RPS Planning, Transport and Environment

INDEX DATA	RPS INFORMATION
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Road Number A419/417	Date April 1991
Contractor Jane Timby.	
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A419/417
CIRENCESTER AND STRATTON BYPASS, GLOUCESTERSHIRE

STAGE 2 ARCHAEOLOGICAL EVALUATION

SUPPLEMENT B

SUPPLEMENT B SPECIALIST REPORT

SUBJECT/AREA Analysis of pottery from the Cirencester and Stratton By-pass

AUTHOR Jane Timby, archaeological consultant.

DATE: April 1991

A417/419 CIRENCESTER AND STRATTON BYPASS EVALUATION

THE POTTERY

by J. Timby

Key:
eware = earthenware hm = handmade wm = wheelmade

SITE B

1991/506

(26)	fired clay, ?tile	unknown
	x2 bodysherds oolitic	med

SITE C

1991/507

(1) (+25m)	x1	bodysherd oolitic	med
(1) (10-15m)	x2	bodysherd oolitic	med
(1) (35-40m)	x1	bodysherd, x1 rimsherd cooking pot	med

SITE D

1991/511

(1) c	tiny scrap Samian, probably part of footring from small cup	Roman 1st-e2nd

SITE E

1991/512

(20)	<3>	x1 small chip tile	
		x2 pale orange, very fine fabric	Roman prob 1st/2nd
(21)	<4>	x1 bodysherd, orange sandy, probably Wilts	Roman ?2nd
(22)	<5>	x7 very abraded small bodysherds, same vessel, sandy, orange with grey core	Roman

1991/513 Fosse Way

(1)	clay pipe stem, iron-glazed eware (?Staffs)	19th-20th
(3)	black glazed kitchen ware	late 18th-19th
(4)	clay pipe (incl. stamp RICH../..ATH/..VS)	
(6)	glazed eware, tin glazed, clay pipe, flowerpot	late 18th-19th

(7)	sherds from large bowl glazed eware, china (c.23 sherds) (incl. blue + white transfer), clay pipe	late 18th-19th
(21)	Westerwald, black glazed kitchen ware	18th
subsoil	glazed eware	18th-19th

1991/514 Fosse Way

(2)	glazed eware	?18th-20th
(4)	rim BB1 straight-sided dish, 1 sherd decor. Samian (?Drag.37), 8 misc. sherds wm local ware (Roman) Glazed eware, tin-glazed china	Roman = 2nd 3rd c. but t.p.q. = 18th c.+
(6)	clay pipe stem	
(7)	eware, china	18th-19th
(8)	clay pipe stem	
(9)	eware, china	

1991/515

(4)	large bodysherd, relatively fresh, hm unglazed oolitic	med

SITE F

1991/516

(1) a	x1 bodysherd unglazed black sandy, abraded	??Roman/med
(1) c	x1 very small bodysherd	prob med
(1) d	x1 bodysherd, fine, clay pellets, limestone etc.	med/late med

1991/517

(1) a	very small frag, fired clay ??pot	
(1) d	x2 bodysherd oolitic	med

SITE H

1991/520

(2) c	x2 bodysherd, grey-brown oolitic	med

1991/521

(1)	2=1 daub/fired clay	

SITE I

1991/522 Flint scatter

(1)	glazed eware, tin-glaze	18th-19th
(2)	china, glazed eware, tin glaze, clay	18th-19th

	pipe	

1991/523 Flint scatter

(2) a spits 1 & 3	china (same vessel), clay pipe	modern
(2) d	x1 bodysherd, oolitic	medieval

1991/524 Flint scatter

(2) b	glazed eware	18th-19th
(2) d	glazed red sandy ware	?late med/pm

1991/526 Flint scatter

(1) a	glazed eware	18th-20th

SITE J

1991/527 Pot scatter

(2) <1>	two joining rims large glazed bowl	post med
<12><13>	join (fresh break) glazed ware	post med
<9>	rim internal speckled green-brown glaze, grey ware with oxidised surfaces	?late med/pm
(2)	x1 unglazed sandy ware	date unknown

1991/529 Pot scatter

(3)	rim from bowl similar to 1991/527 (2)	post med
(3) <1>	very small sherd ?oolitic temper	?med
<2>	unglazed sandy ware (dark grey)	??med
<3,4,7,8,9,10,15>	unglazed oolitic wares (cooking pots)	med (?11th-13th c)
-	rimsherd, hm. black, smooth, vesicular (limestone). F. large diam. cooking pot(?)	?11th-12th

1991/530 Pot scatter

(1)	c.45 bodysherds, x1 ?handle frag, x1 clubbed rim from cooking pot, oolitic temper, unglazed	med. 11th-13th c.
(1) <15>	brown glazed ware ?Staffs	18th c.+
<18>	very small abraded frag	??Roman
<38>	very small abraded frag	??Roman
<40>	very small abraded frag	?med
<67>	rimsherd, sandy orange ?dish	?Roman
<83>	glazed and unglazed red eware	post med
<84>	very small abraded frag	?Roman
<106>	very small abraded frag ?re-used	?Roman

1991/539 Flint scatter

(2) a	x1 glazed eware	post med
(2) d	x1 very abraded fragment	??med

SITE K

1991/531 Pot scatter

plough-	x6	partially glazed red sandy wares	post med
soil	x2	unglazed oolitic temper	med
	x1	orange ware, sparse quartz	?
below	x1	wm sandy ware	??med
brown clay			

SITE L

1991/532 Double-ditched trackway

	<4>	x1 unglazed oolitic ware	med
	<6>	rim cooking pot - oolitic	med
	<7>	x1 unglazed oolitic	med
(11)	<9>	stone (natural)	

1991/533 Double-ditched enclosure

(4)	<1,2,3,5,9,10>	total 12 bodysherds ?same vessel, hm. sparse shell temper + grog/clay pellets, dark orange exterior/outer core, grey-black interior/inner core. Very friable, soft fabric	MBA/LBA
(9)		x1 bodysherd oolitic	med
(9)	<11>	deceased	

SITE N

1991/536 ?Prehistoric field boundary

subsoil	x6	partially glazed red sandy wares	post med
	x2	oolitic unglazed	med
	x1	black glazed kitchen ware	post med

SITE P

1991/540 Flint scatter

(1) (2)	x2	glazed ewares (same)	post med

SITE Q

1991/542 Ring ditch

	<5>	x1 glazed eware	post med
	<6>	ironstone (natural)	
	<9>	basesherd very hard blue-grey ware, orange core, roughly finished	?post med

SITE R

1991/544 Amorphous crop marks

(1) rim wm grey grog tempered ware ?Wilts Roman 2nd c. +

1991/545 Ring ditch

<5> x2=1 glazed orange sandy ware post med
<6> body sherd from collared urn. Dark orange exterior/outer core, dark grey-black interior/inner core. Very smooth, soapy fabric with sparse large grog frags. Sherd quite large grog frags. Sherd quite large but with abraded edges. Impressed cord decoration. EBA
<7> x1 grey wm ware, fine-medium quartz sand Roman

SITE S

1991/548

(2) sect A x2 daub/fired clay
(2) x1 too small to identify

A small quantity of additional ceramic material was recovered from the evaluation fieldwork, following the production of Dr Timby's pottery assessment. This material, of post-medieval date, was processed and analysed at Cotswold Archaeological Trust's office premises.

SUPPLEMENT B SPECIALIST REPORT

SUBJECT/AREA: **Flint Analysis from the Cirencester and Stratton Bypass Evaluation.**

AUTHOR: **Dr. T.C. Darvill, archaeological consultant.**

DATE: **April 1991**

TRENCH NO.	CONT NO.	BRIEF DESCRIPTION	APPROX DATE
Site B			
1991/506	(15)	Flint flake	
Site C			
1991/507	(1) <1>	Battered chip	
	(1) <2>	Flake	
	(1) <3>	Chip	
Site D			
1991/510	(1) <2>	Burnt flake	
	(1) <3>	Flake	
	(1) <4>	Reduced core	
	(1) <5>	Chip	
1991/511	(1) a	x2 Flakes	
Site E			
1991/513	(1) subs	Broken flake	
	(7)	Battered lump	
Site F			
1991/516	(1) a <1>	Burnt pot-lid fracture	
	(1) d <2>	Broken blade fragment	
1991/517	(1) a <1>	Broken blade	
	(1) b <2>	Broken blade fragment	
	(1) a <3>	Core rejuvenation flakes	
	(1) b <4>	Burnt lump ?core	
Site H			
1991/521	(1)	Cortical flake	
Site I			
1991/522	(2) <1>	Small barbed and tanged	

		arrowhead with damage to point and one edge	
	(2) <2>	Burnt flake	
	(2) <3>	Burnt chip	
	(2) <4>	Chip	
	(2) <5>	Tip of arrowhead, ?barbed and tanged but just could be leaf-shaped, not enough to tell, hinge fracture suggests snap or impact break	
	(2)	Cortical flake/chip	
	Important group with BA items and working waste. The presence of burnt flint and implements hints at occupation nearby.		
1991/523	(2) b sp2	Flake on very cherty flint	
	(2) d	Flake - heavily abraded	
	Flakes only - no dating evidence.		
1991/524	(1) a sp1	Flake	
	(1) c sp1	Flake	
	Flakes only - no dating evidence.		
1991/526	(5)	Proximal end of broken blade Damaged	Not datable
	(5) sp2	Cortical flake	
	Important group with BA items and working waste.		
Site J			
1991/529		Proximal end of broken blade Not worked	?Neo/BA
1991/530	(1) <54>	Small end scraper or thick flake	Neo/BA
	(1) <87>	flake	
Site K			
1991/528	Subsoil	Cortical flake	
1991/531	Subsoil	Broad flake with hinge fracture	?Neo/BA
Site L			

1991/532	(6)		Cortical flake - utilized
		<5>	Heavily damaged flake

Flakes only - not datable.

1991/533	(4)	<4>	Proximal end of light blade
	(8)	<8>	Large flake - damaged, but may originally have been worked
	(9)		Cortical flake, ?utilized
	(9)	<12>	Burnt flake or core preparation flake

Blade and flakes only - not datable.

Site N

1991/536	Subsoil	Core trimming flake - burnt Spall or chip

Site P

1991/539	(2) a	Flake - damaged

Working waste? Not easily datable but could be Neo-BA.

1991/540	(2) a	Small nodule - unworked
	(2) a sp3	Cortical flake/?natural
	(2) c sp3	Flake

Working waste? Not easily datable but could be Neo-BA.

1991/541	Topsoil	Cortical flake - ?utilized
	(3) 1a	Pot-lid fracture flake possibly from a polished implement, e.g. axe?
	(3) 2a	small flake

Working waste? Not easily datable but could be Neo-BA.

Site Q

1991/542	<4>	Cortical flake from nodule reduction to form core (core preparation)

Working waste.

Site R

1991/545	(4)	<2>	Proximal end of broken blade
	(4)	<3>	Cortical flake - heavily abraded
	(4)	<4>	x2 Cortical flakes
	(4)	<8>	Proximal end of broken broad blade or flake. Hinge fracture

Flakes and blades only. None of this is very distinctive as to date.

Site S

1991/548	(1)	a	Blade

Field I

A Abraded core used as hammerstone
Large end scraper or cortical flake
Core preparation flake
x3 waste flakes

B x4 waste flakes/spalls

C Heavily reduced pyramidal core

D x2 Blades, one of them a part-made geometric microlith?
x5 Chips and flakes (4 lightly burnt)

E x3 Blades

F x4 Cortical flakes and lumps
x2 Flakes
x1 Heavily burnt flake

G x2 Lumps
x3 Flakes (2 cortical)

General

x2 Core trimming flakes
x1 Cortical blade - ?utilized
x4 Blades
x2 Burnt flakes
x11 Flakes, mostly damaged

This whole group form Site I looks fairly early but there are not enough distinctive pieces to tell ?Meso-Early Neo. Probably working debris rather than occupation debris.

Flints from Field Walking

NGR	
SP 02775/04675	Burnt core rejuvenation flake
SP 02725/04750	Core rejuvenation flake (not burnt)
SP 02750/04725	Flakes
SP 02725/04775	Broken serated blades. ?Neo
SP 02725/04775	Broken implement of some kind
SP 02800/04625	x3 Broken flakes
SP 02825/04675	Broken and battered flake
SP 02825/04650	Battered blade
SP 02850/04650	Battered chip
SP 02850/04625	x3 Flakes
SP 02825/04625	Lightly rolled end scraper
	x1 Small thumbnail scraper
	x2 Flakes
SP 02700/04723	x1 Flake
SP 02775/04630	x2 Flakes
SP 02675/04775	?Natural flake
SP 02800/04650	x2 Broken blade
	x1 ?Core rejuvenation flake
SP 02875/04825	x1 Worked flake, heavily battered
NNW of 1991/507	x1 Abraded worked blade
45m W of scatter	x1 Broken flake

SUPPLEMENT B SPECIALIST REPORT

SUBJECT/AREA: **Assessment of the plant remains from the A417/419 Cirencester and Stratton Bypass**

AUTHOR: **Clare de Rouffignac, MA, GIBiol**
Environmental Archaeologist,

DATE: March 1991

ASSESSMENT OF THE PLANT REMAINS FOR THE A417/419 CIRENCESTER AND STRATTON BYPASS

Clare de Rouffignac, MA, GIBiol
Environmental Archaeologist

March 1991

Archaeology Section
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Tetbury Drive, Warndon
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Report 78

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Assessment of the plant remains from the A419/417 Cirencester and Stratton Bypass

Clare de Rouffignac

1 Summary

A series of evaluation trenches were undertaken by the Cotswolds Archaeological Trust in advance of construction of the Cirencester Bypass. The sites included enclosure cropmarks. A sampling policy was employed to check the quality and quantity of environmental remains from the evaluation area. Most samples recovered contained very few plant and animal remains, and showed considerable modern root contamination. Waterlogged samples from a test pit in the valley floor of the River Churn were also found to be poor in plant remains.

2 Introduction

In December 1990 and January 1991 the Cotswolds Archaeological Trust carried out a number of evaluations in advance of the construction of the Cirencester bypass. A sampling policy was executed for each trench to enable recovery of environmental remains.

When waterlogged deposits were encountered a test pit was also excavated in the base of the valley of the River Churn. Environmental samples from waterlogged deposits under alluvium at Latton in a similar situation were found to contain a considerable number of plant, snail and insect remains (de Rouffignac 1991).

3 Aims

An environmental sampling policy was implemented for the evaluation trenches to assess the quality and quantity of archaeobotanical remains.

It was hoped that plant remains would be found in sufficient quantities to enable:

1 Identification of plants of the local habitat; and

2 Identification of possible human dietary components.

4 Method

The samples were sieved and sorted by the author. The waterlogged samples from trench 504 were sieved to 300μm to enable recovery of small rush seeds expected to be present. The samples were kept damp to prevent decay of the environmental remains. The remaining samples from the other trenches were sieved at 500μm and were air-dried before sorting when charred remains were visible or if no charred remains were visible the samples were scanned while still wet and then discarded.

This enabled rapid examination of a large number of samples in a short period of time.

The sorted plant remains were then examined under a low-power EMT-1 light microscope to enable identification. The plant remains were separated into seeds and other plant remains such as chaff. The seeds and plant

remains were from trench 504 stored in a 70% alcohol solution.

The seeds were identified as far as possible using the Archaeology Section's comparative collection, seed identification manuals (Berggren 1968 and 1981) and an illustrated site report (Griffin 1988). Comparative descriptions of charred cereal seeds and chaff from prehistoric sites were obtained from Jacomet (1987). Habitats and common names of plants were obtained from Blamey *et al*, (1987), More and Fitter (1980) and Keble Martin (1965).

5 Analysis

Nineteen samples from the evaluation trenches were examined. The samples were between one and two litres in size; for uniformity, except with smaller samples, approximately one litre of each sample was sieved. Many of the non-waterlogged samples were found to be heavily contaminated with modern roots due to the shallow depth of stratigraphy and therefore only a selection of samples from every trench were examined.

Table 1 gives a list of the samples which were scanned and discarded. Only two samples were found to contain charred remains and these are described below.

Trench 545, Late Bronze Age ring ditch

Hearth material from ditch 2

The sample consisted mainly of charcoal. A single charred seed of Hordeum sp (barley) was recovered from the sample, together with a fragment of chaff.

Hearth material from ditch 6

There were no charred seeds in the sample, but a considerable quantity of charcoal was noted.

Trench 504, valley floor test pit

Three samples were examined from various points in the deposit. Further samples had been taken, but were not examined as the main aim of the analysis was an assessment of the preservation of environmental remains. A sketch section of trench 504 is given in Figure 1. The measurements following the series numbers represent the depth in millimetres from the datum line where the sample was taken.

Peaty clay, 250-300mm

Only four seeds were recovered from this sample, including *Juncus* spp (rushes) and a single seed from the Cyperaceae (sedges).

Silty clay, 450-500mm

Several *Juncus* spp (rush) seeds but no other plant remains were collected.

Silty clay, 700-740mm

Again, only a few *Juncus* spp (rush) seeds were recovered from the sample.

6 Discussion

Little environmental information could be gained from the samples examined. The low quantities of charred remains is probably related to function. The material from the ditches is no doubt residual, hence its particularly poor state of preservation and lack of seeds. The single cereal seed from the late Bronze Age hearth material in trench 545 is of little botanical significance.

The paucity of plant remains from the waterlogged samples is probably as a result of the type of deposit from which the samples were recovered. *Juncus* spp (rushes) are a ubiquitous type of plant found in most types of aquatic habitats. The deposits seem to represent an infilled oxbow or meander of the river (Walker pers. comm.) and would be unlikely to have preserved plant remains in any significant quantities.

7 Conclusions

It was impossible to draw any conclusions on the function of features or on any agricultural activity which may have occurred in the area.

The lack of archaeobotanical remains from the waterlogged deposits is unfortunate but relates to the mode of deposition of the riverine sediments.

8 Acknowledgements

My thanks are due to Graham Walker of the Cotswolds Archaeological Trust for his cooperation both on site and providing information for the preparation of this report. Thanks are also due to Simon Woodiwiss for editing the report.

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Table 1 Samples from trenches - scanned and discarded

Trench 506 pre-1820 terraced road
Probable hillwash below possible Roman surface 26 - many modern roots present

Trench 513 Fosse Way Roman road
Roman drain fill 16 - numerous modern roots

Trench 514 Fosse Way Roman road
Road ditch fill 4 - some modern roots and a few snails present

Trench 515 Fosse Way Roman road
Roman demarcation ditch sealed by hillwash 10 - few roots and modern seeds

Trench 521 Possible Late Bronze Age flint scatter
Possible pit fill 13 - very few charcoal fragments, many roots and modern seeds

Trench 529 Medieval pot scatter, 12th-14th century
Burnt clay fill within [13], 21 - many roots
Charcoal and soil mix within [13], 21 - no roots, but also no charred remains

Trench 532 Possible Late Bronze Age/Iron Age double ditched enclosure
Ditch fill 2 - a few small charcoal fragments and snails, many roots present

Trench 533 Possible Late Bronze Age/Iron Age sub-rectangular enclosure
Ditch fill 2 - numerous modern roots

Trench 536 Possible Iron Age/Romano-British field boundaries
Ditch fill from terminal 5 - many modern roots present

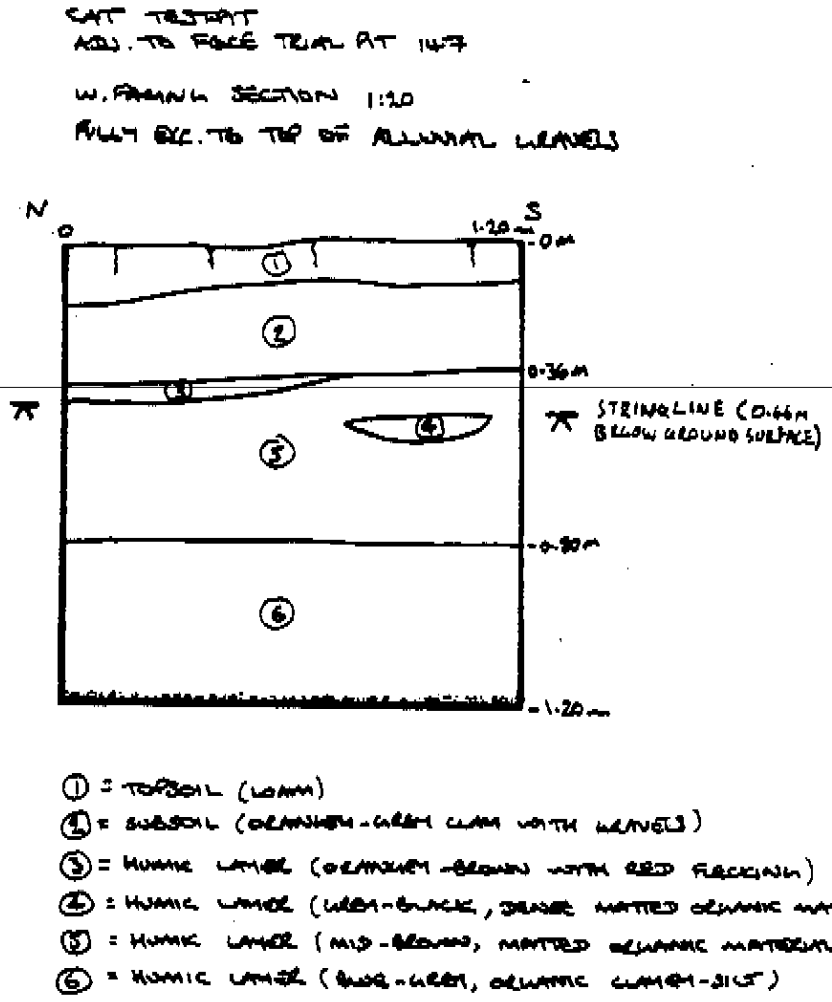
Trench 537 Iron Age/Romano-British field boundaries
Ditch fill 4 - numerous modern roots

Trench 538 Double pennanular ring-ditch
Pit fill 8 - Many modern roots

Trench 542 Single ring ditch
Fill of possible pit 2 - many roots and modern seeds

Trench 544 Boundary ditch
Ditch fill 2 - Many modern roots and seeds

Figure 1 Section through trench 504 test pit



SUPPLEMENT B SPECIALIST REPORT

SUBJECT/AREA: Trinity Mill, Bagendon, Pollen Analysis.

AUTHOR: Dr R. Scaife,
Dept.of Geography,
University of Southampton.

DATE: March 1991

TRINITY MILL, BAGENDON: POLLEN ANALYSIS.

Rob Scaife

I) INTRODUCTION AND AIMS

Five samples taken from contexts 5 and 6 of the archaeological trial trench have been analysed for sub-fossil pollen and spore content. All samples comprised a grey silt with some humic content. These appear to be typical flood plain type deposits with little evidence of gleying or oxidation. The aims of this preliminary palynological study were as follows:

(a) To ascertain the presence or absence of pollen and spores.

(b) If pollen was present, to assess the state of preservation and suitability for more detailed analysis.

(c) To provide an indication of the range of taxa present in the samples.

d) If possible, to indicate the range of vegetation habitats represented with special relevence to anthropogenic factors.

II) METHODOLOGY

Standard extraction techniques were used for concentrating the sub-fossil pollen and spores (Moore and Webb 1979). Samples of 2 ml were prepared. Processes used were Sodium hydroxide (deflocculation); Sieving at 150 u and 10u (removal of course debris and clay fractions); Hydrofluoric acid (digestion of Silica) and Erdtmans acetolysis (removal of cellulose). The concentrated pollen and spores were stained with safranin and mounted in glycerol jelly. Identification and counting was carried out using an Olympus research microscope with x400 and x1000 with phase contrast facility.

III) RESULTS

Pollen and spores were found to be present and moderately abundant in all of the samples analysed (see I.a above). Preservation was, in general, extremely good especially in view of the largely inorganic character of the material prepared (aim I.b. above). The abundance of pollen throughout contexts 5 and 6 would certainly allow a detailed and closer spaced analysis to be carried out.

In order to assess the range of pollen taxa present, 100 pollen grains plus spores were identified and counted from each level. A total of 47 pollen and spore taxa was identified. This is a moderately diverse assemblage in view of the less than normal pollen sum counted. The absolute counts obtained are given in appendix 1 and are also presented in pollen diagram form. The data is calculated as a percentage of the total pollen sum (for each level) and spores as a percentage of pollen plus spores. A quantity of derived pre-Quaternary pollen and spores (see below) was also recorded and which are presented as a percentage of total pollen plus these spores.

IV) THE POLLEN DATA

Overall, the pollen spectra comprise largely herbs. Gramineae is the dominant taxon attaining up to 38% of total pollen. Cereal pollen is also relatively important (to 14% TP at 65-66 cm). Other herb taxa of importance include those typical of arable and pastural land. These inlude Ranunculus type (buttercups), Sanguisorba officinalis (Great Burnet), Plantago lanceolata (ribwort plantain), P. major/media type (rat-tail and hoary plantains); Compositae (Bidens type, Anthemis type and Taraxacum type). Tree pollen is dominated by Quercus (oak to 10% TP) and Fraxinus (ash to 9% TP). Corylus type (hazel) and Salix (willow) are the principal shrubs present. There is some stratigraphical variation in the tree and shrub pollen which is discussed below. Marginal aquatic taxa are dominated by Sparganium/Typha angustifolia type (bur reeds and lesser reedmace). Some taxa included in the main section of herbs are also likely to derive from this source but whose pollen morphology does not allow separation to a lower taxonomic level. Spores of ferns are relatively few except for those derived from the local Jurassic strata. The category of pre-Quaternary pollen and spores includes pollen (Gymnosperms) and spores typical of Jurassic lithologies (eg. Piceapollenites, Classopollis, Eucomiidites, Deltoidospora).

V) INTERPRETATION

It is clear from the pollen spectra that a number of different vegetation environments are represented at this site. The majority of the pollen types appear, as might be expected from the near environment. These taxa are commensurate with the view of a species rich water meadow on or close to the sampled site. Grasses are dominant and it is likely that these represent in larger part this community. Other plants include Ranunculus type, Filipendula (meadow-sweet), Sanguisorba officinalis, Scrophulariaceae, Compositae types and Cyperaceae (sedges). The presence of Sparganium/Typha angustifolia indicate areas of very wet ground or shallow water perhaps fringing the river/stream.

As noted above there is a strong cereal component present. The pollen grains are undoubtedly of cereals, having large grain size, thick exines, large pores and annuli and distinct columellate pattern. This is also associated with weeds typical of arable habitats (segetals). Interpretation of this component is problematic and may be discussed in relation to one or more of the following factors:

(a) The pollen may have derived directly from areas of arable agriculture on drier areas adjacent to the water meadow thus indicating local arable agriculture.

(b) The pollen may have been liberated during local crop processing activities. Pollen trapped in the husks of the cereals may be liberated during threshing and winnowing. This applies to cereal pollen and that of weeds also trapped in the spikes of cereals. This may be relevent if a mill was in proximity.

(c) Pollen readily passes throughout the gut of human and animals and is thus frequently present in faecal debris. Thus, any dung or human faecal waste (cess) dumped into the stream or surrounds might be expected to result in a substantial presence of cereal and segetal taxa. This is frequently encountered in urban or other on-site contexts.

Without more detailed analysis it is not possible to be more specific about the origins of this cereal component and it can only be said that cereals were in use at the time of deposition. Plant macro-fossil investigation might also elucidate this problem if cereal chaff components are recovered. A single record of Secale (rye) is noted since it is not frequent in pollen records. The remaining cereal are of Triticum/Hordeum (wheat and barley).

The only other cultivated/economic plant noted is Cannabis sativa (hemp). This is usually difficult to separate from Humulus lupulus (hop) but in this case good preservation and comparison with pollen reference material indicates Cannabis is represented here. This perhaps indicates the local growth and/or preparation of hemp. Further analysis is required to confirm that this is definitely Cannabis pollen and not Humulus.

Although herb pollen are dominant, some tree and shrub taxa are also important and some stratigraphical variation is evident. The lower three levels have relatively higher values of Fraxinus (ash). This taxon is largely under-represented in pollen diagrams because of its small pollen production and insect pollination. It is likely therefore, that ash formed an

important component of the local landscape. Ash gives way to oak in importance in the upper levels of the pollen diagram and possibly in association with hazel and perhaps indicates local stands of woodland. Salix (willow) is important since this shrub also produces relatively small amounts of pollen. From its presence here, it is suggested that willow was a local component of this marsh/meadow area. Drawing on negative evidence it is interesting to note that Alnus (alder) is almost absent. Any local growth (as might be expected on or near this environment) would be represented by very substantial pollen frequencies. This further indicates that the environment here was one of water meadow or marsh.

VI) SUMMARY AND CONCLUSIONS

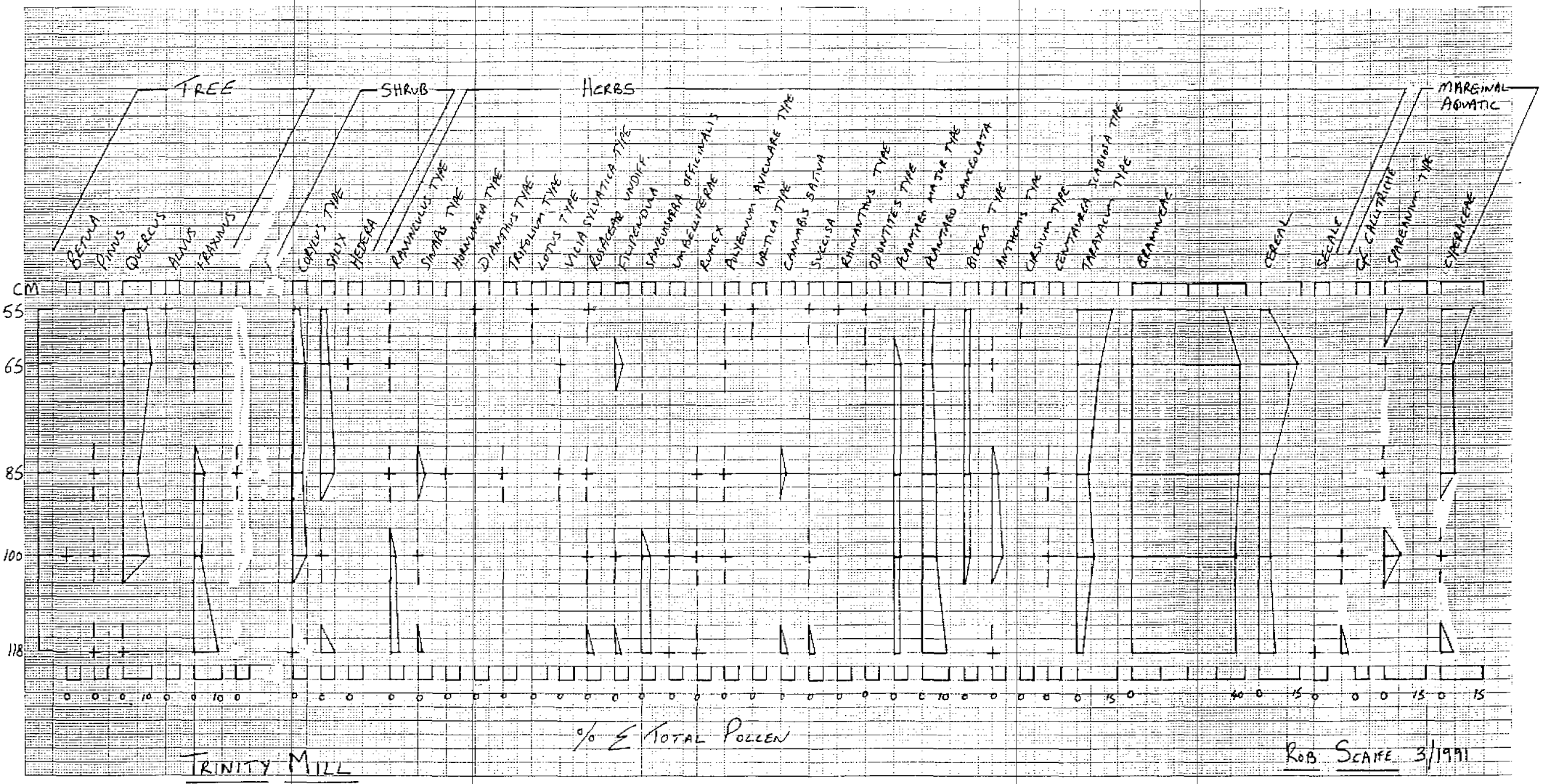
Pollen is present in these sediments. Preservation is good and would enable a detailed pollen analysis to be carried out at a much closer sample interval. Preliminary analysis based on a small count of 100 grains per level has, however, indicated a number of point of interest including a number of different environments. From the pollen evidence it can be suggested/confirmed that the area of sediment accumulation was one of wet floodplain or water meadow. The state of pollen preservation may indicate that this area has remained wet with a (?) high ground water table. Some shallow water environment is also indicated although long term seasonal flooding may be responsible. A strong arable agricultural component is present which may indicate local cropping although as noted above, other factors may be of importance. Some woodland may have been present which displays a change from ash in the lower stratigraphical levels to oak in the upper horizons.

VII) SUGGESTIONS FOR FURTHER ANALYSIS

A 'full' pollen analysis at a sample interval of 2-4 cm and statistically valid pollen sum (eg. 500 grains per level) would produce much greater detail. Dating of the profile would be highly desirable although the profile has the 'feel' of Saxon to Medaeval date! The data provided here might be added to when the results of preliminary plant macro-fossil analyses are available.

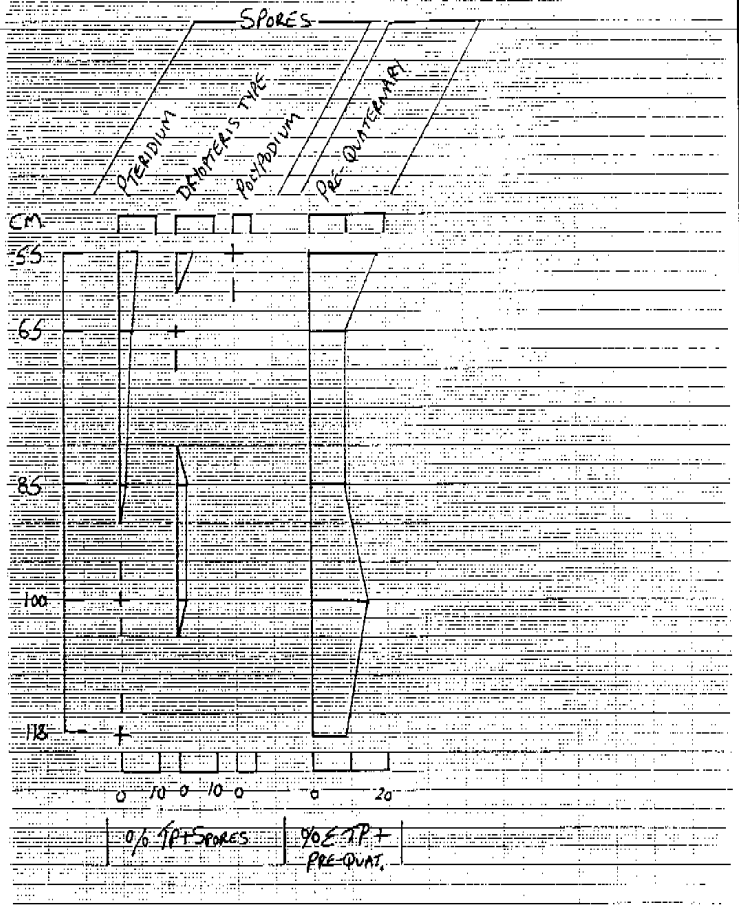
VIII) BIBLIOGRAPHY

Moore, P.D. and Webb, J.A. 1979 'An illustrated guide to pollen analysis'. London, Hodder and Stoughton.



TRINITY MILL

ROB SCAIFE 3/1991


SPORES
PTERIDIUM
DRYOPTERIS TYPE
POLYPODIUM
PRE-QUATERNARY
CM
55
65
85
100
118
0
10
0
10
0
0
20
% TP+SPORES
% E TP + PRE-QUAT.

DEPTH CM'S	Betula	Pinus	Quercus	Alnus	Fraxinus	Fagus	Corylus type	Salix	Hedera helix	Ranunculus type	Sinapis type	Hornungia type	Chenopodium type	Dianthus type	Trifolium type	Lotus type	Vicia sylvatica type	Rosaceae undiff	Filipendula	Sanguisorba officinalis	Umbelliferae	Rumex	Polygonum aviculare type	Urtica type	Cannabis sativa
55-56			8	1			2	2	1	1				1		1		1					1	1	
65-66			10		1		4	3	1	1							1		2				1		
85-86		1	6		4	1	3	6		1	3	1			1		1	1				1	1		2
100-101	1	1	9		3		5	1		2	1							1	1	3	1	1	1		
118-119		1			9		1	5		3	2		1	1				2	2	3	1	2			2

DEPTH CM'S	Galium	Succisa	Rhinanthus type	Odontites type	Plantago major type	Plantago lanceolata	Bidens type	Anthemis type	Cirsium type	Centaurea Scabiosa type	Taraxacum type	Gramineae	Cereal type	Secale	Unidentified	Callitriche (?)	Sparganium type	Cyperaceae	Pteridium	Dryopteris type	Polypodium	Pre-Quaternary Spore		Sum Pollen	Sum Spores
55-56		1	1	1		4	2		1		13	32	3				6	11	5	4	1	22		100	10
																						18			
65-66				1	2	3	2	1			8	38	14		1		1	4	4	1		10		100	5
																						[illegible]			
85-86					2	5	2	2		1	4	38	4			6	1	5	2	3		9		100	5
																						[illegible]			
100-101	1	1			2	5	2	3		1	6	37	4			1	6	1	1	2		17		100	3
																						[illegible]			
118-119	1	2			2	9		1			2	37	5	1		2		5	1			9		100	1
																						[illegible]			

SUPPLEMENT B SPECIALIST REPORT

SUBJECT/AREA Report on Magnetometer Surveys of Archaeological Surveys on the Preferred Route

AUTHOR A D H Bartlett

B Y Turton

DATE: 9th January 1991

CIRENCESTER BY-PASS

Report on Magnetometer Surveys of Archaeological Sites on Preferred Route

1990

A D H Bartlett

B Y Turton

CIRENCESTER, GLOUCESTERSHIRE

Report on Magnetometer Surveys on Preferred By-pass Route, 1990

Introduction

The magnetometer surveys described in this report were carried out at sites of known or potential archaeological interest along the preferred route of the intended Cirencester by-pass. This geophysical evaluation was commissioned by the Trust for Cotswold Archaeology as part of their assessment of the archaeological implications of the road scheme. The fieldwork for the surveys was carried out on 7 December and 15 - 18 December 1990.

Survey

Magnetometer surveys were carried out at 16 locations which were selected and marked out in preparation for the surveys by the Trust for Cotswold Archaeology. At each site readings were recorded using a Geoscan fluxgate magnetometer at a rate of approximately 2.25 readings/metre along traverses 1m apart located on a grid of 30m squares. Plots of the survey results are enclosed with this report. Adjoining sites have been combined on a single plan in some cases to give a set of plans as follows:

Plan	Site(s)
1	AI
2	AII, AIII
3	D
4	E, F
5	H, I
6A	J, K
6B	J, K
7A	L
7B	M, N
7C	M, N
8A	P
8B	R
9	S

Two charts (i and ii) showing magnetic susceptibility readings are also enclosed. The plans listed above include 1:2500 scale map extracts as supplied by TCA showing the location of the 30m grid squares at each of the sites. The small scale route plan for the road scheme which was supplied showing the site locations is not reproduced here, but OS grid references are noted in the description of the findings which follows below.

Results from all the sites surveyed are presented in the form of graphical or trace plots in which the readings from the 30m traverses are plotted as a series of profiles. Half-tone plots are also included for the sites where features were detected which can be more clearly represented in plan by that method. Interpretative markings have been added to some of the graphical plots, where magnetic anomalies of possible interest have been circled or indicated by dashed lines. Dashed lines are used to indicate the general trend of linear features, but the features in some cases are extremely tenuous, and may be no more than chance alignments in the general background noise. The lines have been drawn approximately along the centres of linear features. The plots, with an exception as noted at site J, represent the survey readings after treatment to correct for variations in the instrument zero setting, and after numerical

smoothing to reduce background noise levels. Extreme readings, which are usually caused by scattered pieces of modern iron, have also been truncated. The display range of the half-tone plots represents values in most cases from +1.2 nanoTesla (black) to -1.2 nT (white). The vertical scale of the graphical plots is usually 1.6 nT per traverse interval. Results are presented at scales of between 1:500 and 1:1000 as convenient.

Topsoil samples were collected from grid points along a transect through each site, and their magnetic susceptibility values were tested. Soil magnetic susceptibility provides an indication of the strength of response to be expected from a magnetic survey, and the values often show enhancement in the vicinity of past settlement or industrial sites. Subsurface features with a silted earth fill are usually therefore more clearly detectable by magnetometer when they lie close to centres of past activity, and the response diminishes away from such areas. Susceptibility values also vary according to the geological character of the site. The Jurassic geology of the sites described here provides variable, but in general favourable, conditions for magnetic investigation. The end points of the transect lines where soil samples were collected are marked A - B both on the susceptibility charts i and ii and on the 1:2500 map extracts attached to the survey plans.

Findings from the surveys were as follows:

Site AI (plan 1)

SP 007055

This survey (together with sites AII and AIII) represents an exploratory check in an area of unknown archaeological potential. The plots show considerable magnetic activity, but without any clear or evident plan which would indicate that any of the detected features are likely to be man-made. The irregular linear features could well be the result of periglacial or other natural disturbances of the subsoil. The high susceptibilty values (chart i) mean that natural disturbances of this kind could be detectable. Some of the anomalies (see examples circled on plan) could represent pits, but they are usually of rather irregular form. The large anomaly towards the east end of the survey has a smoother profile which is perhaps more likely than others to indicate an archaeological feature, and should perhaps be looked at first in any future investigation.

Sites AII and AIII (plan 2)

SP 016052/017052

The soil magnetic susceptibility values here are lower than at site AI, and so the overall response from the survey is less disturbed, but they are still sufficiently high (in range 50-80) for archaeological features to be readily detectable. One feature which was clearly detected appears to be a ditch extending through both the surveys AII and AIII. Examples of other fainter ditch-like feature are indicated on the graphical plot, and others could be conjectured from the half-tone plot. They are not well enough defined to determine whether they form a pattern of rectangular enclosures, or are perhaps of natural origin, as may be the case at site AI. There are other anomalies present which could represent pits. The strongest examples are circled and labelled X and Y.

Site D (plan 3)

SP 034033

This survey, which covers the site of a Neolithic/Bronze Age flint scatter, shares some of the characteristics of site AI. Susceptibility values are again high, and there is considerable magnetic disturbance, but without any clearly identifiable man-made features. Neither plot shows any well-defined linear features. It is possible that small pit-like anomalies could be present, but if so they cannot easily be distinguished from the noisy background. Some possible examples have been circled, but without much confidence.

Sites E and F (plan 4)

SP 037027/037025

Site E lies alongside the Foss Way Roman road, and site F represents a flint scatter with cropmarks nearby. Susceptibility values in each case are similar to sites AII and AIII, and the plots therfore lack the high level of (presumably) natural background activity seen at AI and D.

Site E produced no identifiable features, but site F produced a number of quite strong magnetic anomalies which could well indicate the presence of pits, as circled on the plot. Several of these form a cluster at the east side of the survey.

Sites H and I (plan 5)

SP 042022/043020

Flint scatters have been noted in this field, which also adjoins a Roman road on its west side. The field is also crossed by the line of a dismantled railway, which creates a band of magnetic disturbance, probably from slag in the track ballast, across the south-east corner of site H. Only a few other fragmentary linear features or weak pit-like anomalies are visible in the two surveys (apart from the strong anomaly caused by the electricity pole at X in site I).

It is not impossible at a site identified only from a flint scatter that weak and scattered features of this kind could be archaeologically significant, but further investigation would be needed to determine whether this is so. The lack of any intensive archaeological activity is consistent with the low susceptibility values from the two sites, but it is perhaps significant that the lowest of the susceptibility values are from the south of site I, and there are higher values to the north where anomalies were noted.

Sites J and K (plans 6A and 6B)

SP 049013/047013

These two fields contain pot scatters of medieval and perhaps Roman date, but both gave very low susceptibility readings, and produced very few magnetic anomalies when surveyed. The results from both fields are shown as standard smoothed plots on plan 6A. Site K is blank except for the usual few anomalies probably caused by iron objects in the topsoil. Site J has rather more iron, but also a few weak ditch or pit-like features which, as in the case of sites H and I, are of uncertain significance.

The results from this field are displayed also in an alternative unsmoothed form on plan 6B to eliminate the possibility that any of the stronger anomalies could be small kilns or hearths. The weaker ditch and pit-like features are not as easy to recognise here as in the smoothed versions, but all the stronger anomalies can be seen to be single sharp spikes characteristic of iron. The half-tone plot (which is based on the smoothed data) shows a certain amount of small-scale noise, which may be the effect of cultivation, but it fails to demonstrate any clear

patterns in the detected features, although there is a slight hint of a circular arc at the south of the survey (labelled X on plot 6A). There is a pipe alongside the road at the west of the field.

(The survey at site J covers the area which was found to be pegged out in the field, and extends 30m further to the west than the site grid as shown on the plan originally supplied. The area as actually surveyed is marked on the map extract on plan 6A.)

Sites L, M, N (plans 7A, 7B, 7C)

SP 053006 / 053005 / 053004

Cropmarks noted at these sites take the form of double ditches at site L, an enclosure at site M, and faint indications of ditches at site N. All three sites were productive in the survey, although at site L (plan 7A) the double ditches appear to be at the north-east rather than the west of the site. There is fairly strong general magnetic disturbance at site L, and other individual anomalies are hard to identify. The half -tone plot confirms the lack of any clear pattern other than in the north-east corner of the survey.

Site M shows an apparent rectilinear pattern of ditches, as indicated on plan 7B and clearly visible in the half-tone plot, 7C. Similar anomalies are seen also at site N. The most conspicuous of the probable ditches cross site N diagonally, but others appear to be present, and perhaps subdivide the site into enclosures. A few pits may be present. There is magnetic disturbance throughout the site, and it is possible that if the features as marked prove to be siginificant, then others could occur. Soil susceptibilty values are high at all three sites, and reach their maximum at site M and in the centre of site N.

Sites P and R (plans 8A and 8B)

SU 058998 / 059995

A flint scatter has been noted at site P, but much of the area of the survey has been obliterated by relatively recent quarrying. The backfilling of the pits produced strong disturbances in two distinct areas of the plots (plan 8A). There also appears to be a pipe at the south east corner of the survey. Some weaker anomalies are visible elsewhere, but their significance, as at other flint scatter sites, is difficult to assess. Anomalies at the north end of the survey may form a semicircular pattern, but this may be illusory.

A complex system of linear and curving cropmarks is indicated on the location plan for site R (8A), but only some very faint linear trends, and perhaps a few other small anomalies , can be conjectured from the survey plots (8B). Susceptibilty values here are low, suggesting that no intensive archaeological activity is to be expected, and any ditches or other features present are not likely to be easily detectable.

Site S (plan 9)

SU 068982

This site is again alongside a Roman road, and a flint scatter has also been noted. A pipe runs alongside the road, but there is also a series of parallel linear anomalies (arrowed on the half-tone plot). These are quite clearly marked, but their regular spacing suggests they could be the result of modern cultivation. A few small pit-like anomalies have also been indicated on the plot, but they are weak and may not be archaeologically significant.

Conclusions

The most productive of the sites were those with cropmarks, and where fairly substantial settlement activity is likely to have occured. These include sites L, M and N, and possibly also sites AII and AIII.

Sites which are known only from flint scatters are unlikely to display the same intensity of activity, and magnetic findings are correspondingly sparse. The few magnetic anomalies found at these sites do not provide a very satisfactory basis for interpretation, and further investigation would be desirable to establish their archaeological significance. The features as noted on the charts represent only a sample of such anomalies, and if any are genuine, then other such features could well be present. Of the sites in this category, F has perhaps the most promising anomalies, but some features may also have been detected at I, P, R and S. Cropmarks at R appear to have gone largely undetected, perhaps because of the low magnetic susceptibility of the soil.

The pot scatter sites J and K were not very productive, and the few features noted at J should perhaps be viewed with the same caution as those identified at the flint sites.

Sites AI and D displayed considerable magnetic activity which may be of largely geological origin, although archaeological features could also be present.

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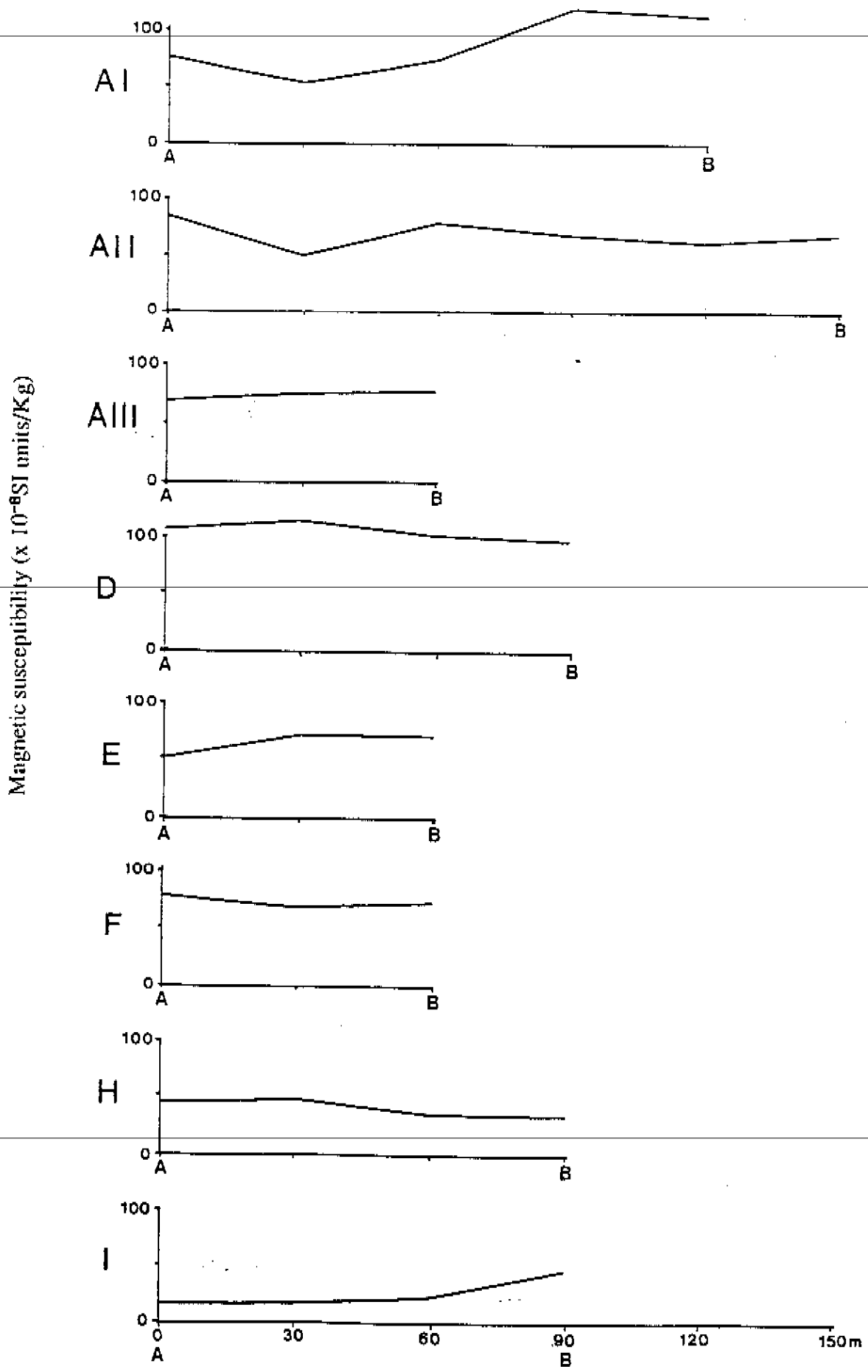
Date of report : 9 January 1990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AI
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AIII
D
E
F
H
I
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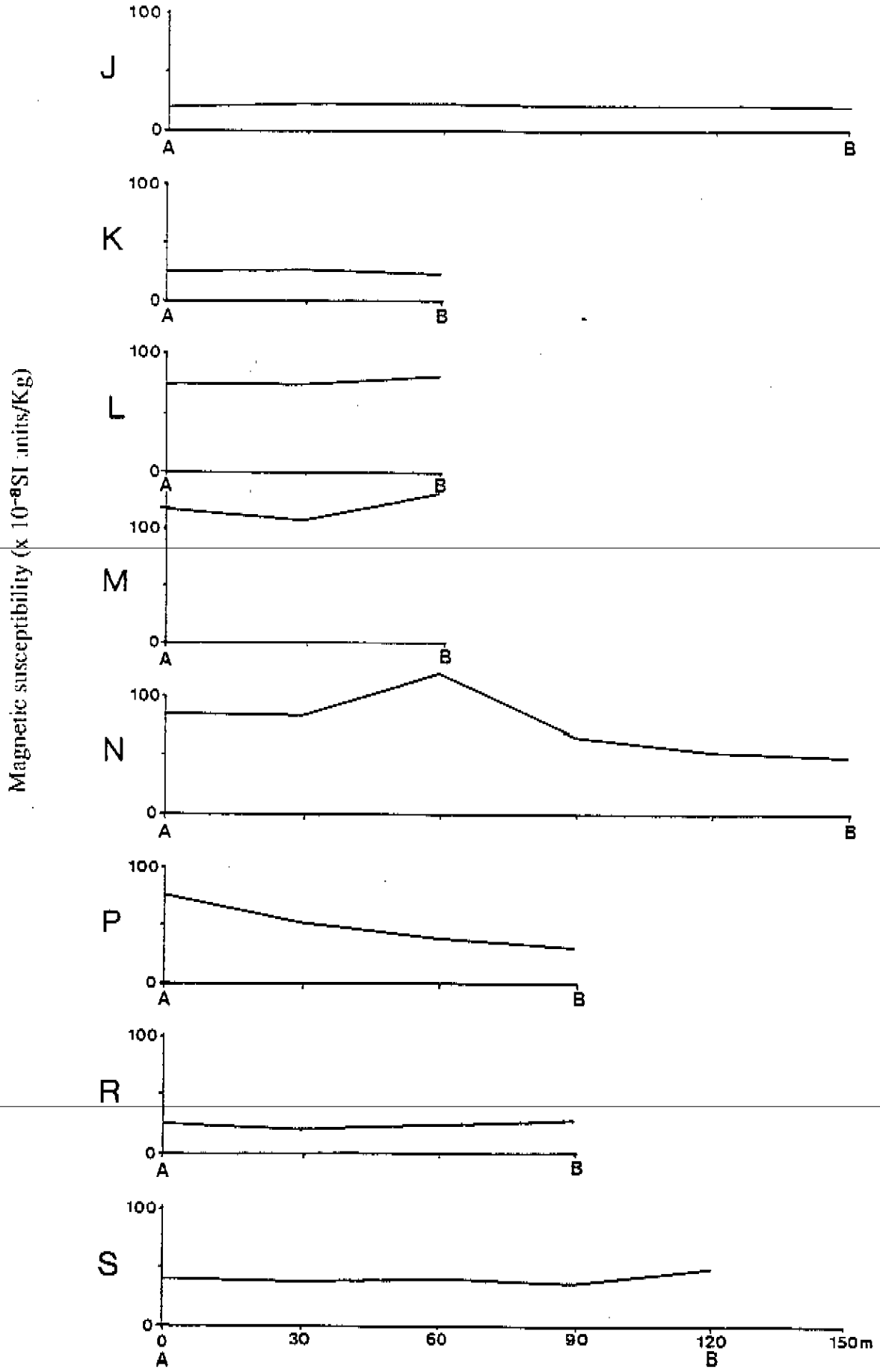
0
A
B
0
30
60
90
120
150m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J
K
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M
N
P
R
S
100
0
A
B
0
30
60
90
120
150m

CIRENCESTER BY-PASS

Report on Magnetometer Survey of sites at Peewits Hill 1991

A.D.H. Bartlett

CIRENCESTER, GLOUCESTERSHIRE

Report on Magnetometer Survey of Sites on Proposed By-Pass Route at Peewits Hill, Bagendon, 1991

NG: SP 013 053

Introduction

This survey was carried out on 15 March 1991 as part of the archaeological assessment of the proposed Cirencester by-pass route, which is being undertaken by the Trust for Cotswold Archaeology. The survey continues work begun in December 1990 when surveys were made of a series of sites along the route. The three areas investigated on this occasion lie between sites A(i) and A(ii)/(iii) as described in the previous report, and are referred to here as sites A(iv) – (vi). The areas covered by the survey are marked by shading on the enclosed map extract (plan 1), which is based on a plan supplied by the Trust for Cotswold Archaeology, and shows the 30m squares as marked out by the Trust in preparation for the survey.

Survey

The survey procedure was similar to that employed for the earlier work, with readings recorded with a fluxgate magnetometer along traverses 1m apart across each 30m grid square. Results are presented in the form of graphical and half-tone plots on plan 2. Soil samples were again collected from grid points along a transect (indicated by letters A – B on plan 1) across each site, and their magnetic susceptibilites measured. The readings are plotted on chart i enclosed. The survey findings were as follows:

Site A(iv)

Two 30m squares were surveyed here, of which the one to the N shows clearly defined magnetic disturbances. These include pairs of parallel linear anomalies (arrowed at a and b on plan 2). At (a) there are narrow positive anomalies which could indicate small ditch or furrow-like features some 3-4m apart, while at (b) there is a distinct negative linear anomaly. A negative anomaly could in principle indicate masonry or a wall footing which is less magnetic than the surrounding soil, but this is perhaps unlikely given that the disturbance can be seen in the half-tone plot to extend across the full 30m square. The magnetic susceptibility values are very high at all the sites surveyed here (in range 80-120 $\times 10^{-8}$ SI/kg), which appears to be an effect of the geology, and this means that small natural irregularities in the depth of topsoil or surface of the bedrock are likely to produce a magnetic response. Further investigation would therefore be needed to establish whether the features noted here are man-made.

Site A(v)

The 30m square to the S of the pair surveyed here lies across the bottom of a small coombe, from which the ground rises to the N. Both squares show a pattern of NW-SE undulations, similar to those seen at site A(vi) further to the E, and which are probably the result of cultivation, but they are also intersected by much stronger NE-SW linear anomalies. The anomaly across the S square (c) could in most circumstances safely be interpreted as a quite substantial ditch, but here given the strongly magnetic soil, it could perhaps be the effect of silting in the bottom of the coombe, although if so it is remarkably clearly defined. Other ditch-like features cross the N square, which lies on open sloping ground where silting would not be expected to occur. There is also a concentration of magnetic activity at (d), where there is a rabbit warren, but which is also close to the reported find spot of a large ancient stone tank, now in the possession of the owner of the property.

Site A(vi)

This area shows only a pattern of linear undulations in the survey plots, some of which align with the northern field boundary, and are therefore presumably the effect of cultivation, as noted also at site A(v). Distinct features of apparent archaeological significance were seen in the earlier survey of the adjoining field to the east (sites A ii/iii), but none appear to have been detected here.

Conclusions

The high susceptibility values, and consequently highly responsive conditions for magnetic surveying at these sites mean that it is difficult in some cases to distinguish slight natural variations in the topsoil cover from man-made archaeological features. There does however appear to be magnetic activity of potential archaeological significance at site A(v) in the vicinity of the find spot of the stone tank, and the linear features at site A(iv) perhaps also justify some limited further investigation.

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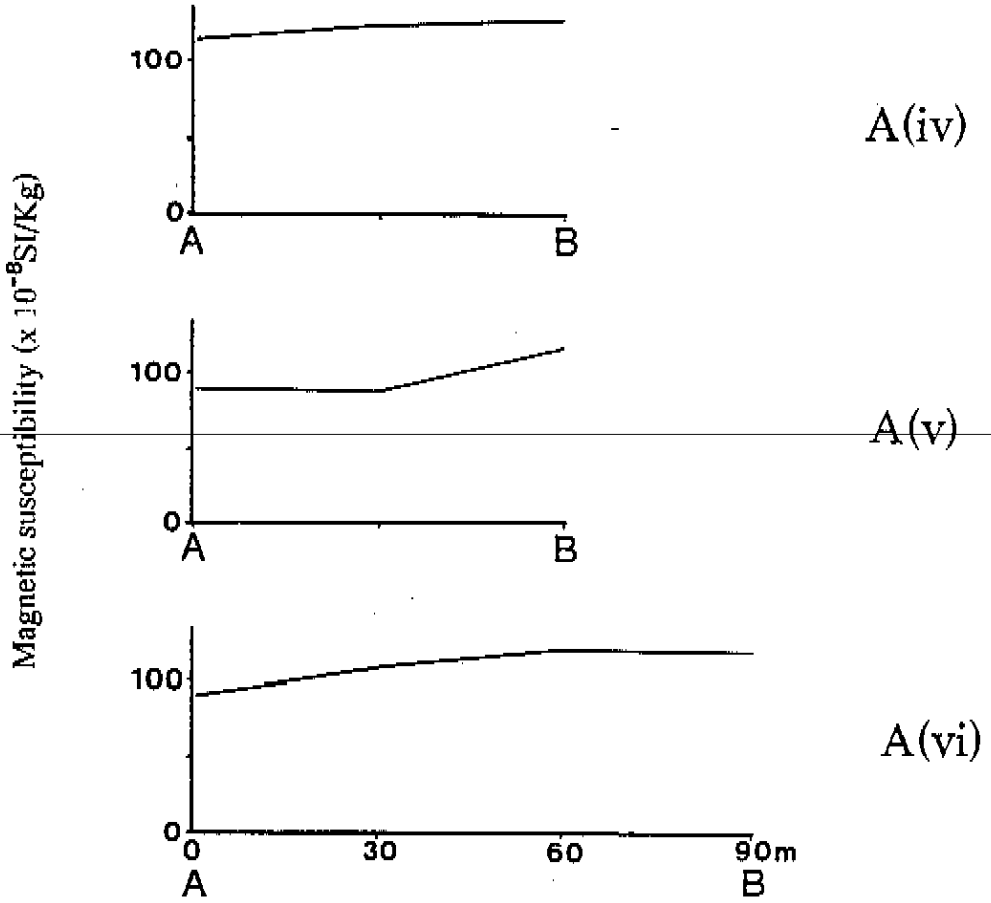
Acknowledgements

This survey was commissioned by the Cotswold Archaeological Trust Ltd, and carried out with the kind permission of the owner, Mrs Robinson.

Date of report: 6 April 1991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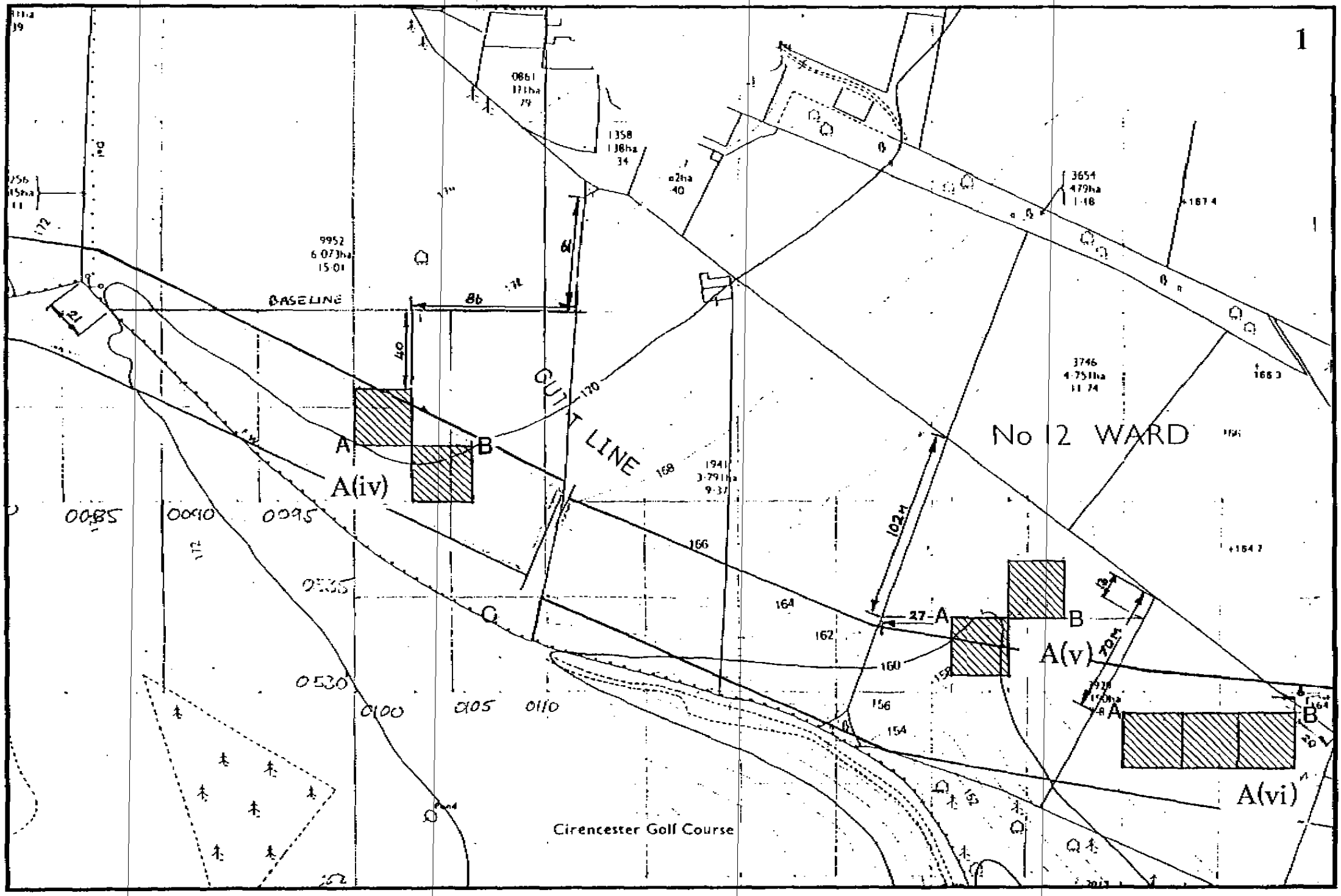
0
30
60
90m
A
B
A(vi)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BASELINE
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A
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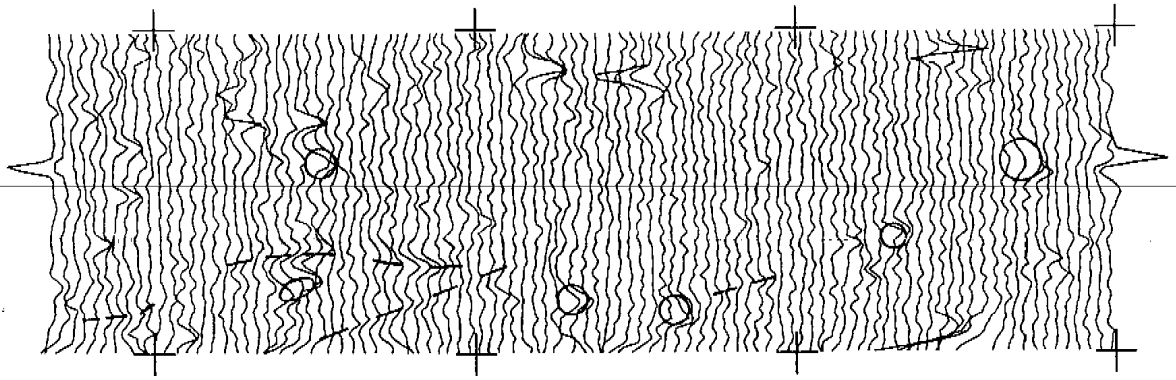
Site AI



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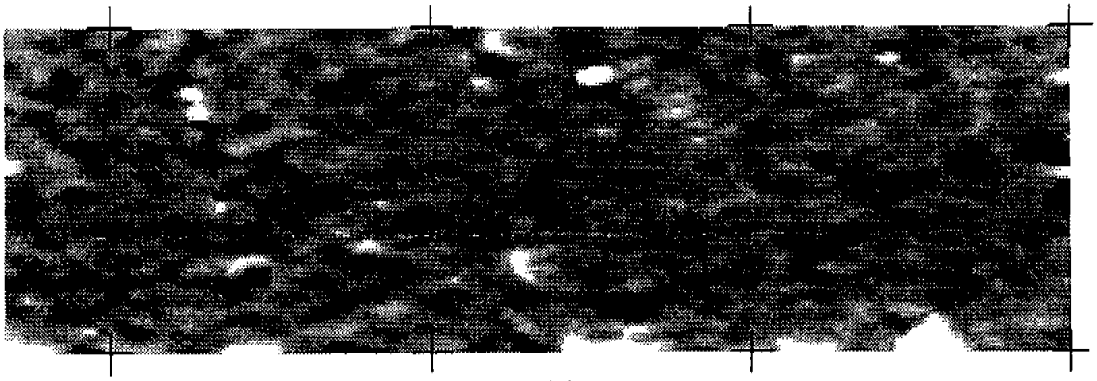

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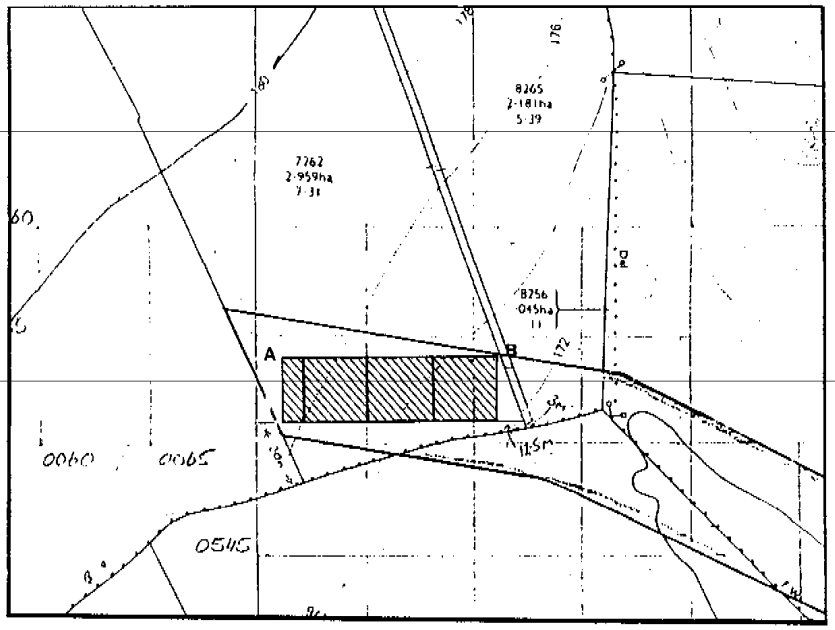
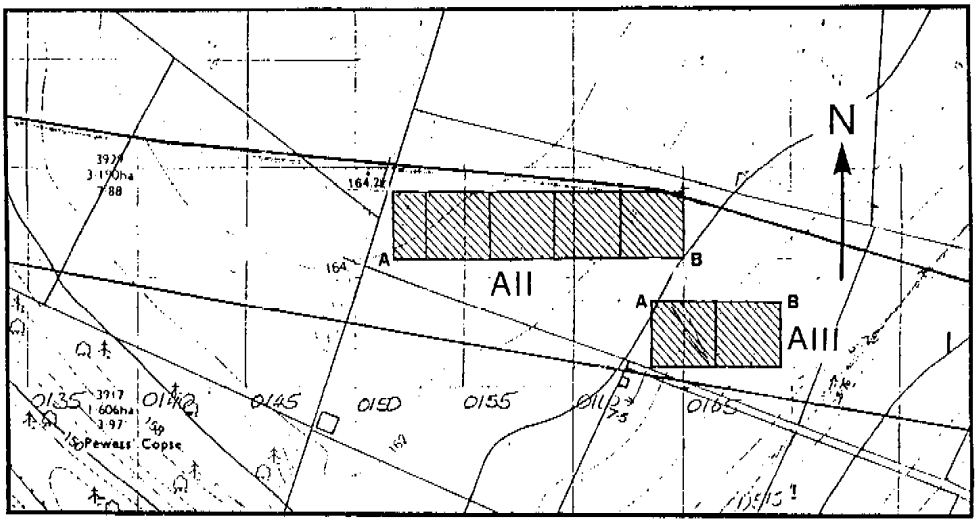


Sites AII, AIII



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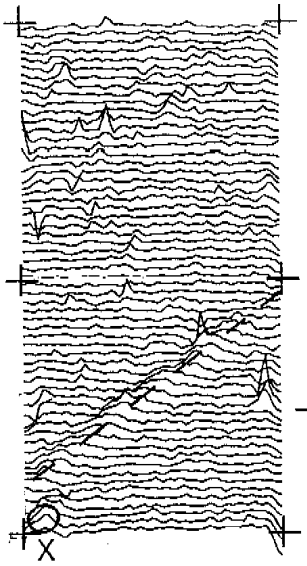

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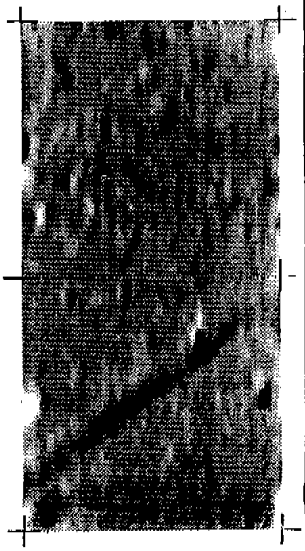

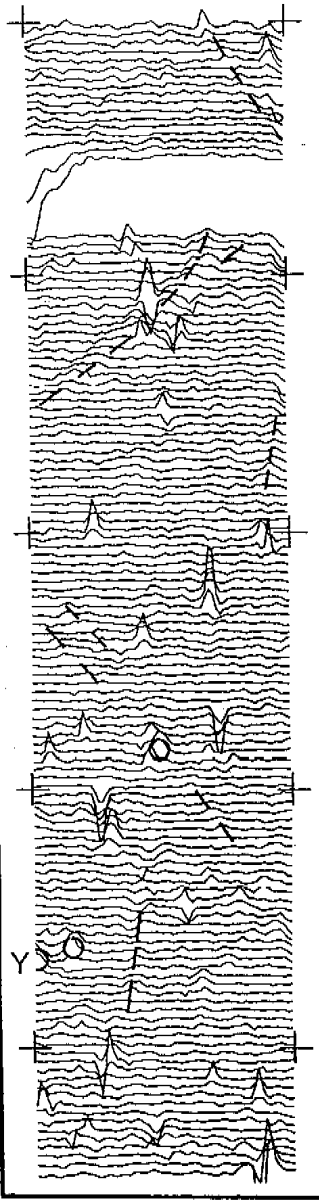

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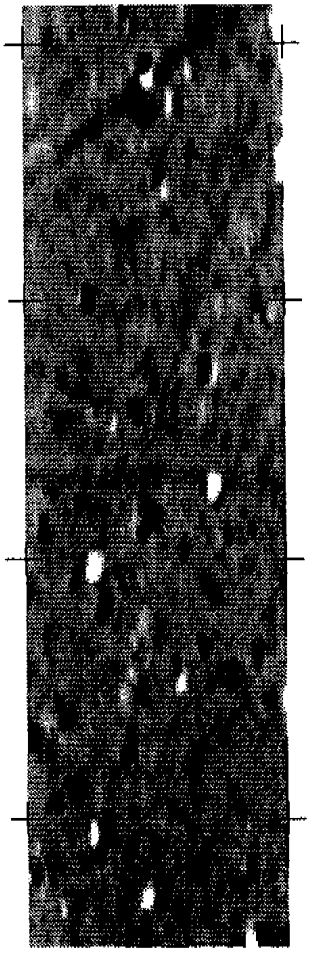

AII

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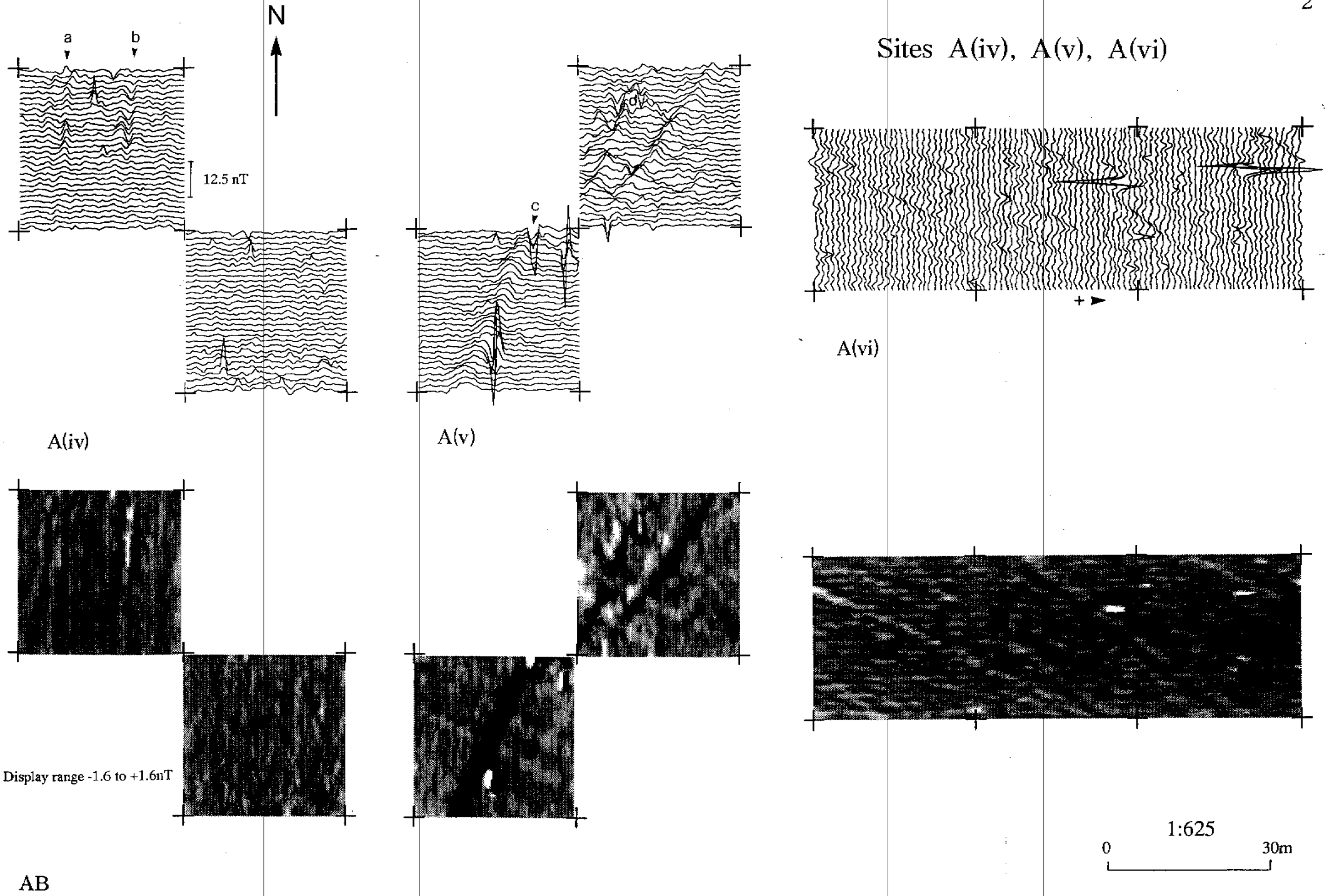
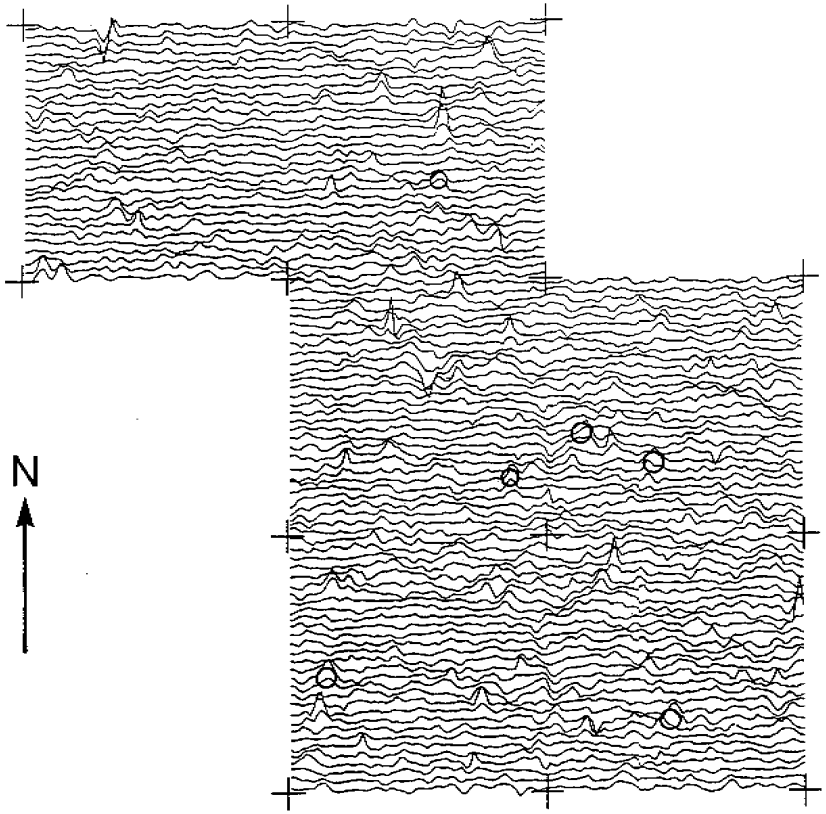
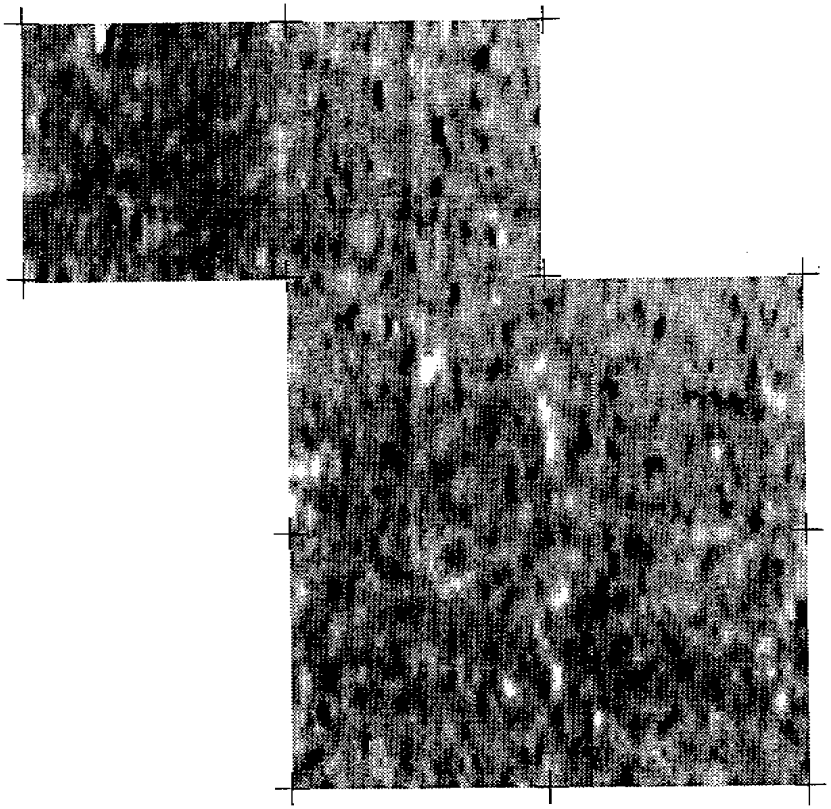
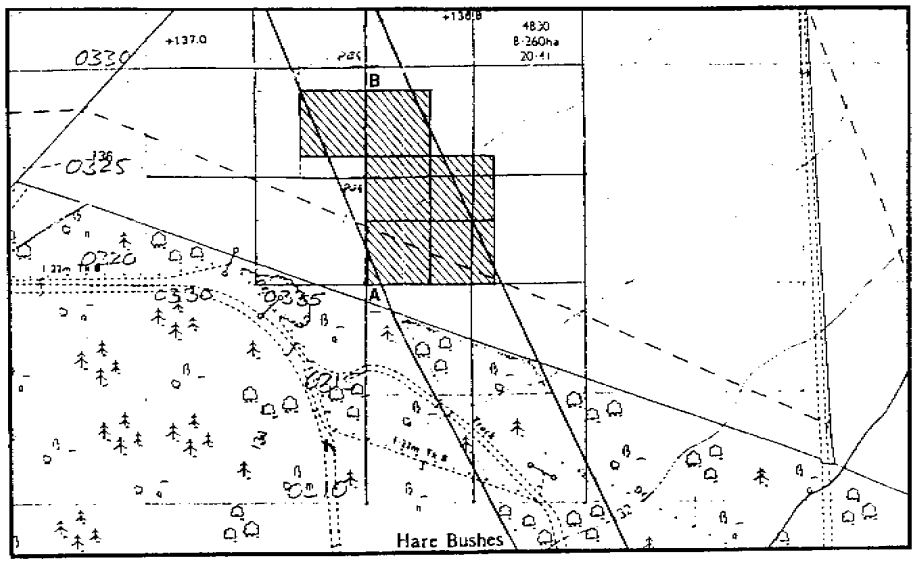
Sites A(iv), A(v), A(vi)



Site D







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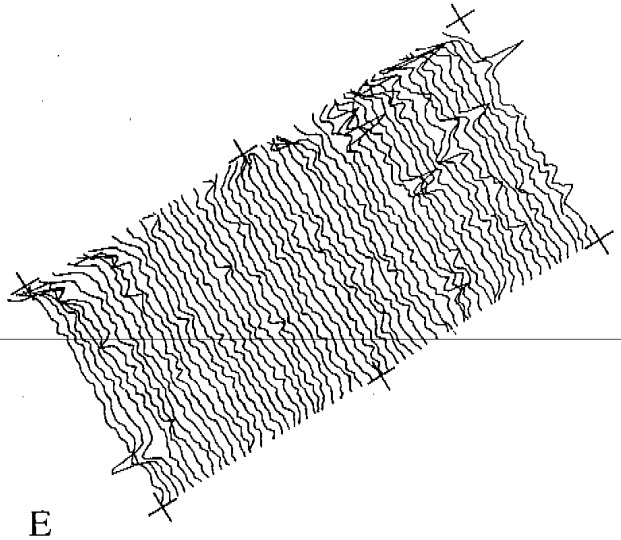
Sites E, F



E

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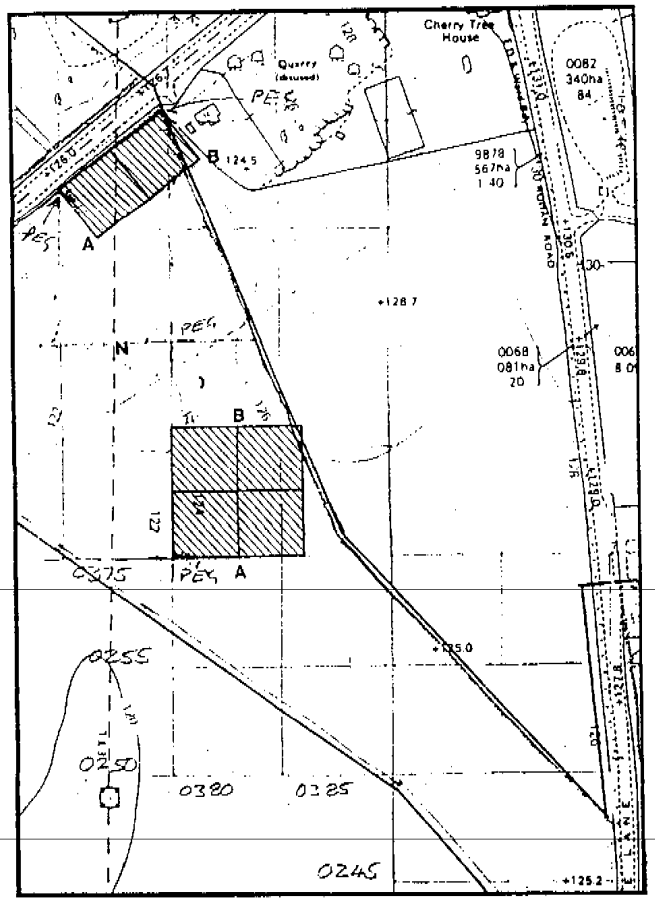

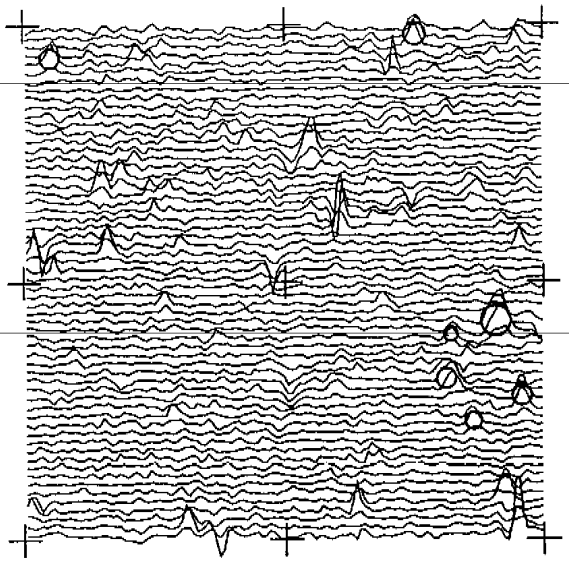

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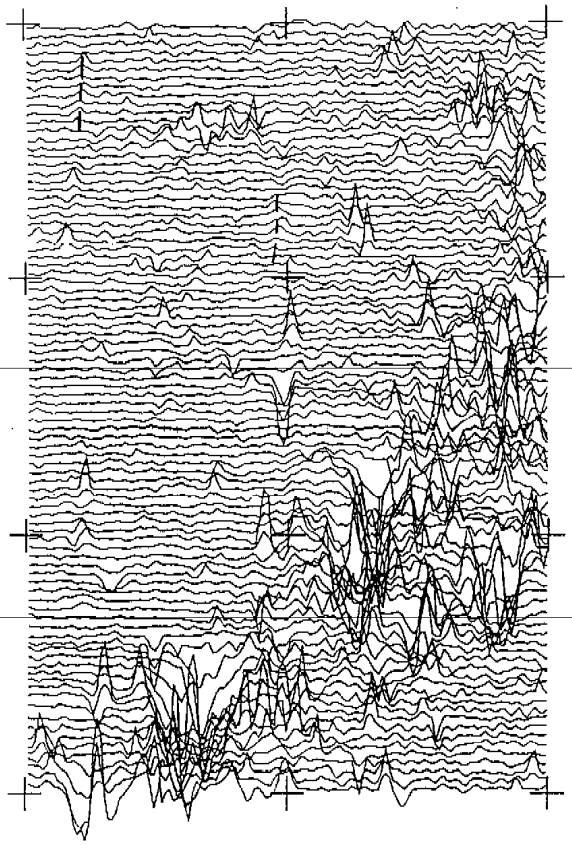
Sites H, I



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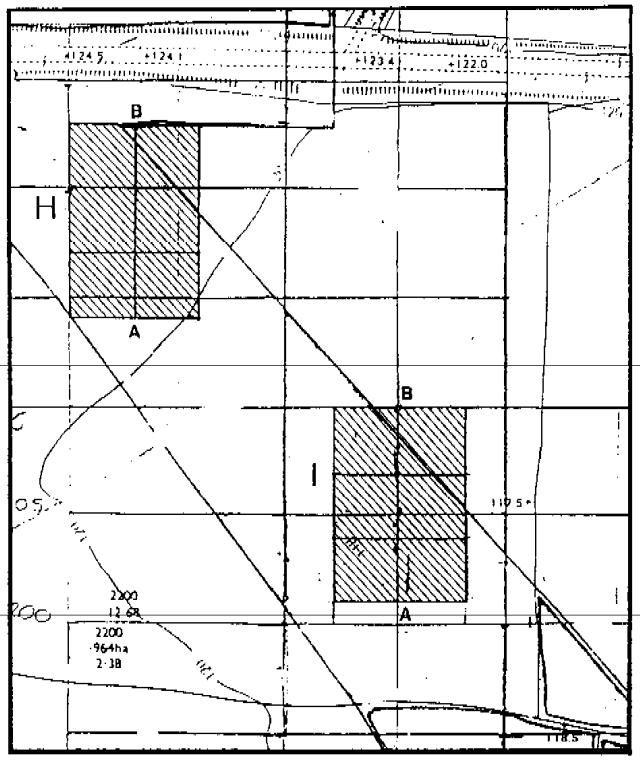

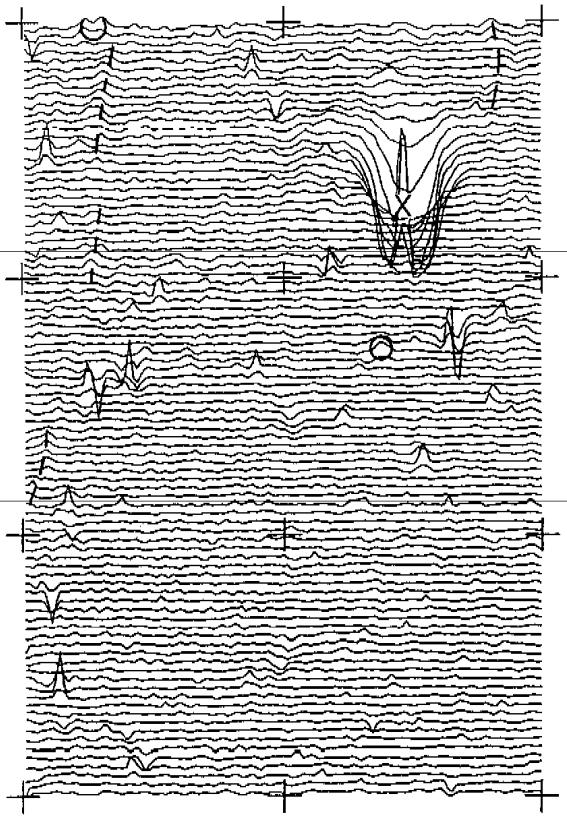

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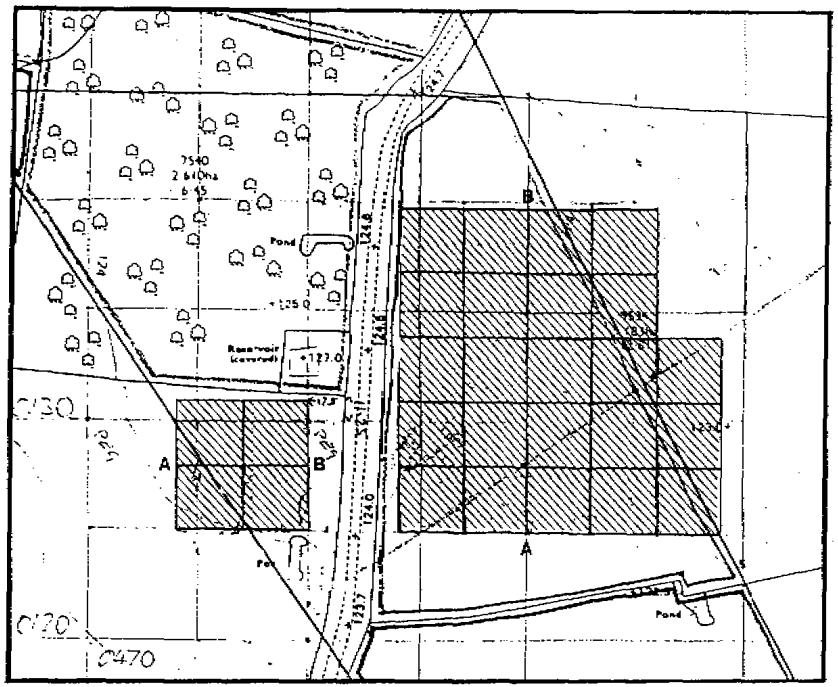
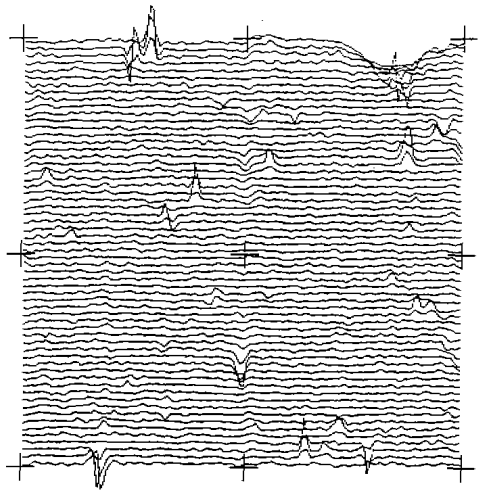
Sites J, K

6A





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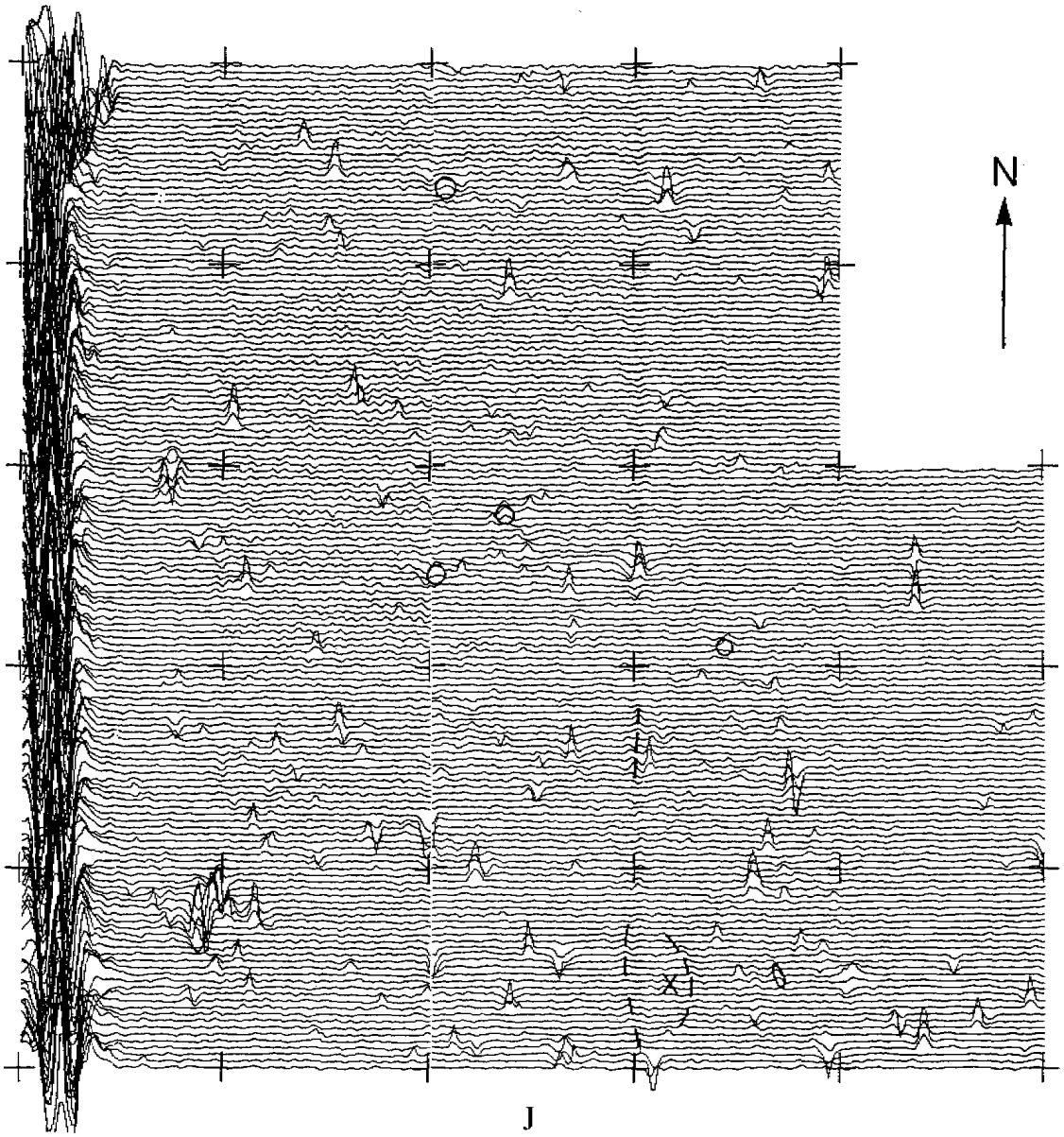

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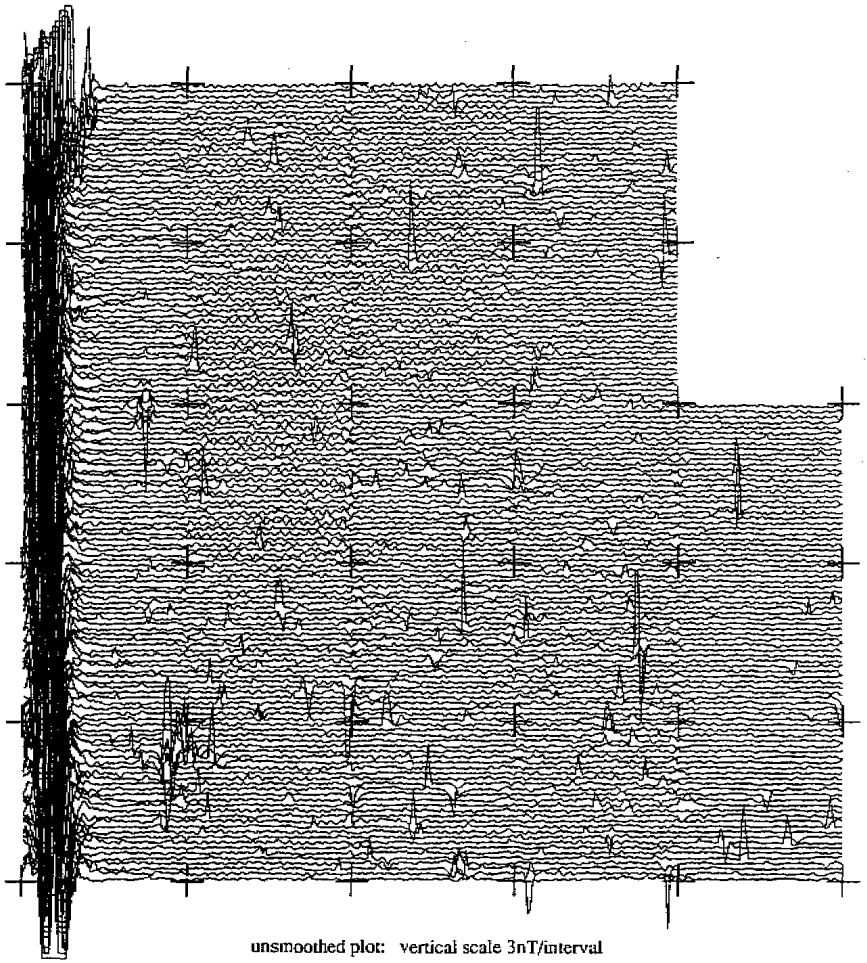
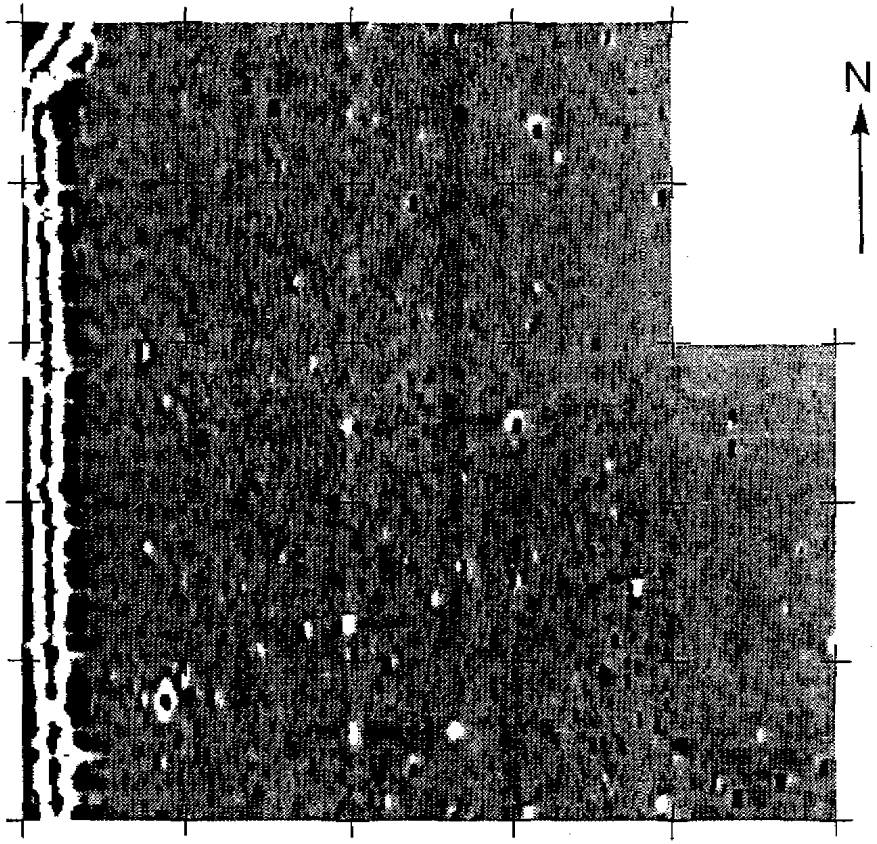
Site J



unsmoothed plot: vertical scale 3nT/interval



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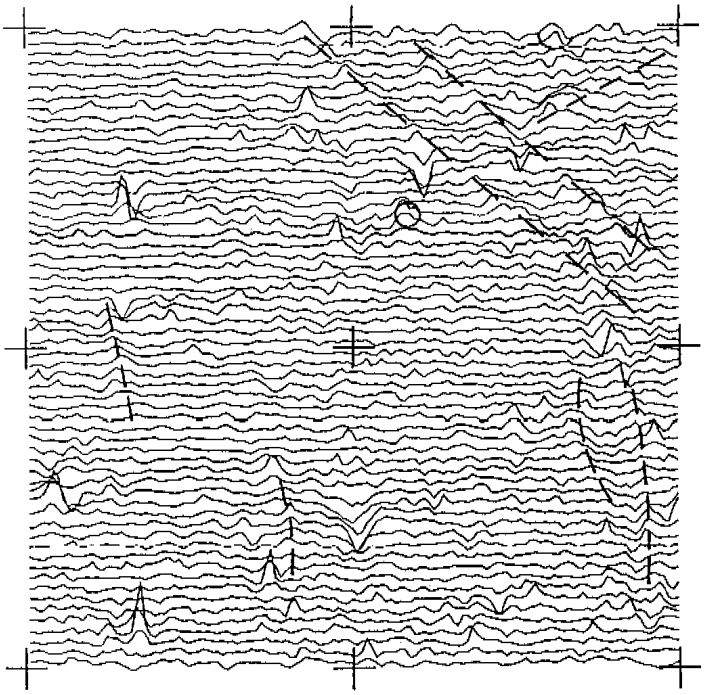

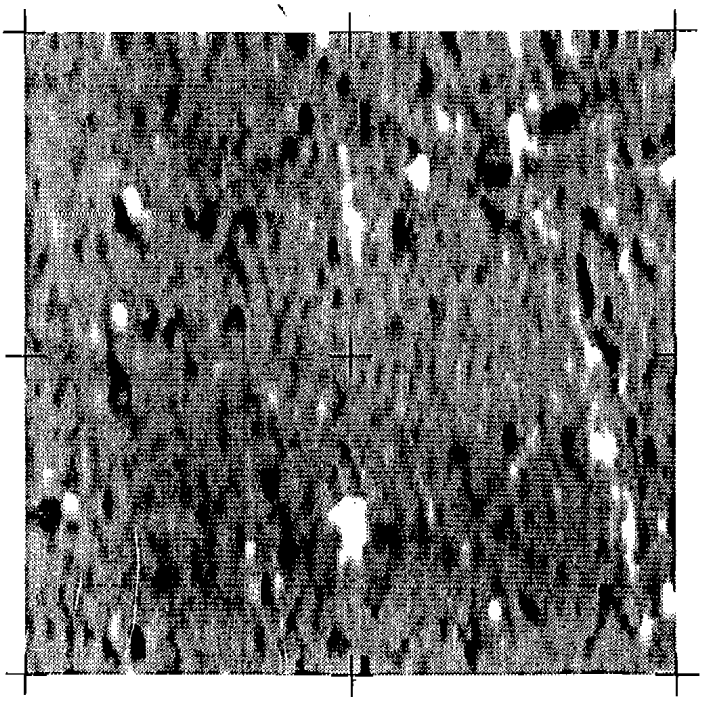

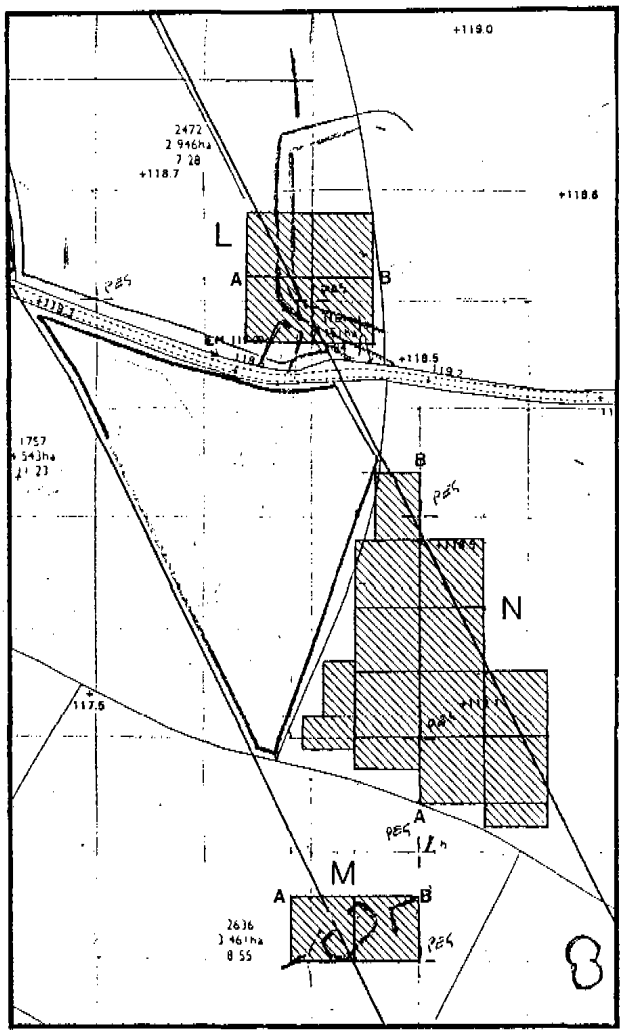

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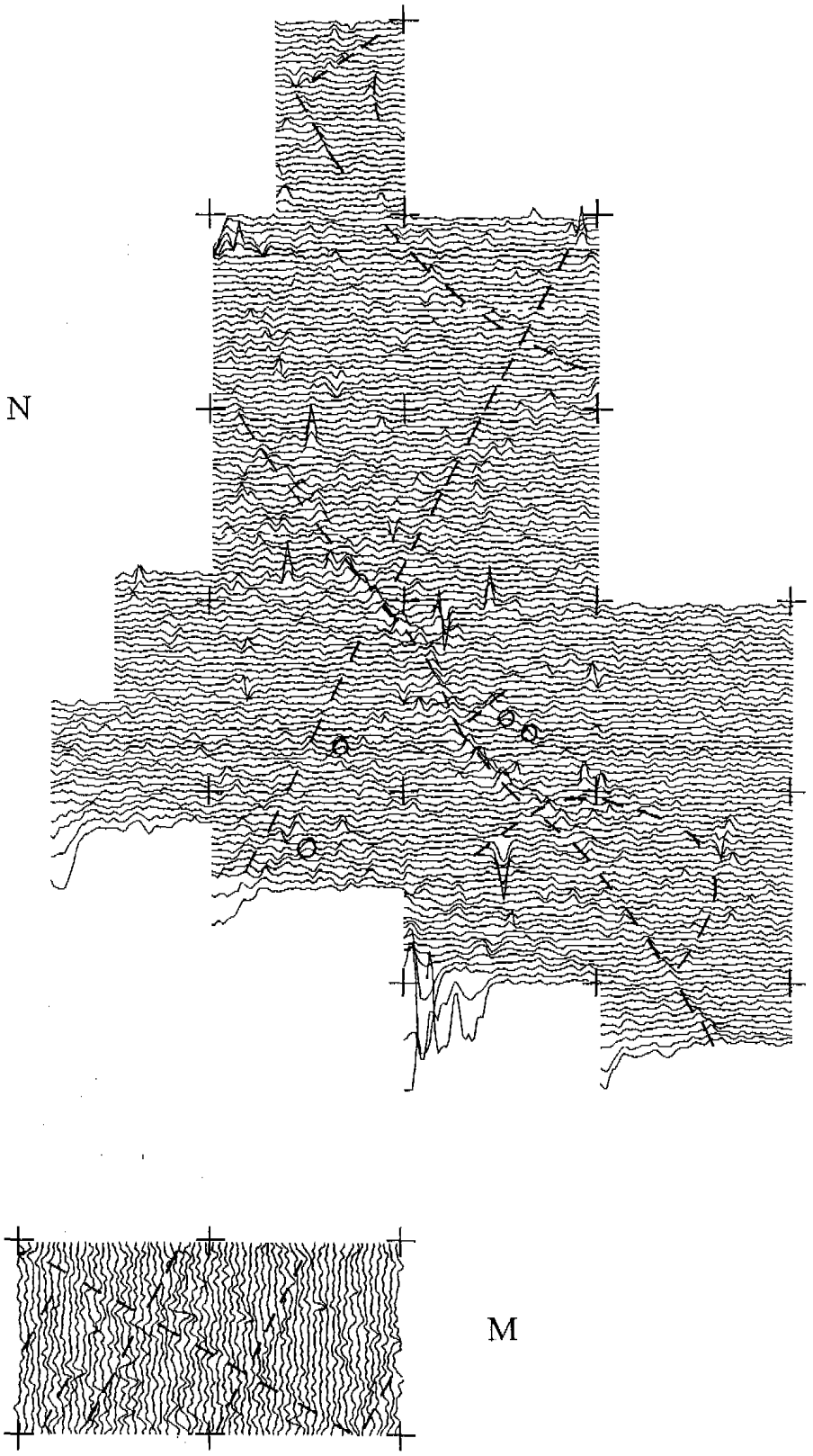

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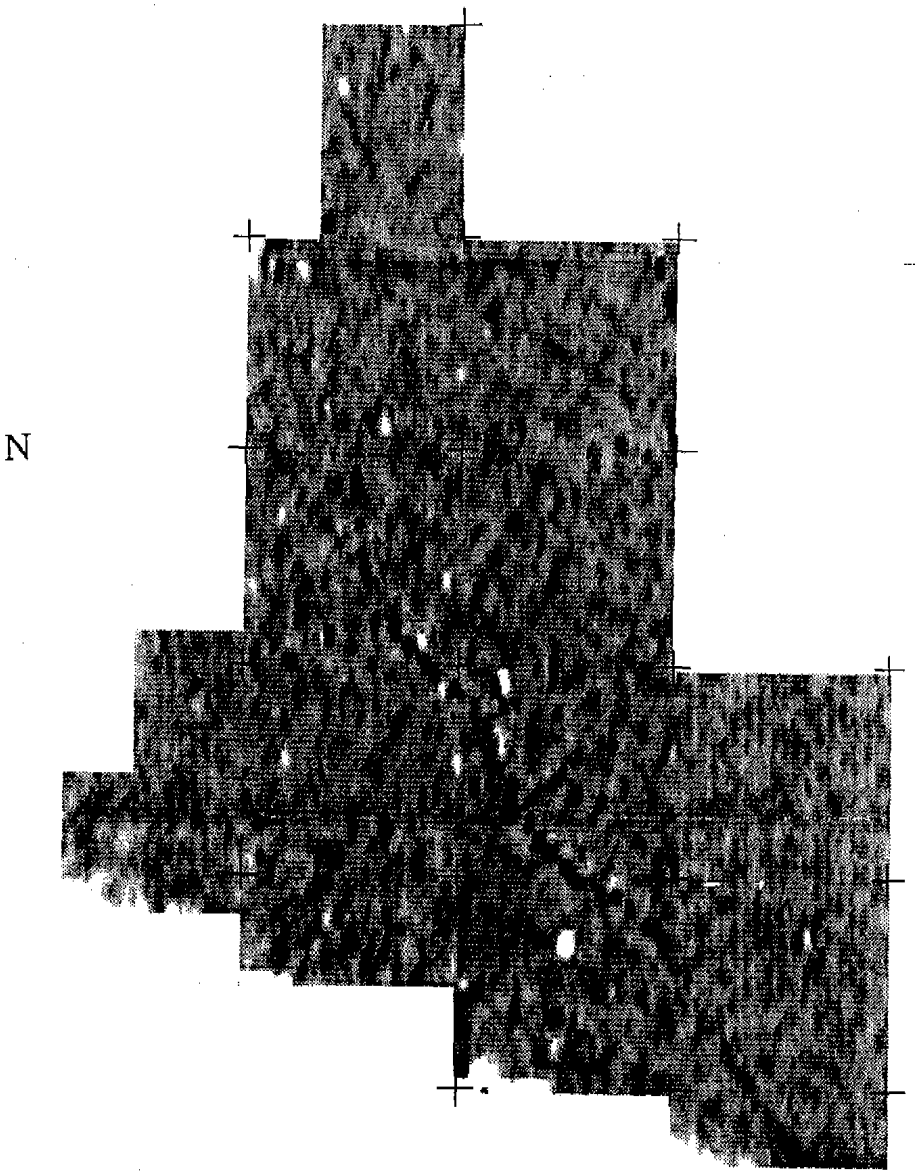

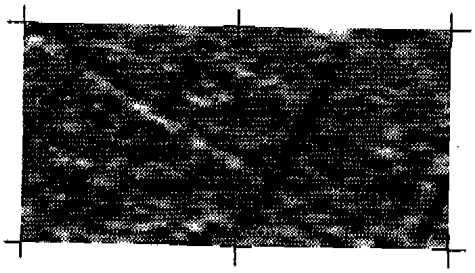

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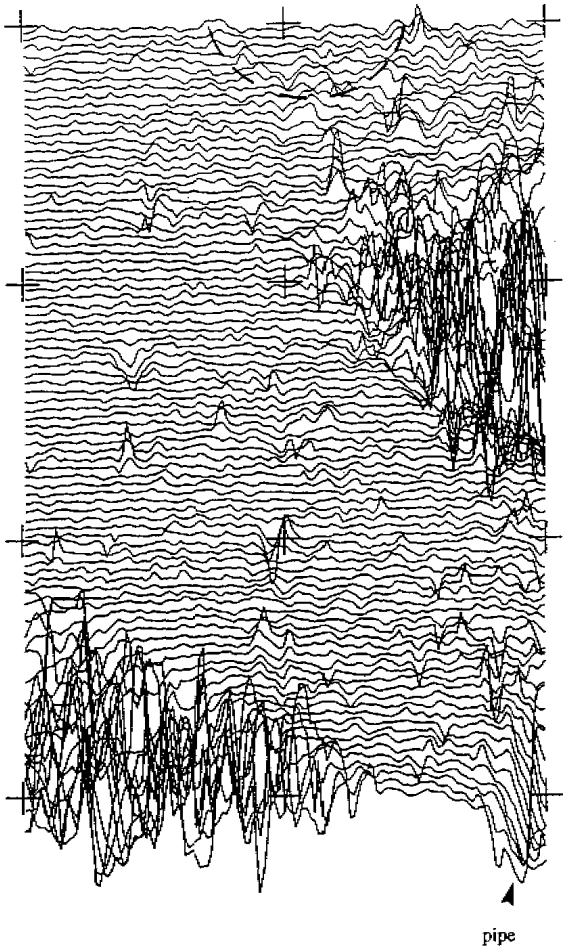
Site P



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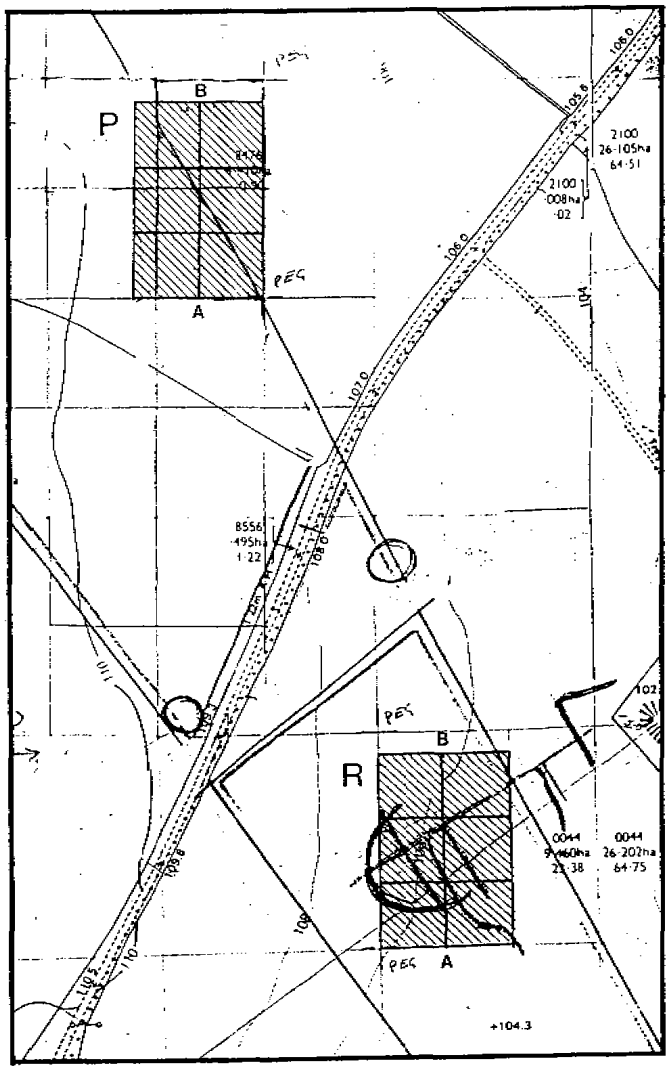

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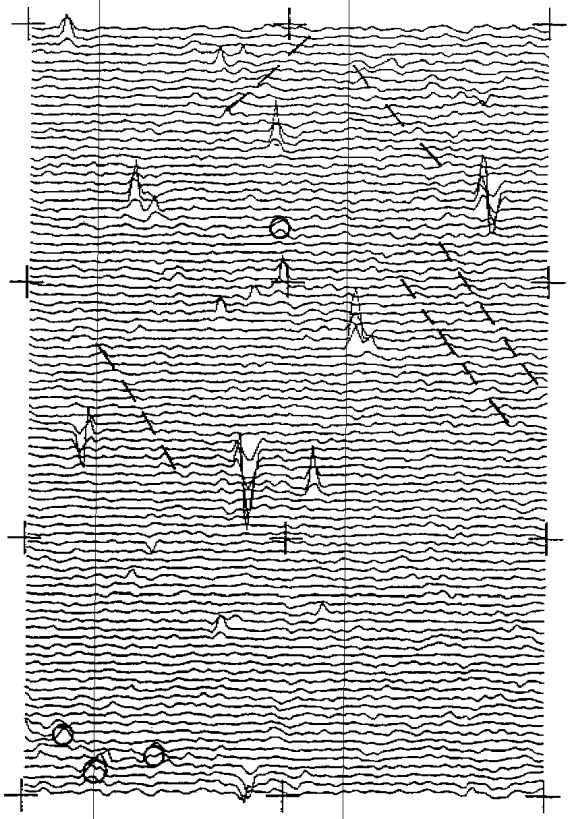

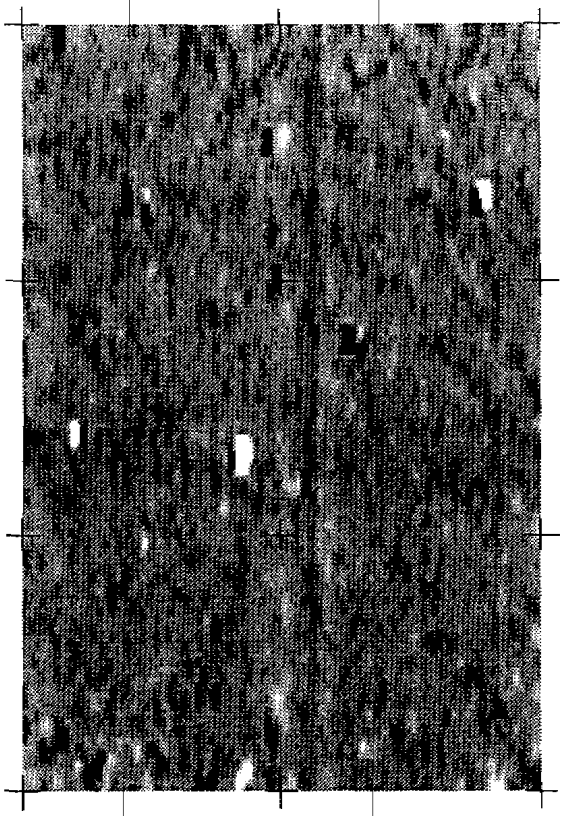

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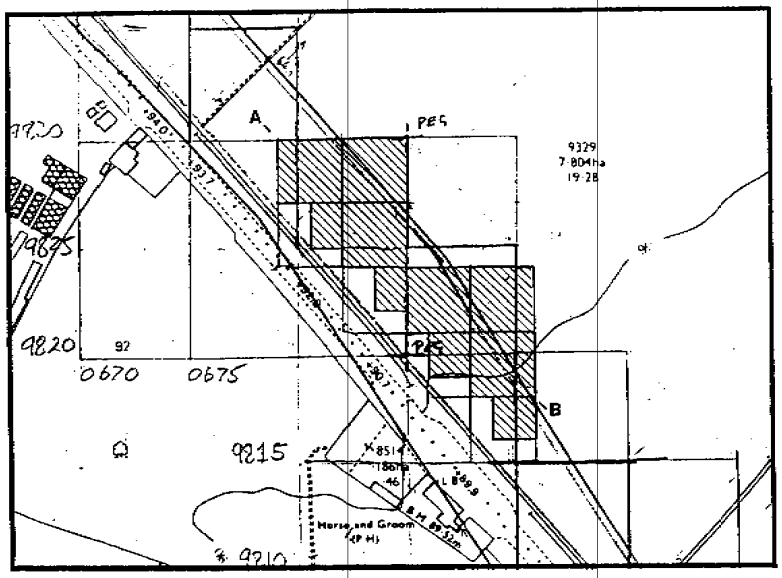
A
B
PES
9329
7.804ha
19.28
9820
0670
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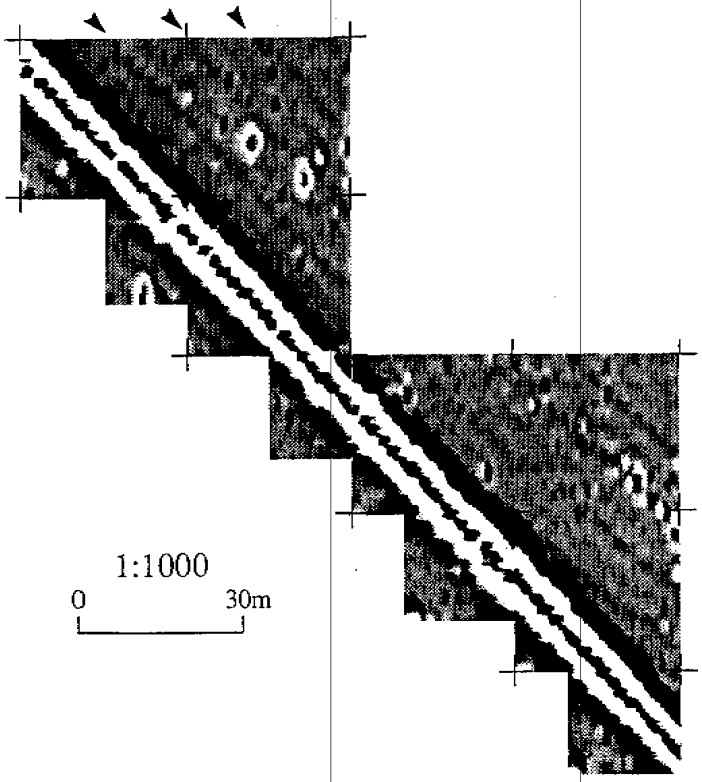
Horse and Groom (P.H.)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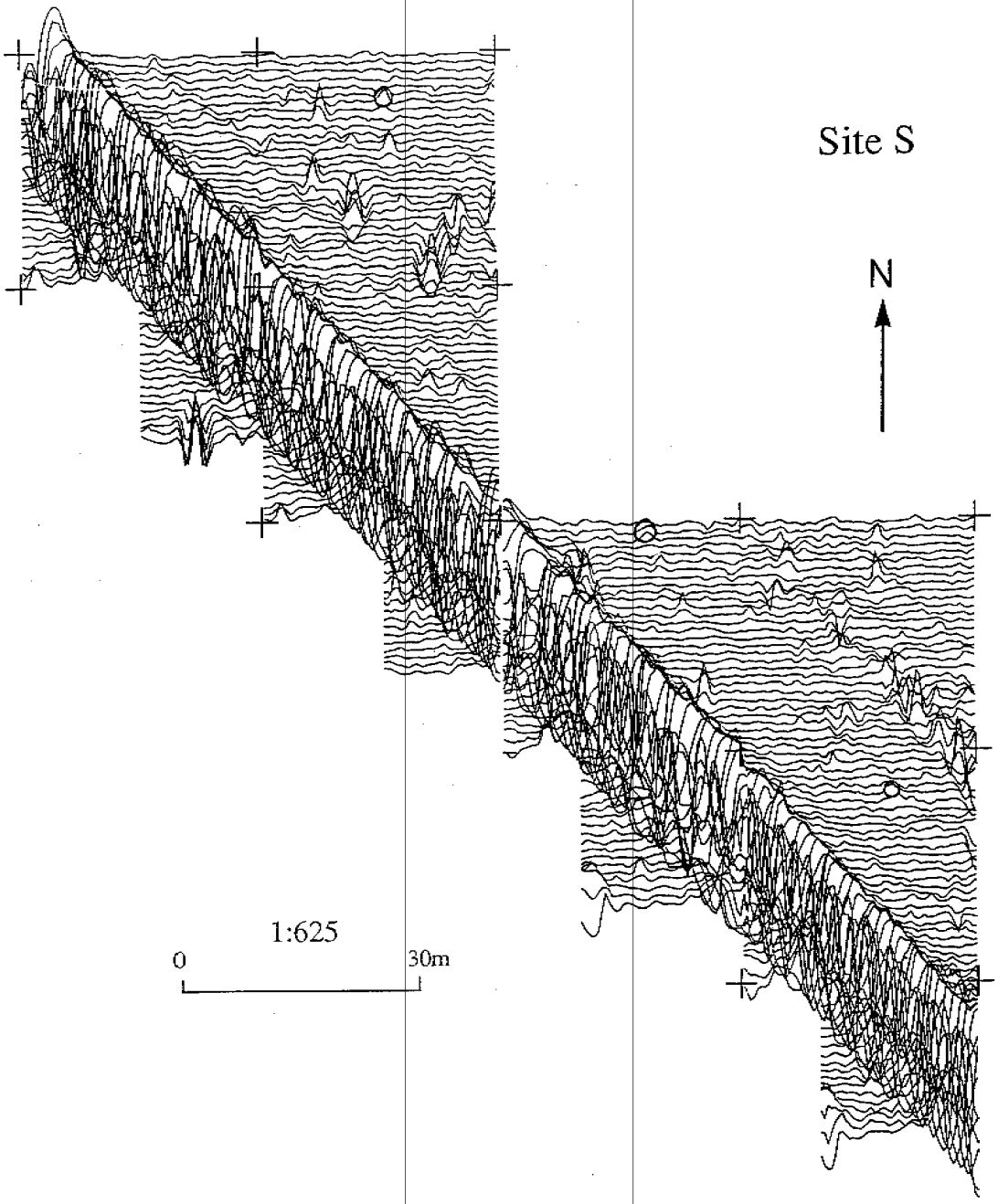
Site S
N
1:625
0
30m

SUPPLEMENT B SPECIALIST REPORT

SUBJECT/AREA: **Trinity Mill earthwork survey**

AUTHOR: **D McOmish**
C Lewis

DATE: **March 1991**

ROYAL
COMMISSION
ON THE HISTORICAL
MONUMENTS
OF ENGLAND

Site Name:	TRINITY MILL
County:	GLOUCESTERSHIRE
Parish:	BAGENDON and BAUNTON
NGR:	SP 02180514 (Complex Centre)
Type of Survey:	INSTRUMENTAL : GROUND
Scale of Survey:	1:1000 (Metric)
Condition of Earthworks:	RATING 7 (Scale 0-10). GOOD

Background

The remains of water-meadows and mill streams lying in the parishes of Baunton and Bagendon, near Cirencester, Gloucester were recorded by the RCHME in December 1990. The surveyed earthworks occupy c. 9.5 ha along the valley of the river Churn. Within the area investigated, the artificial channels and raised beds, which comprise the water-meadow system together with the mill and its associated waterworks, occupy the whole of the level flood plain, which varies between 100m and 140m in width. Other features recorded during survey included natural and artificial channels and causeways associated with the mill.

The operation and value of such irrigation systems and their precise constructional requirements are well documented, although their origins are less easily discernible. Atwood (1963) refers to traces of water-meadows of supposed Roman date on the Hampshire Avon and Gloucestershire Churn, though the connection between these and any modern system is a tenuous one. References to water-meadows from early documentary sources are sparse. Manorial Court Rolls, Customaries, Inquisitions Post Mortems are all generally uninformative. There is little doubt that the main phase of construction started towards the end of the 16th century and was completed by c. 1750 (Bowie 1987, 155).

The benefit of a properly managed water-meadow system was enormous and its success was critical in the evolution of the 'Sheep and Corn' husbandry system where the main function of water-meadows was that of specialised pasturage for sheep. The first grass crop was some 4-6 weeks ahead of that obtainable from ordinary meadows, and this 'early bite' was invaluable to sheep farmers on the downs. The animals would have been returned to the downs after feeding each day where their dung was of great value as an arable fertilizer. The 'drowning' or operation of the system was carried

out within a rigid seasonal pattern, the first phase of winter irrigation taking place between November and December, ceasing in March and the water-meadows allowed to dry out. Towards the end of May, the system was repaired and then watered again, with a hay crop taken in July.

Maintenance of the water-meadow layout was necessary to maintain its productivity. For example, it is likely that the carriers and drains would have been proper wood-lined constructions requiring regular attention. Construction costs were much more severe. Estimates from the early 19th century suggest that it cost as much as £12-£20 an acre in Wiltshire, though this figure fell to £5-£6 in Hampshire (Bowie 1987, 155). Completion time could have been as long as two to three years. The heavy initial capital input requirement was overcome by defraying the costs with more than one investor. Often, the rights of access to water-meadows would have been shared by a number of parishes. At Trinity Mill, for example, the system is shared by two parishes. However, when the meadows were owned by one person, rights to tenancy could be bought. Consequently, water-meadows were a valuable commodity, reflected by the fact that in the early 17th century they were worth at least double the value of arable land (Bowie 1987, 197).

The decline in the importance of water-meadows can be related in part to an increase in the availability of cheap artificial fertilizers and feedstuffs, and new strains of grasses and other foodstuffs (Bettey 1977, 43). By the mid 19th century many water-meadow systems had become redundant (Bowie 1987, 158).

The association of a watermill with water-meadows, as at Trinity Mill, is a

common one. Here, the mill, in its original form, certainly pre-dated the irrigation system. It is first mentioned in a Domesday assessment as Manor Mill, and in 1382, was bought from the Lord of the Manor and made an endowment of the Trinity Chapel in Cirencester (Mills and Riemer 1989, 117). Since then it has spent much of its working life as a corn mill. The buildings as they survive are late 18th - early 19th century in date, with the mill forming a long rectangular range at the right gable end of the miller's house. Within the interior there is one cast iron undershot mill wheel (DoE, 1988).

The mill tail runs under the mill at right-angles and issues from a round headed archway 7m from the building. To the N of the mill, the pound (A-M on plan) has been canalised and the presence of large sluice gates at (A) suggests an earlier course of the river which diverges to the E. The mill pound has been embanked to a height of 1.5m for a distance of c. 50m, immediately to the N of the mill. Several channels extend out from it, representing additional spillways which regulated the level of water used to power the mill. Excess water would have been conveyed to the mill stream and then to the river, avoiding the mill mechanism.

Description

The water-meadows lie primarily in the parish of Baunton, with only two groups of beds situated within Bagendon. The parish boundary adheres closely to the E edge of the waterway conveying water to and from the mill, clearly enclosing these elements within Bagendon parish. The only exception to this is directly E of the mill, where the parish boundary diverges from this line to include a sub-rectangular section of flood plain and water-meadow encompassing c. 1.3 ha in area within Bagendon parish.

The E side of the flood plain of the Churn lies c. 0.5m lower than the W and consequently the water-meadow system is fed from the N and W and drained to the S and E. Water was taken from the Churn on the W side of the flood plain and conveyed by carriers into a series of narrower channels or drawns. These would have run along the top of each long, rectangular raised bed which most commonly lay at right-angles to the carriers. After flowing out of the drawns and across the sides of the beds, the water would have washed down into the drains which were constructed in the depressions separating each ridge and eventually conveyed back to the Churn on the SE side of the flood plain. The beds are arranged in blocks lying parallel to one another with each bed in the block being fed by a common carrier channel. No artificial pumps were employed to move the water across the beds, an even flow of water being maintained only by gradient and careful use of a series of sluices. The surveyed water-meadows fall into five separate units which are fed and drained by different parts of the overall system.

The N-most unit comprises the seven blocks lying E of the Churn and N of the point where it crosses the valley floor at **G**. From the N, a channel (**B-C**) measuring c. 2m wide, extending to the S and parallel to the river, functioned as a feeder carrying water from the Churn to the two blocks of beds immediately to its E. The beds in the N-most block **(1)** are regularly sized and spaced, measuring between 4m and 5.5m wide from drain to drain, c. 0.2m high from drain to crown and 20m-25m in length. They are oriented E-W and all declive by c. 0.3m along their length to drain directly into the main drain to their E which extends N-S from **D** to **E**. The beds in the second block **(2)** watered by the feeder **B-C** display less regularity of form and spacing, suggesting that they have been subject to some degree of rearrangement subsequent to their original creation. This is most

convincingly demonstrated by the close spacing of the second and third channels from the E and the presence of two short sections of E-W oriented bed in the NE corner of this block. The beds measure 20m-60m in length and 3m-15m in width. They appear to have been fed by a combination of the E-W feeder to their N and the feeder **B-C.** The declivity of the beds in this block (0.1m-0.25m along their length) is less than in those to the N. They drain into the subsidiary E-W drain to their S and from there into the main N-S drain (**D-E**).

Further to the S, a block of short beds **(3)** measuring 5m-10m long and oriented E-W lies immediately E of the Churn. These beds must have been watered by a carrier to their W, though none is now visible. The short length of these beds and the similarity of their alignment with those in the block to their E, **(4)**, suggests that they may originally have been linked with these creating longer beds oriented E-W and measuring 70m-90m in length. However, in their most recent form, the beds in block **(3)** feed a subsidiary drain which runs S from **H** to **J**, turning SE to meet the main drain at **E.**

The regularly spaced E-W oriented beds of block **(4)** were most recently fed by the carrier channel **C-F.** Although it is no longer visible beyond **F**, it is likely that, when first dug, it continued further S to supply all the beds in this block. Alteration to the original constructional layout of the beds in the N part of this block is indicated by the longer length of these drains and the very slight traces of the continued line of the N-S oriented beds in block **(2)** across the top of the crowns. The N-most two beds in block **(4)** measure 75m long, 12m wide and declive by 0.3m to drain directly into the main (**D-E**) drain. The remaining eight measure 48m-52m long, 5m-7m wide and declive by 0.3m to drain into a subsidiary N-S drain and then via **J-E**

into the main drain at **E**. To the E, a block of three beds **(5)** measuring c. 120m in length and 10m-12m in width are oriented N-S and also declive by c. 0.5m to drain through **J-E** into the main drain.

Further S, a block of beds **(6)** oriented WSW-ENE appear to have been serviced by the poorly preserved channel **K-L** to their SW. Some confusion in the arrangement of the beds SE of **J**, where the beds in the S end of block **(3)** appear to be intermeshed with those forming the N part of block **(6)**, combined with the erratic orientation of the beds here, suggests that they may represent a later rearrangement of this part of the system. This hypothesis is reinforced by the fact that these are the only beds in the entire surveyed area which drain to their N. They measure 30m-70m long, 3m-4m wide and display a declivity of 0.2m-0.3m along their length.

South of this a block of wider beds **(7)** oriented NW-SE measure between 4m and 46m in length. The extremely short length of the four N-most beds in this block, displaying drains 4m-25m long suggests that they may have been overlain by the beds in block **(6)**. The beds in block **(7)** must have been fed from the W, although no sign now remains of any carrier along the irregular course of the river bank. The regularly spaced beds in this block measure c. 12m wide and the S-most, complete beds declive by c. 0.5m to drain directly into the main drain as it turns SW **(E-G)**.

The second discrete unit within the surveyed system lies at the SE turn of the main course of the River Churn, S of **K**, and comprises only two blocks of beds. The first of these **(8)** is oriented NNE-SSW and would have been watered by a carrier to its N, running parallel with the Churn, of which no sign now survives. The regular beds measure 45m-70m long and 7m-9m wide and declive by 0.3m-0.5m along their length to drain into a spillway

which runs NE from the artificially raised mill pound (**A-M**) which marks the W limit of the flood plain. West of this block slight traces of narrowly spaced ridges lying on rising ground at the edge of the flood plain appear to be the remains of ridge-and-furrow. Traces of four furrows forming block **(9)** lie S of the main area of ridge-and-furrow on slightly lower level ground. Their poor state of preservation makes it difficult to be certain whether they represent water-meadow beds or ridge-and-furrow.

The third discrete unit of the water-meadow system is bounded on the N by a spillway and the River Churn, and to the S by a stone wall which follows the line of the parish boundary between Baunton and Bagendon. It comprises six small blocks of beds, all draining to the S and E. A series of short beds oriented NW-SE **(10)**, which comprise the first block have been fed most recently from the W by a carrier running parallel with the spillway. The short length of the beds suggests that they may have been truncated by the spillway and originally extended N to join the fragmentary remains which form block **(9)**. The beds measure 6m-27m long and 8m-9m wide and declive by 0.2m-0.4m along their length to drain into a subsidiary drainage channel and, via a second spillway (**P-Q**), into the Churn which forms the main drain S of **G**.

The beds in the second block **(11)** are oriented NE-SW and would have been fed by the NW-SE channel to its N. The beds in this block measure 60m-68m long and 6m-10m wide. They declive by c. 0.5m along their length and drain into the main drain via **P-Q**.

South of **P-Q** the third block **(12)** is fed from the W by carriers oriented NE-SW. The surviving sluices may have been used to govern the flow of water to the meadows at this point but, in view of their absence elsewhere

in the system, it seems likely that the water-meadow sluices were made of wood and thus do not survive, and that this surviving stone sluice was in fact constructed for use in regulating the level of water in the mill pound. The beds in block **(12)** are oriented NW-SE and measure 45m-80m long and c. 12m wide. They lie either side of the spillway running E from **R** and each bed turns at its E end to drain into this spillway.

East of this, a block of short beds **(13)** is orientated NE-SW. The beds measure c. 30m long and 5m-10m wide and declive by an unusually steep, 0.5m along their short length to run into the spillway leading to the river. South of these, a second block of short beds **(14)** is also oriented NW-SE. These regular beds measure 23m-25m long and c. 12m wide. It is possible that they may have originally formed part of the beds in blocks **(12)** and **(13)**. They declive to the S by 0.2m along their length and, must be assumed to have drained into the Churn via a subsidiary drain along the line of the parish boundary, now marked by the stone wall.

The final block in this group **(15)** is oriented NW-SE and consists of three short beds 15m long and 5m wide, which drain to the E.

The fourth group of water-meadow beds comprise those lying within the parish of Bagendon. While lying on a similar alignment to the beds within Baunton, they are fed and drained by a separate set of channels, and raise the possibility that, at least in its final stages, this part of the system may have been operated independantly of the Baunton meadows. The first block of beds **(16)** is oriented NE-SW. In its latest form it was watered by a N-S carrier immediately to its NW, but the presence of several fragments of bed W of this suggest that the beds here may originally have extended further to the W to join up with these fragments. They may also have

formed one block with those in block **(17)** which lie on a similar orientation and are of similar dimensions. The beds in block **(16)** and **(17)** all measure 20m-28m long and c. 10m wide and declive by c. 0.3m along their length. The beds in block **(17)** appear to have been fed by the same carrier as those in block **(16)** and drained into the same NE-SW oriented drain **(S-T)** which carried the returning water from the beds in block **(16)**.

The third block of beds in this group **(18)** comprise three beds oriented NE-SW. These must be assumed to have been fed by a carrier running parallel with the stone wall to their N, although no sign remains of any such feature. These regular beds measure 46m-52m long and 10m wide. They declive by 0.15m-0.2m to the S into a NE-SW oriented drain of which the S section, unusually, falls from the SE to the NW to carry the returning water away from the Churn into the drain **S-T** and then to the river.

To the S, a further block of beds, **(19)**, is oriented NNE-SSW and comprises four beds fed from the N and draining to the S into **S-T** and **T-U**. These beds measure 25m-45m long and 6m-9m wide. Two drains to the E of block **(19)** may also have formed part of it.

The final block in this group, **(20)**, comprises a series of very short beds oriented WNW-ESE and measuring between 5m and 10m in length. These must have been fed by a carrier, now gone, running alongside the river. Once again, the arrangement of the beds is significantly different to that in the Baunton meadows, as the beds in block **(20)** drain away from the river. The water would have flowed into a NE-SW drain to the W which is bounded on its W side by the remains of a collapsed stone wall. This in turn drains into **T-U** and from this, into the Churn.

Also within this unit there is a raised causeway extending E from the mill building, cutting through the beds in block **(19)** and traversing the drains in its path by means of small stone bridges, now mostly collapsed. The atypical arrangement of the beds and most noticeably the drains in this group is significant. The pattern of the drains is not consistent with the efficient use of the area for water-meadows and thus the drains appear to function primarily as part of the system of water management associated with more recent use of the mill. While the presence of the beds demonstrates that there were functioning water-meadows in this area at some point it is unlikely, given the necessity of careful overall planning in the construction of successful water-meadow systems, that these represent a later attempt to fill in the gaps between the mill stream drains. Thus it seems most likely that the water-meadow beds represent the earlier exploitation of this area and that this system was severely disrupted and altered by the creation of the drains associated with the mill. The attempt to fit the mill streams around the water-meadow beds does suggest that the latter may have continued in use in the modified form dictated by the requirements of the mill system.

The S-most unit within the water-meadow system lies within Baunton parish, but is less well preserved than the parts to the N. In the first block **(21)**, the beds survive in fragmentary form, and are oriented NE-SW altering to NNE-SSW in the NE part of the unit. In this area they are on a similar orientation to the beds in block **(19)** to the N, and may originally have been part of a different layout to the beds in the S of block **(21)**. The declivity displayed by all the beds in block **(21)** indicates that they must have been fed from the NE, but no sign of any carrier survives and the poorly preserved state of the remains makes it impossible to suggest where this may have been positioned. They drain into a N-S drain and from there into the Churn at **V**.

West of this, the beds in the S part of block **(22)** have been subject to disturbance and no detail is visible. The surviving beds in this block are oriented E-W and must have been fed by a carrier running W of and parallel to the carrier draining block **(21)**. The beds measure 15m-25m long and 6m-10m wide and drain to the W via a long N-S drain (**W-X**) into the Churn. Several linear hollows at the N end of the unit are oriented N-S and may represent the damaged remains of beds or of drainage channels associated with the mill.

West of this, the beds in block **(23)** are oriented on a similar alignment to those in block **(22)**, but drain to the E, also into **W-X**.

The S-most block in the surveyed area **(24)** is oriented NNW-SSE. The beds measure 40m-70m long and 6m-9m wide and would have been fed from the N and declive by c. 0.35m to the S. The W-most three beds feed into a subsidiary drain to their S and then to the river, the three in the centre of the block drain via **W-X** into the Churn; the E three drain directly into the Churn.

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RCHME, Salisbury
16th January 1991

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SUPPLEMENT B SPECIALIST REPORT

SUBJECT / AREA: **Assessment of the animal bones from A417/419 - Cirencester by-pass evaluation trenches.**

AUTHOR: **Mark Maltby, archaeological consultant, Dorset Institute, Poole.**

DATE: **April 1991**

ASSESSMENT OF THE ANIMAL BONES FROM A417/419 - CIRENCESTER BY-PASS EVALUATION TRENCHES

Mark Maltby

The animal bones were scanned and identified to species where possible. No detailed records of individual bones were made but summary observations were recorded onto forms.

Only ten contexts from the evaluation trenches produced animal bones, of which only the fill of the postmedieval quarry (1991/513/(7)) provided a large assemblage of material (Table 1). Altogether, 163 bones were recorded from this context, of which 73 were identified as horse, 29 as cattle and one as sheep. The bones represented in the cattle and horse assemblages are listed in Table 2.

The horse assemblage consisted mainly of large bones from adult animals. A minimum of six individuals were represented by pelves. The upper limb bones were also well represented. Most of the remainder of the horse assemblage consisted of vertebrae. No carpals, tarsals nor metapodials were recovered and a single first phalanx was the only bone of the limb extremities represented. Similarly, apart from the occipitals from two animals, bones from the head were not found. It does not seem likely therefore that the horses were deposited as complete articulated carcases. Although several of the limb bones and pelves were complete, others had been broken probably prior to deposition. Evidence for dismemberment of at least some of the carcases was also found. A humerus had knife cuts situated close to its proximal end probably made during disarticulation from the scapula; a tibia had been sawn completely across the middle of the shaft; one of the pelves had knife cuts on the ilium near the sacro-iliac joint. Assuming that retrieval bias between large and small bones was not a significant factor, it is possible that these large bones were selected as most suitable for the infilling of the quarry. It is possible that the feet and heads were detached from the rest of the body during skinning and this could also explain their absence. The use of the metapodials as raw material for boneworking is also a possibility. The horse bones were all from fairly large animals, which would accord with an origin dating to the 18th-19th centuries. Most of the bones belonged to adult horses, although a few of the later-fusing limb bone epiphyses were unfused, signifying that they belonged to animals under about four years old. Several horse bones bore pathologies. The bodies of two sets of lumbar vertebrae had fused together (spondylosis); several other bones bore minor exostoses or had distortions that probably resulted from a variety of causes (e.g. degenerative conditions, minor trauma). .

The cattle assemblage from 1991/513/(7) was similar to that of horse. Vertebrae were the most commonly recovered with upper limb bones also quite well represented. Bones of the head and feet were again rarely recovered (Table 2). All the upper limb bones represented were broken apart from the femur and tibia of a young calf or calves. Butchery marks were recovered on several of the vertebrae and an otherwise fairly complete skull had been

chopped towards the back of the frontal, presumably to gain access to the brain. Again the sample is biased towards large bones and bones from the major meat-bearing parts of the carcase suggesting that the carcases had been processed prior to deposition. Most of the cattle limb bones belonged to adult animals.

The sheep bone recovered from this context consisted of the frontal of a hornless animal. The 60 unidentified fragments consisted mainly of fragments of ribs and vertebrae of large mammals (cattle or horse).

Only 21 bone fragments were found in other contexts from the evaluation trenches. In most cases their preservation was poor. Only cattle and horse were identified from prehistoric contexts but only two loose teeth of horse and very eroded fragments of two metatarsals and a tibia of cattle were identified. All these are dense elements which have a greater chance of survival than most other parts of the skeleton in poor presevation conditions.

It seems unlikely that similar prehistoric features in the vicinity of these trial trenches would produce a faunal assemblage of any importance. The material from the postmedieval quarry, although of some interest, is unlikely to be sufficiently closely dated to be of value for further investigation.

Table 1

Number of Animal Bone Fragments from A417/419

Trench	Context	Cattle	Sheep	Horse	Unidentified	Total	Pr
1991/513	3				1	1	QG
1991/513	4				1	1	QG
1991/513	6				8	8	M
1991/513	7	29	1	73	60	163	G
1991/523	Quad.B Sp.3				1	1	P
1991/530	1				4	4	QP
1991/532	11			1		1	M
1991/533	9	1		1		2	P
1991/536	5	1			1	2	P
1991/545	Subsoil	1				1	P
Total		32	1	75	76	184	

Pr = preservation; G = good; QG = quite good; M = moderate; QP = quite poor; P = poor.

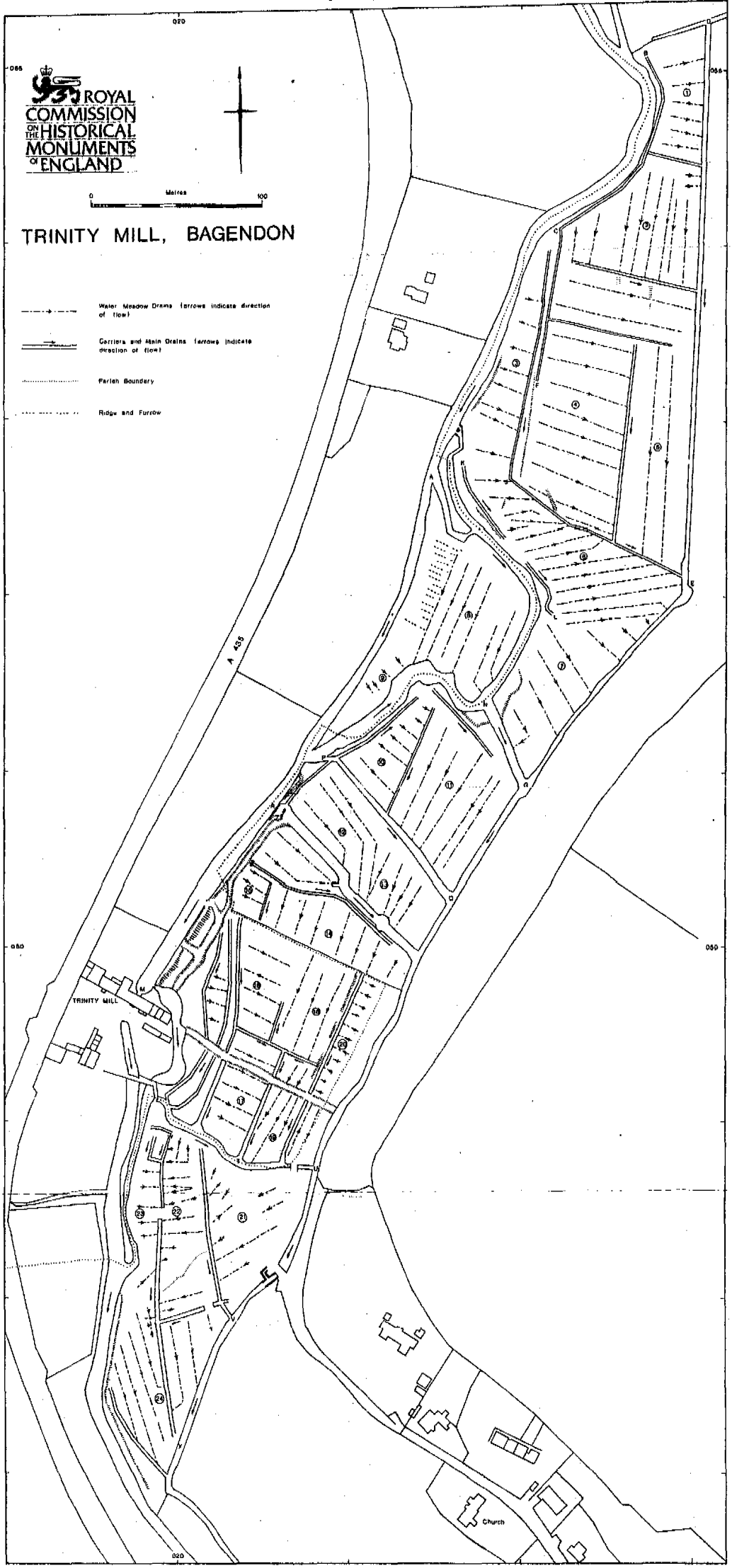
Following Mark Maltby's production and submission of this report a small quantity of additional bone material was recovered during the last stages of evaluation fieldwork. This material was processed at Cotswold Archaeological Trusts' premises. No items of importance were identified.

Table 2

Horse and Cattle Bones from 1991/513/(7)

		Horse Left	Horse Frag.	Horse Right	Cattle Left	Cattle Frag.	Cattle Right
Skull			2			1	
Scapula	DF	3		2			
Humerus	PFDF			1			
	PF	1		1			
	PJ				1		
	PN	1		1			
	DF	3			1		
Radius	PF	1		1			1
	DF	2		3			1
Ulna	PF	1		1			1
Pelvis	AF	6		4	1		
Femur	PFDF			1			
	PNDNH						1
	PF	3			1		
	DF	2		1			
	shaft					1	
Tibia	PFDF			1			
	PNDNH						1
	PF	3		1	1		1
	PN				1		
Metacarpal	PFDF				1		
1st Phalanx	PF		1				
Atlas			2				
Axis			1			2	
Other Cervical v.			9			4	
Thoracic vertebrae			4			4	
Lumbar vertebrae			7			3	
Sacrum			2			1	
Sternebrae			1				
Total			73			29	

P = proximal; D = distal; A = acetabulum; F = fused; J = fusing; N = unfused; H = porous.


ROYAL COMMISSION ON THE HISTORICAL MONUMENTS OF ENGLAND
Metres
0
100
TRINITY MILL, BAGENDON
Water Meadow Drains (arrows indicate direction of flow)
Carriers and Main Drains (arrows indicate direction of flow)
Parish Boundary
Ridge and Furrow
A 435
TRINITY MILL
Church