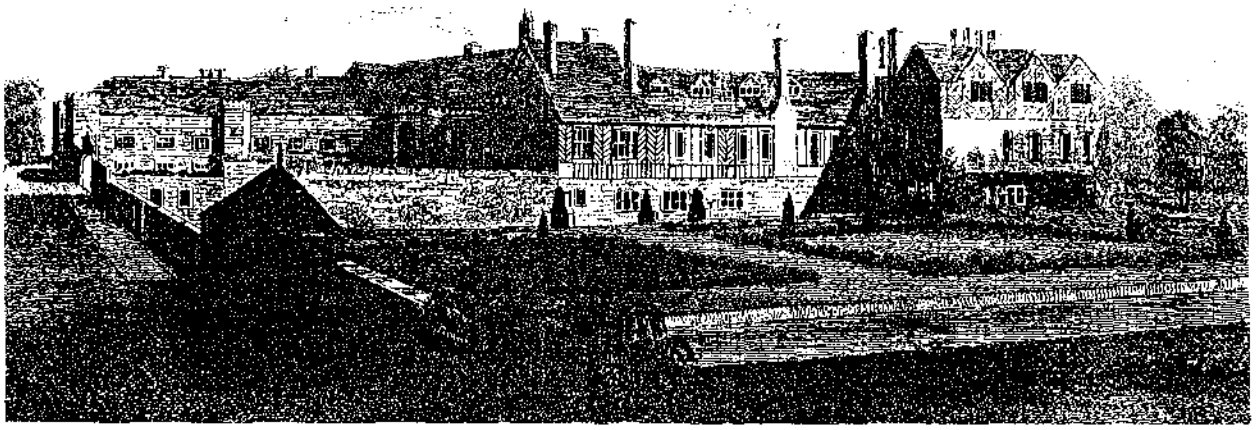
*BIRMINGHAM UNIVERSITY*
*FIELD ARCHAEOLOGY UNIT*

# VALE ROYAL, CHESHIRE

## an archaeological evaluation 1989



by Alex Jones

*B.U.F.A.U.*

# V A L E  R O Y A L  C H E S H I R E

## An archaeological evaluation 1989

Including proposals for further excavation

By Alex Jones

# CONTENTS

## LIST OF FIGURES

# V A L E  R O Y A L  C H E S H I R E

## A n  a r c h a e o l o g i c a l  e v a l u a t i o n  1 9 8 9

### 1.0: SUMMARY

This report describes the results of a geophysical survey and small-scale excavation on land adjoining Bell Cottage, Vale Royal, Cheshire (Figure 1A: Figure 1C), and their archaeological implications. The majority of the area was mapped by resistivity survey, complemented by a selective magnetometer survey. The results of trial trenching indicate the extensive levelling of structures belonging to the Cistercian monastery of Vale Royal, and the limited survival of robbed-out wall footings in this part of the south east quarter of the monastic precinct. The geophysical anomalies have been interpreted within the framework of the excavated evidence from the site, and elsewhere within the monastic complex (Thompson 1962).

### 2.0: INTRODUCTION

In May 1989 Birmingham University Field Archaeology Unit (BUFAU) was commissioned by Willan Homes of Sale, Cheshire to undertake a geophysical survey and small-scale trial excavations on land adjoining Bell Cottage, Vale Royal Abbey, near Northwich, Cheshire, (centred on NGR. SJ 639697) (Figure 1C: Figure 2). The evaluation was effected with reference to the submission of development proposals for planning consent. The site comprises an area of approximately 5000 square metres, forming a private ornamental lawned garden with herbaceous borders, south east of Vale Royal House. The geological drift deposit is boulder clay, deposited during the Pleistocene Period (Figure 1B). Excavations north of the site have uncovered the footings of the monastic church (Thompson 1962), and the location of further monsatic structures has been indicated by a previous geophysical survey (Hyatt in McNeill and Turner forthcoming). Vale Royal

House itself incorporates elements of former monastic claustral buildings (Mc Neill and Turner, forthcoming).

The purpose of the geophysical survey was to define the extent, complexity, and survival of any archaeological features in the walled garden, to provide an evaluation of the area proposed for the residential development (for the research design see Ferris 1989.) Both geophysical survey and excavation were confined to the lawned areas of the garden (Figure 2): other areas were densely planted with trees and shrubs and not suitable for examination. Following the completion of a resistivity survey, the most promising areas were re-surveyed prior to excavation using a Proton Magnetometer.

Five trenches were hand excavated in the north of the site to sample the areas of the strongest geophysical anomalies, and to provide information on the quality and depth of the surviving archaeology (Figure 2). Information from the limited trenching may be combined with the more extensive geophysical survey to build-up a wider picture of the surviving archaeological deposits. In each trench the deposits encountered were recorded by means of written pro-formas, drawn and photographed.

This report presents an interim assessment of the archaeological results, and the implications of the proposed development on the surviving archaeology.

## 3.0: THE SITE AND ITS SETTING

The Cistercian abbey of St Mary was founded at Vale Royal, on the left bank of the river Weaver near the village of Whitegates, in 1277 (Figure 1C), under the patronage of Edward I. Originally a small Cistercian colony from Abbey Dore in Herefordshire settled at Darnhill, 4 miles from Vale Royal, but soon moved into temporary quarters at the better location of Vale Royal (Thompson 1962). Building commenced on an ambitious scale, with 150 skilled masons employed in the first year of construction, but royal interest ceased by 1290. Construction came to a standstill before completion of the church and ancillary buildings. Monks moved into the

abbey proper in 1330, when the buildings were still incomplete. Generous funding was once again forthcoming in the 1350s when the Black Prince agreed to complete the project (Thompson 1962).

The abbey was sold after it's suppression in 1539 to Thomas Holcroft, who retained the majority of the cloister ranges, later incorporated into Vale Royal House. Excavation in the area of the church (Thompson 1962) supports the evidence from documentary sources of the widespread robbing-out of walls to foundation level or below, following the dissolution. The area under consideration in this report was laid out with ornamental gardens in the seventeenth century (SMR No 830/1/2), suggesting the levelling of monastic structures by this time. Cartographic evidence indicates the location of a large greenhouse in the centre of the site in the late nineteenth century and further greenhouses were located inside the line of the encircling boundary wall to the north.

## 4.0: THE GEOPHYSICAL SURVEY

### 4.1: Principles of Geophysics

The main role of geophysical survey in archaeology lies in the rapid examination of large sites to pinpoint areas of human activity that may merit further archaeological investigation. In this instance a resistivity survey was considered to be the most appropriate technique of examination, given the ground conditions, the results of a previous survey in an adjoining area (Hyatt in Mc Neill and Turner, forthcoming), and the nature of the features anticipated.

Resistivity surveying involves applying a small electrical current into the ground via metal electrodes, and measurement of the soil's resistance to the flow of electricity (Tite, 1972). Soils vary considerably in resistivity, depending on their content and wetness, and thus detailed and accurate measurements of variation in ground resistance from place to place can detect quite subtle changes (anomalies) in the near subsurface which may be due to natural processes or manmade features, such as walls, ditches and pits. Water-retentive materials, such as clay, are of notably low

resistivity, whilst stone walls and floors have a higher resistivity, due to their low water content which impedes the flow of electricity. The technique cannot distinguish between differing soils of similar resistivity, and climatic conditions may cause the anomalies to reverse or even disappear.

An alternative geophysical technique, using a magnetometer, measures subtle variations in the soils's magnetic field intensity, and can locate features such as hearths that have acquired thermoremanent magnetism as a result of heating. This equipment can also pinpoint archaeological features by detecting small variations in magnetic gradient between differing soils. Natural variations in the magnetic field within the natural clay could mask any manmade features.

For maximum accuracy in the plotting of magnetic anomalies it is necessary to compensate for the displacement caused by the geomagnetic latitude. Thus the centre of a high magnetic anomaly lies to the south of the feature itself, at a distance equal to one-third of the depth to the feature. A low magnetic anomaly may be to the north of the feature at a distance equal to its depth (Tite, 1972). The purpose of the survey was to establish areas of disturbance by cross-correlation with resistivity data and for simplicity this slight correction was not made.

All geophysical methods of examination provide only an <u>indirect</u> method of site investigation. They are incapable of the same precision and complexity in interpretation as a direct method of examination, such as excavation. Such a survey cannot be seen as an alternative to excavation, but, as here, a preliminary stage in site evaluation.

4.2: Field techniques.

An Atlas Copco SAS 300 Terrameter was used in conjunction with a 1m dimension 4-electrode square array. The square array comprises a frame in which all four electrodes are positioned at the corners of a square. A 5mA current was injected into the ground through two of the electrodes, the potential difference, or ground resistivity, being measured across the

second pair. The effective depth of investigation depends on ground conditions, and the separation of electrodes, around 0.45m (Edwards 1977). Measurements were obtained by inserting the four basal electrodes of the array securely into the ground, at 1m intervals, along contiguous grid lines.

An Elsec type 770 Proton Magnetometer was employed to measure localised changes in magnetic gradient, measuring in the 50 gamma range. The 25 cm long archaeological probe attached to the magnetometer was grounded at 1m intervals, following the same grid used for resistivity survey. Variations in the earth's magnetic field intensity during the survey (diurnal variation) were compensated by re-measurement of the first point after completion of the survey, and the intervening measurements were adjusted accordingly.

Selective auguring of the areas investigated enabled the choice of the correct array to penetrate the archaeologically sterile, modern overburden, and allowed direct comparison between the resistivity values recorded and the physical characteristics of the deposits thus encountered at an early stage in site investigation.

4.3: Data processing

Geophysical data were logged onto an IBM compatible micro-computer. A graphics package was employed to provide on-screen interperatation of the data and the illustrations for this report, in the form of dot-density plots. These computer-generated plots highlight the areas of anomalies, represented by darker shading in areas of higher than average resistivity, and lighter shading in areas of lower than average resistivity. In the case of magnetometer survey, darker shading represents a higher magnetic gradient: lighter shading indicates lower values. The dot density plots in this report emphasise the areas of higher resistivity, and higher magnetic gradient, by the use of a logarithmic rather than arithmetic progression in shading.

After recognition and definition, anomalies may be interpreted as either natural or manmade features. Interpretation relies on study of the surrounding topography, the results of auger boring, and the anomalies shape and sharpness in outline. Cross-comparison between resistivity and magnetometer surveys can assist. Some disortion of anomalies exists along the line of the measuring grid (west-east, in all areas), and single point anomalies may derive from machine error, or metal in the immediate sub-surface (magnetometer), and these have been disregarded.

4.4: Area I

Area I (Figure 2: Figure 4) was a narrow lawned strip at the north of the site, bounded by flower borders to the north and south, and by an orchard to the west. Background readings of resistivity fell within the range 100-150 Ohm Metres. Anomaly A1, located at the south west of the area, consisted of an 'L' shaped area, recording values from 400-700 Ohm Metres. Anomaly A2 followed the northern boundary of the area for ca. 15m and was 1m wide, containing values averaging 300 Ohm Metres. A3 was aligned north-south, in the centre of the area, and measured up to 25% higher than the surrounding values.

Interpretation of anomalies in such a restricted area is difficult, particularly when, as here, parts are in moisture shadow, and extensively penetrated by roots.

A maximum variation of 50 Nano Tesla (nT) was recorded during the magnetometer survey (Figure 2: Figure 5). Linear anomaly M1 is characterised by an area containing readings up to 25 nT higher than the surrounding area. Anomaly M2 extends discontinuously east-west to the north of the survey area, comprising a high magnetic anomaly immediately north of a low order anomaly: each defined by values 25 nT above or below those surrounding.

4.5: Areas II and III

Areas II and III (Figure 2: Figure 4) comprise tha main area of the survey, measuring ca. 40m by 60m. The flower beds, and small circular lawns in the centre of the area were excluded from investigation, as was the shrubbery to the south and the gravelled path to the west. The overall pattern of background resistivity in this area is clear. To the north, readings are recorded in the range 150-200 Ohm Metres, gradually decreasing to the south, to around 80-150. The lawn slopes slightly downwards to the south, towards the former course of a stream.

Anomalies are mostly concentrated within the northern part of these areas. Anomaly A4 is aligned south west-north east, measuring 3m by 4m maximum, and containing values up to 600 Ohm Metres. Anomaly A5 contains values from 300-400 Ohm Metres, aligned west-east. The anomaly also comprises two areas of lesser resistivity, measuring up to 250 Ohm Metres. Anomaly A6 is of irregular outline, and a maximum length of 4m, containing values around 300 Ohm Metres. Anomaly A7 is 'L' shape, measuring 5m on its longest axis, measuring 400 Ohm Metres. Anomaly A8 is located in the north west, adjoining the orchard and is difficult to define in shape.

Anomaly A9 occupies part of the centre of the area, is of L-shape and measures ca. 18m on its longest axis. The area of highest resistivity occupies the southern part. The area on west-east axis is separated by a line ca. 2m wide of lower resistivity. Anomaly A10 is located in the south east, towards Bell Cottage. It comprises an area ca. 12m by 15m which contains small pockets of higher readings, suggesting an extensive area of intermittent disturbance, concentrated to the south west. Readings recorded fall within the range of 200-300 Ohm Metres, contrasting against background values in the region of 80-120 Ohm Metres.

Examination of these areas by magnetometer was restricted to a strip 10m wide, at the north of the main lawned area (Figure 2: Figure 5). Again a maximum variation of around 50 nT was recorded. Anomalies in this area were difficult to define in shape, and interpret; they often comprised high values within an anomaly of overall lower magnetic gradient than the

adjacent area. Anomalies M3 and M5 exhibit such a pattern of readings, ranging from 25 nT above and below the surrounding values, but cannot be clearly interpreted. Anomalies M4 and M6 are aligned approximately north-south, and like M7 are difficult to define.

4.6: Area IV

In this area (Figure 2) (plot not illustrated), measuring 6m by 25m resistivity values fell within the narrow range between 80-120 Ohm Metres. No discernible anomalies were noted.

The results of the resistivity and magnetometer surveys are discussed in section 6.2 below.

5.0: THE EXCAVATION RESULTS (Figures 2 and 3)

5.1: Trench 1

Trench 1 was dug to investigate anomalies apparent on both resistivity and magnetometer surveys (A4:M6). An area 5m by 1m was excavated and the deposits were removed in spits: an extension was dug to define the alignment of the features thus encountered. A similar procedure was adopted in Trench 2.

Natural stiff orange clay was contacted ca. 1.8m below the modern surface, (ca. 5cm below the water table). Above was a horizon of humic, dark grey soil, mixed with small fragments of burnt wood, and flecked with soft charcoal. Overlying this was a mixed layer of orange clay and grey silt soil, cut by the north side of a steep-sided ?robber trench, aligned approximately south-west - north-east. The robber trench contained small crushed limestone fragments, and faced mortared blocks in a matrix of grey-brown silt soil. Filling a depression above the robber trench was a dump of crushed limestone blocks set in dark brown silt soil, following the alignment of the trench. This layer was sealed to the south of the trench by a linear deposit of plastic orange clay, similar to that encountered in

Trench 3. Above was a build-up layer of brown silt soil, flecked with clay, containing fragments of earthenware plant pot, below the modern garden soil.

5.2: Trench 2

Trench 2 was dug to test anomalies A5 and M3 apparent on the geophysical survey. In this trench natural orange clay was contacted ca 1.85m below the modern surface, underneath a layer of dark organic grey-black silt soil, flecked with charcoal. The northern part of a steep-sided pit or robber trench cut this layer, and into the natural beneath; a layer of light grey silt filled the bowl of the feature. This was sealed by a disturbed layer comprising redeposited natural orange clay mixed with grey silt soil, partly beneath the water-table. The upper fill contained a quantity of fragments of crushed limestone blocks and patches of soft off-white mortar.

The alignment of the eastern edge of a further robber trench was defined at the west of the trench (Figure 3A). This was filled with densely-packed angular stone fragments, but was not fully excavated.

Sealing these features was a deep layer of brown silt soil, flecked with natural orange clay, representing a deliberate build-up of the area. A similar deposit was found in Trench 1. A dark garden soil was contacted immediately beneath the modern turf surface.

5.3: Trench 3

Trench 3 measuring 1m by 5m, was dug to test amomalies appearing on both magnetometer and resistivity surveys (A7:M7). The earliest level contacted (at 0.7m below the modern surface), was a brown silt soil, flecked with charcoal. A shallow layer of plastic orange clay sealed the silt at the east of the trench and followed its long axis. The surface of the clay retained the impressions of the stone blocks formerly bedded into this foundation. At the north of the trench small angular limestone fragments were pressed into this clay bedding, and may represent the remains of rough

wall footings. The upper levels of this trench comprised a build-up layer of brown soil flecked with orange clay, beneath the modern topsoil and the turf.

5.4: Trench 4

Trench 4 measuring 1m by 5m, was located at the eastern end of the north lawn to sample both geophysical and magnetometer anomalies (A1:M1). The earliest manmade feature contacted comprised the southern edge of a heavily robbed foundation trench, aligned approximately west-east, and cut into natural orange clay (Figure 3B). The trench contained a fragment of window tracery, mortared faced limestone blocks and shattered angular fragments of limestone: but the feature was not fully excavated. The robber-trench was cut by the laying of an earthenware garden drain perpendicular to the trench. Above was a grey-brown silt-soil containing flecks of orange clay, over a lens of buff-brown sand localised at the north of the trench. The upper levels comprised a notably dry topsoil containing a quantity of ?greenhouse plate glass immediately beneath the modern turf surface.

5.5: Trench 5

Trench 5, measuring 5m by 1m and located in the centre of the northern area, was dug to examine an extensive linear anomaly aligned west-east appearing in both resistivity and magnetometer surveys (A2:M2/M2a). Excavation ceased ca. 0.3m below the modern surface, when the upper horizon of a dump of broken brick, patches of mortar and glass fragments was contacted. This may be demolition rubble from the greenhouse located inside the boundary wall of the garden, as indicated on a late 19th-century map. Sealing this rubble was the modern topsoil capped by turf.

6.0: DISCUSSION

Few datable artifacts were recovered during the evaluation. The discussion which follows is based on the examined archaeological stratigraphy, and documentary evidence.

The charcoal rich layers contacted in Trenches 1 and 2 may provide evidence for the intitial use of the site. Because of the relative depth of the water-table potential exists for the recovery of environmental evidence from this deposit.

No stone footings, or floors were contacted in situ, and no direct evidence exists for stone monastic buildings. However, by inference the substantial robber trenches and their fills of well-hewn blocks and architectural fragments, contacted in Trenches 1,2,3 and 4, confirm the location of extensive stone-walled buildings here. Potential clearly exists for the recovery of the plan of the extensive monastic buildings in this area.

Robbing-out of the monastic wall-footings is documented immediately following the suppression of the monastery. However, this activity has not eradicated all trace of the monastic buildings.

Sealing the robber-trenches is a build-up level, which may be associated with the 17th-century ornamental garden to the south of Vale Royal House indicated by documentary evidence.

A second, and more recent levelling-up of the area is evidenced by the mixed deposit below the modern garden soil. This contains fragments of plant pot, plate glass and 19th-century artifacts. Cartographic evidence indicates that ranges of greenhouses occupied the centre and northern edge of the site. The quality of the deposits in the modern flower-bed areas is unknown.

6.2: The geophysical survey

This evidence indicates that the northern area of the site is of the greatest archaeological interest. The evidence from the southern sector derives solely from a resistivity survey, uncorroborated by magnetometer evidence, and large parts of this area were, in any case, unavailable for survey. Any archaeological remains in the southern area may have gone undetected if they are sealed beneath an exceptionally deep modern

overburden. Equally, modern surface interference may mask features of greater antiquity more deeply buried.

## 7.0: IMPLICATIONS AND RECOMMENDATIONS

### 7.1: Implications

Excavation and geophysical survey have demonstrated the presence, towards the north of the site, of heavily robbed-out stone buildings. The nature and function of these structures cannot by ascertained by such a limited excavation.

However many Cistercian houses share a common layout. Around the cloister, south of the church, radiated the refectory, the dorter, reredorter and kitchen. To the south east of the monastic complex (in the approximate position of the Bell Cottage garden site) the infirmary, warming house, Abbot's lodging and kitchen may be found. Vale Royal is a particularly exciting site because of the substantial royal resources expended upon the project, the unusual layout of the church, and the potential of large-scale excavation to add to our understanding of the layout, function and economic activities of this monastic community.

Until further work is undertaken on site further academic speculation is not worthwhile.

### 7.2: Recommendations

<u>The northern area</u>

To obtain a plan of the monastic buildings in this area, it is proposed that an area ca. 60m by 25m be completely stripped, and archaeologically excavated (Figure 3).

Neither geophysical survey, nor the limited trenching, has identified internal features or floor deposits, and while it can be assumed this area was subjected to the same depredation as witnessed in the church (Thompson,

1962), such features and deposits may be present. Total excavation of the area shown on Figure 3 is therefore recommended.

The central and southern areas

The geophysical survey suggests that the central and southern areas of the walled garden may not be as archaeologically important as the northern area. However, no excavation has been possible here. The results of geophysical survey in this zone need to be interpreted with care. Modern disturbance close to the surface may mask earlier features more deeply buried, and the depth of modern overburden may be too deep for the equipment to penetrate. Certain features, such as post holes may be too small to be detected by this geophysical survey. An extensive part of this area was overgrown with shrubs and trees, and was unavailable for examination.

It is recommended that if this area is to be developed, an archaeological presence in the form of a watching brief be maintained during the groundworks. This will enable the examination and recording of any archaeological features so uncovered.

## 8.0: ACKNOWLEDGEMENTS

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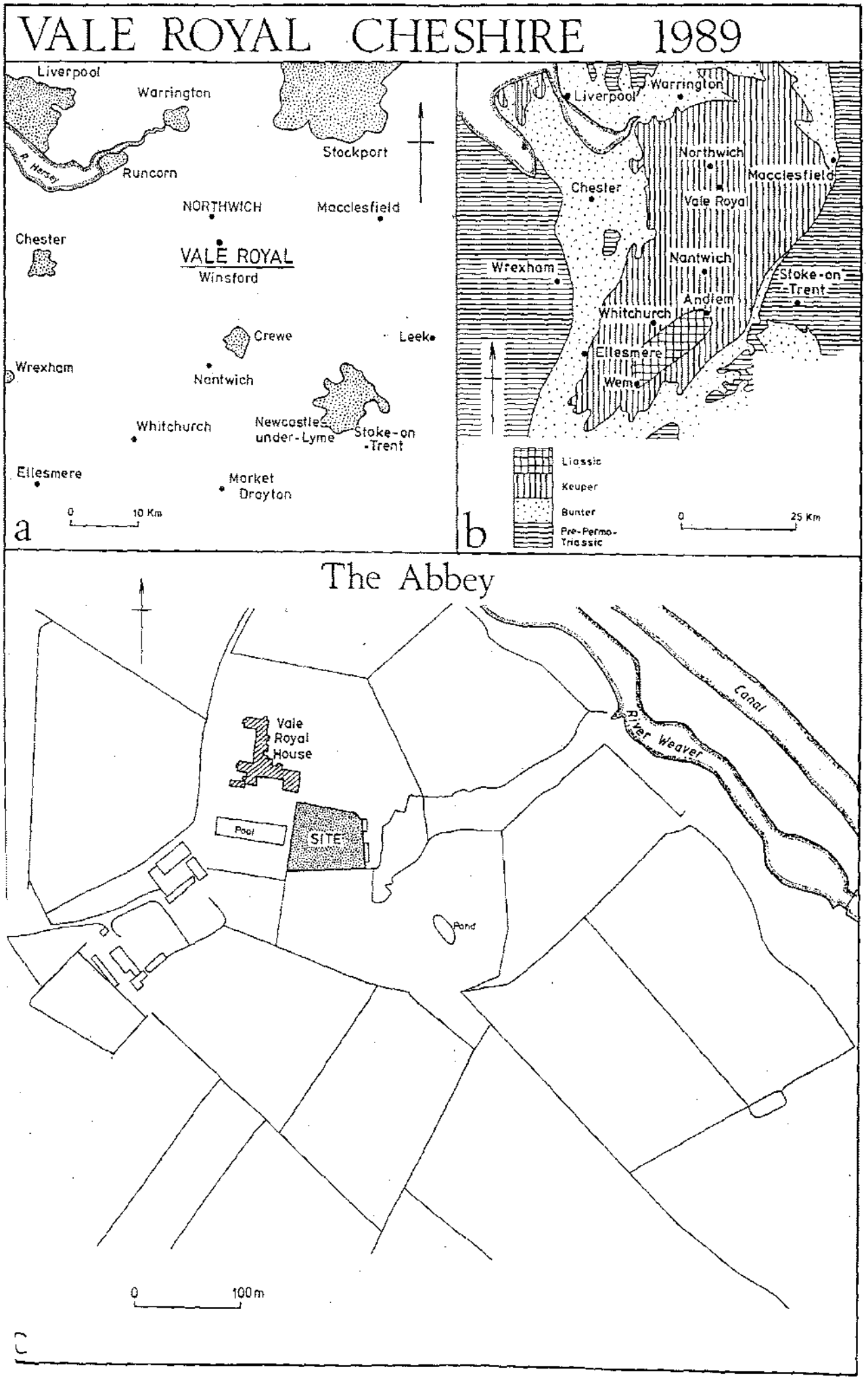

VALE ROYAL CHESHIRE 1989
Liverpool
Warrington
R. Mersey
Runcorn
Stockport
NORTHWICH
Macclesfield
Chester
VALE ROYAL
Winsford
Crewe
Leek
Wrexham
Nantwich
Whitchurch
Newcastle under-Lyme
Stoke-on -Trent
Ellesmere
Market Drayton
0
10 Km
a
Liverpool
Warrington
Northwich
Macclesfield
Chester
Vale Royal
Nantwich
Wrexham
Stoke-on -Trent
Audlem
Whitchurch
Ellesmere
Wem
Liassic
Keuper
Bunter
Pre-Permo-Triassic
0
25 Km
b
The Abbey
Vale Royal House
Pool
SITE
Pond
River Weaver
Canal
0
100m
c

Figure 1

# VALE ROYAL 1989

## Areas of archaeological investigation
## Bell Cottage garden

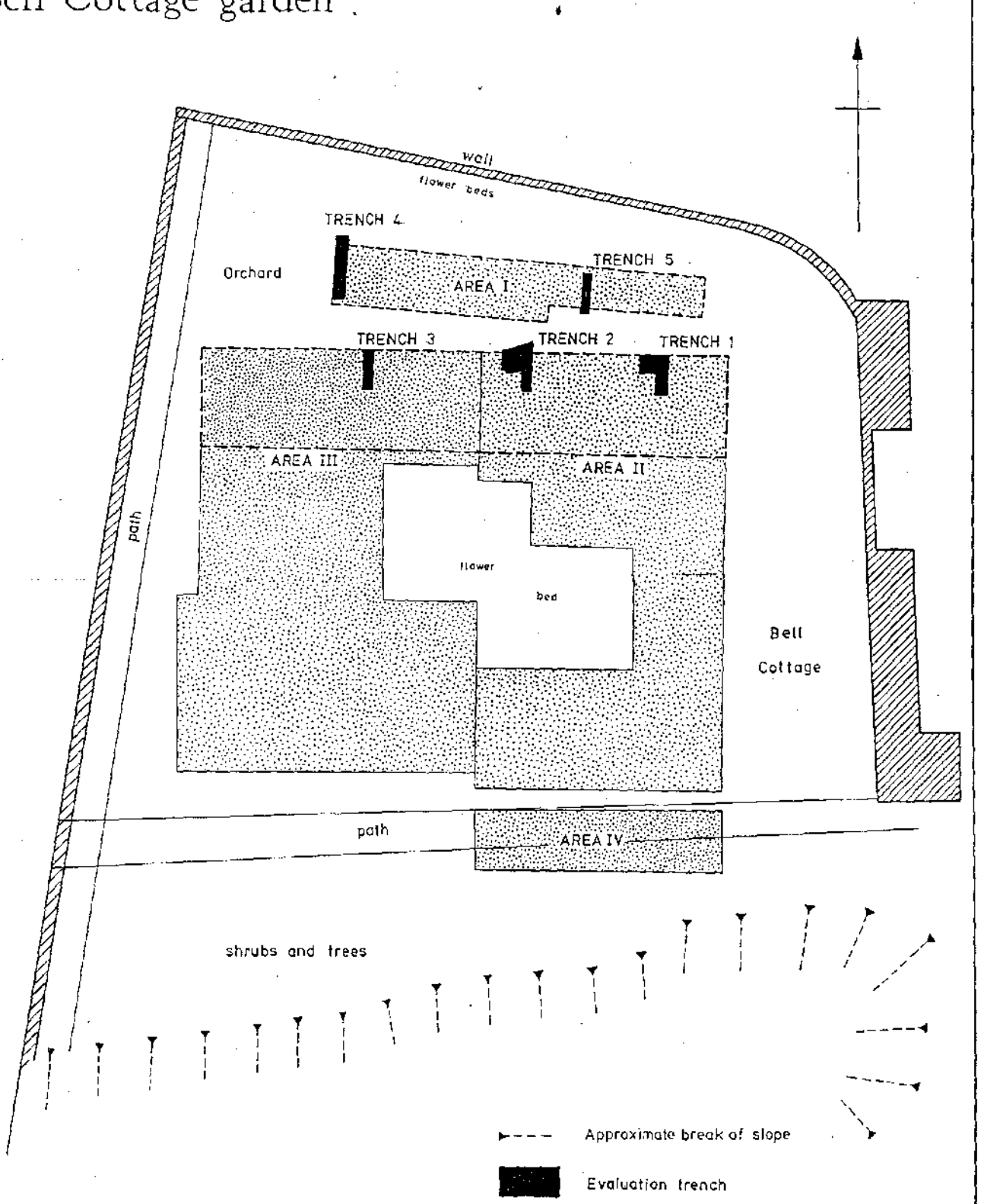



Figure 2

VALE ROYAL 1989 *Main features and sections*

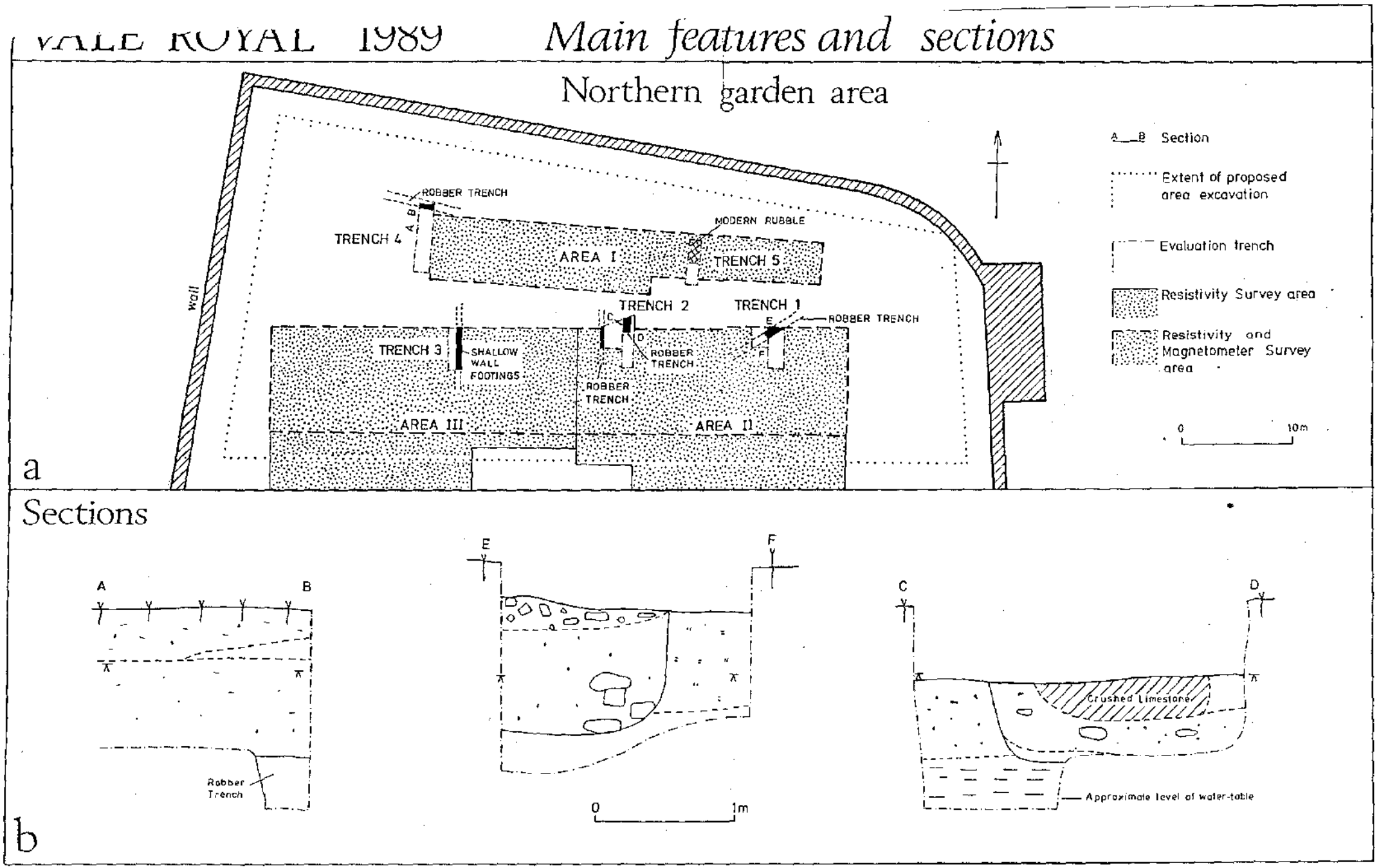
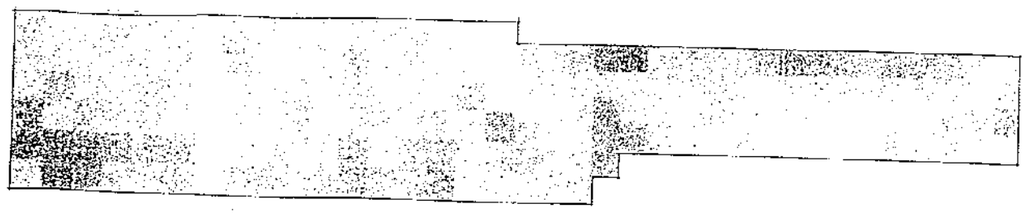



Figure 3

# VALE ROYAL 1989 *Resistivity Survey*

## Area I

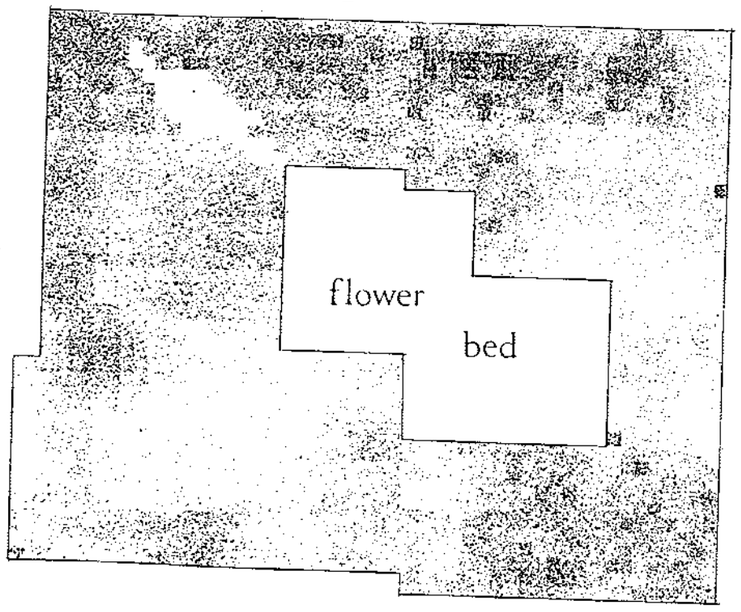
plot



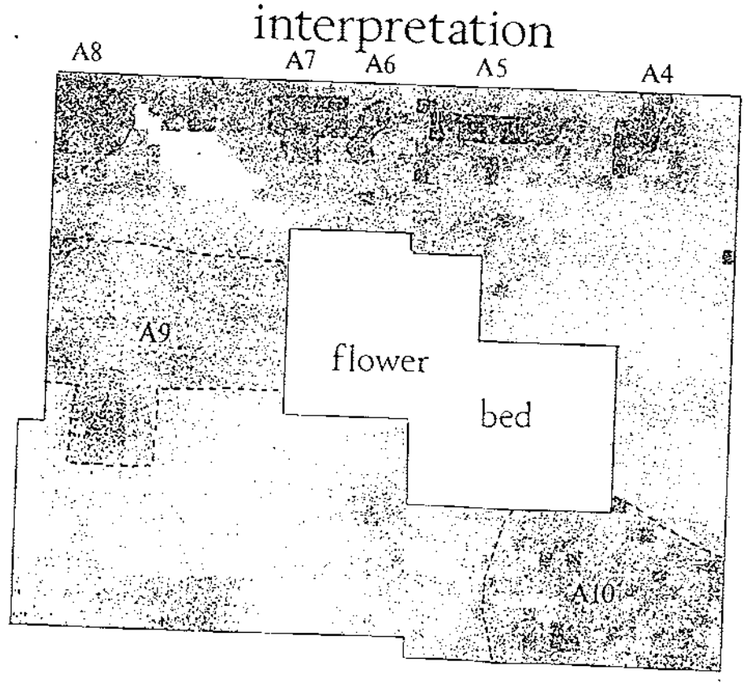
interpretation


## Areas II and III

plot




interpretation




0 25m

Figure 4