

The York Environs Project: an early medieval town and its hinterland

J. D. RICHARDS

Introduction

During the first millennium AD, the City of York grew to be one of the foremost towns of northwest Europe. This study will examine the origins and growth of the Viking age town, whose development can be seen to parallel that of many of the urban centres of early medieval Europe. It will draw upon the work of the York Environs Project which is seeking to describe and explain the relationship between the town and its hinterland, and will consider the application of computerized Geographical Information Systems (GIS) to study the urban-rural interface.

Background

York initially developed from a Roman legionary fortress, *Eboracvm*, founded in AD 71 on the major land route to the north, and at the confluence of the rivers Ouse and Foss. The fortress had acquired a substantial civilian settlement, or colonial one, by AD 237 and during the early third century became the capital of *Britannia Inferior*. Following the decline of central Roman power, settlement appears to have retreated within the Roman fortress walls where some form of administrative role may have been maintained, although the town's social and economic links with its hinterland were reduced, and international trading links were cut off (see e.g. Ottaway 1993).

Economic growth was rekindled in the seventh century AD, with the establishment of a trading network which had links throughout northwestern Europe. At the same time royal and ecclesiastical power developed in the old legionary fortress with the foundation, by St Paulinus, of a small wooden church dedicated to St Peter near the site of the modern minster.

In the ninth century, however, there is evidence for a hiatus in trade after the decline of *Eoforwic* and before its capture by the Viking Great Army in AD 866. The exposed trading site at the confluence of the rivers Ouse and Foss was abandoned in favour of a more easily defended area between the two rivers and closer to the Roman legionary fortress. The walls of the Roman fort survived sufficiently for York to withstand attack in the ninth century. Although breached in several places, much of the fortress wall stood more than 3 m high, and the insertion of the so-called Anglian tower into the walls has been taken as evidence for continued maintenance of the

defences. Around AD 900, York's new Viking rulers apparently renovated the defences so as to enclose an area bounded by the Roman walls to the north and west and by the rivers to the south and east (Hall 1988). The total enclosed area of Viking York was therefore some 36 ha (87 acres), making it larger than the major Scandinavian towns at Hedeby and Birka. By the time of the Domesday Book, of the eleventh century, York is the largest urban site in England (Fig. 1), surpassed only, it is supposed, by London. Scandinavian finds have been reported throughout the walled area, although the best evidence for structures within the former Roman fortress has come from excavations beneath the Norman cathedral church, where antler and bone-working and both ferrous and non-ferrous metal-working was taking place within the walls of the former Roman barrack blocks (Philips & Heywood 1995). Southwest of the river Ouse, the area of the former Roman colonial or civilian settlement was also occupied during the Viking age (Moulden & Tweddle 1986). Evidence for the most intensive settlement, however, has come from excavations on the Coppergate site, on land sloping down towards the river Foss, where a series of four tenements have been examined, and has provided rich evidence for a wide variety of craft industries, ranging from coin-die production and repair to leather working (Hall 1984).

The rich archaeological evidence for Viking age urban life within York, however, has not been matched by archaeological research into its hinterland (Addyman 1984). As in most cases in northwest Europe, the pressures of urban development and rescue archaeology has seen several millions of pounds worth of public and private investment expended upon urban archaeology, with nothing comparable funded in the area around the town. This has led to a very imbalanced picture, with a vivid picture of town-life, as represented in the Jorvik Viking Centre for York, for example, but very little known about how the town interacted with its hinterland. Virtually nothing is known, for instance, about the Viking age settlement pattern within the Vale of York, and its economic relationship with Jorvik, apart from a few clues in the animal bones recovered from the town sites (O'Connor 1989).

The level of archaeological activity in urban York can be compared with that undertaken in the region over the period 1969–89 by reference to the Yorkshire Archaeological Register, published in the *Yorkshire Archaeological Journal*. This reveals, for the Anglo-Saxon period, eleven interventions recorded for York compared with just one in the region. For the Viking period, there were nineteen urban interventions and no rural sites (Vyner 1991).

Nevertheless, it is suggested that there was a major change in land ownership as a result of the Viking take-over (Richards 1991). *The Anglo-Saxon Chronicle* records that in 876: 'Healfdene shared out the lands of the Northumbrians, and they proceeded to plough and support themselves'.

Place names have been taken as evidence for the scale of this settlement. Within Yorkshire as a whole, a grand total of 744 Scandinavian place names have been recorded in the Domesday Book. In the East Riding, 48 per cent of the names are of Scandinavian influence; in the North Riding 46 per cent, and in the West Riding 31 per cent (Fellows-Jensen 1972; Fellows-Jensen 1975).

A series of stone crosses erected in a Scandinavian style may also represent a new class of land-owners, and their attempts to symbolize their power in a traditional Anglo-Saxon ecclesiastical medium. Sculptures such as the Middleton warrior should perhaps be read as symbols of secular power (Lang 1978).

However, excavated archaeological evidence is very rare, for the main reason that the Viking farms and manors probably lie under the heart of the present-day villages. Both the scale of Viking age settlement and the status of the settlers are both much disputed. Where excavation has been possible, as at the site of the deserted medieval village of Wharram Percy in north Yorkshire, it appears that the landscape underwent a significant change at this time, with the nucleation of a series of dispersed settlements into a planned village, and the establishment of a new church, and perhaps a proto-manorial centre (Hurst 1984; Milne & Richards 1992).

The York Environs Project

The York Environs Project was established in May 1991 to redress the balance between knowledge of York and its hinterland (Vyner 1991). One of its primary goals is to examine the development of the Anglo-Saxon and Viking age settlements around York (Vyner 1992). The development of a computer-based Geographic Information System (GIS) is considered to be central to achieving this goal (Chartrand, Richards & Vyner 1993). The project is proceeding with a survey of existing material, in county Sites and Monuments Records (SMRs), museums and published sources, and will enhance this with survey work in selected resource patches (Fig. 2). In certain cases targetted excavation will be used to gather artefact or environmental samples, or to characterize classes of site discovered by aerial or geophysical prospection, for example. The GIS will play a major role in the administration of existing data, and a predictive role in identifying possible sites, but will also allow us to target certain key questions which may reveal the relationship between the Viking town and its hinterland, such as:

- (1) Artefact dispersal. The fall-off of material away from York, for instance, may reflect the town's role as a redistribution centre, and as a consumer of raw materials and finished goods.

- (2) Community interaction. The distribution of artefacts will also reflect the relationship between urban and rural populations.
- (3) Environmental change. It should be possible to identify the effect of York on the environs, in terms of such factors as mineral extraction, woodland management, and agricultural exploitation.

Having described the background and aims of the York Environs Project, and given some introduction to the archaeology of the area, I shall now discuss the design and implementation of the GIS, and report on progress towards the project goals. The York Environs Project provides a case study for many of the key issues that reflect a town's relationship with its hinterland, and the approaches adopted may inform on how technology may be used to answer similar problems elsewhere.

Project Methodology

The project consists of four phases:

- (I) Data collection
- (II) Data integration
- (III) Data quality assessment
- (IV) Data analysis

Phase I: Data collection

The project study area comprises a rectangular transect of the landscape, totalling some 4100 km². Any attempt to draw lines on a map has to result in fairly arbitrary borders, and does not mean that we must necessarily ignore evidence from outside this area. Indeed, it is known that during the Viking age, York had international trading contacts embracing the North Sea, the north Atlantic and the Mediterranean. Nevertheless, it is argued that the study area encloses that area which provided most of the bulk resources required by York, and whose population turned to York as the centre of their area.

Within the study area, the York Environs Project has adopted a stratified sampling strategy, having identified a number of resource patches, largely on geomorphological ground, such as clay vale, limestone upland, millstone grit area, moorland area, etc. Each resource patch is of roughly equal area but may comprise between six and a dozen parishes, which are the smallest administrative districts and also the basic unit within which fieldwork takes place.

Data for the project is being collected from a number of existing electronic sources, with some additional data collection by the York Environs Project. The study area includes parts of the counties of north Yorkshire, west Yorkshire and Humberside. Each county holds computerized Sites and Monuments Records, but each is held in a different database package. There is an additional problem that the record

structure between Sites and Monuments Records is incompatible, both in terms of the different recording fields and the different terminologies used. For the City of York there are two main electronic data sources: firstly data for archaeological deposits within York were collected for an evaluation of the archaeology of the city; and secondly the York Archaeological Trust holds an extensive finds database of objects found on their excavations within the City since 1972.

The project is attempting to integrate these various data sources within the project GIS using ARC/INFO. A GIS is more than a map-based interface to a database, but as a minimum it does require a digital map base. This causes problems for most GIS projects because of the difficulties of availability of such data. Our digital map base includes the coastline, rivers and watercourses, relief, urban areas, and administrative districts at a scale of 1:250,000, with additional coverages of soils and geology at 1:250,000. For detailed study areas, such as the City of York, we are making use of Ordnance Survey digital map data at a scale of 1:1250.

Phase II: Data integration - the metadata concept

The initial problem facing the project was how to reconcile the various data sources? We had to be in a position to query three mutually incompatible county Sites and Monuments Records, each with records for several thousand sites, and one urban database with ten thousands of records for finds from one 'site', the urban centre of York.

One possible solution would be that of standardisation, reducing all records to the lowest common denominators. However, this has several disadvantages, including that it would be labour intensive and time consuming; that there would be the danger of introducing errors, through our interpretation of someone else's data; and that there would be the loss of valuable data in the effort to find what is consistent. In addition, the project had the need to be able to give data back to the individual originating databases.

Therefore it was decided to adopt a second solution, making use of the concept of metadata, which introduces the idea of storing data about data. Using the metadata approach the York Environs Project store the original data files, plus information about data structure and data dictionaries which allow one to query them as if they were one file. Therefore, it should be possible, for instance, to ask for all occurrences of York ware pottery and for the database to know where to look within each individual file, and to check a thesaurus to see if York ware might be classed under a different term in each database.

Phase III: Data quality assessment – visibility

Having integrated data into a consistently accessible format, the next problem is to assess the quality of the data. The distribution of sites and finds is a product of three factors:

- (1) The original pattern of human activity in the landscape is the primary source of archaeological interest in the distribution.
- (2) Differential survival of archaeological evidence is a result of such factors as: the subsequent agricultural regime, and whether the landscape has been subjected to ploughing for instance; building development; and localised soil conditions varying with acidity and moisture content etc. There is the additional problem of taphonomy and the differential survival of durable and non-durable artefacts, such as textiles compared to pottery.
- (3) Differential recognition of the archaeological evidence, according to such factors as where archaeologists have worked; the areas of controlled flying zones; and current land use and its susceptibility to techniques of remote sensing. Cropping patterns may improve the visibility of certain classes of site, for instance, just as ploughing may make sites visible through field walking or metal detecting.

The third phase of the project, therefore, is to utilize the GIS to assess bias in the distribution. Our goal is to identify if there are any patterns which cannot be explained by the subsequent history of land use, and must therefore relate to the original settlement pattern.

In order to address this goal we must use the GIS to overlay maps of land use, soils, geology, with distributions of sites discovered by aerial photography, for instance, to see if this reveals a pattern. The GIS should allow us to distinguish between gaps in the distribution which are real, and those which can be explained in terms of the subsequent land use. This will assist the production of 'visibility templates' which will allow us to mask those areas where we should not expect to find anything because of survival and recovery factors.

Phase IV: Analysis of settlement pattern & urban/rural relations

Having isolated those patterns that are archaeologically meaningful the final stage is to analyze various aspects of these distributions:

- (1) Settlement distribution analysis, for example, to assess sites of likely Viking age rural settlements.
- (2) Rural provisioning of the urban core, for example, to examine those resources which were available to the town in the different areas of its hinterland, based on both modern information and earlier historical documentation, such as the Domesday Book and medieval tax returns. Alongside there is a need for

archaeological research into the past environment of the hinterland, and for examination of material from the town, particularly faunal remains.

- (3) Urban redistribution, looking at the distribution of traded items which must have been imported through the town, and focusing upon diagnostic materials, such as lava quernstones, walrus ivory, and imported pottery. It should be possible to map the fall-off of distinctive artefact classes away from the urban core, such as York ware pottery, or coins known to have been minted in York.

Conclusions

Our experience with the York Environs Project to date leads us to four conclusions:

1. Towns cannot be seen in isolation; they must be studied in relation to their hinterlands; none can be entirely independent; most will depend upon movements of both people and goods.
2. There is generally an archaeological imbalance between urban and rural archaeology. Work has generally been concentrated in the towns as a result of several factors:
 - (a) urban damage is more visible, particularly as a result of building development,
 - (b) more people live in towns, therefore there is more awareness of and potential interest in archaeology, and a greater potential for archaeologists to exploit tourist revenue and
 - (c) urban archaeology is easier to fund because it is higher profile, and it is easy to designate an urban unit responsibility.
3. The organization of archaeology perpetuates the urban vs rural divide:
 - (a) administrative factors mean that different bodies are responsible for archaeology in the town and country and inevitably these use different recording systems and
 - (b) the difference in scale, for example in the density of finds and excavations in towns compared to that in the country, makes comparison difficult.
4. The use of information technology may help overcome some of these problems, as it will:
 - (a) allow us to examine urban/rural questions on a grand scale and to deal with the large quantity of data involved,
 - (b) allow us to integrate different data sources, permitting us to jump seamlessly from one scale to another, although there is still a need to be conscious of the resolution of maps used of course,
 - (c) allow us to assess the quality of the various data sources, and to filter the data through a visibility template and

(d) allow us, ultimately, to study those patterns that will throw light on urban *versus* rural relations.

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Captions for illustrations

Fig. 1: Anglo-Saxon and Viking Yorkshire: Domesday manors. Bartholomews 1:250,000 digital map data; topography derived from OS 1:50,000 digital map data ARC/INFO 7.0. (J. D. Richards)

Fig. 2: Undated crop-mark enclosures and settlement sites. Data derived from Humberside, North Yorks and West Yorks County SMRs Bartholomews 1:250,000 digital map data.