basal sediments (10200 cal. BC) and around 4000 cal. BP (to be defined by further C14 dating; below) analyses will be at 200-year intervals, or around 30 subsamples. Between *c.*4000 cal. BP and *c.*300 cal. BC the temporal resolution will increase to *c.*75 year intervals, requiring around 50 subsamples.

Pollen analyses will be to 500 total land pollen, and will include taxonomic recording to the highest resolvable level, measurements of pollen concentration, preservation, microscopic charcoal and sulphide spherules. The *c.*80 subsamples have to be processed which will take 20.0 days, and consumables costs are £80 in total. Analyses will take 80.0 days and will require analysis at post-doctoral level.

C14 Dating: two C14 dates will not suffice to describe the chronology of these complex sediments, and eight further analyses are costed through Beta Analytic Inc.

Report Preparation: the preparation of a report will combine and synthesise all the physical, geochemical and palaeoecological analyses described above, and will incorporate archaeological data from Nosterfield and the surrounding area following consultations. The writing of the report will take 10.0 days.

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PART 4: PALAEOECOLOGY OF NOSTERFIELD CORE F45

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1.0 INTRODUCTION

Pollen and radiocarbon analyses have been completed on a core, F45, supplied by Dr. Debbie Long and Dr. Richard Tipping which they recovered from a small sediment-filled hollow threatened by quarrying operations at Nosterfield, North Yorkshire. They obtained radiocarbon dates on the base and top of the sediments of 10,180 ± 60 BP and 2330 ± 40 BP respectively. In this new study, samples for pollen analysis were prepared throughout the core to the base at 280cm, but pollen was not preserved below 136cm. The diagram has pollen counts at four centimetre intervals from 136cm to 4cm below the ground surface.

2.0 STRATIGRAPHY OF THE CORE

Based upon field descriptions by Dr. Tipping and upon laboratory description of the core during sub-sampling, the stratigraphy recorded at Nosterfield F45 was as follows.

Depth (cm)	Description
0 - 14	Well humified peat with small amounts of herbaceous *detritus,* wood fragments, *turfa* (peat comprising decomposed roots and stems of herbaceous plants) and small stones
14 - 50	Humified peat with Cyperaceae (sedges) and vertical *Phragmites* (reed) stems
50 - 100	Well humified amorphous and *detritus* peat with some wood fragments, small stones, silt and sand
100 - 119	Humified peat with wood fragments and some *detritus* and turfa
119 - 129	Well humified peat with some clay, *detritus,* wood fragments and *turfa*
129 - 166	Humified peat with clay lenses and some silt, sand, wood fragments, *detritus* and *turfa*
166 - 189	Well humified peat with some *detritus, turfa,* wood fragments and small stones
189 - 221	Peat with clay and some stones, sand, *detritus, turfa* and wood fragments
221 - 227	Silty clay with sand and stones
227 - 281	Well humified peat with clay bands, wood fragments, detrital *Phragmites* stems, sand and stones. Wood fragments at 257-260cm.

The stratigraphic units indicate several phases of deposition under contrasting hydrological conditions. The organic sediments described as peat contain high proportions of detrital organic material which probably indicate some standing water within the hollow, or at least a very wet sediment surface. However the consistent presence of *turfa,* peat composed of plant roots and stems, within the sediment column suggests that any water covering the sediment was never very deep and that it probably fluctuated in depth. Minerogenic sediments ranging in size from clay to gravel occur at intervals in the deposit and represent periods of flooding of varying intensity and the inwash of soil material, which may have included much organic detritus.

3.0 POLLEN ANALYSIS

The results of the pollen analyses are shown as Figure 1. Despite the calcareous nature of the site catchment, pollen was generally well preserved in the upper part of the core. A count of 300 land pollen grains was made at each level, plus aquatic pollen and spores. Below 136cm pollen was not preserved. It is likely that a dry phase and water table fall in the mid to late Holocene caused drying and oxidation of the sediments. The vegetation history for the lower part of the profile, shown by radiocarbon to have begun at the start of the Holocene, has therefore not been preserved. From 136cm upwards, however, there is a full pollen record from which to reconstruct vegetation history. The pollen diagram is sub-divided into nine phases which are characterised by the degree of influence of woodland disturbance. **Phases a, b, c** and **d** represent periods during which disturbance pressure on the vegetation was low. **Phases 1**, **2**, **3**, **4** and **5** represent periods with higher levels of disturbance activity.

Phase a (136 and 132cm) is characterised by low *Ulmus* (elm) pollen frequencies which suggests a post elm-decline, later Holocene, date after *c*.5000BP for this part of the profile. There are low levels of grassland weeds like *Plantago lanceolata* (ribwort plantain) and *Taraxacum* (dandelion)-type but most non-tree pollen are from wetland types like Cyperaceae (sedges) which are probably associated with the very local wetland. The local landscape seems to have been relatively well wooded with a substantial cover of trees including *Alnus* (alder), *Betula* (birch), *Pin us* (pine) and *Quercus* (oak), and shrubs including *Corylus* (hazel).

Disturbance **phase 1** (128 and 124cm) records some human activity close to the site as cereal-type pollen grains occur together with some cultivation type weeds like *Artemisia* (mugwort), Chenopodiaceae (fat hen family) and Cruciferae (charlock family). Several other open ground herbs also appear in the pollen record, including a peak of *Plantago lanceolata,* while *Betula,* and initially *Corylus,* frequencies fall. A phase of arable farming, either at low intensity or not closely adjacent to the site, seems to be reflected here as other tree taxa are unaffected.

During **phase b** (120, 116, 112, 108 and 104cm) *Betula* and *Corylus* percentages are restored and woodland cover re-established. There are no indications of renewed disturbance, although the continuing presence of weed types *Plantago lanceolata* and Chenopodiaceae suggests that some open areas remained around the site.

Disturbance **phase 2** (100 and 96cm) records renewed agricultural activity with cereal-type pollen again recorded. Slight reductions occur in the frequencies of *Alnus* and *Corylus* but there are no real peaks in weed type pollen except *Taraxacum-type.* No major reduction of woodland cover occurred during this limited phase of cultivation.

During **phase c** (92, 88, 84, 80 and 76cm) there are no indications of disturbance of the woodland cover. Several open ground herbs are present as before, but all in very low percentages. Some grassland areas persisted within the open woodland community. Herbs such as *Mentha* (mint)-type and *Filipendula* (meadowsweet) will have been associated with the wetter areas on the site.

Disturbance **phase 3** (72 and 68cm) is a major phase of woodland reduction with *Betula, Pinus, Quercus* and *Corylus* percentages all falling sharply. Cereal-type pollen is recorded and peaks occur in the frequencies of several weeds of open ground, mainly *Plantago lanceolata* and *Taraxacum-type.* Extremely high frequencies of *Pteridium* (bracken) spores occur and point to a real removal of tree cover around the site. Cyperaceae percentages are also greatly increased and clearance may have encouraged increased land drainage onto the site and increased mire surface wetness and sedge growth.

During **phase d** (64, 60, 56 and 52cm) woodland dominance is restored and non-tree pollen frequencies are reduced to very low values. Full regeneration of tree cover occurred after the previous phase of agricultural activity and clearance. The previously unimportant woody taxa *Tilia* (lime) and *Salix* (willow) also increase at this time. Herbaceous pollen is at the lowest percentages in the diagram.

Disturbance **phase 4** (48, 44 and 40cm) includes the decline of most tree types, although indicators 6f agriculture are not significantly increased. There are no cereal-type grains to indicate cultivation and the pasture or grassland herbs are reduced, *Plantago lanceolata* even ceasing to be recorded at one level. Tree curve declines are gradual, with first *Betula* then *Pinus, Tilia* and *Alnus* falling in turn. Cyperaceae and *Pteridium* gradually increase through the phase. As well as the Cyperaceae rise, increases in *Sphagnum* moss spores and *Botryococcus* alga suggest increased wetness. In the absence of indicators of agricultural clearance, climatic change may have been responsible for the tree decline. Hydrological changes on the mire surface itself may have increased the pollen representation of wetland plants, mainly Cyperaceae, and so suppressed tree pollen values further.

Disturbance **phase 5** (36, 32, 28, 24, 20, 16, 12, 8 and 4cm) begins with a continuation of the reduction of woody taxa as *Corylus,* the only remaining tree or shrub type in high frequencies, falls sharply. The reintroduction of cereal-type pollen and major increases in the curves for *Plantago lanceolata* and *Taraxacum-type* suggest that renewed human agriculture was the cause of this increased clearance. *Pteridium* frequencies are also greatly increased and sustained. Although cereal-type pollen is not present in most levels in the phase, a much greater range of weeds of open ground occurs throughout, including *Plantago malor-media* (great and hoary plantains) and *Polygonum aviculare* (knotgrass) which suggest cultivation. Rising Cyperaceae and *Typha angustifolia* (lesser reedmace) curves indicate that the trend to increased wetness continued.

4.0 CHRONOLOGY

In addition to the two dates provided by Dr. Tipping, nine AMS radiocarbon dates were funded by English Heritage. These eleven dates provide a chronology for the vegetation history and the ten dates on the upper profile are shown on Figure 1. To avoid hard water effects from the calcareous substrate dating was only conducted on macrofossils from terrestrial plants. These were not present at all levels and while dates are placed as close as possible to important pollen horizons in some cases, disturbance **phase 3** for example, direct correspondence was not possible. The very low *Ulmus* frequencies at 136cm and the presence of cereal-type pollen just above this suggested that all of the countable levels are post Elm Decline (*c*.5000 BP) in age. This has been confirmed by the AMS datings at 140 and 125cm which show the early part of the pollen profile to have formed around 4000 BP. Although there is a small reversal in these two dates they show disturbance **phase 1** to be late Neolithic to early Bronze Age in date. The date on **phase 1** itself was 11,675 ± 50 BP and so clearly in error by several thousand years. The material for this date, charred wood, must have been reworked.

The end of disturbance **phase 2** also has dates of around 4000 BP. Very rapid deposition may have occurred in this part of the profile unless the dates, which are on wood or bark, are all on reworked material of similar age. The radiocarbon dates from 42cm upwards are in sequence between *c*.2400 BP and *c*.2200 BP, except for the surface date which is slightly inverted. The reason for this similarity is not clear, unless very rapid deposition occurred. The dates do, however, support the age of the pollen changes in **phase 4** as corresponding with the major mid-third millennium BP climatic deterioration which caused greatly increased wetness and mire growth across north west Europe. The dates also show the agricultural activity and dominance of open habitat vegetation in **phase 5** to be of Iron Age date. By interpolation the major but temporary clearance episode of **phase 3** is likely to have been of Bronze Age date, before *c*.3000 BP.

5.0 CONCLUSION

The early and mid-Holocene pollen record at Nosterfield F45 has not survived, but there is a record of vegetation history from the late Neolithic to the late Iron Age which includes five phases of woodland recession. One of these, in the Iron Age, appears to have been climatically instigated. The other four contain pollen records of agricultural activity which indicate that human land-use was instrumental in the opening and then removal of woodland.

Acknowledgments

This research was completed with the support of a grant from English Heritage under the Aggregate Levy Sustainability Fund, with the radiocarbon dates provided by Dr Alex Bayliss of the English Heritage Scientific Dating Section. Thanks to Mike Griffiths and Dr Richard Tipping for arranging access to the sediment samples studied here. Mairead Rutherford assisted in the field.

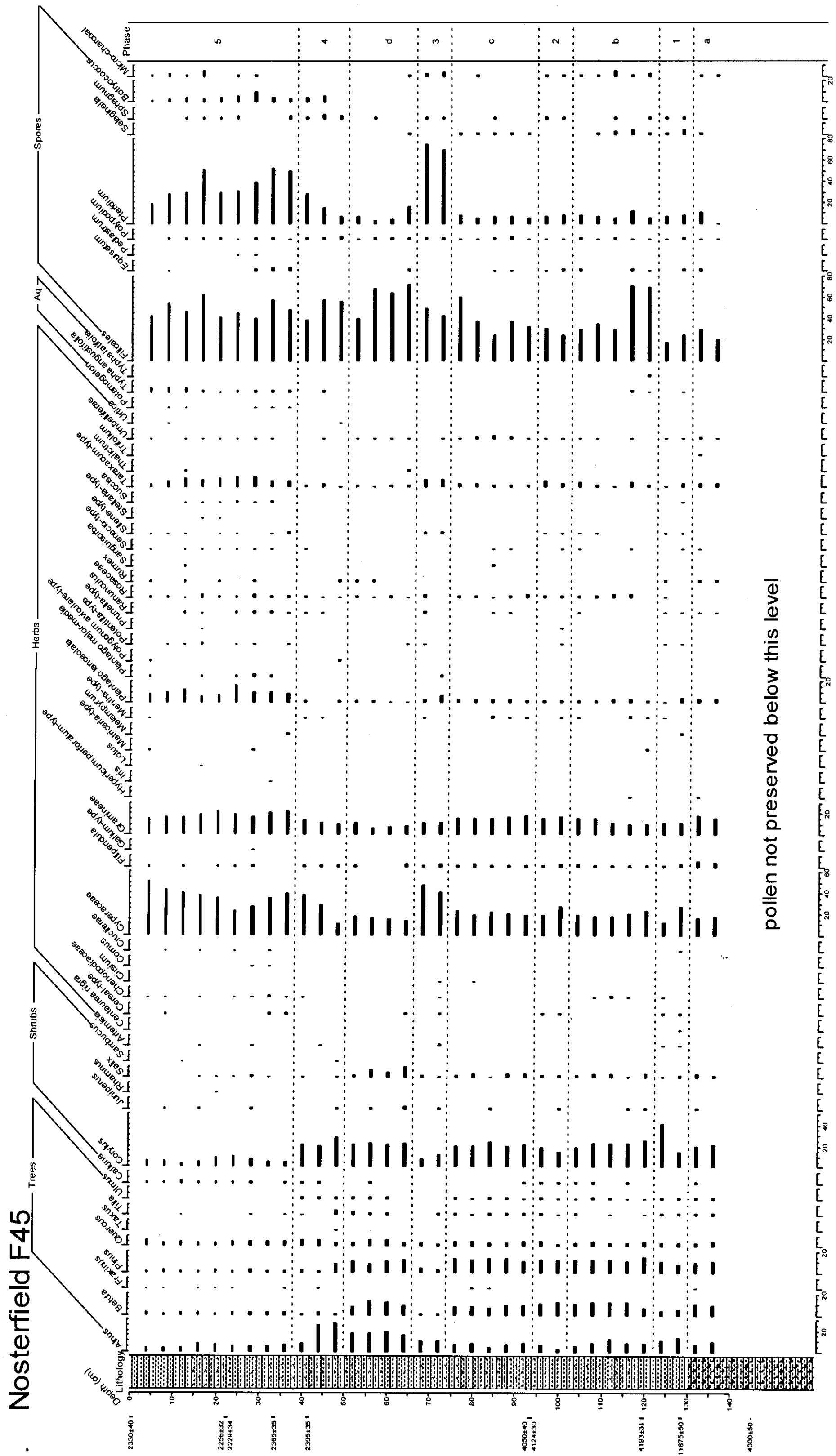
Nosterfield F45
Trees
Shrubs
Herbs
Aq
Spores
Phase
Lithology
Depth (cm)
pollen not preserved below this level

Figure 1

PART 5: PALYNOLOGY OF NOSTERFIELD: THE FLASKS - CORE 69

Dr Jim Innes, Department of Geography, University of Durham

1.0 DESCRIPTION

A two metre core from this site contains a limnic mud overlying a silty clay containing mollusc shells. Above the limnic mud is about sixty-five centimetres of grey silty clay and then a surface organic unit of almost ninety centimetres of humified peat, of which the upper half is oxidized and crumbly, and unsuitable for palynology or radiocarbon dating. The tree and shrub pollen assemblage of the limnic mud comprises mainly birch with some willow and juniper, while the non-tree pollen is dominated by sedges with lesser grass percentages and some wetland herbs like *Filipendula* (meadowsweet). There are low percentages of micro-charcoal.

Birch percentages are much reduced in the overlying silty clay, with sedge frequencies abundant at over 60% of total pollen. Willow and grass pollen remain significant. Herbs tolerant of severe cold and disturbed soils increase in representation, such as *Artemisia*, *Helianthemum*, *Thalictrum* and *Rumex*. The more thermophilous *Filipendula* increases near the upper part of the clay. Open water conditions are shown by *Pediastrum* algae, with abundant pollen of aquatic taxa *Typha angustifolia* and *T. latifolia* near the end of the unit. Micro-charcoal frequencies are generally high.

Near the base of the surface peat unit there is a rise in birch pollen percentages to almost 50% of land pollen, replacing the high percentages of sedges and grasses. Aquatic pollen frequencies fall sharply. Hazel percentages start to rise slowly and pollen of deciduous trees like oak and elm become consistently recorded. The juniper pollen curve ends at about 65cm. At 50cm depth, before the peat becomes oxidized, hazel rises to high values of over 50%, with birch declining and sedges reduced almost to nothing. Herb pollen, including wetland types, fade from the record. There is little micro-charcoal.

2.0 INTERPRETATION

The stratigraphy of a limnic unit separated from a surface peat sequence by a thick layer suggests deposition during the Late Glacial period, with Late Glacial Interstadial organic lake muds laid down under temperate climate and covered by inorganic inwash clays under severe cold conditions of the Late Glacial (Loch Lomond) Stadial, before deposition of peats under renewed temperate, Holocene climate. The pollen data support this, with open birch and willow woods established in the two organic units, but a sedge-tundra of open herbaceous vegetation dominant in the intervening cold phase. Climatic amelioration at the end of this phase allowed increased biological productivity in the wetland and terrestrial plant succession at the start of the Holocene and the transition to a wooded landscape. Juniper scrub was shaded out by birch woods, which were in turn replaced by hazel, creating a closed canopy ground cover, a succession typical of early Holocene woodland vegetation history in this region (Innes 2002, Innes and Blackford 2003). The record is truncated above this point. This Late Glacial and early Holocene record at the Flasks core 69 profile is comparable to others in the area from Dishforth Bog (Giles 1992), Bingley Bog (Keen *et al* 1988) and Tadcaster (Bartley 1962).

Five levels are proposed for radiocarbon dating. Date 1 at *c*. 55cm would provide an age for the rise of hazel pollen frequencies, a nationally significant biostratigraphic zone boundary. Further pollen levels will locate this event more closely. Date 2 at *c*. 65cm would date the final decline of juniper pollen. Date 3 at *c*. 83cm would date the early Holocene rise in birch pollen and the establishment of Holocene woodland. Date 4 at *c*. 154cm would date the end of temperate Interstadial conditions in the Late Glacial. Date 5 at *c*.184cm would date the onset of that Late Glacial temperate event. Further pollen counts are needed to locate these levels exactly.

3.0 SUMMARY

Flasks core 69 provides a vegetation history through Late Glacial and early Holocene period up to the expansion of hazel woodland, broadly dated elsewhere to about 9000BP. Five dates on pollen zone boundaries and stratigraphic boundaries are proposed.

PART 6: PALYNOLOGY OF NOSTERFIELD: THE FLASKS - SHAKE HOLE 1

Mairead Rutherford, Department of Geography, University of Durham

SUMMARY

Pollen analysis of a 5m core describes a landscape dominated by mixed deciduous woodland from 5m to 85cm. A dramatic change in landscape appearance occurs between 85cm and 65cm and from 65cm to the top of the section the landscape is dominated by sedges and grasses with virtual disappearance of woodland. The entire sequence is probably of post-Elm Decline age, although values for Elm are quite high between 500-240cm. *Plantago lanceolota* is present sporadically from the base of the diagram but consistently and in higher numbers from 180cm. Cereal pollen is recorded sporadically from 150cm.

DESCRIPTION

Mixed deciduous tree pollen types recorded include birch, oak, pine, lime, alder and elm. These taxa, in addition to hazel, are consistently present in relatively uniform numbers from 500cm to approximately 250cm.

Values for some tree pollen record an expansion between 230cm and 85cm (alder) and 260cm to 200cm (birch). Pine values show a little peak between 290cm and 250cm. Values for elm decline above 240cm and lime disappears above 110cm.

A dramatic close to the woodland vegetation is seen above the interval 85cm-65cm; with virtual disappearance of alder, lime and elm with very low counts for birch, oak and pine. Hazel follows the same pattern.

The other main component of this diagram is that of sedges and grasses. Sedges are consistently present in relatively large numbers; grasses too are present consistently but expand from 170cm and above. Sedges, and, to a lesser extent, grasses, replace the woodland vegetation which disappears between 85cm – 65cm.

A range of shrub and herb taxa are also recorded. Among these is the consistent presence of *P. lanceolota*, taken as an indicator of grassland communities and associated with *Rumex* and occasional cereal pollen suggests possible low scale pastoral activity in woodland clearings. The taxon is present sporadically from the base of the diagram but consistently and in higher numbers from 180cm. Additional herb taxa include *Taraxacum*, Umbelliferae, *Rumex*, *Mentha*, Chenopodiaceae as well as a range of Caryophyllaceae and various Compositae. Cereal pollen is present, although in low numbers. It first appears at 150cm.

Freshwater indicator taxa include the aquatic flora *Menyanthes*, *Potamageton*, *Equisetum* and *Typha*. These taxa are sporadically present throughout the diagram but most consistently within the upper part of the core, from approximately 155cm. Charophyte oogonia have been recorded through the core and are especially common between 220cm and 205cm.

There is no microscopic charcoal recorded through the core.

INTERPRETATION

The sediments have accumulated in the shake-hole as a result of collapse caused by dissolution of the underlying Magnesian Limestone. The accumulated 5m of sediment show a constantly wet environment supported by sedges, grasses, aquatic flora, charophytes and green algae. These taxa suggest development of a shallow pool, which was constantly infilled with sediment and pollen from nearby sources. Carophytes (stoneworts) and green algae may have lived on the surface of the pond.

Pollen from the surrounding area shows a dominant mixed woodland environment. Clearances within the woodland for agricultural use may be interpreted from the presence of open grassland taxa such as *P. lanceolota* and *Rumex* spp.

The dramatic change in vegetation seen towards the top of the diagram with the virtual disappearance of woodland suggests active woodland clearance rather than climatic-induced change. If the climate becomes much wetter (which is likely), trees with a preference for wet landscapes would continue to flourish (alder). The record from this shake-hole indicates widespread clearance of the woodland.

The precise age of the sequence contained within the shake-hole is difficult to estimate without use of radiocarbon dating. Analogy with sites in Yorkshire and in the North York Moors suggests a possible correlation with a transition from Bronze Age to Iron Age and continuing up to the post-Roman period. At Bole Ings (Dinnin and Brayshay 1994) forest clearance in surrounding landscape and increased wetness occurs during the upper Bronze Age period. During the Iron Age, drastic woodland clearance with increased flooding and arable and pastoral activity is identified.

The lowlands of northeast England first experienced major forest clearance during the Bronze Age (Bartley *et al* 1976). Climatic deterioration from the early Iron Age onwards encouraged development of marshland and bogland and this may have had a detrimental impact on woodland communities. However, the pollen diagrams such as that from Fen Bogs (Atherden 1976) show a massive woodland clearance during this time (in spite of increased wetness) and this has been attributed to human activity (Simmons *et al* 1993). Extensive deforestation in Britain also took place during Roman times and also during the Medieval period.

The sequence of events at the Nosterfield shake-hole site will only be clarified by a suite of radiocarbon dates.

APPENDIX F WYAS ARCHAEOLOGICAL REPORTS

PART 1 ARCHAEOLOGICAL WATCHING BRIEF

Contents

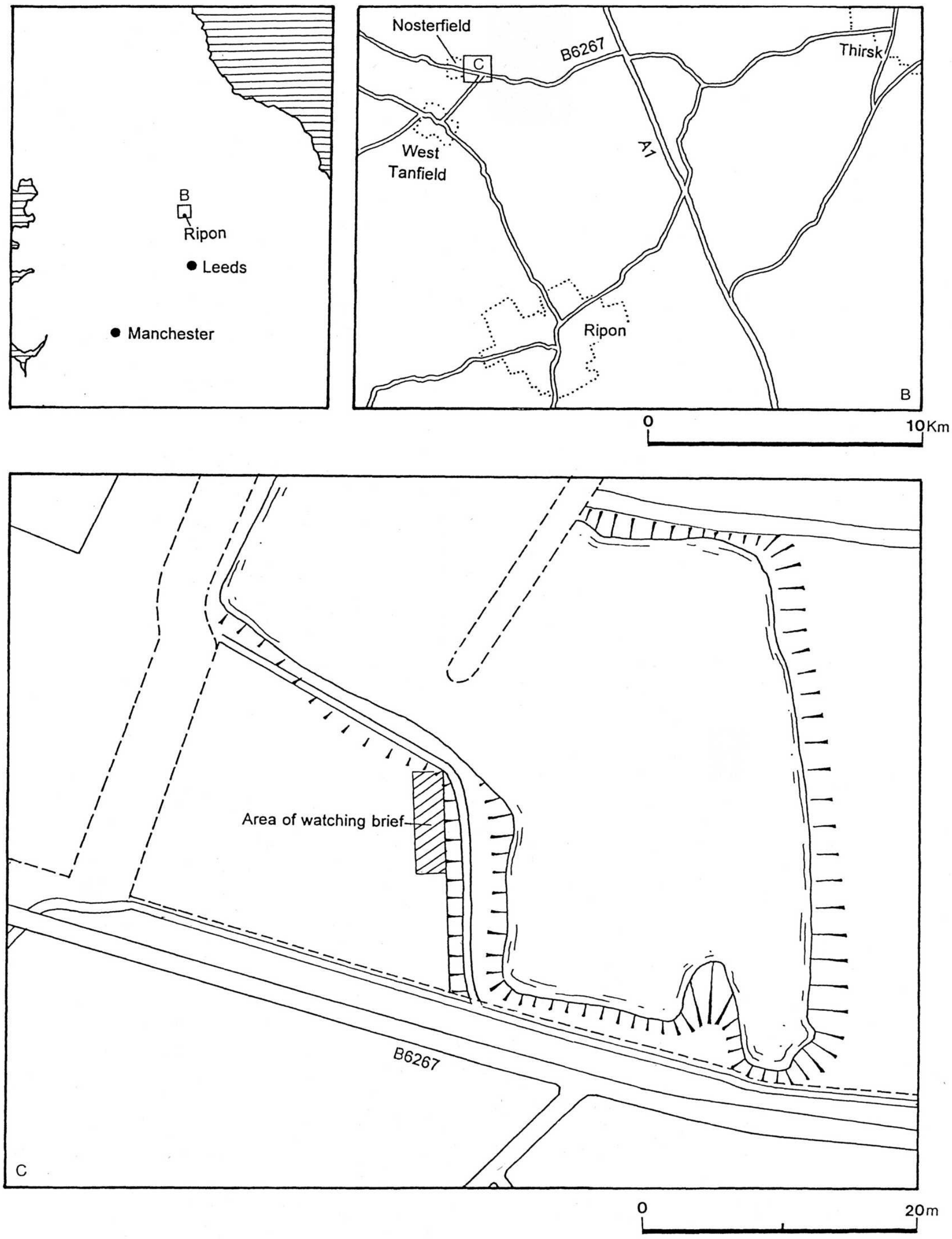

Figure 1: Location of Nosterfield Quarry, North Yorkshire

1.0 SUMMARY

Objectives
To identify any archaeological remains exposed during topsoil and subsoil stripping.

Methodology
Close archaeological supervision was maintained during topsoil and subsoil stripping. All spoil was inspected for artefacts and a full written, drawn and photographic record was made of any archaeological features.

Results
No archaeological features or artifacts were identified or recovered.

2.0 INTRODUCTION

Archaeological Services WYAS were commissioned to carry out an archaeological watching brief on the 29th January 1997 on an area within the Nosterfield Quarry. The investigation was designed to identify and record any archaeological features in advance of the proposed quarrying.

3.0 ARCHAEOLOGICAL BACKGROUND

Nosterfield Quarry is approximately quarter of a mile north of the northern most henge of the 'Thomborough Complex', one of the most important prehistoric ritual landscapes in Britain. Previous work in the area has uncovered a number of pits dating from the Neolithic period. The area adjacent and to the west of the subject area produced artefacts of a Neolithic date.

4.0 METHODOLOGY

An area 60m by 7m was stripped of soil down to the natural gravel. The operation was carried out using a tracked backactor mechanical excavator under direct archaeological supervision. The topsoil was stripped and scanned for artefacts. Subsequently the subsoil was removed in a series of controlled spits until the natural geological strata of sandy gravel was reached. This surface was then inspected for negative features. A photographic record was made of this process.

5.0 RESULTS

The dark brown stony topsoil was inspected for artefacts but contained none. The brownish grey stony subsoil was also inspected with the same result. There were no features cut into the natural yellowish orange gravel. This area of the site would appear to be devoid of any identifiable archaeological activity.

Acknowledgements

Project manager:	Mr C. Moloney.
Field work:	Mr C. S. Hum
Report:	Mr C. S. Hum.
Graphics:	Miss E. Carter.

PART 2 GRADIOMETER SURVEY
Alistair Webb

CONTENTS

1.0 Summary

Objectives
To gather sufficient information to establish the location and extent of any archaeological features (particularly pits) within the proposal area, and, where possible, to characterise the archaeology located in this way.

Method
To achieve these objectives a detailed gradiometer survey was carried out over a 1 hectare area using a Geoscan FM36 fluxgate gradiometer.

Results and Conclusions
The gradiometer survey identified three responses which it was thought could be caused by pits as well as an area of enhanced magnetic response. A negative linear anomaly was also identified. This is probably caused by a plastic service pipe.

2..0 INTRODUCTION AND ARCHAEOLOGICAL BACKGROUND

2.1 Archaeological Services (WYAS) was commissioned by Mike Griffiths and Associates, Consulting Archaeologists, to carry out a gradiometer survey on a 1ha site at Nosterfield Gravel Quarry, operated by RMC/Tilcon Ltd., in advance of the projected expansion of the extraction area.

2.2 The quarry lies about 1km east of Nosterfield to the north of the B6267 in a particularly rich archaeological landscape. Three aligned henge earthworks lie immediately south of the quarry, south and west of the village of Thomborough, and there are numerous other tumuli in the immediate vicinity indicating the importance of the area in prehistory. Within the quarry site itself previous excavations revealed a prehistoric pit alignment which it was thought might continue into the current application area.

2.3 The aim of the survey was twofold; firstly to see if gradiometry was an appropriate evaluation technique on gravel geology and secondly to see whether discrete archaeological features, such as pits, could be identified.

2.4 At the time of survey, March 18th 1997, the site was under short grass.

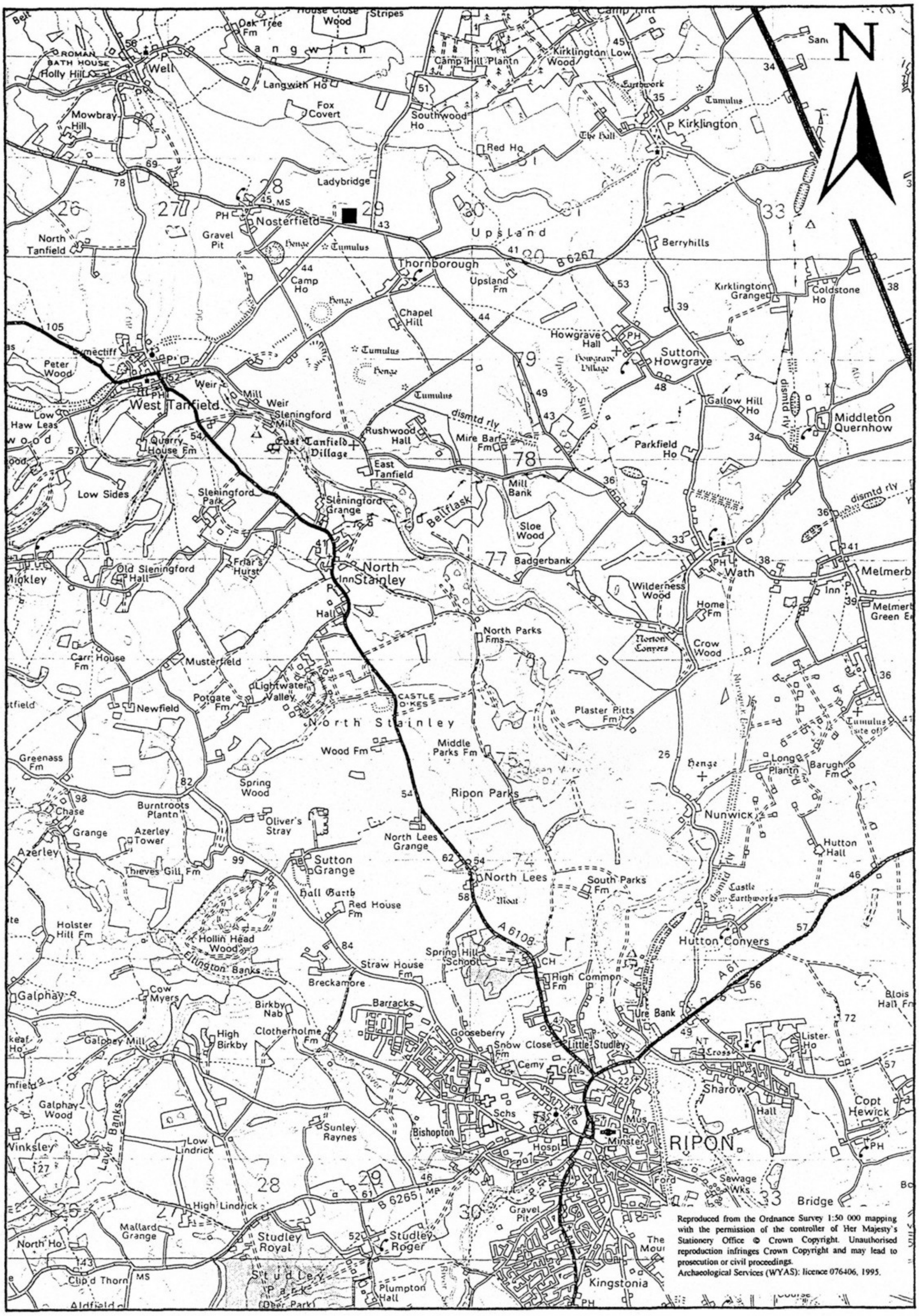

Fig. 1 Site location

3.0 RESULTS AND DISCUSSION

3.1 THE PRESENTATION OF THE RESULTS

3.1.1 The gradiometer data is presented as a greyscale plot overlain on a 1:1250 plot of the site survey in Figure 2 and in dot density and X-Y trace formats at a scale of 1:500 in Figures 3 and 4. The data is interpreted in Figure 5.

3.2 THE GRADIOMETER SURVEY (Figures 3 AND 4)

3.2.1 The most obvious anomalies in the magnetic data are the isolated positive/negative (dipolar) responses which are common across the whole site. These responses are caused by ferrous material on the ground surface and in the topsoil. They are not normally archaeologically significant.

3.2.2 Three isolated responses have been identified which it is thought could reflect discrete features such as pits. These anomalies differ from "iron spikes" in that the response is positive, not dipolar, and is often seen on more than one traverse ("iron spikes" are generally only detected on one traverse). The positive response is due to the fill of the feature having a higher magnetic susceptibility than the surrounding topsoil.

3.2.3 A more general area of enhanced susceptibility has also been detected. This probably reflects an area of burning.

3.2.4 One negative, curvi-linear, anomaly has been detected at the far eastern edge of the site. This is probably due to a plastic service pipe.

4.0 CONCLUSION

4.1 The gradiometer survey has shown that both discrete and linear features can be detected on a gravel substrate.

4.2 The isolated positive anomalies could be pit features.

The results and subsequent interpretation of geophysical surveys should not be treated as an absolute representation of the underlying archaeology. It is normally only possible to prove the archaeological nature of anomalies through intrusive means such as by trial excavation.

Acknowledgements

Project Management: A. Webb BA
Geophysical Survey: J. Nicholls BA MSc
Report: A. Webb BA
Graphics: H. Boyd HND

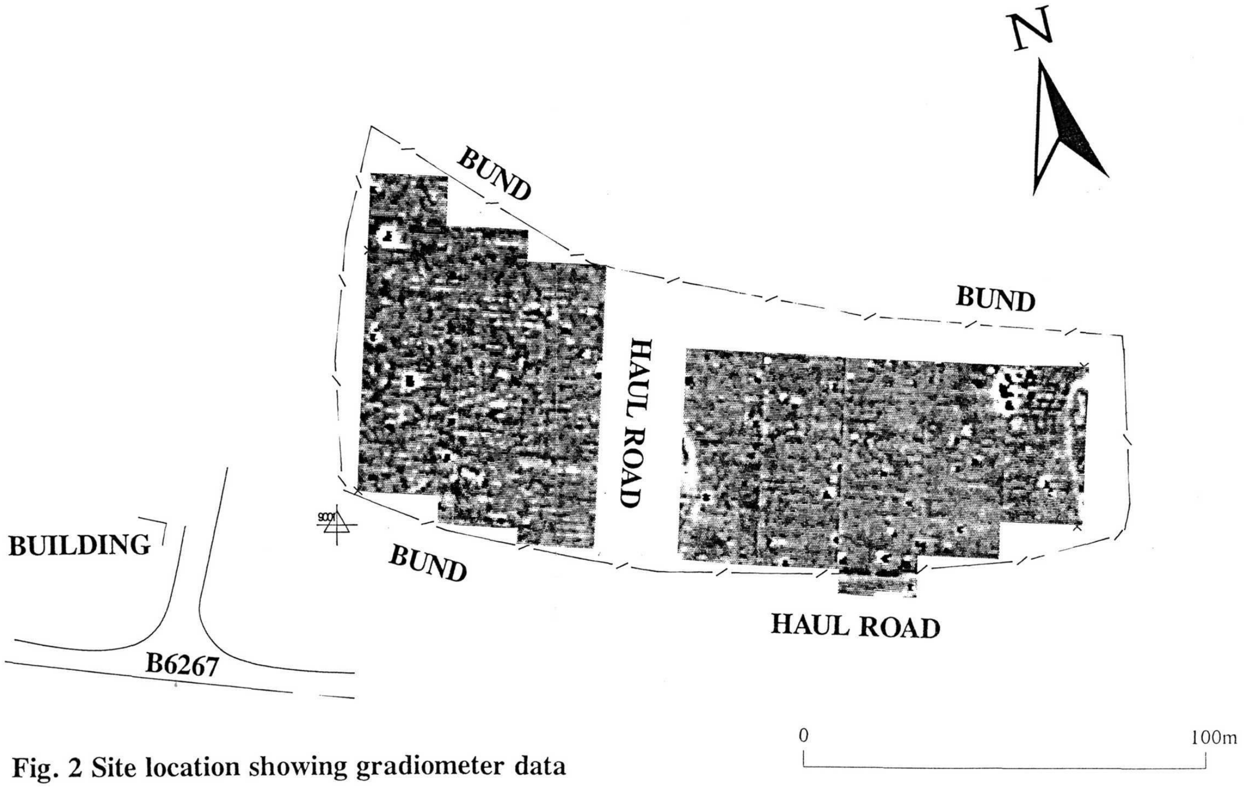

Fig. 2 Site location showing gradiometer data

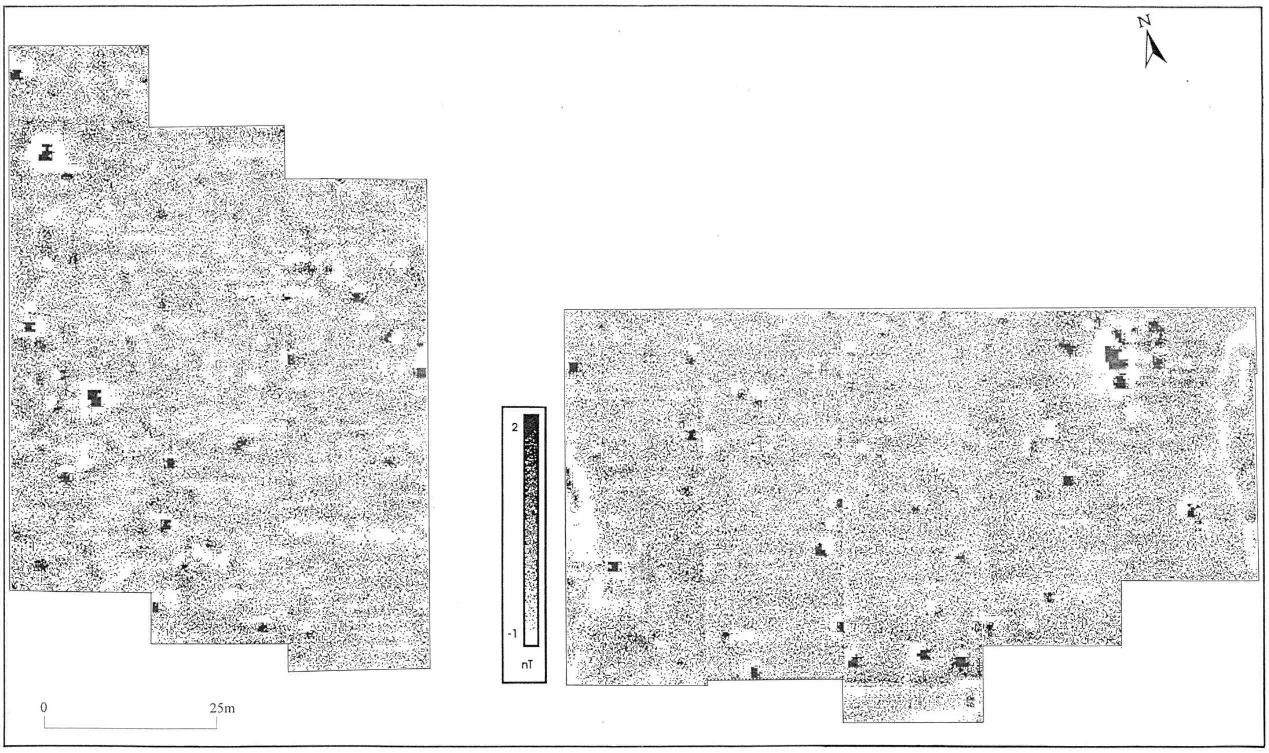

Fig. 3 Dot density plot of the gradiometer data

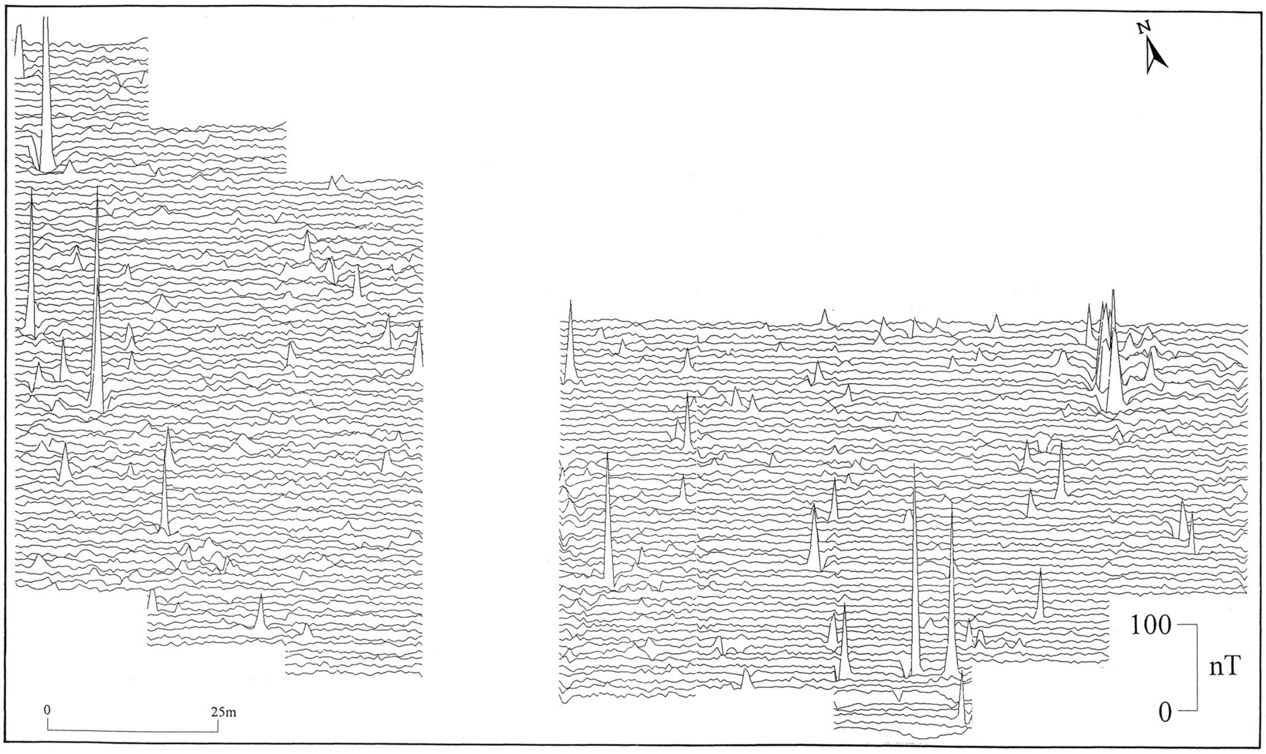

Fig. 4 X-Y trace plot of the gradiometer data

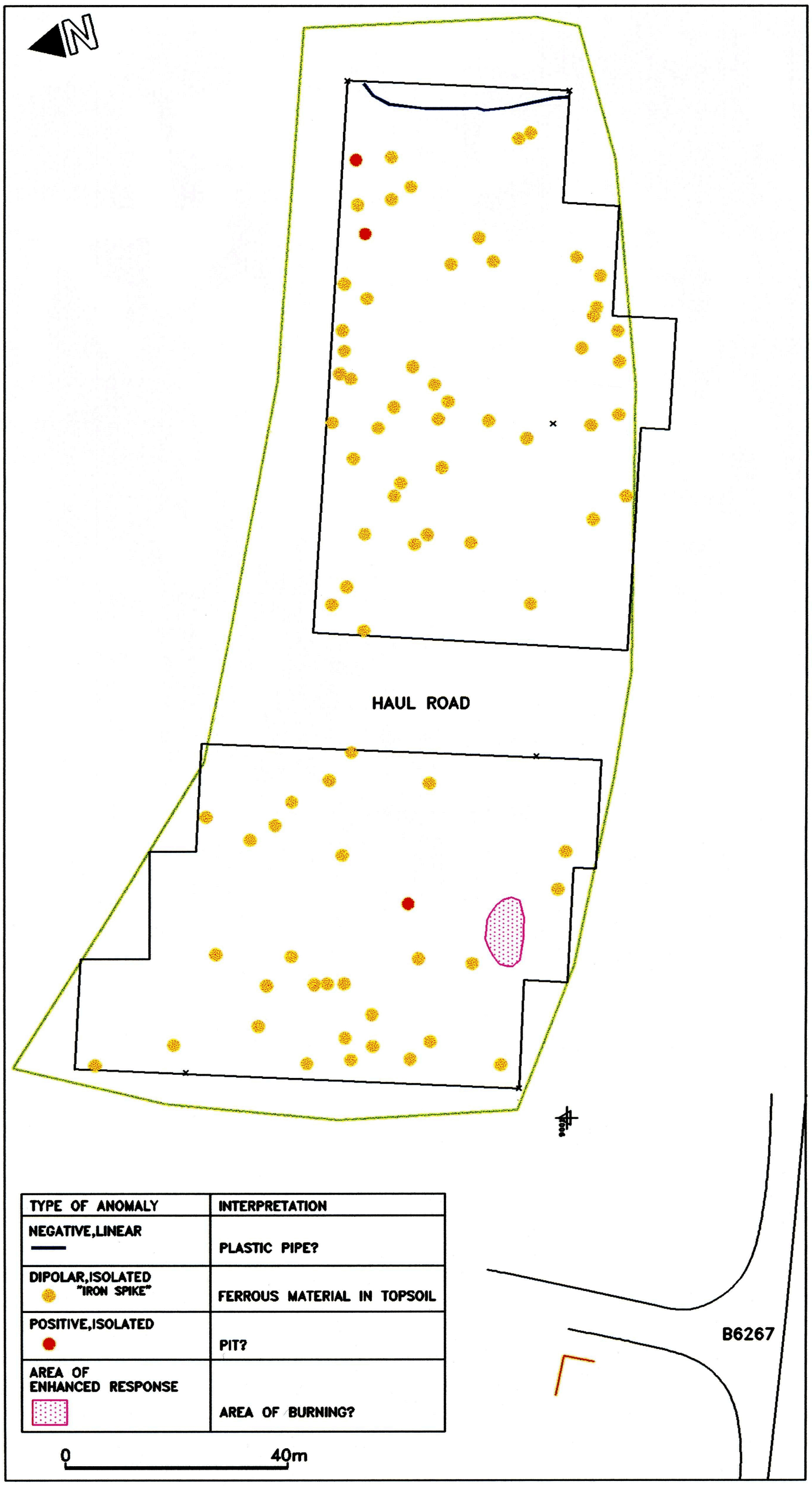

Fig.5 Interpretation of gradiometer data

APPENDIX 1 GRADIOMETER SURVEY: TECHNICAL INFORMATION & METHODS

1.0 TECHNICAL INFORMATION

1.1 Iron makes up about 6% of the Earth's crust mostly dispersed through soils, clays and rocks as chemical compounds which are weakly magnetic. Human activities can redistribute these compounds and change (enhance) others into more magnetic forms. These anthropegenic processes result in small localised anomalies in the Earth's magnetic field which are detectable by a gradiometer.

1.2 In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of the topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic (iron minerals) to concentrate in the topsoil thereby making it more magnetic than the subsoil or bedrock. Linear features cut into the subsoil or solid geology, e.g. ditches, that have silted up or been backfilled with topsoil will produce a positive magnetic response relative to the background soil levels. Discrete features such as pits can also be detected. Less magnetic material such as masonry or plastic service pipes which intrude into the topsoil will give a negative magnetic response relative to the general background level.

1.3 The magnetic susceptibility of the soil can also be enhanced significantly by heating. This can lead to the detection of features such as hearths or kilns.

1.4 The highest responses are usually due to iron objects in the topsoil. These produce a response characterised by a rapid change from positive to negative readings (iron "spikes").

1.5 The types of response mentioned above can be divided into the five main categories which are described below:

1. Iron Spikes (Dipolar Anomalies)
These responses are referred to as dipolar and are caused by buried iron objects. Little emphasis is usually given to such responses as iron objects of recent origin are common on agricultural sites.

2. Rapid, strong variations in magnetic response
Also referred to as areas of magnetic disturbance these can be due to a number of different types of feature. They are usually associated with burnt material such as industrial waste or other strongly magnetic material. It is not always easy to determine their date of origin without supporting information.

3. Positive, linear responses
The strength of these responses varies depending on the underlying geology. They are commonly caused by ancient ditches or by more recent field drains.

4. Isolated positive responses
These exhibit a magnitude of between 2nT and 300nT and, dependent on the strength of their response, can be due to pits, hearths, ovens or kilns. They can also be due to natural features on certain geologies. It is, therefore, very difficult to establish an anthropogenic origin without an intrusive means of examining the features.

5. Negative linear anomalies
These are normally very faint and are commonly caused by features such as plastic water pipes which are much less magnetic than the surrounding soils and geology. They too can be caused by natural features on some geologies.

2.0 METHODOLOGY

2.1 There are two methods of using the fluxgate gradiometer. The first of these is referred to as *scanning* and requires the operator to visually identify anomalous responses on the instrument display whilst covering the site in widely spaced traverses, typically 10m - 15m. The instrument logger is not used and there is therefore no data collection. This method is used as a means of selecting areas for detailed survey when only a percentage sample of the whole site is to be surveyed. Scanning can also be used to map out the full extent of features located during a sample detailed survey.

2.2 The second method is termed *detailed survey* and this employs the use of a sample trigger to automatically take readings at predetermined points, typically at 0.5m intervals, on zig-zag traverses usually 1m apart. These readings are stored in the memory of the instrument and are later dumped to computer for processing and interpretation. This method was employed during the survey.

2.3 A Geoscan FM36 fluxgate gradiometer and ST1 sample trigger was used to take readings at 0.5m intervals on zig-zag traverses lm apart within grids measuring 20m by 20m, 800 readings therefore being taken within each 20m grid square. In-house software (Geocon Version 9) was used to interpolate the "missing" line of data so that 1600 readings in total were obtained for each complete grid.

APPENDIX G ZOOARCHAEOLOGICAL REPORT

PART 1: ASSESSMENT OF HAND-COLLECTED ZOOARCHAEOLOGICAL REMAINS FROM NOSTERFIELD

Stephen Rowland, Field Archaeology Specialists Ltd

Summary

An archaeological watching brief was undertaken by Field Archaeology Specialists (FAS) Ltd, on behalf of Mike Griffiths Associates for Tarmac Northern Ltd at Nosterfield quarry, North Yorkshire. The watching brief encountered multi-period archaeology dating from the late Neolithic to the 19th century. A small vertebrate assemblage of 362 fragments was recovered by hand-collection and flotation.

Assessment of this material indicated that only a very small proportion of these remains (28 fragments) could be identified to taxon, most of which comprised of more durable elements such as loose teeth. The range of identified taxa was limited, comprising of horse, pig, cattle, Pleistocene deer and human.

1.0 INTRODUCTION

This document reports on the zooarchaeological assessment of approximately 40 litres of animal bone recovered by hand-collection and flotation from an archaeological watching brief undertaken by Field Archaeology Specialists Ltd (FAS) between 1998 and 2003 at Nosterfield Quarry, North Yorkshire. A total of 28 contexts from 23 features contained vertebrate remains, these features comprising of pit alignments, ditches, a drying oven, a pit, a posthole, a swallow hole, a drain and a cremation burial.

1.1 AIMS AND OBJECTIVES

The aim of the zooarchaeological study was to assess the potential of faunal material for providing information about ritual, social, economic, husbandry and butchery practices at the site.

1.2 METHODOLOGY

Zooarchaeological remains were recorded using Microsoft Access 2002, with subjective and semi-quantitative notes made on the state of preservation (‘excellent’, ‘good’, ‘fair’ or ‘poor’), angularity (‘spiky’, ‘quite spiky’, ‘rounded’ or ‘battered’) and colour, as well as the degree of fragmentation and the proportions of butchery, burning, gnawing and fresh breakages as expressed in percentage ranges. Data was imported into Microsoft Excel 2002 for the purposes of preparing figures and tables.

Identifications were made using the FAS and University of York Palaeoecology reference collections and recording followed the Environmental Archaeology Unit (EAU) protocol for recording animal bones (Dobney, Jaques and Johnstone 1999) which, to increase speed of analysis and to maximise the potential of the most informative elements, advocates the recording of a specific suite of ‘A bones’ using the bone zones of Dobney and Reilly (1988). In addition, to aid determination of the final epiphyseal fusion stage, vertebrae were also recorded to species if more than 50% of the vertebral body (Zone 1) was present. The remaining elements were not identified to taxon, regardless of completeness. Instead, along with less complete elements, these were identified to anatomic element where possible, and recorded generally as medium mammal 2 (dog, cat or rabbit sized), medium mammal 1 (caprovid, pig and small deer sized), large mammal (cow, horse and large deer sized) or unidentified.

Mammal bones were recorded as 'juvenile' if the epiphysis was unfused and if the epiphysis or metaphysis was spongy with billowing growth surfaces. If the bone was particularly small, then it was described as 'neonatal', although bones described thus could derive from animals several months old.

2.0 ASSESSMENT

2.1 BONE FROM PIT ALIGNMENTS

There were eight contexts from eight aligned pits - F103 C1149, F123 C1184, F125 Cbf, F145 C1226, F155 C1250, F156 C1256, F190 C1376 and F262 C1635. Bone was generally described as in a fair or poor state of preservation, and fragments tended to be 'battered' in appearance. Bones were pale in colour, either fawn or beige, with those from F103, C1149 being white and calcined. Fragmentation was high, with the majority or all of the bones from most contexts measuring less than 5cm across and none over 20cm. There was no evidence for butchery or for carnivore gnawing and the only burning was observed in the F103 where all fragments were calcined. A very small number of bones were identified to taxa, including an isolated cow tooth and a fragmentary male horse mandible from F156, C1256 and two calcined pig phalanges from F103. The remaining 204 fragments were dominated by medium mammal (184 fragments) the majority of which came from F203. Fragments of medium and large mammal were generally of more durable long bone shaft.

2.2 BONE FROM DITCHES

Ten contexts from four ditch features - F15, F44, F82 and F132 contained bone. Most bone was in a fair state of preservation with 'rounded' edges, although two of the five contexts from F15 contained bone in good condition, while that from F44, C1074 was poor and 'battered' and F132, C1189 was poor and 'rounded'. Bones from two contexts from F15 were in a good and 'spiky' condition. Colouration was again pale, either beige or fawn and fragmentation, similar to bone from pit alignments, was high. No butchery or gnawing was observed, and the only burning was a calcined human ulna fragment from F82, C1242. The only identified domesticate was horse, with one or two isolated molars (totalling 15 fragments) present in all but two contexts - F82, C1242 and F132, C1199. More or less complete mandibles with measurable molars were recovered from F15, C1030 and C1041, while F132, C1233 contained left and right mandibles with measurable tooth rows along with a tibia and a possible radius.

2.3 BONE FROM BOUNDARY PITS

Several pits were interpreted as the extension of a prehistoric ditched boundary. Three of these, F8, F9 and F10 contained a total of 14 fragments of animal bone, all identified as large mammal and generally comprising long bone shaft with single fragments of humerus and radius remaining distinctive. The bones tended to be in a fair state of preservation, rounded, and were fawn in colour. Fragmentation was moderate to high and there was no evidence of burning, gnawing or butchery.

2.4 F4 POSTHOLE

A poorly preserved cow tooth was recovered from C1015.

2.5 F13 SWALLOW HOLE

F13 was initially interpreted as a pit, but subsequently identified as a natural peat-filled swallow hole. Two backfills contained bone: C1020 a piece of large mammal tibia and C1022, a very large deer mandible. This mandible is extremely dense and appears to be partly fossilised. It is possible that the mandible of that of elk, or megaloceros, both taxa that had not been extant in Britain since the Pleistocene (Terry O'Connor pers. comm.). The overall preservation of the bones was fair but rounded and they had been stained dark brown by their peaty environment.

2.6 F72 DRAIN

C1116 contained eight rounded bones in a fair state of preservation. These included six pig teeth: five incisors and a female canine, a bird shaft fragment and a piece of medium mammal skull.

2.7 F91 CREMATION PIT

A single fragment of calcined medium mammal bone was recovered through flotation from C1135.

2.8 F101 OVEN CHAMBER

F101 was identified as the chamber of a drying oven of Roman date. Two contexts, C1146 and C1380 yielded a poorly preserved medium mammal rib and two large mammal shaft fragments, described as either battered or rounded and either beige or white in colour. There was no evidence of burning on the bones that might indicate that they had been *in situ*, as a fuel source for example, when the oven was in use.

3.0 DISCUSSION

Overall, there is little that can be said about the animal bones from Nosterfield beyond tantalising inferences: there are too few fragments and too little in the way of dating evidence. While each of the main domesticates are represented, there are insufficient bones from which to establish any idea of animal husbandry or local economic practices. In addition, it is clear that from the survival of the more robust elements such as teeth and long bone shaft fragments, their poor state of preservation and their roundedness, that intense taphonomic processes have acted upon the bones, and the assemblage that was recovered is likely to be very different from that which was originally deposited. The bones would certainly suggest that rubbish dumping, and by inference human occupation, took place in the area of the excavated features.

One aspect of interest may be the relatively high numbers of horse bones. The concentration of head elements may not be significant since other parts of the body were found, in general they are less likely to survive. However, the discovery of F316, a quadruple horse burial during more recent work at Nosterfield, for which analogous features have been found at other Iron Age sites such as Blueburton (Mike Griffiths pers. comm.), would suggest that horses played an important role in ritual activity. Horses also made an appearance in a large pit of probable ritual importance dated to the 3rd century AD at Site 25 on the Silk-Willoughby-Staythorpe gas pipeline in Nottinghmashire. Here, the basal deposit contained the skulls of a horse and a cow and a pair of dog mandibles, while the upper fills contained a large number of horse bones deriving from at least two individuals (FAS 2003). When the material from Nosterfield is combined with the evidence of two square ditched features, thought to be barrows of Iron Age date, it seems likely that a certain degree of ritual activity was carried out at the site during that period. Indeed, it can be argued that horse remains were quite closely associated with these square barrows: F316 was cut about six metres from F304 and in direct alignment with it, while the only artefact accompanying male burial F335 (placed into the west ditch of barrow F320), was a horse molar found between his legs. It is possible then that horses may have been deposited into features for ritual reasons, or perhaps even that their skulls were displayed. The presence of a cremated human ulna fragment in F82, C1242 is not particularly out of place given the widespread occurrence of human body parts in Iron Age features from a wide range of sites.

Ritual activity is also likely to be associated with the pit alignments. F103 contained material that might suggest that it derived from ritual activity. In this case, there were 170 small fragments of calcined bone, two of which could be recognised as pig phalanges one of which was unfused. The rest of the fragments could be identified only as medium mammal, but included fragments of skull and long bone. It is possible that this deposit represents some sort of burnt offering.

4.0 POTENTIAL FOR FURTHER ANALYSIS

At present, the assemblage from Nosterfield is a little too small and poorly preserved to warrant much in the way of detailed further analysis. However, should more refined dating be acheived for some of the features containing horse remains, then it may be worth making an archive of horse tooth measurements.

5.0 RECOMMENDATIONS

It is recommended that the horse bones from Nosterfield should be fully measured and recorded only once a tighter chronology has been established and within the context of a specific research question. A full identification of the large deer mandible is also desirable. The rest of the material should be retained so that it can be combined with further material from the watching brief whereupon it may be necessary to reassess its potential.

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Table 1 Summary of context and preservation information from Nosterfield

Key: Int=Intervention, Type=feature type, Pres=preservation (f=fair, p=poor, g=good), Ang=angularity (s=spiky, q=quite spiky, r=rounded, b=battered), Col=colour (be=beige, g=ginger, f=fawn, db=dark brown, w=white). The following expressed in percentages where: n=none, 0=o-10%, 1=10-20%, 2=20-50% and 5=50%+; 0-5cm = fragments between 0 and 5cm across, 5-20cm = fragments between 5 and 20cm across, 20cm+ = fragments over 20cm across, Butch=butchery, Gnaw= gnawing, Burn=Burning

Int	Feature	Context	Type	Pres	Ang	Col	0-5cm	5-20cm	20cm+	Butch	Gnaw	Burn	Fresh Breaks	Total Frags
5	4	1015	post hole	p	s	be	5	n	n	n	n	n	5	1
5	8	1009	boundary pit	g	q	g	n	5	n	n	n	n	n	1
5	9	1010	boundary pit	f	r	f	2	5	n	n	n	n	5	8
5	10	1011	boundary pit	f	r	f	5	2	n	n	n	n	5	5
4	13	1020	pit	f	r	db	n	5	n	n	n	n	5	1
4	13	1022	pit	g	r	db	n	n	5	n	n	n	n	1
5	15	1022	ditch	f	r	be	n	5	n	n	n	n	n	1
5	15	1023	ditch	f	r	f	2	5	n	n	n	n	5	3
5	15	1025	ditch	f	r	be	n	5	n	n	n	n	n	1
5	15	1028	ditch	g	s	f	5	n	n	n	n	n	5	1
5	15	1030	ditch	g	q	f	5	2	n	n	n	n	2	22
5	15	1041	ditch	f	r	be	5	2	n	n	n	n	5	14
5	44	1074	ditch	p	r	be	5	n	n	n	n	n	5	1
5	72	1116	drain	f	r	be	5	n	n	n	n	n	2	8
5	82	1242	ditch	f	r	w	5	n	n	n	n	5	n	1
5	91	1135	cremation pit	f	r	w	5	n	n	n	n	5	n	1
5	101	1146	oven chamber	p	b	be	5	n	n	n	n	n	5	1
5	101	1380	oven chamber	p	r	w	5	n	n	n	n	n	5	2
5	103	1149	aligned pit	f	r	w	5	n	n	n	n	5	n	170
5	123	1184	aligned pit	p	b	be	5	n	n	n	n	n	5	8
5	125	bf	aligned pit	f	b	f	5	2	n	n	n	n	n	8
5	132	1199	ditch	p	b	be	5	n	n	n	n	n	f	9
5	132	1233	ditch	f	b	f	5	2	0	n	n	n	5	64
5	145	1226	aligned pit	f	b	f	n	5	n	n	n	n	5	6
5	155	1250	aligned pit	f	b	f	n	5	n	n	n	n	1	1
5	156	1256	aligned pit	p	b	f	5	n	n	n	n	n	5	4
5	190	1376	aligned pit	p	b	be	5	n	n	n	n	n	5	10
5	262	1635	aligned pit	f	b	be	5	n	n	n	n	n	5	9

Table 2 Summary of fragment count by taxon according to feature type from Nosterfield

Taxon		Aligned pit	Boundary pit	Cremation pit	Pit	Ditch	Drain	Oven chamber	Post hole	Grand Total
horse	*Equus* f. domestic	1				15				**16**
deer	*Cervus* sp.				1					**1**
pig	*Sus* f. domestic	2					6			**8**
cow	*Bos* f. domestic	1							1	**2**

Taxon	Aligned pit	Boundary pit	Cremation pit	Pit	Ditch	Drain	Oven chamber	Post hole	Grand Total
human *Homo sapiens*					1				**1**
large mammal	20	14		1	54		2		**91**
medium mammal1	186		1		13	1	1		**202**
bird						1			**1**
unidentified	6				34				**40**
Grand Total	**216**	**14**	**1**	**2**	**117**	**8**	**3**	**1**	**362**

Table 3 Summary of analysable bones from Nosterfield

Taxon	Measureable	Mandibles	Teeth	New Born	Juvenile	Unfused	Fragments	Weight
horse *Equus* f. domestic	7	2	1	0	0	0	16	985
deer *Cervus* sp.	0	1	0	0	0	0	1	406
pig *Sus* f. domestic	0	0	1	0	0	1	8	21
cow *Bos* f. domestic	0	0	0	0	0	0	2	18
human *Homo sapiens*	0	0	0	0	0	0	1	4
large mammal	0	0	0	0	0	0	91	639
medium mammal1	0	0	0	0	0	0	202	73
bird	0	0	0	0	0	0	1	0.5
unidentified	0	0	0	0	0	0	40	18
Total	**7**	**3**	**2**	**0**	**0**	**1**	**362**	**2164.5**

APPENDIX H SCIENTIFIC DATING OF ARCHAEOLOGICAL FEATURES

PART 1: RADIOCARBON DATING OF HUMAN BONE
Scottish Universities Environmental Research Centre (SUERC)

SUMMARY OF RADIOCARBON DATING CERTIFICATES

Feature No	Context No	Laboratory code	Material	$\delta^{13}C$ relative to VPDB	Radiocarbon age BP	Radiocarbon age BC/AD
91	1135	SUERC-3776 (GU-12280)	Cremated bone: Human	-22.9%	3085 ± 35	1135 ± 35 BC
92	1136	SUERC-3777 (GU-12281)	Cremated bone: Human	-22.0%	3210 ± 35	1170 ± 35 BC
96	1140	SUERC-3781 (GU-12285)	Cremated bone: Human	-22.2%	3050 ± 40	1100 ± 35 BC
106	1157	SUERC-3782 (GU-12286)	Cremated bone: Human	-20.5%	3000 ± 35	1050 ± 35 BC
253	1617	SUERC-3778 (GU-12282)	Bone: Human	-20.8%	1910 ± 35	AD 40 ± 35
267	1642	SUERC-3779 (GU-12283)	Bone: Human	-21.1%	3190 ± 40	1240 ± 40 BC
269	1647	SUERC-3786 (GU-12287)	Cremated bone: Human	-23.0%	3555 ± 35	1605 ± 35 BC
335	1754	SUERC-3780 (GU-12284)	Bone: Human left femur	-20.5%	2085 ± 35	135 ± 35BC

PART 2: RADIOCARBON DATING CERTIFICATE: F216, C1482
Scottish Universities Environmental Research Centre (SUERC)

Laboratory Code: AA-51419 (GU-10384)
Submitter: Andrew Copp
Field Archaeology Specialists Ltd
University of York
King's Manor
York
YO1 7EP
Site reference: Nosterfield sand and gravel quarry, North Yorkshire
Sample reference: F216 C1482 G
Material: Sediment: Acid wash only
Delta ^{13}C rel. PDB: -26.0%
Radiocarbon Age BP: 6625 ± 60

N.B.
1. The above C14 age is quoted in conventional years BP (before 1950AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.
2. The calibrated age rages are determined from the University of Oxford Radiocarbon Accelerator Unit calibration programme (OxCal3)
3. Samples with an AA coding are measured at the University of Arizona AMS facility and should be quoted as such in any reports within the scientific literature. Any questions directed to SURRC should also quote the GU coding that is given in parentheses after the AA code.

Conventional age and calibration age ranges calculated by: R.Anderson Date: 26-11-02
Checked and signed off by: P.Naysmith Date: 26-11-02

PART 3: ARCHAEOMAGNETIC ANALYSIS OF F159
GeoQuest Associates

Summary

A total of 13 samples of fired stone and 1 of fired clay were removed from F159 for the purpose of archaeomagnetic analysis and dating. Specimens were oriented in situ using the button method, combined with spirit levels and a sun compass. Demagnetisation tests showed that the magnetisation in the material is highly stable. The mean archaeomagnetic vector in the samples was compared with the UK Master Curve to suggest that last firing occurred in the date range 100-170A.D.

MAGNETIC DATING REPORT

SITE NAME: Nosterfield Tarmac Quarry **LOCATION:** Nosterfield, N. Yorks.
SITE CODE: N0S02 **COORDINATES:** 54.2°N 1.6°W
SAMPLING DATE: 10/6/02 **SITE CONTACT:** Annette Roe
CONTEXT: F159 Fired stone & clay **FEATURE TYPE:** Roman(?) kiln/dryer

SITE/CONTEXT DESCRIPTION

Feature was discovered during a watching brief by Field Archaeology Specialists during topsoil stripping of a proposed extension to the Tarmac aggregate quarry at Nosterfield. It comprises a kiln or corn drying oven, about 1.2m long by about 0.8m across, constructed of stone mortared with fired clay. A disuse fill which dished into the feature contained sherds of probable Roman date, thus providing *a terminus ante quem* for the feature.

ANALYTICAL METHODS

Sampling via button method with orientation by sun compass. Archaeomagnetic remanence measured using a Molspin fluxgate spinner magnetometer and stability assessed using stepwise, alternating field demagnetisation. Secondary components of magnetisation removed by partial demagnetisation. Mean of selected vectors computed (with unit weights) and corrected to Meriden. Comparison then made to the UK Master Curve to obtain a last firing date. Further details of technical methods are contained in the Appendix.

RESULTS

SAMPLE	J	D	I	A.F.	D	I	Comment
NOS1	209.7	356.4	55 8	2 5	352.6	56.3	Stone
NOS2	48.1	11.6	690	25	12.7	68.3	Stone
NOS3	145.3	349.2	61 6	2 5	347.9	62.6	Stone
NOS4	82.6	353.3	67 5	2 5	358.3	67.0	Stone
NOS5	123.0	353.2	79 0	2 5	354.7	80.2	Stone
NOS6	77.6	350.0	61.3	2.5	350.4	60.3	Stone
NOS7	247.3	8.0	66.5	2.5	6.0	66.1	Stone
NOS8	1.8	348.3	60 3	2 5	346.7	63.6	Stone
NOS9	34.5	12.2	711	2 5	10.9	69.9	Stone
NOS10	25.1	20.0	76 3	2 5	16.3	74.1	Clay
NOS11	63.1	15.2	67.1	2.5	15.5	67.1	Stone

SAMPLE	J	D	I	A.F.	D	I	Comment
NOS12	84.9	354.1	672	2.5	351.4	66.9	Stone
NOS13	58.5	356.9	602	2.5	356.8	61.4	Stone
NOS14	129.5	354.8	629	2.5	335.3	62.8	Stone
MEAN: K=110.7 Alpha95=3.8 c.s.e.=2.1					357.0	66.6	
MERIDIEN					357.1	65.3	

KEY: D=declination, I=inclination, J=intensity in units of $mAm^{-1}x10^{-3}$. A.F.=peak alternating demagnetising field in milliTesla. K=precision parameter, c.s.e.=circular standard error, alpha95=semi-angle of the 95% cone of confidence.

ESTIMATED DATE RANGE FOR LAST FIRING:100 A.D. – 170 A.D.

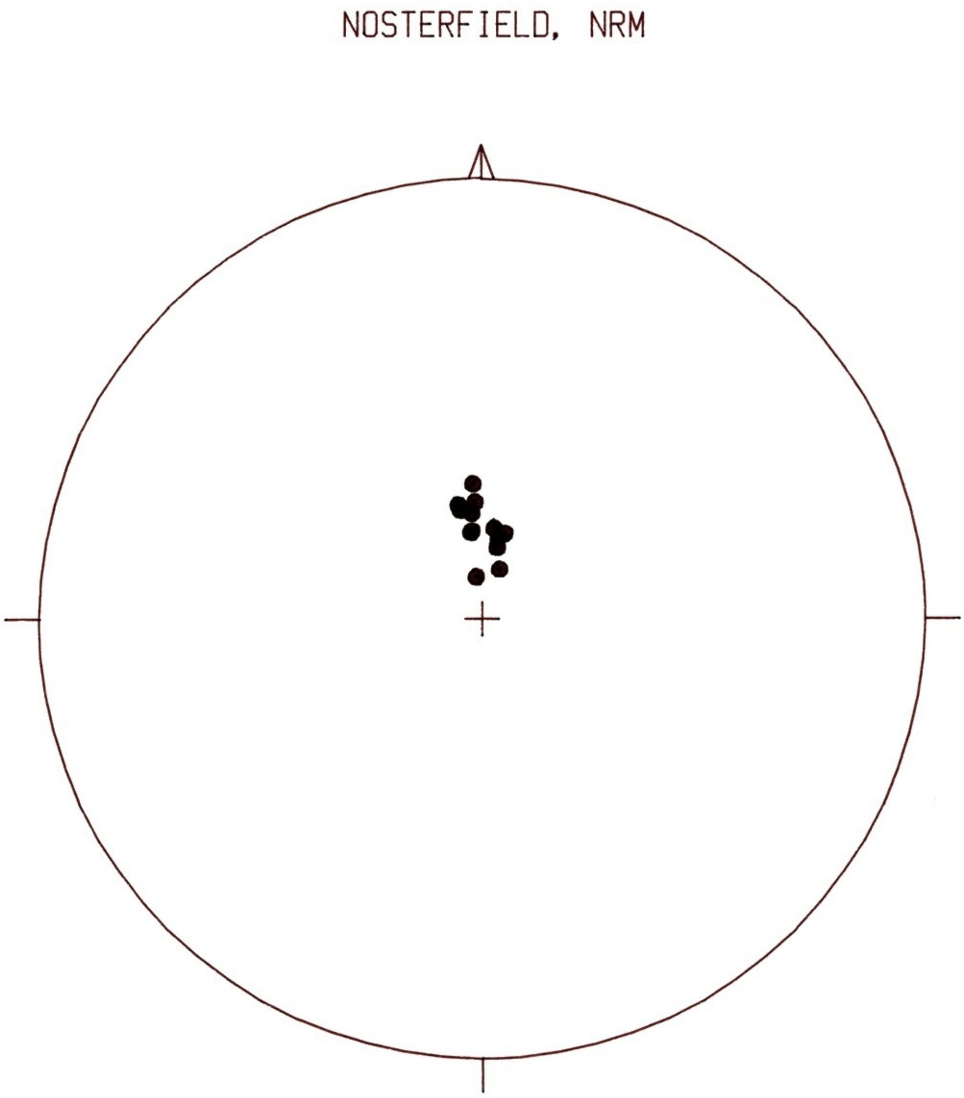

Figure 1 Directions of natural remanent magnetisation in samples from F159 at Nosterfield, shown on an equal area stereogram. In this representation, declination increases clockwise while inclination increases from zero at the equator to 90° at the centre of the projection.

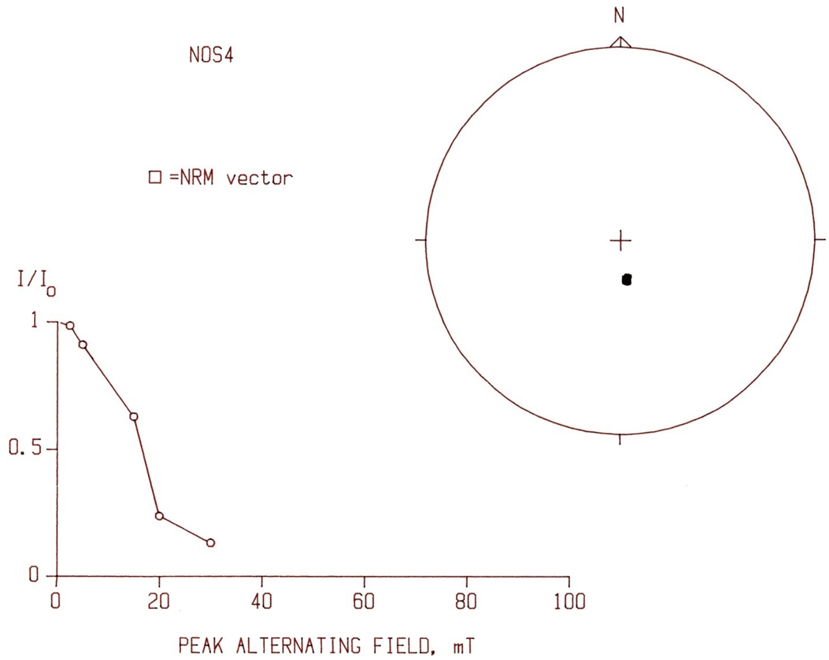

Figure 2 Changes in the direction and intensity of remanent magnetisation in pilot sample N0S4 during stepwise demagnetisation in alternating magnetic fields.

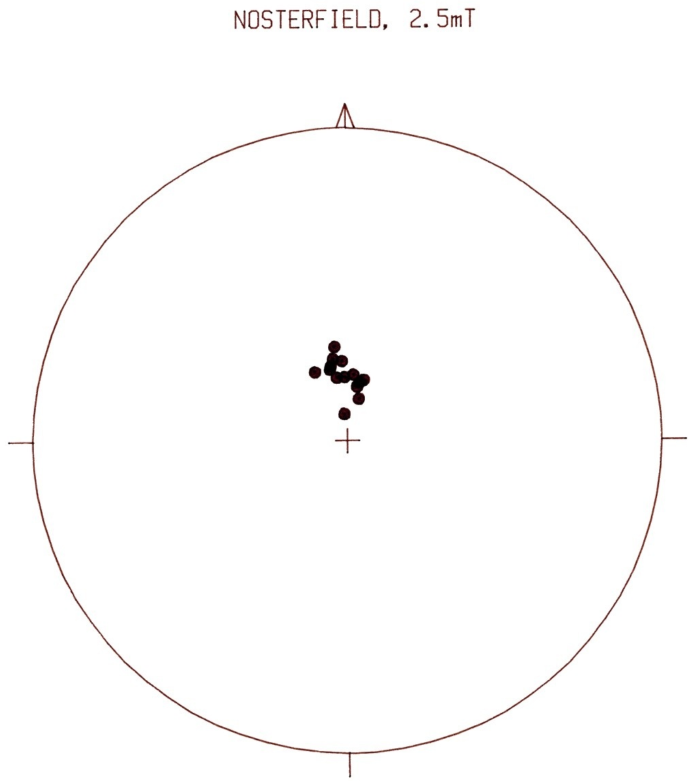

Figure 3 Directions of natural remanent magnetisation in samples from F159 after partial demagnetisation in an alternating field of 2.5mT.

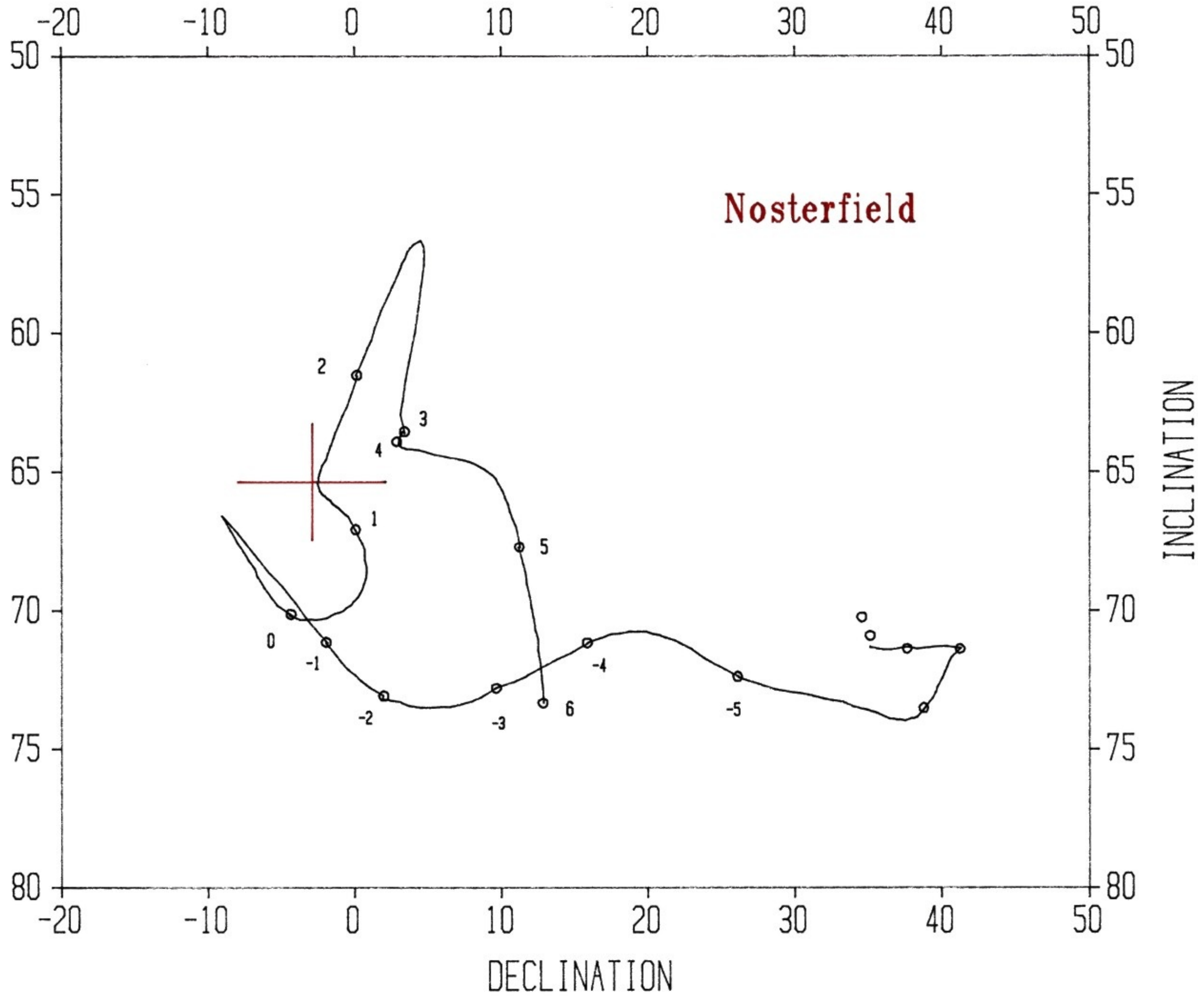

Figure 4 Comparison between the mean archaeomagnetic vector in the feature with the UK Master Curve 1000 B.C. to 600 A.D. Numbers refer to the date in centuries. The error bar is based on the circular standard deviation given in Table 1.

APPENDIX 1 Principles of Magnetic Dating

Magnetic dating is based on comparing the remanent magnetisation in an archaeological structure with a calibrated reference curve for the geomagnetic secular variation. Two distinct methods have evolved. The *intensity* technique relies on obtaining estimates of the past strength of the Earth's magnetic field while *directional* magnetic dating uses archaeomagnetic measurements to derive the orientation of the geomagnetic vector in antiquity. Intensity dating can only be applied to fired materials which have acquired a thermoremanent magnetisation upon cooling from high temperatures (>600°C) while the directional method enables the age of a broader range of archaeological materials to be determined. For example, sediments and soils may have acquired a dateable 'detrital remanence' if magnetic grains had been aligned by the ambient field during deposition. The growth of magnetic minerals during diagenesis or as a result of manufacturing processes can also give rise to a magnetisation which may enable materials such as iron-rich mortars, for example, to be dated. However hearths, kilns and other fired structures are the most common features selected for magnetic dating primarily because their thermoremanence is generally strong, stable and sufficiently homogeneous that the ancient field can be determined with sufficient precision from a small set of specimens. An analysis of dated archaeomagnetic directions, largely from fired structures, together with lake sediment and observatory records has enabled a master curve for the UK region to be synthesised for the period 2000 B.C. to the present (Clark, Tarling and Noel 1988).

For directional magnetic dating it is essential to obtain specimens of undisturbed archaeological material whose orientation with respect to a geographic coordinate frame is known. A number of sampling strategies have evolved, enabling specimens to be recovered from a range of archaeological materials with orientations being recorded relative to topographic features, the direction of the sun, magnetic or geographic north. For this feature the miniaturised 'button method', illustrated overleaf, was employed Clark *et al,* 1988). Modern archaeomagnetic magnetometers are sufficiently sensitive that only small volumes of material (--1 ml) are required for an accurate remanence measurement (Molyneux 1971). This has the advantage of reducing the impact of sampling on archaeological features - of particular significance if they are scheduled for conservation and display. For dating, all archaeomagnetic vectors are transposed to Meriden, the reference location for the UK Master Curve (Noel and Batt 1990).

Bibliography

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Molyneux, L., 1971. 'A complete result magnetometer for measuring the remanent magnetisation of rocks' *Geophys. J. R. Astr. Soc.,* 24: 429-433.

Noel, M. & Batt, C.M., 1990. 'A method for correcting geographically separated remanence directions for the purpose of archaeomagnetic dating,' *Geophys. J. R. Astr. Soc.,* 102: 753-756.

PART 4: RADIO-CARBON DATING OF A HORSE FEMUR FROM F316, C1732
Scottish Universities Environmental Research Centre (SUERC)

RADIO-CARBON DATING CERTIFICATE

Laboratory Code: SUERC-2974 (GU-11688C)

Submitter: Cecily Spall
Field Archaeology Specialists
University of York
King's Manor
York YO1 7EP

Site reference: NOSTERFIELD QUARRY

Sample reference: NOS'03 F316 C1732

Material: Bone (horse femur)

$\delta^{13}C$ relative to VPDB: -22.2%

Radiocarbon Age BP: **2000 ± 35** [AD 50 ± 35]

N.B.
1. The above 14C age is quoted in conventional years BP (before 1950 AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard, and the random machine error.
2. The calibrated age ranges are determined from the University of Oxford Radiocarbon Accelerator Unit calibration program (OxCal3).
3. Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and shoul be quoted as such in any reports within the scientific literature. Any questions directed to the Radiocarbon Laboratory should also quote the GU coding given in parentheses after the SUERC code.

Conventional age and calibration age ranges calculated by:	BRIAN T	13/08/2004
Checked and signed off by:	GORDON COOK	13/08/2004

APPENDIX I OSTEOLOGICAL REPORTS

Osteological analysis was undertaken by Field Archaeology Specialists in 1999 and 2003 on cremated and unburnt bone assemblages from three phases of watching brief at Nosterfield Quarry, North Yorkshire (SE 7661 0886) on behalf of Mike Griffiths and Associates for Tarmac North Ltd (Part 1). Subsequently, York Osteoarchaeology was commissioned to examine one skeleton excavated in December 2003 (Part 2).

PART 1: OSTEOLOGICAL ANALYSIS

Summary

Nineteen assemblages of cremated bone were the subject of osteological analysis, which identified that eight of these were non-human and were subsequently omitted from the analysis. Ten of the cremations were part of a small scattered cemetery, which is provisionally dated to the Middle Bronze Age. The cemetery contained both urned and unurned burials, some of which contained grave foods in the form of animal bone. The group included individuals of all ages, suggesting that the cemetery may have served a small community or family.

Another assemblage of cremated bone, as well as two inhumations were recovered from a discrete area. The assemblage included the cremated remains of an adult female, who might have been interred in a box, located within the perimeter of a large ring ditch. Two unusual inhumations were found in pits close to the ring ditch. Both graves only contained long bones arranged beside one another, with a skull placed on top. These burials probably represent secondary interments, following exposure of the body with subsequent loss of some bone to animal attack; the surviving bones were then collected and placed in pits. The burials contained a mature adult female buried in an isolated pit, and a female middle adult who had been placed in a pit of a pit-alignment that cut the ring ditch.

Acknowledgements

Field Archaeology Specialists Ltd would like to thank Dr Matthew Collins for his advice on the excarnated skeletons. FAS would also like to thank Karen Barker for the excavation of the skeletal remains contained in the urns.

1.0 INTRODUCTION

Human remains were uncovered during three phases of watching brief at Nosterfield Quarry, North Yorkshire (SE 7661 0886). These comprised a small cremation cemetery assemblage and two inhumations excavated in 2002 (Intervention 5), as well as four deposits of calcined bone excavated in 1999 (Intervention 1) by Field Archaeology Specialists Ltd. Three further assemblages of calcined remains were excavated in 1997 by Mike Griffiths and Associates. In September 2003, osteological analysis was carried out on the calcined and inhumed remains from all three phases of excavation.

Two inhumed skeletons (C1617 and C1642) had been interred near the perimeter of a large ring ditch (F264) in Intervention 5. The skeletons were found in unusual positions; only some of the long bones, the skulls and a small number of bone fragments representing the trunk were recovered from these burials. The position of the long bones laid out beside one another, with the skull placed on top of the bones, as well as the apparent lack of some skeletal elements, implies that the individuals must have been skeletonised prior to burial. A cremation burial (F269) was found in a square cut within the area enclosed by the ring ditch and may have been associated with the inhumations.

A small cremation cemetery was discovered in the central part of Intervention 5 and contained ten burials, which were dispersed around a small ring ditch. Four of the burials had been interred in urns and two of these may represent a double burial (F92 and F93), although their relationship was not clear upon excavation. Dating evidence from four urns and pottery sherds recovered from the cremation cemetery date these burials to the Middle Bronze Age (approximately 1300 BC), while all other deposits are undated.

The remaining assemblages of calcined bone derived from scattered pits and scoops.

1.1 AIMS AND OBJECTIVES

Initially, the assessment aimed to identify whether all calcined bone recovered from the site was human. The skeletal assessment then aimed to determine age, sex and stature, as well as any pathological conditions from which the individuals may have suffered. Information was also sought regarding the cremation techniques and the unusual funerary ritual of the two inhumed individuals.

1.2 METHODOLOGY

The inhumed skeletons were analysed in detail, assessing the preservation and completeness of each skeleton, as well as determining the age, sex and stature of the individuals and any pathological conditions.

The cremated bone was first analysed to determine whether it was human or non-human. The human bone was subsequently sieved through a stack of sieves, with 10mm, 5mm and 2mm mesh sizes. The bone recovered from each sieve was weighed and sorted into identifiable and non-identifiable bone. The identifiable bone was divided into five categories: skull, axial (excluding the skull), upper limb, lower limb, long bone (unidentifiable as to the limb). All identifiable groups of bone were weighed and bagged separately.

Bone colour, fragmentation, preservation and rate of cracking and warping resulting from the burning were recorded in order to obtain information on cremation processes and subsequent funerary rituals.

2.0 OSTEOLOGICAL ANALYSIS

Osteological analysis is concerned with the determination of the demographic profile of the assemblage based on the assessment of sex, age and stature, as well as measurements and non-metric traits. This information is essential in order to determine the prevalence of disease types and age-related changes. It is also crucial for identifying gender dimorphism in occupation, lifestyle and diet, as well as the role of different age groups in society.

2.1 PRESERVATION

All calcined bone assemblages recovered from Intervention 1, as well as those excavated in 1997, were found to be non-human. Additionally, the uppermost backfill of pit F103 from Intervention 5 contained calcined bone, which was non-human (Table 1). The eight assemblages of animal bone have been omitted from this report. Ten burials originating from the cremation cemetery and a single cremation burial as well as two inhumations are discussed here.

Table 1 Summary of the assemblage preservation

Area	Context	Feature	Feature type	Human/ Animal	Inclusions	Bone State	Preservation	Age	Sex	Weight (g)
1997	1075	-	-	animal	-	white	poor	-	-	68.1
1997	1306	-	-	animal	-	white	poor	-	-	0.5
1997	7081	-	-	animal	-	white	good	-	-	1.2

Area	Context	Feature	Feature type	Human/ Animal	Inclusions	Bone State	Preservation	Age	Sex	Weight (g)
1	1174	116	pit	animal	-	white	poor	-	-	1
1	1186	125	scoop	animal	-	white	moderate	-	-	122
1	1200	134	pit	animal	-	white	moderate	-	-	14
1	1195	142	scoop	animal	-	white	poor	-	-	0.7
5	1134	90	burial	human	charcoal	white	poor	-	-	0.6
5	1135	91	burial	human	charcoal, pottery, hoof	white	good	38139	-	104.4
5	1136	92	burial	human	urned	white	good	13+	-	90.4
5	1137	93	burial	human	urned	white	moderate	-	-	1.7
5	1140	96	burial	human	urned, animal bone	white	good	36+	?male	1301.7
5	1143	98	burial	human	charcoal, pottery	white/blue/black	moderate	16+	-	5.4
5	1144	99	burial	human	charcoal	white/brown	poor	-	-	0.3
5	1145	100	burial	human	charcoal	white	very poor	-	-	1.3
5	1149	103	pit	animal	-	white/blue	moderate	-	-	37.7
5	1156	105	burial	human	charcoal	white/blue	moderate	-	-	73.8
5	1157	106	burial	human	urned, charcoal	white/blue	excellent	16+	-	216.8
5	1617	253	inhumation	human	-	unburnt	very poor	26-45	female	-
5	1642	267	inhumation	human	-	unburnt	very poor	46+	?female	-
5	1647	269	burial	human	charcoal	white	good	16+	female	206.2

Skeletal preservation depends upon a number of factors, including the age and sex of the individual as well as the size, shape and robusticity of the bone. Burial environment, post-depositional disturbance and treatment following excavation can also have a considerable impact on bone condition. Preservation of human skeletal remains is assessed subjectively, depending upon the severity of bone surface erosion and post-mortem breaks, but disregarding completeness.

Preservation was assessed using a grading system of five categories: very poor, poor, moderate, good and excellent. Excellent preservation implied no bone surface erosion and very few or no breaks, whereas very poor preservation indicated complete or almost complete loss of the bone surface due to erosion and severe fragmentation.

Preservation varied considerably throughout the bone assemblages (see Table 1). The severity of erosion and fragmentation depended to a large extent on the degree of disturbance by ploughing, which is estimated to have truncated the features by around 0.30m. The use of chemicals in agricultural activities and leaching from rain water may have exacerbated degradation. Few of the cremation burial pits survived as more than 2cm of the base of the burial pit. The degree of truncation of the features was illustrated by some of the cremation vessels, where little more than the base had remained intact, with the exception of the urn in F106, which was inverted and had remained intact. Nevertheless, the presence of the urns had protected the bones from the effects of leaching and erosion. This was illustrated most effectively in burial F106, which contained bone fragments up to 70mm long and showed no evidence for erosion. Cremated bone recovered from outside the cremation vessel on the other hand, was fragmentary and had suffered from severe erosion. The extent of the truncation had therefore not only caused significant bone loss, but also considerable deterioration to the surviving bone.

The inhumation burials were also truncated, resulting in loss of parts of the skulls, which were uppermost in the burial pits. These unburnt bones were extremely porous, and disintegrated upon removal from the grave. Erosion had destroyed the bone surface entirely. Furthermore, none of the spongy parts of the bone, such as the vertebrae or long bone joints were preserved. It is possible that the bones had already been weakened as a result of exposure before burial, which would have allowed weathering of the bone, as well as the possibility of fungal, mammal and bacterial attack.

The fragment size of cremated bone is frequently attributed to post-cremation processes. This is because skeletal elements retrieved from modern crematoria tend to be comparatively large before being ground down for scattering or deposition in urns. However, bone is also prone to fragmentation if it is moved while still hot (McKinley 1994, 340) and it may be this process which contributed to the fragmentation of the cremated bone from Nosterfield Quarry. It is probable that truncation affected bone degradation, which is illustrated by the comparative difference in skeletal fragment size from urned burials F96 and F106. Burial F96 contained the greatest quantity of bone in the best preserved, though truncated vessel. Nevertheless, the bone fragment size from this burial was considerably smaller than the size of fragments from F106, an inverted burial that had survived intact.

Bone fragment size varied between and within the eleven cremation burials. However, the majority of bone recovered derived from the 5mm sieve (Table 2). Bone smaller than 5mm was often not separated from the fine gravel residue, and therefore constitutes only a small proportion of the total assemblages. In 55% of burials, one third or more of the assemblages constituted bone fragments larger than 10mm. These were mostly assemblages which contained a more substantial proportion of bone. However, only in two burials (18%) was the majority of bone larger than 10mm. The majority (64%) of assemblages contained bone fragments that were between 5 and 9mm in size. Two burials which had suffered from particularly severe truncation and contained less than 4g of human bone contained bone fragments which were retained predominantly in the 2mm sieve.

Table 2 Summary of cremated bone fragment size

Feature No	10mm (g)	10mm (%)	5mm (g)	5mm (%)	2mm (g)	2mm (%)	Residue (g)	Total human (g)
90	0	0	0.6	100	0	0	162.1	0.6
91	28.7	27.5	65.9	63	9.8	9.5	1225	104.4
92	35.3	39	45.2	50	9.9	11	0	90.4
93	0	0	1.7	100	0	0	0	1.7
96	583.2	45	432.7	33	285.8	22	83.8	1301.7
98	1.4	26	4	74	0	0	321.3	5.4
99	0	0	0.3	100	0	0	235.9	0.3
100	0	0	0	0	1.3	100	394.4	1.3
105	3.2	0	1.4	44	1.8	56	73.8	3.2
106	132.2	61	73.7	34	10.9	5	0	216.8
269	72.3	35	124.9	61	9	4	960.7	206.2

The quantity of cremated bone per burial varied considerably from 0.7g to 1301.7g (see Table 1), with an overall mean weight of 175.6g. The quantity of bone retrieved from the burials weighed considerably less than that produced by modern crematoria, which tends to range from 1001.5g to 2422.5g with an average of 1625.9g (McKinley 1993). Wahl (1982, 25) found that archaeologically recovered remains of cremated adults tend to weigh (between 250g and 2500g), as a result of the commonly practised custom of selecting only some of the cremated bone from the pyre for inclusion in the burial, thereby representing a symbolic, or token, interment. In a study of Bronze Age cremation burials, McKinley (1997) also observed that the entire cremated remains were rarely, if ever, interred in the burial. Most burials from Nosterfield Quarry produced less than 10% of the quantity of bone expected to remain following burning, and only burial F96 contained the amount of bone similar to the quantity expected to survive cremation. The only intact cremation burial (F96) only contained 216.8g of cremated bone, which supports the idea of a token interment. Nevertheless, it is improbable that the small quantity of bone in some of these burials was solely the result of post-cremation selection, but is probably also influenced by the severe truncation of the burials.

The cremated bone from Nosterfield was very well burnt, causing the complete loss of the organic portion and producing a white colour throughout most assemblages. One assemblage (F99) also contained brown bone elements (see Table 1). Brown colouration of cremated bone is generally associated with haemoglobin, or soil discolouration (Correia 1997, 276). Some of the bone fragments from burials F98, F105 and F106 exhibited a bluish hue, which occurs when the organic components of the bone are pyrolised. According to McKinley (1989), the body requires a minimum temperature of 500 degrees Celsius over seven to eight hours to achieve complete calcination of the bone.

Despite the fragmentation of bone elements, it was possible to identify skeletal elements in all cremated bone assemblages that weighed more than 1.5g. In three burials containing between 0.3g to 1.3g of bone, it was not possible to identify any bone elements (Table 3). In 55% of burials the majority of bone fragments could be identified. In all cases, the majority of identifiable bones were long bone shaft fragments or cranial fragments. However, other skeletal elements were also recovered from the burials, particularly vertebral articular facets and rib shaft fragments. Furthermore, burial F269 contained a number of intact finger bones (phalanges), including most of the bones in the finger tips. Large bone fragments, such as parts of the femoral shafts, the ear bone (petrous temporals) and parts of the lower jaw also survived well and were noted in a number of burials.

Table 3 Summary of identifiable elements in the cremation burials

Feature No	Skull (g)	Skull (%)	Axial (g)	Axial (%)	U L (g)	U L (%)	L L (g)	L L (%)	UI L B (g)	UI L B (%)	Total ID (g)	Total ID (%)	Total UI D (g)	Total UI D (%)
90	0	0	0	0	0	0	0	0	0	0	0	0	0.6	100
91	51.4	54	8.5	9	1.4	1	2.6	3	31.1	33	95	91	9.4	9
92	17.2	24	3	4	6	11	22.3	31	21.4	30	71.9	80	18.5	20
93	0.3	18	0	0	0	0	0	0	1.4	82	1.7	100	0	0
96	148.7	22	55	8	15.8	2	108.2	16	358.9	52	686.7	53	615	47
98	0.9	20	0	0	0	0	0	0	3.8	80	4.7	87	0.7	13
99	0	0	0	0	0	0	0	0	0	0	0	0	0.3	100
100	0	0	0	0	0	0	0	0	0	0	0	0	1.3	100
105	0	0	0	0	0	0	0	0	1.4	100	1.4	44	1.8	56
106	32.6	17	21.5	11	29	15	27.3	14	83	43	193.6	89	23.2	11
269	59	37	13.8	8.5	12.2	7.5	6.5	4	69.6	43	161.1	78	45.1	22

UL - upper limb; LL - lower limb; UIL - long bone (unidentified as to upper or lower limb); ID - identifiable bone; UID - unidentifiable bone

Four of the burials were excavated in spits which varied in size between 20mm to 50mm in an attempt to ascertain, whether the bone was distributed in a deliberate order, or whether it had been placed into the urn with no regard for skeletal element. Spit excavation showed that in the urned burials, the majority of bone was located in the upper part of the vessel, suggesting that water may have percolated through the burial, causing the base of the vessel to act like a silt trap, depositing smaller fragments of bone and silt at the base of the vessel, while the larger fragments remained in the upper parts of the urn. In the unurned burials on the other hand, the central of three spits contained the largest quantity of bone, implying that the lack of a vessel allowed more even distribution of the bone in within the cut. However, the complete lack of the upper parts, and often the majority of the burials means that this is merely a hypothesis. Excavation of the burials in spits did not determine any pattern of deliberate bone deposition in the burials.

Upon excavation of the matrix in one of the vessels (F106), it was noted that this included a number of air pockets, which are not uncommon and may point to the fact that organic material had been included within the vessel, which has subsequently deteriorated (McKinley 1997, 142).

Two of the burials (F91, F98), which were severely truncated, contained a small number of pottery fragments. It is possible that these burials had been interred in urns, or that pottery had been provided as grave goods. All of the unurned burials and one of the urned burials included a small amount of charcoal, suggesting the inclusion of some pyre material with the skeletal remains. According to McKinley (1997, 137) it is not unusual for pyre debris to be included in Bronze Age burials. However, pyre debris appears to have been deliberately omitted from the remaining urned burials.

Inclusions of animal bone were found in two burials: burial F91 contained a fragment of hoof, while burial F96 included one fragment of unidentified animal long bone. Both bone fragments were burnt and had probably been placed on the pyre with the deceased as a pyre good, to be selected later for inclusion in the grave.

2.2 MINIMUM NUMBER OF INDIVIDUALS

A count of the 'minimum number of individuals' (MNI) recovered from a cemetery is carried out as standard procedure during osteological assessments of inhumations in order to establish how many individuals were represented by the articulated and disarticulated human bones (without taking the archaeologically defined graves into account). The MNI is calculated by counting all long bone ends, as well as other larger skeletal elements, such as the hip joints and cranial elements. It is not possible to calculate the MNI for cremation burials, because only a token selection of bone from the pyre tends to be buried. Double burials can be identified only if skeletal elements are duplicated, or if skeletons of different ages are represented in one burial. In this instance, no double burials were identified.

Although archaeologically, two distinct inhumation burials were identified, it is possible in this instance, that the burials did not represent discrete individuals, but may have contained an amalgamation of different individuals' bones. However, the complete lack of long bone ends did not allow the determination of an MNI. Neither was it possible to suggest, whether the shape and size of the bones in each grave were uniform and would have belonged to one person. However, it was possible to suggest that none of the bone elements in either grave were represented by more than their usual number, suggesting that each grave contained only one individual.

2.3 ASSESSMENT OF AGE

The determination of age relies on the development and degeneration of bones and teeth. Different stages of development and degeneration have been mapped using data gathered from individuals of known age (Cox 2000). Methods used to determine age rely on the preservation of the dentition and hips and are most precise when used to assess the developing skeleton, due to the fact that the growth of bones and teeth follows a relatively predictable course up to the age of twenty-five. However, the degeneration of the skeleton, which is assessed according to the severity of wear on the teeth, hips and ribs, depends on the sex, occupation, lifestyle and health of the individual analysed. The effect of wear on the teeth and bones tends to vary increasingly with advancing age; as a result, age cannot be reliably determined beyond 46 years.

Age was divided into a number of categories, including foetus (up to 40 weeks *in utero*), neonate (around the time of birth), infant (following birth to 1 year), juvenile (1-12 years), adolescent (13-17 years), young adult (18-25 years), young middle adult (26-35 years), old middle adult (36-45 years) and mature adult (46+years). Age was determined using standard ageing techniques, specified by Buikstra and Ubelaker (1994) and Scheuer and Black (2000).

Because none of the criteria normally used for age determination were represented in any of the burials, it was not possible to estimate age in three of the cremated individuals. This meant that age determination was based on less reliable criteria. The dental development of F91 suggested that this individual was aged between two to six years, whereas F92 was over the age of thirteen. Age estimation was based on bone robusticity in burials F98 and F106, which suggested that these individuals were adolescents or adults. Possibly the oldest cremated individual was F96, who, based on the dental development and the presence of degenerative joint disease, was older than 36 years of age. This implies that the cremation cemetery held individuals of all ages and suggests that it may have represented a communal or family burial plot.

The cremated individual (F269) interred in the vicinity of the inhumations was at least sixteen years old, but no more than 25 years of age, based on the dental development, cranial suture fusion and fusion of the finger bone joints.

The extremely fragmentary and eroded state of preservation of the inhumed skeletons allowed only tentative age assessment. This was based solely on dental wear, which is not an accurate ageing characteristic. The limited dental wear on the molars of F253 initially suggested an age of 26 to 35 years. However, the anterior teeth of this individual were severely worn, indicating that this individual may have been older. A wider age bracket, between 26 and 45 years has therefore been suggested for this individual. Similarly, the dental wear of skeleton C1642 varied considerably, with severe wear on one side of the jaws, and moderate wear on the other. However, such uneven wear may occur, when corresponding teeth on the upper or lower jaw have been lost ante-mortem, and it is therefore probable, that the more severe wear represents the individual's age, which is thought to be older than 46 years.

2.4 SEX DETERMINATION

Sex determination is a vital part of the analysis of human remains, because of the likelihood that different sexes followed different lifestyles as a result of varying occupations, child bearing, or other activities which may have affected their health.

Sex assessment relies on the presence of the skull and pelvis, the morphology of which are sexually dimorphic, as described by Mays (2000). It was possible to estimate sex in two cremated individuals, F96, who was a probable male, and F269, who is thought to have been female. None of the other cremated assemblages contained skeletal elements which were sexually dimorphic.

The mastoid process (bone behind the ear) from inhumation, C1617 suggested that this individual was a female, a diagnosis, which was supported by the gracile nature of this skeleton. The sex of the second inhumed individual could not be established with certainty. However, based on the gracile nature of the bones, it was thought that this individual may have been female. Sex could be assessed in two of the cremated individuals; while the individual from burial F269 was female, the largest burial (F96) contained a male. It is interesting to note that the two inhumed individuals, as well as the cremation associated with ring ditch F264, were female.

2.5 METRIC ANALYSIS

Cremated bone shrinks at an inconsistent rate (up to 15%) during the cremation process and it was therefore not possible to measure the bone from these cremation burials. The fragmented nature of the inhumed individuals did also not allow any metrical analysis.

2.7 NON-METRIC TRAITS

Non-metric traits are additional sutures, facets, bony processes, canals and foramina, which occur in a minority of skeletons and are thought to suggest diversity and familial affiliation between skeletons (Saunders 1989). Each skeleton and cremated bone assemblage was examined for thirty cranial and thirty post-cranial non-metric traits selected from the osteological literature (Buikstra and Ubelaker 1994, Finnegan 1978, Berry and Berry 1967). Non-metric traits were not identified in the cremated or inhumed individuals.

3.0 PATHOLOGICAL ANALYSIS

The analysis of skeletal and dental manifestations of disease can provide a vital insight into the health and diet of past populations, as well as their living conditions and occupations. However, only one individual (F96) exhibited skeletal manifestations of disease.

Joint disease is commonly observed in populations of all periods, especially in those where older individuals are well represented. Degenerative joint disease (DJD) is caused by a number of factors, including increasing age, mechanical factors, hereditary predisposition and endocrine stress. Different factors can affect different joints; Jurmain (1980, 1991) observed that DJD in the elbow and knee was more likely to be caused by functional stress, whereas the hip and shoulder were more likely to degenerate as a result of increasing age. DJD is expressed as additional bone formation around the joint margins (osteophytes), or through pitting of the joint surface. Evidence for DJD was observed in the spine of F96. Two vertebral articular facets were found to exhibit evidence for DJD: one of the facets showed pitting on the joint surface, while the second facet showed manifestations of joint disease in the form of additional lipped new bone formation (osteophytes) at the margin of the join (Plate 1).

Plate 1 F96, two vertebral facets with DJD in the form of porosity (left) and osteophytes (right)

Spinal joint disease is very common in most populations from archaeological contexts, because of stress exerted on the spine as a result of bipedalism. The intervertebral discs are the ‘shock absorbers’ of the spine, but these can degenerate as a result of gradual desiccation, which then causes transmission of the stress from the vertebral discs to the articular facets and ligaments (Hirsh 1983, 123). Spinal osteophytes form in response to the constant stress that is placed on the spine as a result of human posture (Roberts and Manchester 1995, 106). Increasing stress or activity can therefore lead to increased size and prevalence of osteophytes (*ibid*). The degree of joint disease is therefore graded from mild to severe. The severity of both the porosity and osteophytes suggests that this individual suffered from a moderate expression of the condition.

The small quantity of cremated bone recovered from Nosterfield Quarry, as well as the considerable fragmentation and erosion of the bone from both cremation burials and inhumations may explain the lack of further pathological manifestations from the site.

4.0 DENTAL HEALTH

Analysis of the teeth from archaeological populations provides vital clues about health, diet and oral hygiene, as well as information about environmental and congenital conditions. Tooth crown and root fragments were recovered from burials F91, F92, F96 and F269. Unfortunately, little information could be gained from these teeth, because they were shattered into tiny fragments during the cremation process.

Few teeth survived in the graves of the two inhumed females, and even fewer remained in the jaw bones. As a result, it was not possible to determine, which of the teeth had been lost ante-mortem or post-mortem.

Thirteen teeth (of a maximum number of 32) were recovered from grave F253, but two of the teeth (a mandibular molar and premolar ante-mortem) had been lost ante-mortem (Appendix 1). This individual had not suffered from any cavities or dental plaque concretions (calculus) adhering to the teeth, although it is possible, that the latter may have been lost as a result of post-depositional processes. It was, however, possible to determine that this individual had suffered from considerable periodontitis, which is an inflammatory disease affecting the soft tissues and bone surrounding the teeth. Periodontitis results in the resorption of the alveolar bone, which can lead to loosening of and eventual loss of the teeth and may have been responsible for the ante-mortem tooth loss of two teeth.

Neither of the jaw bones survived in the mature adult female (C1642). This individual had sixteen surviving teeth, which were all mandibular, with the exception of a maxillary canine and premolar. Four of the teeth exhibited thin or patchy deposits of concreted dental plaque. Additionally, the individual suffered from a moderately sized dental cavity on the right mandibular wisdom tooth.

Dental wear tends to be more common and severe in archaeological populations than in modern society, being caused by a much coarser diet based upon contemporary corn grinding techniques. Severity of the dental wear was assessed using a chart developed by Smith (1984). Each tooth was scored using a grading system ranging from 1 (no wear) to 8 (severe attrition of the whole tooth crown).

Wear was slightly less severe in the younger individual, and ranged from two to six, with the least wear on the wisdom teeth (which are the last teeth to erupt and are therefore least likely to exhibit attrition). The wear of the mature adult (C1642) ranged in severity from moderate to severe, with the worst wear on the left mandibular molars.

The dental health of the two inhumed females suggests that these women practised relatively poor dental hygiene, leading to inflammation of the gums, tooth loss, cavities and plaque concretions.

5.0 DISCUSSION AND SUMMARY

Nineteen deposits of calcined bone were recovered from Nosterfield Quarry between 1997 and 2002, eight of which contained solely non-human bone. Ten human cremation burials were found in the wider vicinity of a small ring ditch (F148). Four of these burials had been interred in urns and it is possible that two further burials, which contained fragments of pottery, had also been urned. Alternatively, sherds of pottery may have been included as grave goods in these cases. Evidence for possible grave goods was found in two burials in the form of single animal bone inclusions. Both bones were calcined, and had probably been placed on the pyre together with the deceased. Charcoal was found in all unurned and one of the urned burials, and may have been a deliberate inclusion in the burials, or may have been accidentally raked up from the pyre together with the human remains. It is possible that one of the burials (F106) also contained organic material, which had since deteriorated, but had left air pockets in the soil matrix in the urn.

The group included one possible double burial (F92 and F93), characterised by two urns in a poorly defined cut. Notably, the less truncated urn contained considerably less bone than the more severely disturbed vessel. This may suggest that one of the urns was an accessory vessel, or that the smaller quantity of bone may simply relate to differential bone deposition within the urn. Osteological analysis was not able to define, whether the bone derived from the same, or from different individuals and the tiny quantity of bone in F93 (1.7g) did not permit any conclusions regarding funerary ritual.

Age determination was difficult in most cases, because of the lack of skeletal ageing characteristics in the burials. Nevertheless, it was possible to determine that the cemetery group included individuals of all ages, with an under-representation of children. Notably, even the single burial of a young child contained pottery, suggesting that archaeologically visible evidence for burial ritual was not affected by age. It was only possible to determine sex in one individual (F96) who was male; thus comparisons with funerary ritual and gender could not be made.

No pyre sites were observed during excavations at Nosterfield. Although Bronze Age pyre sites have been found in the vicinity of a number of cremation cemeteries, they tend to have been constructed on the ground surface (McKinley 1997, 132). In experimental case studies, heat effects of surface pyres penetrated no more than 0.10m below the surface (McKinley 1997, 134) and may therefore have been subject to the severe truncation of the site. Additionally, pyre sites were often cleared soon after use, so that little charcoal ash and cremated bone may remain *in situ* to identify the feature (*ibid*). A number of features containing charcoal and evidence of *in situ* burning have been located at Nosterfield Quarry and although none of these contained human bone, it is possible that they represent cremation pyres.

Two inhumations and a further cremation burial were found in the vicinity of a much larger ring ditch (F264), which was situated 292m to the southwest of ring ditch F148. One of the inhumations was found in the upper part of the backfill of a pit in one of the pit-alignments. The skeletal remains of a middle-aged female had been interred in the pit after this had silted up, suggesting that the burial was secondary to its original use. The same alignment cut the ring ditch F264, implying that it is later in date.

The second inhumation of an elderly female was located immediately to the southeast of the ring ditch in a sub-oval pit. The inhumation burials were both thought to be secondary interments, following skeletonisation of the body. Only some bone elements, which included predominantly skulls and long bones, had been placed in an orderly, but not anatomical manner in the pits. The evidence suggests that the bodies had been left exposed and underwent normal processes of decomposition, as well as defleshing and attack as carrion, which may explain the lack of some of the bones. Any surviving bones were finally collected and interred in burial pits. Alternatively, it is possible that the bodies were defleshed deliberately and only token samples placed in the pits.

A cremation burial was found in a square cut within ring ditch F264, on the southern side of its centre. The burial had been severely truncated, and contained 200g of human bone, as well as a small quantity of charcoal. This individual was also a female adult, but her age could not be determined more accurately. It is possible, that the burial had been interred in a square container, which may explain the shape of the grave cut. Its location within the ring ditch suggests that this burial may have been associated with the ring ditch.

Although there is no evidence to suggest that the inhumations were contemporary, this is assumed on the basis of the similarity in bone deposition and their vicinity to ring ditch F264, despite the distinct nature of the burial features. However, the burials may not be contemporary with the ring ditch itself, and the cutting of the ring ditch by two of the pits implies that there was at least some time lapse between the excavation of the ditch and that of the pits. Furthermore, their relationship with the cremation burial has not been identified. Although cremation burials and inhumations do occur contemporaneously at other sites in Yorkshire, particularly the Wolds (Woodward 2000, 23), it is equally possible that the burial features are several generations apart.

Prehistoric burials are frequently associated with liminal spaces, such as boundaries. In this case, at least one of the inhumations is directly associated with a boundary, through its interment in one of the pits from the pit alignment. Similarly, the smaller ring ditch is cut by a ditch which encloses a large part of the excavated site. The small cremation cemetery in this part of the site appears to be spread alongside the ditch, rather than distributed around the ring ditch, which may suggest a further boundary association. However, until the features have been subject to absolute dating, it is not possible to determine, which of these features may be contemporary with the cemetery and any attempts of interpreting these must be regarded as tentative.

6.0 RECOMMENDATIONS

Until targeted absolute dating has been carried out of the inhumations and some of the cremation burials, interpretations of the funerary treatment are mere speculation. Once their date is known, focussed research on mortuary behaviour of the period can be carried out, with the aim of identifying parallels for the funerary treatment of the individuals interred at Nosterfield Quarry. Dating may also contribute further information regarding the prehistoric land use and character of the landscape.

Furthermore, histological analysis of the inhumed skeletons may be able to prove scientifically, whether these individuals had been exposed prior to burial or had been deliberately defleshed. This will provide a further insight into the beliefs of the people interred at Nosterfield.

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APPENDIX A: OSTEOLOGICAL AND PALAEOPATHOLOGICAL CATALOGUE

Skeleton number	F253
Preservation	Very poor
Completeness	15%; parts of the skull, shoulders, lower arms, legs, hands, vertebrae and ribs
Age	26-45, middle adult
Sex	female
Stature	-
Non-metric traits	-
Pathology	-
Dental health	parts of mandible present; moderate periodontitis; 13/32 teeth; considerable wear; two teeth lost am

	Right dentition								Left dentition							
Present	-	p	-	p	p	p	p	-	-	-	p	p	p	-	-	p
Calculus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	-	4	-	6	5	5	5	-	-	-	4	5	-	-	-	2
Maxilla	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Mandible	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Present	-	-	am	am	-	p	-	p	-	p	-	-	p	-	p	-
Calculus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	-	-	-	-	-	4	-	3	-	4	-	-	5	-	-	-

Skeleton number	F253
Preservation	very poor
Completeness	18%; parts of the skull, left humerus, lower arms, femora, tibiae, fibulae and pelvis
Age	46+, mature adult
Sex	female
Stature	-
Non-metric traits	-
Pathology	-
Dental health	parts of mandible present, 16/32 teeth, moderate to considerable wear, calculus on 5/16 teeth, moderate root resorption

	Right dentition								Left dentition							
Present	-	-	-	p	-	-	-	-	-	-	p	-	-	-	-	-
Calculus	-	-	-	Sa	-	-	-	-	-	-	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	-	-	-	5	-	-	-	-	-	-	4	-	-	-	-	-
Maxilla	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Mandible	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Present	p	p	-	p	p	p	p	p	p	p	p	p	p	-	p	p

Calculus	-	-	-	-	-	Fm	-	Fa	-	Fa	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	Mb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	4	4	-	4	5	4	4	5	5	4	4	5	4	-	7	7

KEY:

Present - Tooth presence; am - ante-mortem tooth loss; pm - post-mortem tooth loss; p - tooth present; - - jaw not present

Caries - Calculus; F - flecks of calculus; S - slight calculus; M - moderate calculus; H - heavy calculus; a - all surfaces; b - buccal surface; d - distal surface; m - mesial surface; l - lingual surface; o - occlusal surface

DEH - dental enamel hypoplasia; l - lines; g - grooves; p - pits

Caries - caries; s - small lesions; m - moderate lesions; l - large lesions

Wear - dental wear; numbers from 1-8 - slight to severe wear

PART 2: NOSTERFIELD QUARRY, NORTH YORKSHIRE

Malin Holst, York Osteoarchaeology Ltd

Summary

In January 2004, York Osteoarchaeology Ltd was commissioned by Field Archaeology Specialists Ltd to carry out an osteological assessment of one human skeleton recovered during a watching brief at Nosterfield Quarry, North Yorkshire (NGR SE 7661 0886).

The skeleton had been interred in the partially backfilled ditch of a square barrow, provisionally dated to the Middle Iron Age. The barrow was part of a prehistoric landscape of ritual significance, which includes henge monuments, pit alignments, a cremation cemetery and further barrows.

Osteological analysis revealed that the skeleton was that of a man in his late thirties to mid forties. The bones of the arms, thighs and neck exhibited evidence for muscular strain indicative of their use in occupational activities. The man had also suffered from inflammation of the left leg, although this was healing at the time of his death. Two successive fractures of the left forearm would have caused disability of the left arm, which resulted in the subsequent greater use of the right arm in order to compensate. It is probable that these fractures were defence or work-related injuries.

Acknowledgements

York Osteoarchaeology Ltd would like to thank Field Archaeology Specialists Ltd for their help and support during this project.

1.0 INTRODUCTION

In January 2004 York Osteoarchaeology Ltd was commissioned by Field Archaeology Specialists Ltd to carry out an osteological assessment of one skeleton excavated in December 2003 during a watching brief at Nosterfield Quarry, North Yorkshire (NGR SE 7661 0886).

The skeleton (C1754) had been interred in a supine semi-flexed position in an oval pit (F335) cut into the partly backfilled ditch of a square barrow (F320). The individual had suffered slight damage to the left knee and right foot when the barrow ditch was re-cut at a later date. The skeleton was orientated NNE to SSW and the skull leant on both hands, which were positioned under the left side of the face, as if asleep. One horse tooth was recovered from between the legs of the skeleton and this may represent a grave good, or may have accidentally found its way into the grave, when the barrow ditch was re-cut. The burial has been tentatively dated to the mid Iron Age on the basis of its style.

1.1 AIMS AND OBJECTIVES

The skeletal assessment aimed to determine age, sex and stature, as well as to record any pathological conditions from which the individual may have suffered. Additionally, an attempt was made to identify the possible reasons for the unusual position of the arms of this individual.

1.2 METHODOLOGY

The skeleton was analysed in detail, assessing the preservation and completeness, as well as determining the age, sex and stature of the individual (Appendix 1). All pathological conditions were recorded and described.

2.0 OSTEOLOGICAL ANALYSIS

Osteological analysis is concerned with the determination of the demographic profile of the assemblage based on the assessment of sex, age and stature, as well as measurements and non-metric traits. This information is essential in order to determine the prevalence of disease types and age-related changes. It is also crucial for identifying gender dimorphism in occupation, lifestyle and diet, as well as roles of different age groups in society.

2.1 PRESERVATION

Skeletal preservation depends upon a number of factors, including the age and sex of the individual as well as the size, shape and robusticity of the bone. Burial environment, post-depositional disturbance and treatment following excavation can also have a considerable impact on bone condition. Preservation of human remains is assessed subjectively, depending on the severity of bone surface erosion and post-mortem breaks, but disregarding completeness.

Preservation was assessed using a grading system of five categories: very poor, poor, moderate, good and excellent. Excellent preservation implied no bone erosion and very few or no post-depositional breaks, whereas very poor preservation indicated complete or almost complete loss of the bone surface due to erosion and severe fragmentation.

The skeleton was moderately well-preserved, due to extensive bone loss of the spongy bones of the joints and spine, and the cranium was fragmented, but complete. Additionally, many of the bones had suffered a moderate degree of fragmentation and erosion, some of which may have been caused when the skeleton was disturbed during re-cutting of the barrow ditch. Loss of the spongy bones meant that the skeleton was 70% complete.

2.2 MINIMUM NUMBER OF INDIVIDUALS

A count of the ‘minimum number of individuals’ (MNI) recovered from a cemetery is carried out as standard procedure during osteological assessments of inhumations in order to establish how many individuals were represented by the articulated and disarticulated human bones (without taking the archaeologically defined graves into account). The MNI is calculated by counting all long bone ends, as well as other larger skeletal elements, such as the hip joints and cranial elements. The largest number of these is then taken as the MNI. The MNI is likely to be lower than the actual number of skeletons which would have been interred on the site, but represents the minimum number of individuals which can be scientifically proven to be present.

As expected, the count of major bone elements provided a MNI of one individual.

2.3 ASSESSMENT OF AGE

The determination of age relies on the development and degeneration of bones and teeth. Different stages of development and degeneration have been mapped using data gathered from individuals of known age (Cox 2000). Methods used to determine age rely on the preservation of the dentition and hips. They are most precise when used to assess the developing skeleton, due to the fact that the growth of bones and teeth follows a relatively predictable course up to the age of twenty-five. However, the degeneration of the skeleton, which is assessed according to the severity of wear on the teeth, hips and ribs, depends not only on the age, but also on the sex, occupation, lifestyle and health of the individual analysed. The effect of wear on the teeth and bones tends to vary increasingly with advancing age; as a result, age cannot be reliably determined macroscopically beyond forty-six years.

Age was divided into a number of categories, including foetus (up to 40 weeks *in utero*), neonate (around the time of birth), infant (following birth to 1 year), juvenile (1-12 years), adolescent (13-17 years), young adult (18-25 years), young middle adult (26-35 years), old middle adult (36-45 years) and mature adult (46+ years). Age was determined using standard ageing techniques, specified by Buikstra and Ubelaker (1994) and Scheuer and Black (2000).

The poor preservation of the hips meant that the age determination was based on less accurate criteria. The dental wear, long bone fusion, grade of cranial suture closure and degeneration of a tiny surviving fragment of hip joint (auricular surface) suggested that this individual was an old middle adult, aged between 36 and 45 years.

2.4 SEX DETERMINATION

Sex determination is a vital part of the analysis of human remains, because of the likelihood that different sexes followed different lifestyles as a result of varying occupations, childbearing, or other activities, which may have affected their health. Sex assessment relies on the presence of the skull and pelvis, the morphology of which are sexually dimorphic, as described by Mays (2000).

Sex determination relied solely on the cranial morphology, which consistently suggested that this individual was male.

2.5 METRIC ANALYSIS

Stature can only be established if at least one complete and fully fused long bone is present. In this instance, none of the long bones were intact, which meant that stature could not be established. Leg measurements were obtained from the femora and tibiae and were used to calculate robusticity indices. From front to back, the right femoral shaft was broad and flat, while the left femoral shaft was more rounded. The *platycnemic* index (robusticity index) of the tibiae was calculated in order to establish the degree of tibial shaft flatness. The tibiae of skeleton C1754 were of average shape.

Craniometric measurements could not be taken because the skull was extremely fragmented. As a result, the skull shape could not be established. However, it was possible to establish through the survival of the nasal part of the face that this individual had a very prominent nose.

2.6 NON-METRIC TRAITS

Non-metric traits are additional sutures, facets, bony processes, canals and foramina, which occur in a minority of skeletons and are thought to suggest diversity and familial affiliation between skeletons (Saunders 1989). The origins of non-metric traits have been extensively discussed in the osteological literature and it is now thought that while most non-metric traits have genetic origins, some can be produced by factors such as mechanical stress (Kennedy 1989) or environment (Turkel 1978).

A total of thirty cranial and thirty post-cranial non-metric traits were selected from the osteological literature (Buikstra and Ubelaker 1994; Finnegan 1978; Berry and Berry 1967) and the skeleton was scanned for these traits. Two cranial traits were recorded, including a *mastoid foramen extrasutural* and a *precondylar tubercle.* Both traits are thought to have genetic origins. The skeleton was also found to have *hypotrochanteric fossae* on both femora, as well as a third trochanter on the left femur. These traits have been attributed to mechanical stress, in particular to the main bottom muscle, *gluteus maximus*, and may therefore be activity-related.

3.0 PATHOLOGICAL ANALYSIS

Pathological conditions can manifest themselves on the skeleton during life, especially when these are chronic or the result of trauma to the bone. The bone elements to which muscles attach can also provide information on muscle trauma and excessive use of muscles.

3.1 DEGENERATIVE JOINT DISEASE

Degenerative joint disease (DJD) is caused by a number of factors, including hereditary predisposition, increasing age, endocrine stress and mechanical strain. Occupational stress often affects the joint itself, whilst age may induce marginal changes. These marginal changes (*osteophytes*) are characterised by additional bone formation, whereas pitting affects the actual joint surface.
Evidence for DJD was observed in the spine of this man, in the form of mild pitting on the vertebral body surfaces of the cervical (neck) vertebrae. It is not uncommon for individuals in the 36 to 45 year age group to suffer from mild manifestations of joint disease.

3.2 INFECTION

Evidence for non-specific infection was very common before the introduction of antibiotics and is frequently observed in populations derived from archaeological contexts. Inflammatory lesions on human bones can be indicative of infectious diseases, such as leprosy and syphilis, or of non-specific infection, such as varicose veins, leg ulcers or trauma to the shins. However, skeletal lesions are only produced if the infection is chronic and long-standing (Roberts and Manchester 1995, 125).

Evidence for infection was observed in the form of superficial (*periosteal*) inflammatory lesions on the left tibia of Skeleton C1754. Any manifestations present on the right tibia would have been eroded. The nature of the lesions suggests that the inflammation was receding.

3.3 TRAUMA

Occasionally, it is possible to infer soft tissue trauma from the bones, in the form of muscular or ligamentous trauma. This is expressed trough the formation of bony processes (*enthesopathies*) at ligament attachments. Additionally, it is possible to observe cortical defects at the site of muscle attachments, which are the result of constant micro-trauma and are usually activity-related (Hawkey and Merbs 1995, 334). Cortical bone excavations were noted at a number of muscle attachments of Skeleton C1754, including *brachialis* at the ulnar tuberosities, which is a muscle that flexes the forearm. The skeleton also showed evidence for muscular strain to *gluteus maximus*, the main muscle of the bottom (discussed above). The muscle extends and laterally rotates the hip joint and extends the trunk. Evidence for an *enthesopathy* was noted at the back of the skull, where the *trapezius* muscle attaches to the occipital bone. The muscle also attaches to the shoulders and to the spine in the form of a large trapezoid, and is responsible for elevating, adducting and depressing the shoulders. This muscle is easily strained, which may have been the cause for the *enthesopathy*.

The most dramatic skeletal manifestation of pathology was observed at the left ulna. This bone had suffered a fracture at the lower third of the shaft. The fracture had moved from the supero-lateral part of the shaft obliquely to the infero-medial side. The fracture was well-healed, but had mal-united, causing overlapping of the two broken bone ends by 19.9mm. This would have caused considerable shortening of the bone.

The bone had been fractured a second time, from the same origin of the first fracture, but moving at a lesser angle medially (Plate 1). It is thus probable that the bone was fractured twice at the same site, but the overlapped part of the bone had been too strong to re-fracture, causing the fracture path to move superiorly to the initial fracture site. Notably, the second fracture is not united, and the two bone ends have formed a false joint with an irregular, pitted surface. It is assumed that the rotational stress placed on the forearm prevented union of the two fractured bone ends.

Although the proximal and distal joints of the radius were missing, it cannot be ruled out that the bone was completely unaffected. Remarkably, the radius shaft was not fractured and the injury may have affected only the ulna.

Alternatively, it is possible that this fracture was a so-called 'Monteggia fracture', which results in dislocation of the radial head (at the elbow joint) and fracture of the ulnar shaft, although the fracture site tends to be closer to the elbow.

Plate 1 Fracture of left ulna

It is certain that this injury would have hindered extensive use of the left forearm and it was therefore not surprising to note well-developed muscle attachments at the right humerus and right hand. It is possible that the initial injury was a parry injury, caused when the forearm is raised in front of the face or chest for protection against an attacker or advancing object. However, it is unusual for the bone to be broken twice at the same site, which may suggest that this was caused during a habitual activity. Alternatively, the second fracture may have been deliberately induced, with the aim of reducing the shortening of the ulna.

4.0 DENTAL HEALTH

Analysis of the teeth of archaeological populations can provide vital clues about health, diet and oral hygiene, as well as information about environmental and congenital conditions.

Despite the poor survival of the upper jaw (maxilla), 27 of 32 teeth of this individual survived. The upper left second incisor and all four lower incisors were absent. The jaw bone holding these teeth was eroded and it was therefore not possible to determine whether the teeth had been lost ante-mortem or post-mortem. However, considering the lack of dental pathology, it is more likely that the teeth had been lost post-mortem. Loss of the anterior teeth in the burial environment is not uncommon, because the teeth are single-rooted and easily slip out of the jaw once the surrounding soft tissues have decayed.

Dental wear tends to be more common and severe in archaeological populations than in modern society, being caused by a much coarser diet based upon contemporary corn grinding techniques. Severity of the dental wear was assessed using a chart developed by Smith (1984). Each tooth was scored using a grading system ranging from 1 (no wear) to 8 (severe attrition of the whole tooth crown). The individual exhibited moderate to severe wear, which was consistent with his age.

Because of the lack of calculus deposits on the teeth, periodontal disease was slight and caused only mild resorption of the bone surrounding the teeth. The good dental health of this individual suggests that he was practising unusually good dental hygiene.

5.0 MORTUARY BEHAVIOUR

The skeleton was interred in a ritually significant landscape, dating form the Neolithic to the late Iron Age. Nearby are the three Thornborough Henge Monuments, several pit alignments, a Bronze Age cremation cemetery, inhumations and round and square barrows. The burial was found in the ditch of a small square barrow. A second square barrow was located approximately 155m to the southwest of the burial, which may have been associated with a quadruple horse burial, 5m outside its perimeter.

The inhumation burials excavated at Nosterfield Quarry have so far proved most unusual. The two earlier burials represented secondary interments, following exposure of the body with subsequent loss of some bones and later burial of all surviving bones. While the burial of skeleton C1754 was not as remarkable, the position of his arms on the right side of the chest, with the hands positioned under the left cheek is very uncommon.

6.0 DISCUSSION AND SUMMARY

The osteological analysis of a single skeleton from Nosterfield Quarry has provided a small glimpse into the life of this person. The skeleton was a male who had survived into his late thirties to mid forties. Poor skeletal preservation meant that it was not possible to establish his stature or obtain much evidence for facial characteristics, with the exception of the presence of a prominent nose.

This man enjoyed general good health, particularly of the teeth. He had, however, suffered from the effects of repetitive muscular injury to the arms and thighs, suggesting that he had carried out activities involving regular use of these muscles. Evidence for functional strain on the neck was noted in the form of muscular trauma, as well as mild degenerative joint disease on the vertebrae of the neck.

It is possible that trauma to the shins, an infectious disease or simply varicose veins were responsible for the development of inflammation on the left tibial shaft. The inflammation was receding, suggesting that it had begun to heal before the individual died. Inflammatory lesions to the shins are frequently observed in skeletons from all periods, but are usually more common in those populations from densely occupied urban areas.

Most notable, however, were two fractures of the left forearm, which may have been the result of a defence or work-related injury. The first fracture, which may have been associated with a dislocation of the radius at the elbow, resulted in considerable overlapping of the broken bone ends and must have caused considerable discomfort, as well as disabling the forearm. Whether the arm was fractured through another accident, or whether the second fracture was the result of an attempt to reduce the bone overlap could not be determined. Nevertheless, it is certain that the second fracture caused more discomfort as a result of the non-union of the broken bone ends. This resulted in greater use of the right arm, which was observed in the form of pronounced muscle attachments on the right upper arm and hand.

It could not be established, whether this injury was the reason for the unusual positioning of the arms of this man., which were placed on the left side of the chest, with his hands under the left side of his face, as if asleep. It is notable that this burial was disturbed during re-cutting of the barrow ditch, because this implies that those who worked on the ditch were not aware of the presence of the burial, or alternatively, that they were not afraid to disturb the burial of this man.

The presence of the horse tooth in the inhumation burial may suggest a tentative link with the quadruple horse burial near the larger barrow nearby. However, radiocarbon dating and further analysis of the archaeological evidence would be required to confirm any relationship between the burials.

7.0 RECOMMENDATIONS

It is recommended that the skeleton is subject to absolute dating, with the aim of establishing, whether this individual dates to the same period as the horse burial and inhumations previously excavated at Nosterfield Quarry. This may in turn aid the interpretation of the prehistoric landscape in which this man had been interred.

Once their date is known, focussed research on the mortuary rituals observed at Nosterfield Quarry could be considered, with the aim of establishing parallels for the funerary behaviour observed in the immediate locality of the site, and further afield.

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APPENDIX 1 OSTEOLOGICAL AND PALAEOPATHOLOGICAL CATALOGUE

Skeleton number	C1754
Preservation	moderate
Completeness	70%, the majority of the skull, long bones and hands are present
Age	36-45, old middle adult
Sex	male
Stature	-
Non-metric traits	mastoid forarem *extrasutural* (right), *precondylar* tubercle, *hypotrochanteric fossae* (bilaterial), third trochanter (left)
Pathology	bone excavations for *brachialis* at ulnae, bone excavations for *gluteus maximus* at femora, *enthesopathy* for *trapezius* at occipital, double fracture of distal third of shaft of left ulna, well-healed with ma-union and overlap at first fracture, non-union at second fracture
Dental health	27/32 teeth present, 5 teeth lost pm, slight peridontal disease, moderate to severe wear

	Right dentition								Left dentition							
Present	p	p	p	p	p	p	p	p	p	-	p	p	p	p	p	p
Calculus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	4	6	8	7	6	6	7	7	7	-	6	6	7	8	6	4
Maxilla	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Mandible	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Present	p	p	p	p	p	p	-	-	-	-	p	p	p	p	p	p
Calculus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	4	5	7	5	5	6	-	-	-	-	7	5	5	6	5	4

KEY:

Present - Tooth presence; am - ante-mortem tooth loss; pm - post-mortem tooth loss; p - tooth present; - - jaw not present

Caries - Calculus; F - flecks of calculus; S - slight calculus; M - moderate calculus; H - heavy calculus; a - all surfaces; b - buccal surface; d - distal surface; m - mesial surface; l - lingual surface; o - occlusal surface

DEH - dental enamel hypoplasia; l - lines; g - grooves; p - pits

Caries - caries; s - small lesions; m - moderate lesions; l - large lesions

Wear - dental wear; numbers from 1-8 - slight to severe wear