Volume Seven : 1973-74
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DEFENCE OR WATCH TOWERS ?

by W.J. Goode

Were our East Anglian Round Towers, originally built for defence against the Vikings? This is the romantic story of why our Round Towers were built. Many writers have told us convincingly, with words and photographs, that these fascinating Towers on our East Anglian Churches, were built as Watch Towers or Lookouts, to spot the Viking Raiders, and when a raiding party was spotted, the villagers, with their valuables would gather in the Tower until the Raiders had passed. We have now had so many writers on this theme, all of whom point to the pros, but carefully avoid the cons. I feel it is time to make a full and impartial study of this theory. The following is the result of my studies extending over a number of years, and of visiting all the Round Tower Churches.

Our first object must be to marshal all the points put forward FOR the Defence Tower Theory, and then carefully examine these in the light of our present knowledge. As a student of these Towers, I do feel that many writers are swept along by the romantic theory, and have done little or no real research on the subject before writing their articles.

POINTS TO EXAMINE:-

(1)	Strategic Position	FOR
(2)	When they were built	
(3)	Viking Raids	FOR
(4)	Athelstan's Law 937	
(5)	Height	
(6)	Time to Build	
(7)	Resemblance to Irish Towers	FOR
(8)	Towers Built Before Churches	FOR
(9)	Upper Doorway	FOR
(10)	Fortified Appearance	FOR
(11)	Tower Arches	FOR
(12)	Roofing	FOR

First I would like to talk about the writers who propound this theory. Baldwin Brown, the father of our Anglo-Saxon studies, stated this popular belief, and discarded it. I find that Munro Cautley in his 'Suffolk Churches' of 1937, puts forward the six points FOR that head this article, and concludes that these prove the theory. Mr. E.A. Fisher, in 1969 however, mentions the possibility of Defence Towers, but remains non committed; while naming earlier writers who favoured this theory. In the last 20 years, we have had a whole spate of articles in magazines and journals, most of whose writers, I feel sure, have not visited half of these Towers, yet alone ascended them to study or carry out any measurements.

So we are left with only one early writer for this theory, worthy of consideration. He is Munro

Cautley, an eminent authority on East Anglian Churches, and Diocesan architect for Suffolk. He is a man who must surely command respect, and he gives his reasons which one must admit, taken at their face value, sound quite valid. Other eminent writers however, either disregard the idea, or are non-committal; so for our early writers' views on this subject we must say 50-50. The great weight of written evidence FOR the theory is from present day writers, and I have yet to see any that can prove their points.

Baldwin Brown, and E.A. Fisher, both eminent men in their field, who either decide against or remain on the fence. Then come the modern writers, who all seem to be FOR the theory; usually with Photographs of Defensive looking Towers, with Battlements and slit windows. Very little seems to be known however of their studies of the Round Tower Churches. One wonders if many are just writers getting on the bandwagon of a popular article, rather than students of Archaeology and History.

So we come to No: (1) In the argument FOR the theory – A Strategic Position. This really is a non starter, I have seen lecturers, using only SAXON Churches, try to prove their Strategic positions by coast, river and hill. They are still left with some, that do not fit, and are forced to overlay the map with a grid of the Old Roman Roads. This will finally line up the known Saxon Churches. The truth is really that every Saxon village was a Strategic position, because they would all be situated beside a river, on the coast, or occasionally at the crossroads of the old Roman Military Road. Students trying to use this as a basis, have to use maps with all these conditions to fit them in. If however, they included ALL the early churches, they would find that they fitted in quite as well. Building on the top of a hill is another point. But this also applied to all churches. One case comes readily to mind; Lowestoft Parish Church, was built one mile outside the village, just to get it on the highest point of land in the area.

(2) When were they built? Archaeologists so far only call some 40 to 45 out of 169, Saxon, and those where datings are given are invariably in the 11th century. So let us look at:-

(3) Dates of the Viking Raids. These are from the Saxon Chronicle and so they must be taken as reasonably accurate. In 793 Lindesfarne was destroyed. By 838 they had raided Kent and East Anglia. In 850 they wintered in East Anglia. This is the date of our earliest Round Tower Church, East Lexham. In 865 they concentrated and organised an army in East Anglia, and in 866 they launched from there raids on the North.

871 to 878 were years of the Danish wars, with King Alfred as our leader. By 874 we have reached an age of conquest and permanent settlement says Modgkin. Alfred had Victory in 878, but in 879 Guthrum the Dane marched his army into East Anglia and there occupied and divided the land. Presumably in accordance with King Alfred's wishes. In 886 there was a treaty between the English under Alfred, and the people who dwell in East Anglia under Guthrum. This wording certainly appears to refer to more than one race, i.e., the Danes and the Saxons; the latter either living as subjects, or having equal rights with the Danes.

All this with only one Round Tower Church (as far as we know) built. So we come to:-

(4) 937. Athelstan's Law. That a Bell Tower must be built on the land of every Thane.

A few writers try and suggest that this Law was for the building of these Defence Towers. But (a) Bells are mentioned, but no words of Defence Towers (b) by now the Danes were as much a apart of East Anglia as the Saxons (c) as far as our knowledge goes, there was still only one Round Tower Church in East Anglia. Unless our dating is out to the rate of 150 years or more, no other early Towers remain, and the other Saxon Towers are between 950 and the Conquest, with more near the latter date.

From 886 therefore, the Danes (Vikings), settled in East Anglia, and gave their names to the farms and villages they created. We hear little more of East Anglia in the wars that still went on for a number of years. By 937, Athelstan decisively defeated the Danes, and there was comparative peace until the reign of Ethelred the Unready in 979. It follows that during the second wave of Danish Wars, they would be sympathetic to their brethren from overseas, and assist rather than fight them. It was less than 100 years from the time that Guthrum settled in this area. They would have little to fear from the invaders so long as they allowed free passage, and probably supplied food and drink. Indeed the second Danish Wars do not mention much in the way of Raids on East Anglia. On 12th November 1002, Ethelred orders a general massacre of Danes, as they had been friendly to the new armies. This sounds like those in East Anglia, but we must not let that blind us to known facts. By 1013, Sven had forced Ethelred to flee the country, and so the Danes were the masters.

(5) Height of Towers and time to build, must surely play an important part in any defence work. We are certain that all these early Towers were quite low, being only about 30 feet in height, or just above the Nave Roof. As a lock-out in the forest region of East Anglia they would have been poor vantage points to view our winding rivers; which would not have an open landscape as at the present day. No, a tree would give a much better view. These Towers would have taken three to four years to build, as the maximum height in one year was 10 feet. This can be measured in quite a number of Towers, and it is borne out in Castle building.

(7) Their resemblance to the Irish Defence Towers is put forward, and coupled with the Upper Doorway, (9) also seen in these Towers. The Irish Towers were much taller, therefore holding more people on several floors. They could be built much quicker by the use of dressed stone. They had no building attached to them, and were roofed in slates or tiles (12). I feel that it is this similarity which impresses most present day writers, but a 30 foot Tower whether attached to a (12) Thatched Church or not is not a very defensible position. When a raiding party burned the Church (as they surely would), those in the Tower would be roasted, as the Tower would act as a chimney, because the door could not be made fire proof and air-tight. I believe also that these Towers were originally Thatched as were the Churches; though if they were defensive this could not be the case.

(8) We are now approaching the crucial point of this exercise; Munro Cautley says, these Towers were built before the Churches. Three Early Saxon Towers I have examined carefully, ALL show that they were built on to existing Churches, and ALL have this Upper Doorway.

While these are early days, I am certain I will find many more in this category. The three Churches mentioned are Hales, Thorpe next to Haddiscoe and Little Bradley.

I must now return to the Upper Doorways. Why are these always, with only a handful of exceptions, on the East side of the Tower. They should always be away from an enemy if defensive. Hardly a mistake to be made so often. One writer to whom I mentioned this fact replied, that they used the Church as a cover in order to reach the Upper Doorway. So if detached the door was on the wrong side, and if attached, anyone sheltering would be roasted. My belief is that a ladder was the simplest form of stairs to the first Upper Rooms to be made by the Saxons. It also left the complete floor space for use as a Vestry; Study; or a living room for a Curate,

(10) The last main point – Their fortified appearance, does not need a lot of explaining when we remember that in Saxon and Norman times, glass was almost unheard of, and certainly not cheap enough to glaze Church windows. Most of the Early Saxon Windows are double splayed. Those that are of the slit type, with deep internal splays, are invariably framed with dressed stone. These have a very high probability of being Norman insertions; when raiders were no longer feared. The Battlements, which give a distinct fortified appearance were all 13th. to 15th. century additions.

Munro Cautley says that (11) proof of the Towers being built before the Churches is in the fact that many of the Tower Arches are cut straight through without any dressed stone on the return side. This however overlooks the fact that the Saxons of East Anglia had no dressed stone to face their Tower Arches. Only the wealthy Churches could afford the cost of importing dressed stone from outside the area. These Tower Arches were built at the same time as the Towers, and any dressed stone was built in later in Norman times, or even later in some cases.

This then is the result of my preliminary study of this theory. The Round Towers were built after the Vikings had settled in East Anglia. The Upper Doorway was simply the entrance to the Upper Room, and in some cases it had probably been a West Window in a Towerless Church. The position of a Round Tower Church is no more important than any other Medieval Church, and conforms to their positions. This is not to say they have never been used as lookouts, as most Churches have been used in this way at some time. But their prime purpose in being built was to hang Church Bells to herald the Mass, and other celebrations.

Lest it be thought that this articles has been written to depreciate these Round Tower Churches, may I hasten to add, that they hold a vast storehouse of interest. Art and History, Craft and Beauty; most of which is at present unrecorded. Ample work here for the Student and beauty for the casual observer. No crowds or parking problems either when looking at these historical treasures.

W.J. Goode, Chairman,

Friends of the Round Tower Churches Society

THE MID-SUFFOLK LIGHT RAILWAY AND ITS REMAINS

by R. Shaw

During a short holiday in East Anglia, I became interested in a very recent, but nevertheless intriguing piece of industrial archaeology, in the form (or rather the shade) of the Mid-Suffolk Light Railway, closed in 1952. I am sure members of the Society could tell me a great deal about this railway; and I would certainly like to know more than the little I have learned, which is as follows:-

The Mid-Suffolk Light Railway was conceived during an era, at the turn of the century, when it was regarded in the natural course of things that no town or even large village should lack at least one railway station. Only such a philosophy could have promoted a railway to fill the thinly populated rectangle of East Anglia bordered by the Waveney to the north, and with Beccles and Diss, and Ipswich and Wickham Market to the south forming its four corners.

The original plan, approved by Parliament in 1901 was more ambitious than the form which transpired. The scheme involved an independently-owned east-west railway from Haughley on the Great Eastern Railway main line; to Halesworth on the same company's Ipswich-Lowestoft line. In addition, half way along its 28 miles length, a branch was to run off to the south and cover the 14 miles to Westerfield.

In fact the line starting from Haughley got little further than Laxfield, two-thirds of the way to Halesworth, where it petered out in a field near the village of Cratfield. The branch to Westerfield was engineered for little more than two miles, coming to an abrupt stop near Debenham. The wonder was that any of the line was built at all, because it could never have been a commercial success. By 1912, the rails had been lifted beyond Laxfield and on the Debenham branch, and the railway settled down to a penurious existence, bankrupt and in chancery from soon after it opened, until absorbed by the L.N.E.R. in 1924. It provided a service for passengers and goods, mainly agricultural traffic, between the main line at Haughley and its terminus at Laxfield. The second World War delayed its closure, but it finally succumbed on July 28th 1952, some years before Dr. Beeching commenced his activities on the railways.

The Mid Suffolk branched off the Great Eastern at Haughley, three miles north of Stowmarket and followed a fairly straight course past Mendlesham, passing under the Roman Road (A143) by a short cutting and proceeding through stations at Brockfords, Aspall and Kenton. Beyond Kenton, the line curved one way, then the other, winding through stations serving the villages of Worlingworth, Horham and Stradbroke, and then to Laxfield.

The Mid-Suffolk was one of the lines to be built as an outcome of the Light Railways Act, which permitted certain rural lines, subject to strict speed restrictions and other limitations, to be built to less stringent requirements with regard to track, signalling, and so on, than was imposed on more major lines. Consequently, and to keep costs down, the line meandered between hills, following the contours, and avoiding the necessity for extensive earth-works or cuttings.

Perhaps it is because of the lightness of its original construction, surprisingly little remains today to be found. Much of the route was over agricultural land, and the ground has quickly reverted to that purpose. In places, the alignment has entirely vanished.

Oddly enough, the still-born Debenham branch leaves the most obvious remains, in the form of an embankment and abutments of an over bridge on the B1077, one mile north of Debenham (Ordinance Survey grid reference 174643).

The alignment here leads on to a half mile long cutting, by far the biggest excavation on the whole line. Clearly this was too much for the promoters, as the cutting comes to a dead end (OS 171638). Debenham never did get its railway.

For the rest, the line to Laxfield at its easterly end has largely returned to agriculture or to nature. It occasionally manifests itself as a farm track of unusual straightness; for instances where it crossed the B1077 (OS 166665) and the B1116 (OS 273727). At Horham the old station still stands, a modest affair of board and corrugated iron but with a tiny brave crenulated canopy, G.W.R, style. The weeds now stand nearly as high as the station roof (OS 214719). A ghostly alignment curves away down hill to the north. In the gloom of an autumn evening one can imagine still an ancient Holden 0-6-0 tank engine, with its train of one ram shackle coach and two goods wagons, battling manfully up the slope.

The terminus at Laxfield was slightly grander. It is still to be seen, and its tiny coal yard still serves, supplier by lorries (OS 288725). The line ran a little beyond Laxfield station, through a level crossing

on the B1117, and the alignment towards Cratfield can still be seen – pointing like a compass finger to the never-attained objective of Halesworth and the sea.

Had the Mid-Suffolk Light ever reached Halesworth, it would have shared its terminus on the Great Eastern line with another independent, the Southwold Railway, a narrow gauge affair; and a very odd one at that. There was even talk of adapting the Southwold Railway to standard gauge and forming an end-on junction with the Mid-Suffolk. This is speculation, but may solve the enigma of how the Mid-Suffolk came to be built at all. It was heavily financed by the mighty Midland Railway, who lacked an East Coast port. Quite how the Midland, from its nearest point 70 miles away at Bedford St. John, hoped to reach Haughley, and thus Halesworth and the sea is not clear. But had they succeeded, Southwold could have become another Immingham. Perhaps it is as well that the Mid-Suffolk Light Railway, got no further than peaceful Laxfield and passed its days in obscurity. As for the eccentric, notorious and much-lampooned Southwold Railway – but that is another story, and must await next summer's holiday!

R. Shaw

COASTAL AND ESTUARINE CHANGES OVER THE LAST TWO THOUSAND YEARS AND THEIR RELEVANCE TO THE STUDY OF THE PORTS AND HARBOURS OF EAST ANGLIA.

by Wilfrid J. Wren.

The many important effects of changes in the coastline upon the viability of East Anglian ports and harbours have for some reason been largely ignored in many works on the history of the region. This is very odd, because they would seem to be fundamental to the understanding of port history.

There is reason to believe that after the last glaciation period (c 8000 BC) the shape of East Anglia was totally different from that of today. With the resulting relative rise in sea-level, the present area of Norfolk and Suffolk became a peninsula almost completely cut off from the rest of Britain (which itself became separated from the continent of Europe at the same time). The sea penetrated up the Stour valley in the south-east and up the Granta valley in the west, to isolate a wedge-shaped region of chalk overlaid with glacial deposits of boulder-clay in the centre and north-east, and with marine Pleistocene deposits along the eastern seaboard. The chalk ridge (later followed by the Icknield Way) bounded the base of the wedge to the west; the glacial moraine of the Cromer Ridge extended far out into the North Sea as a long peninsula. The gap between the Stour and Granta sea-creeks was probably only about eight miles wide, closed by impenetrable forest such as cover the whole of East Anglia until the Anglo-Saxon clearances. Suffolk was likewise divided from Norfolk by the sea-creeks of what are now the valleys of the Little Ouse and the Waveney.

The next factor to be considered is the periodic oscillation of the land-mass of Britain around the axis running roughly from the Humber to the Severn. While it is true to say that the general trend of movement in south-east Britain since Mesolithic times has been in the direction of a very slow fall of land relative to the sea, there were times when the trend was in the reverse direction. This alternation of rise and fall has been clearly shown by borings through the Fens in the Wisbech area; here, the peat of the southern fens repeatedly interdigitates with the estuarine silt layers of the norther areas next to the present day bay.

What is important in the study of harbours is that the last main oscillation about a mean point has taken place within the last 2000 years. In Roman times the land was 'low'; it then gradually rose during the Anglo-Saxon period to reach its greatest 'height' from about 900 AD to the end of the thirteenth century. A comparatively sudden fall of land seems to have occurred before the year 1300, probably as a peripheral result of the interaction of two land-mass 'plates'; this upheaval gave rise to a series of unprecedented North Sea storms and tidal-surges which were especially catastrophic in the Wash and Cromer-Shipden Ness areas. The consequences were enormous: in the years from 1260 onwards, for instance, most of the smaller estuaries and creeks of the Suffolk and north Norfolk coasts were completely choked with sand and shingle, and by 1600 only the very smallest boats could work in and out of those few which remained open to the sea. The town of Wisbech was destroyed by a tidal surge in 1260; the river to Norwich became so silted up that Yarmouth became its seaport from

1300 onwards; Dunwich, at the height of its prosperity, was irretrievably damaged by the storm of 1328 when its harbour was choked, and the whole town was eroded by the sea between that date and 1700. (Many south coast ports such as Rye were similarly overwhelmed at the same time, and the history of the Netherlands shows the same pattern). All this is not to mention the other series of disasters of the period, such as the Black Death and the political upheavals of insurrections and internal wars.

From 1300 there has been a steady fall of land relative to the sea, with possibly an acceleration in the seventeenth and early eighteenth centuries. Today, East Anglia is still faced with a falling coastline; but it seems likely that the periodic oscillations have a 'wavelength' of approximately 2000 years (with the last two 'nodes' occurring at about 600 and 1600 A.D), and it is therefore quite possible that the rate of fall will flatten out over the next 200 years if some further major movement does not occur between the continental plates.

We must now look at other phenomena which have changed the coastline. The parts of Suffolk and east Norfolk bordering the North Sea in Roman times almost certainly consisted of a series of protruding nesses separated by deep indentations of sea-creeks and estuaries, very much as the Essex coast is today. (The islands of Flegg and Lothingland correspond to Mersea in Essex). This outline must have persisted well into the Anglo-Saxon period to account for the settlements of that time far inland and also for the existence of the many 'lost townships' later eroded by the sea (which, in north-east Anglia, include Snitterley, Shipden, Keswick, Eccles, Waxham, Newton Cross, Southmere and most of Covehithe, and Easton Stone.)

Factors besides the rise and fall of land which have converted the indented Roman coastline to the smooth shape we see today may be summarised as follows:-

Firstly, there has been a continual erosion of nesses by stormy seas, especially with the wind in the north-east, the direction in which the waves have the maximum amount of space to build up in strength (tidal surges, which do not erode nesses, tend to build up with the wind in the north-west) Secondly, there is a litteral drift of material from the nesses – from Cromer-Shipden Ness in two directions, one southwards as far as Orford Ness and the other westwards as far as Scolt Head in the north-west Norfolk. Thirdly, there is a continual up-scouring of material from off the sea-bed in the off-shore areas of the North Sea: this sand and shingle is then turned landwards and adds to the deposition of 'ness material' to form elongated shingle spits which tend to close the creeks and estuaries. Fourthly, other material has been continuously borne southwards from the Yorkshire coast to add to the shingle spits and off-shore sandbanks from the Wash to the Thames estuary. Fifthly, landspring water which accumulates in the clay cliffs of north-east Norfolk causes sporadic explosions of dammed-up water which disintegrate the cliff faces; this material is then carried down by litteral drift to add to the spits and sandbanks. Sixthly, beyond Orford Ness in the south, and in the Wash in the north, sand and shingle arriving by a combination of the above methods are deposited not on the shore but in the form of massive, constantly-shifting sandbanks which make navigation in these waters more hazardous perhaps than anywhere else in the British Isles – a fact reflected on charts by the colossal number of aids to navigation such as lighthouses, floating lights and lightships, radio beacons and lifeboats.

East Anglia since 1300 has therefore been in the paradoxical situation where the advantage of a falling land level (which would in theory produce deeper estuaries and harbours channels) is counterbalanced by the silting up of harbour entrances. The coast of East Anglia in 1974 is in a state of equilibrium in fact; yet the land still faces disasters such as the 1953 tidal surge (and the 'near miss' at the end of 1971) because of the remaining factor of relative land-fall. In this context, there is a significant statement in A.E. Trueman's book 'Geology and Scenery in England and Wales', where he says: 'It is important to speculate on what will happen if the whole coast is eventually encases in concrete with groynes, and no further supply of material is available from coastal erosion'.

It will be apparent from what has been said, that the southern estuaries have not suffered the same inconveniences as those farther north; the Haven ports of Ipswich, Harwich and Parkeston Quay, and Felixstowe are the only ones in the region which do not have to rely absolutely on constant dredging (or other devices) to keep the quays open at all states of the tides. (The Orwell Haven dredging is done to allow even larger vessels to reach the quays than in former years, not to keep the quay's open).

All that happened in the southern estuaries, as the land rose and fell, was that the heads of navigations moved 'downstream' and back again, (making due allowances for the increase in size of seagoing ships over the centuries).

We must now look at some aspects of Man's influence on the geography of coastal structures. Between 1000 and 1300, when the land was 'high', a great deal of reclamation of earlier swamps and estuarine mud-flats took place, chiefly under the auspices of the many wealthy sheep-owning monastic foundations in the eastern counties. Every estuary from Boston to the Thames was embanked section by section, providing new areas of grazing for sheep and cattle. Quite incidentally, and apart from improving land drainage, these banks narrowed the flow of rivers and tides to give much-improved scouring of river and estuary channels; this scouring tended in many places to keep pace with the increased draught of more modern vessels in each succeeding century.

It was, of course, this same period of 'high' land which allowed the digging of peat in the Broads area on a huge scale; the resulting excavations were suddenly and completely flooded in the catastrophes around 1300, and have remained behind as the many lakes of Broadland whose origin was proved not really very long ago.

The artificial draining schemes of the fens have produced problems which are too complex to be discussed here. The first attempts (by the Romans) and the second phase (undertaken by monastic establishments) had purely local effects, all of which were beneficial at the time. The third and fourth phases, on the other hand, (those of Vermuyden in the seventeenth century, and of the great engineers of the nineteenth and twentieth centuries) have been almost too effective. The peat lands of the southern fens have contracted downwards at such a rate that the rivers and drainage channels have come to lie higher and higher above the surrounding 'levels'. The result is that not only do the banks have continually to be made higher, but the flow gradient diminishes across the coastal silt-lands, accentuated gradually by the general fall of land-level (though this may not be so great here since the Fens lie fairly near the Humber- Severn axis). This has obvious consequences for the Wash ports of Boston, Wisbech and King's Lynn; fenland rivers have to cross the higher coastal silt-lands (which have not contracted) before becoming the entrance channels of the ports. Attempts to solve these problems have included complicated systems of pumps and sluices to control inflow and outflow, and the creation of 'overflow washes' to allow for the overspill of extra high flood-tide levels. But in spite of all these devices, the Wash ports remain peculiarly vulnerable to the caprices of natural phenomena.

Finally, wherever one travels in East Anglia, from Boston to the Thames, fresh reminders of the dangers which could threaten to overwhelm the estuary borders at any time can be seen in the continual heightening of all sea-walls, estuary walls, and river banks. At the present time, the construction of new walls cannot be allowed to cease for more than ten years at a time. There are places (and the Hundred River valley at Kessingland is one) that will once more become arms of the sea if no reinforcement is made of the shingle bank; build-ups such as the recent one at Pakefield are always made at the expense of other beaches (as at Gorleston) and the supply of shingle to keep the sea at bay is not inexhaustible, as A.E. Trueman showed. One doubts whether the money will ever be found to build concrete barriers across such relatively unimportant areas as the Hundred River grazing lands. We shall see a mud ford at Mutford yet, as there was in the early Anglo-Saxon era.

This articles is based on a part of the introductory chapter, 'The development of the Saxon Shore', of the forthcoming book 'PORTS OF THE EASTERN COUNTIES', by Wilfrid J. Wren, to be published shortly by David & Charles of Newton Abbot.

Wilfrid J. Wren, February 1974

IRONBRIDGE

by D.I. Iosson

Ironbridge is a small town in Shropshire which has been named from and grown around an iron bridge. This bridge, which spans the River Severn is of considerable historical importance as it is the world's first bridge to be constructed with iron. It was built by Abraham Darby III in 1779, with iron cast in his Coalbrookdale ironworks, (Coalbrookdale is now engulfed by the town of Ironbridge, but in the 18th Century it was a very important industrial town).

So well was this bridge constructed that it still stands today; though closed to traffic since the 1950's it is open to pedestrians. In recent years, cracks have appeared in the ironwork, which have formed, not

as a result of a fault in the metal; or corrosion, but from movements of the bridge's foundations. These movements have been caused by landslips and erosion of the river banks, extensive restoration work has been carried out; mainly by the Ironbridge Conservation Trust. This Trust is a charitable organisation dedicated to the preservation of a part of our industrial heritage.

Abraham Darby III, as well as constructing the bridge designed it and largely paid for it himself. The bridge was built for his vehicles and work people to be able to cross to the opposite bank of the River Severn. It is however my own belief that this bridge was much more than this; it was a kind of advertisement, to show the world the versatility of iron and the high quality of his castings.

The bridge weighs 387½ tons and spans 100 feet. Its 70 feet long semi-circular main-ribs were cast in open sand moulds, direct from the blast furnace. All the parts of the bridge were hoisted up and then fitted together using wedges. Not a single bolt or rivet was used in its construction. The methods used, were those used for building of timber bridges. At that time in the 18th Century iron was a 'new material' as far as major constructional work was concerned and the only constructional methods known were those used for the traditional materials such as timber or stone. Probably it was thought that perhaps bolts would not be strong enough. (Bolts and rivets were of course used in other fields where iron was used – e.g. in the construction of steam engines). Nevertheless this iron bridge is a silent testimony to the art of the craftsmen who built it.

Abraham Darby's ironworks of Coalbrookdale was founded at the beginning of the 18th Century (about 1708) by his grandfather – Abraham Darby I (1677 - 1717). He was not a native of Coalbrookdale, but of Bristol, where he served his apprenticeship in the malting trade. He did not pursue his career in this field, but instead he turned to metalwork.

He started off by setting up a small brassworks. Following this he turned to iron, and whilst still in Bristol he made kettles, pots and pans from cast iron, which he sold locally. He made his cast iron in the traditional way to start with, i.e. using charcoal to chemically reduce the iron oxide ores to iron in a blast furnace.

Towards the end of the 17th Century charcoal was becoming difficult to obtain, owing to deforestation. Timber was in great demand for both shipbuilding and charcoal (for metal smelting). It was this shortage of timber (hence charcoal) which could have been instrumental in Darby moving his ironworks, to Coalbrookdale, where there were plentiful supplies of iron ore, limestone (used as a flux in the blast furnace) coal and water (for power and transport). It is not known whether Darby started his business in Coalbrookdale using charcoal in his furnace or not, but it was he who pioneered the use of coke instead of charcoal for the reduction of the iron ore, (both coke and charcoal are composed essentially of the same element - Carbon). Having served his apprenticeship in the malting trade, he was familiar with the uses of coke, during the manufacture of beer. It had previously been discovered (sometime in the 17th Century) that if coal were used in the fires then the beer would have a foul taste. This was due to the presence of sulphur and tars present in the coal. Coal had previously been tried in those furnaces, but without success, due to the presence of sulphur; tar and other contaminants. Thus having founded his ironworks in Coalbrookdale he was able to produce a cast-iron of acceptable quality for pots and kettles etc. by using coke in his furnaces. Coal was plentiful in the area, with a healthy trading relationship with Bristol and S.W. England. The coal mainly for domestic use, was sent by barge down the River Severn.

Darby produced his coke by heating coal in special coking ovens, having a restricted supply of air. The effect of his was to remove most of the volatiles – sulphur, hydrocarbons and tar, all of which would contaminate the iron and make it useless, if coal were used in the blast furnaces.

The quality of the cast iron produced by Abraham Darby I, though acceptable for pots and kettles, was very brittle and of a much inferior quality to that produced in blast furnaces using charcoal. The reason for his was that charcoal is a much purer form of carbon, than in coke. Non volatile impurities in the coke notably phosphorus, were contaminating the iron and thus making it brittle. The problems of the removal of the phosphorus contaminant were not solved until the mid 19th Century. Iron which was contaminated with phosphorus could not be converted to wrought iron, because the phosphorus could not be removed by heating the iron and then beating it with hammers.

All cast iron, from whatever source, contains approximately 4-5% of carton. This carbon makes the iron hard and resistant to corrosion but also makes it brittle, (although nowhere near as brittle as phosphorus contamination) for certain applications; the iron was converted to wrought iron, by repeatedly heating and beating the iron. The effect was to burn off all of the carbon contamination.

This iron is commonly known as bar iron, and was generally manufactured in small quantities – in blacksmiths forges for example. Because the wrought iron contains no carbon it is strong and non-brittle, and can easily be worked into the desired shape. It is interesting to note that it was not until the mid 19th century, when the quantity of carbon present in the iron was able to be carefully controlled (the Bessemer process for manufacture of steel). Today different steels have different proportions of carbon present. The proportion; depending upon what application the steel is put to. For example mild steel used in car body pressings is of low carbon content, but hard faced machine tools are of a high carbon content.

The consequences of all this is that Abraham Darby III was not able to build his bridge of wrought iron, because of the size and quantities involved, steel making in quantity was a century away. Thus he built his bridge of cast iron. The fact that the cast iron from which it was built, is of a very high quality, is obvious. He was able to produce high quality cast iron without the empirical chemical knowledge, which we have today, but by the craftsman's art and practical experience. To avoid the problems of phosphorus contamination, which his grandfather experienced, he chose his coals very carefully, for the production of his coke. He chose coals with a low phosphorus content, without knowing that it was phosphorus causing the problem. He also improved on techniques to produce coke for his blast furnace. Thus reducing the possibility of contamination of some of the volatiles remaining in the coke due to incomplete carbonisation. By 1779 improved blast furnace techniques had also come about. A notable one was the use of a steam driven pump to supply the air for the furnace.

The Darby family of iron makers of Coalbrookdale played a very important part in the Industrial Revolution and contributed a great deal to the technology of iron making. Would you not agree that this Ironbridge still spanning the river Severn is a fine advertisement to their achievements?

D.I. Iosson

PREHISTORIC JOURNEY

by Paul Durbidge

In 1964 I was shown a beautiful example of a very small flint arrowhead, with very delicate curved sides and minute pieces of flint removed from both faces. This was my first encounter with prehistoric tools and a study that has progressed through the years. In learning the subject, it has been my good fortune to have been in the company of two people who have helped me considerably both in research as well as in the field, for without their help and patience comparatively few results would have been achieved. For several years Mr. Dennis Collins has been working on a study of the pre-Palaeolithic remains along the Eastern Bavents, near Southwold and during this time he has amassed a variety of very early stone tools as well as pieces of worked fossilised bone remains. This type of study is to say the least, a very complex one, bearing in mind that the remains became extinct many years ago. Nevertheless working almost entirely alone he has now collected several hundred specimens of stone tools and will shortly be publishing a paper on the subject.

Kessingland over the last few years has yielded several specimen pieces of prehistoric implements and it was here that Mr. Anthony Collings first showed me the skill of the Neolithic flint worker as well as the great range of tools used and rejected on a settlement during its life time.

My first introduction to a prehistoric settlement was to say the least most instructive. It had been found quite by chance while taking a dog for a walk round the perimeter of a field close to marshland at Kessingland. It was no doubt chosen by reason of its close proximity to water and also by way of the ready supply of the raw material flint. Although at the time we did not realise the full extent of the settlement. Continued searches later on showed there was a small Mesolithic camp close by, adjacent to marshland. After seeking permission from the local landowner we proceeded on the field surface and although there was a sizable crop of beet in the field it soon became evident that much would be found sooner or later by the amount of rejected cores we began to encounter. The cores were mostly of the multi-platformed type with the occasional blade core and even rejuvenating cores. Up until now the cores and flakes were fashioned from either black or grey flint and some had signs of burning to their surfaces possibly as a result of recent surface fires. The presence of crops in the field at that time

caused some degree of impatience which in later years I learned to check but in time the crops were lifted and the field surface lay before us.

The ideal search conditions require a variety of attention by the elements,. Firstly the freshly ploughed surface must become broken up by rain then with the stones exposed both sun and winds effectively complete the conditions, the sun drying up the soil and the wind blowing off any loose earth that may be present. In fair conditions Tony Collings and I took to the field and systematically we covered the greater part of the field and also the adjoining one. In retrieving such finds as those made at the time the thought goes through one's mind that here we are now picking up materiel used by Neolithic man, certainly in the region of 2500 B.C. The industry consisted of a great many scrapers, bones, arrowheads, blades cores, two sickles, spear heads, knives, hammerstones and countless numbers of non-descriptive worked flakes. It became apparent after several more searches that the settlement was grouped in three main parts of two fields with the main concentration overlooking the marshland, which during the life time of the settlement was quite probably an inland water way. The need for hunting was indicated by the finds of leaf shaped arrowheads as well as several transverse types attributed to the Neolithic B. Workmanship on these projects varied considerably although as one transverse arrowhead had been carefully flaked over both faces only leaving the wide chisel edge clear of attention. Of the spear heads found one was fashioned from a long light brown flake while the others had been lightly trimmed in an attempt to straighten up the shape of the projectile, in fact the weapon had received comparatively little attention to detail suggesting it was designed for much use. In constructing the implements both bone and flint had been employed as fabrications although only the latter have been recovered, these are again varied being constructed with reasonably thin working points to those with the more conventional chisel like ends. Several small flint saws have been found during searches and on one there were some twenty small teeth cut into the side of a small thin flake. Other saws show signs of damage to the cutting edges which is probably a combination of wear at he time of construction as well as later damage, by ploughing, by way of their size which is mostly in the region of 2-3 inches. It is unlikely they were used for much more than cutting very small twigs or sinews and other very light functions. Two straight sickles indicate that some form of agriculture may have been employed here or they may have been used to gather animal fodder, but either way we can only assume. The discovery of these two sickles and later the tip of a third one certainly suggests farming and it is worthwhile mentioning at this point that the greater part of a straight sickle was found in 1969 at Carlton Colville near Oulton Broad while a short distance away a magnificent example of an undamaged plano-convex knife was found with a scatter of scrapers and assorted flakes during a search for fresh evidence of Neolithic occupation.

Although Kessingland has produced some very finely worked implements and in great variety up to the time of writing only one complete conventional polished axe has been found and this was discovered some distance away from the site, being found when workmen were putting in some drains on a local housing estate. It is most likely that the area was reasonably well forested and we do know that several axes were used while the settlement was occupied but all those we have recovered are broken with only the partially ground cutting edges present. There have been no finds of butt ends of axes apart from one found half a mile away and one must consider that the remainder of the axes may well have been re-sharpened for further use and taken further afield. From time to time small pieces of shaped flint have been observed which were used mounted in antler sleeves or some such way and employed as light cutting tools usually such types have one end slightly tapered with the characteristic spine chippy to the cutting edge of the tool. The destruction rate caused by farm machinery has not been as severe at Kessingland as it has been at Carlton Colville; this is by way of the soft or light soil areas which have caused the implement to be pushed under rather than being cracked and broken on the surface of the field, which from our point of view is very fortunate. The continuation of searches on the field surfaces at Kessingland had turned up the odd broken blade and blade core and later on we were able to pinpoint a small field close by upon which had been sited a very small camp during the Mesolithic period. Like the main Neolithic site this had been positioned on sloping ground and a stones throw from what was once a wide expanse of water. From the very light soil here were found quantities of very small narrow blades and several cores and other waste material. Several of the blades had been fashioned into points or had been blunted along one edge. Another interesting find was the remains of a small oval pebble which they had tried to detach blades from. The result was failure as the material refused to flake properly and in examining the opposite end one can see it was then used as a hammerstone from the small pits caused by striking other more suitable material. Although the camp site is small some of the finds are to my mind more interesting, in examining blade

cores we can marvel at the accuracy of these people in removing very small narrow slivers of flint which was then employed for points, saws or barbs, along with a countless number of uses quite unknown to us. The Mesolithic finds date in the region of 8000 BC and unlike the following Neolithic remains they are not nearly so prolific. In general these were nomadic people who hunted by the rivers and sea shores in a quest for food, jealously guarding their food supply against all comers. The main food was fish caught from the inland waterways by using bone prongs and harpoons, but it is almost certain they also used the forest as well to eke out their diet.

Apart from the forest animals, good use would have been made of wild plums, hazel nuts and probably acorns, to supplement their food. The once wide estuary that separated Benacre from Kessingland is now marsh land with the meandering river Hundred passing between wide areas of marsh. This area was no doubt constantly fished by hunters sitting astride roughly hewn boats and it comes as no surprise to find two heavily patinated worked flakes amongst upcast from one of the marsh dykes close to the present river.

More evidence of Mesolithic finds have come from two areas in Benacre and also from Rushmere and Gisleham. Apart from the use of Sarson hammerstones being used at Gisleham the flint industry compares favourably with artefacts found at Kessingland. It is also worth mentioning that there is also Neolithic material to be found on these sites though not in quantity. The travelling from one area to another often led to many small camps where a family stopped to rest overnight before resuming the next day. One family could produce a number of implements to suit their basic requirements and would reject them before moving on. The more favoured tools and weapons would be retained further hunting or even trading. Single finds of implements such as a broken leaf arrowhead found by a schoolboy in Oulton Broad can be the result of loss by hunting the same as single finds of an axe or in some cases the implement is just broken and is left. Paternation on the fractured end can in many cases show if the implement was broken during the period it was made. An axe found in clay at Windward Way, Oulton Broad had been made from a light brown flint and had been broken close to the cutting edge. Examination of this edge showed it to be of the same colour as the axe itself which showed it had been broken either by accident or deliberately during its lifetime. Fractures and chips caused by recent damage are relatively easy to identify by way of the colour and texture of the basic material. Our own research into the prehistoric picture has shown extensive penetration over wide areas of Lothingland. The quality of several of the flint axes which we found outside field searches have shown that there was need for them to clear forest and woodland and we are reminded of the Neo-Bronze age site behind the College of Further Education in Lowestoft. Here several axes were found during the period from 1915-1936 along with some greatly varied types of arrowhead. Many implements must have been lost here due to the railway development which is close by as well as an equal amount lost through lack of identification, While it is relatively easy to identify excepted tools such as axes and arrowheads the main bulk of everyday implements is invariably the most important for it is from those that the size of a site or camp can often be assessed. During roadworks near St. Margarets Church several years ago two long chipped arrowheads in sand-coloured flint were found by workmen from their shape it is certain they were fashioned from metal forms and were most certainly of Bronze age date alas, their whereabouts now is not known. This is the importance of the museum we now have, it gives one a chance to collect local antiquities, either on loan and sometimes presented thus showing people the early history from this particular part of East Anglia. The adjacent area around Lowestoft is no doubt rich in archaeological finds, in fact, if one reads up the history related to the parish of Lothingland, it is an excellent exercise to base further research on. Undoubtedly field walking holds the key to the history of Lothingland and anybody who has firstly the interest and secondly the time would be well rewarded by say investigating one parish at a time. Apart from the surface finds of pottery etc, there are of course the visual remains that may exist such as ploughed out barrows or ditches and even moated sites, these features have never had any real consideration as yet and they certainly do exist in some parts of the vicinity. To conclude I would like to take the opportunity of thanking the farmers over the last year for allowing searching to take place on their land and also to thank the very small group who have given time and effort on the field searches this year.

P.M.D 1974

List of finds on the next page.

SURFACE FINDS DURING 1974

4 Sarson hammer stones Part of a very thin knife Scatter of cores and scrapers 1 chipped axe	Rookery Farm Gisleham
1 chipped waisted pick	White House Farm Oulton Broad
Small spear head Butt off a spear head Tip off a small arrowhead Tip off a beaker knife ? Two transverse arrowheads Scatter of blades and scrapers Small chipped axe	Manor Farm Kessingland
Broken knife Various cores and trimmed flakes	Beach Farm Benacre
Part of a very thin leaf arrowhead ripple flaked on both faces	Highland Way Oulton Broad

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A MOATED SITE AT RAVENINGHAM – Norfolk

by Paul Durbidge

Just inside the Raveningham boundary lies College Farm and sited close by lies a very large rectangular moated site. It is one of three in Raveningham and although not easy to identify it is certainly the largest, being positioned on appreciably high ground with moat water supply by springs. Like many more of these moated sites little is known of its history apart from a few odd scraps of information. From the Doomsday Book Raveningham was under the Lordship of Ralf Lord Baynard and apart from details of the land and workers on it there is no reference to Raveningham again until 1350 when Raveningham College was founded by Sir John De Norwich. From here we learn that Sir John was vice admiral of England and by his wife Margaret he had an heir Walter. Also we know that the College was endowed with the manors of Lyng, How, Blackworth, Hadeston, Snoring, Parva, in addition to these lands and tenants in East and West Wretham and Ilington, Mettingham Castle, the manors of Ilketshale, Shipmeadow, Melles, Bromfield, Wenhaston and Redesham. The masters of the College at Raveningham are recorded from 1349 with Thomas De Boytom and conclude in 1433 with the death of John, Duke of Bedford. Such is briefly the documentary evidence, although whether this is related to the moated site is open to opinion. Certainly the site was constructed by a wealthy landowner for the amount of manpower to construct what are now dry moats must have been very considerable. The site measures 487 feet along the north moat by 280 by the east and tucked in the right hand corner is yet another area of land 225 feet by 116 feet and this too is encircled by a defensive moat. The site is situated in very pleasant surroundings well off the main road and positioned in meadow land. What were once wide deep moats are now silted up leaf beds with nettles and bushes completing the picture of decay. By standing in the now dry moats it is just possible to see above normal ground level; while in some places the sides are still relatively steep to clamber up. The site was dug out of heavy boulder clay and quantities of small chalk lumps and small flints are noticeable, after a dry spell on the sides of the ditches. Access onto the site is by crossing over the south moat by way of an earth infill and there may be a more consolidated crossing point of over the moats original southern access. When standing on the inner enclosed area the shape of the encircling moats can roughly be seen by the trees and shrubs now well established after several years. In a confusion of dense scrub and trees positioned in the north west corner lies a very large dried up strip of water. This water which is now partially visible at times has like the moats suffered the ravages of

time by growing vegetation though its shape is still quite well defined once one can battle through thorns and scrub to inspect it.

This was most probably the fish pond supplying fish to the occupants of the moated homestead as well as water for crops and cattle, which were part of the working system of the homestead. Part of the wide outer enclosed area would have been used for orchards and light buildings with the animals grazing outside the moat perimeters during the day and being brought within their protection for the night.

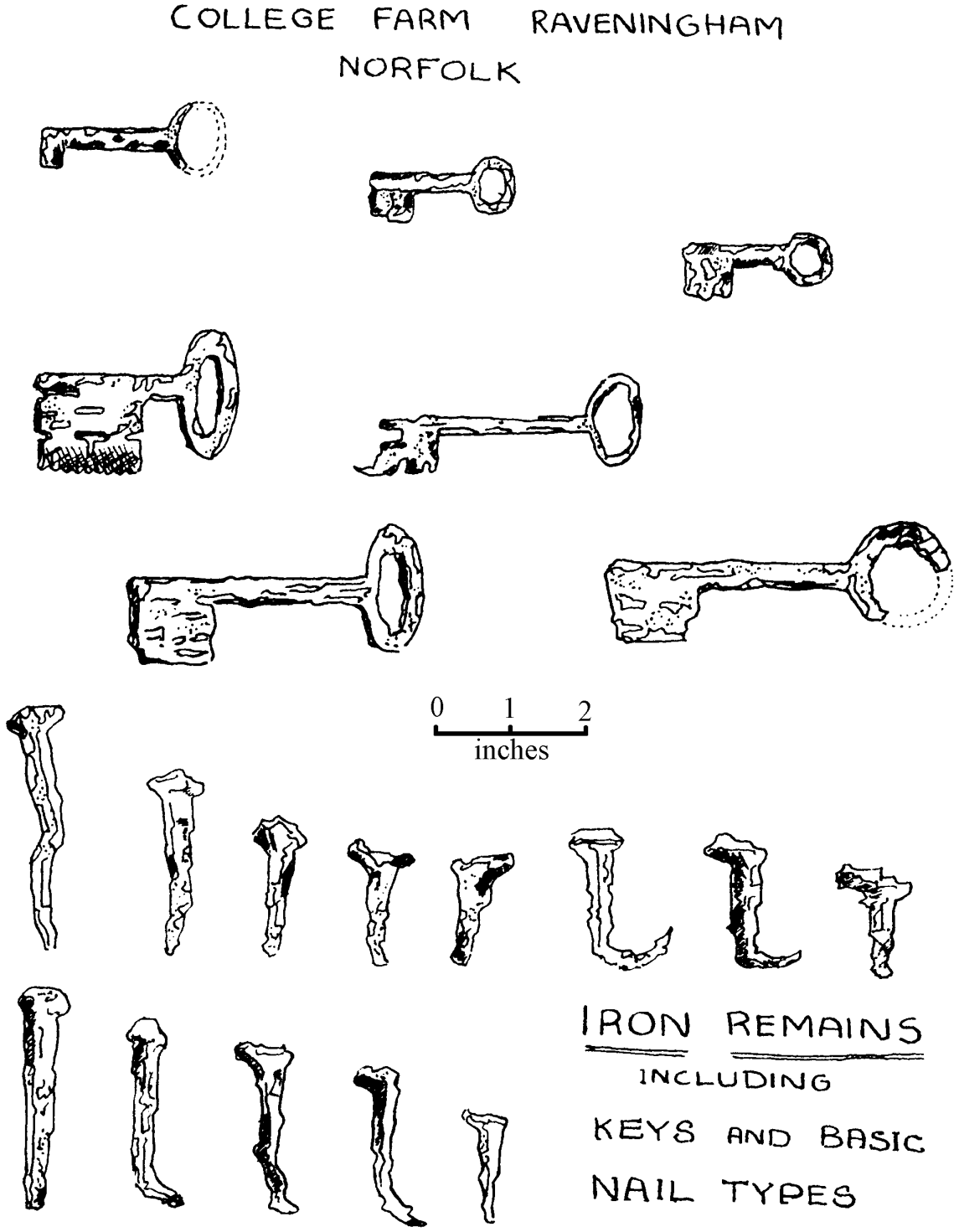
An attempt to section one of the dry moats on the north side was made in June of 1970 when a three foot cutting was started in an attempt to determine the true size and shape of the ditch. Initially work going through the silted layers went well although penetration of the subsequent boulder clays was a different matter. The warm weather at College Farm has a devastating effect on the earth remains with the tendency of the ground surfaces to crack and ball up causing scraping back layers to be extremely difficult. In removing three layers black infill brown boulder clay and dirty brown boulder clay we encountered quite a number of shell fragments attributed to the swan mussel which suggested that they lived here quite well in a sizable draught of water during the medieval period. A small sherd of badly worn pottery was also found amongst these shells though badly water worn and rolled it was of medieval type. In removing up to four feet of infill from the ditch the presence of water draining in from the easterly direction was beginning to cause problems. With the source of the springs supplying the water for the site being at the east end of the Homestead we found there was a gradual draining of water towards the cutting we had started. Shortly after this heavy rains increased the problem more and we began to see another aspect of soil reaction on the site. Once wet the clay sticks like glue to ones boots and clogs up everything it encounters, there were several attempts to obtain the section which at this stage was well under way but by way of the weather change and wetness of the clay it became obvious that this was a hopeless task and that we could do no further work on the section so it was very reluctantly abandoned.

Shortly after this a second attempt was made on the south moat 100 feet from the access over the moat and this time we were able to conclude our findings. The section revealed a flat bottomed ditch some 36 feet wide and nearly 9 feet deep with gradually sloping sides, the bottom of the ditch measuring 5½ feet. The upcast had been pitched out on both sides unlike the north section where it had been thrown outwards to form a bank. A few sherds of pottery and a rim of 13th century character were found as well as a scatter of animal and bird bones but these were the sum total of the finds during the operation.

INNER ENCLOSED AREA

The dwelling area of the homestead is thought to be positioned in the N.E. corner of the site which is the only area of the homestead encircled by wet moats. This enclosed area which has no visible access of the moats is a mass of scrub and nettles and like the external defences it is encircled by hazel bushes, trees and countless other shrubs. Since there were no visual features to investigate four trial squares we laid in the S.W. corner some 17 feet from the moats to test the stratification. This was made up of topsoil containing a few post medieval sherds, boulder clay with occupation material 13-14 century, dark clay with occupation material 13th century and finally light grey clay which was the natural layer. Very light scatters of flints were revealed along with oyster shells during the beginning of operations and an isolated wall footing consisting of clay bonded flints was revealed. The wall and later a path surface were found to be lying parallel to each other measuring 10 feet long running east to west. The construction of the pathway was by using crushed chalk although it terminated with no signs of resumption further on. Pottery fragments found between the wall and path were of 13-14 century date and were mostly of dark grey or red fabric; cooking pot sherds and bowl types account for the majority of the pieces found at this juncture. For the most part it seemed unusual to find features at this point of the site and the later discovery of a water hole dug some three feet wide going down into natural clay did at first suggest it might have been a rubbish pit. The investigation of the hole revealed comparatively nothing as its contents consisted of several flints, small pieces of pottery and bone and a small amount of cockle and oyster shells. Close to this there was evidence of a small fire area where fragments of pecked lava millstone had been placed no doubt to place things on. These mill stone pieces were rather small but again oyster shells and bones were in evidence as well as a number of iron nails. Some of these were clenched over and they varied in size from quite small up to three inches in length. All appear to be squared section with large squared or rounded heads. The presence of other very small fire stains close by along with small burnt pieces of millstone we

observed but nothing on a large scale. Certainly the region around the pit and the pathway produced several interesting discoveries, the first being a scallop shell with very small near perforated holes drilled through its base. This may be one of the pilgrim's badges used by being attached to Pilgrims cloaks during the pilgrimage to Santiago de Composlela in Spain during the early part of the 11th century. It was called the badge of St. James and it can be seen on many of the statues and paintings in Spain and even in Germany up to the 15th century.



Apart from the iron nails there have been several medieval keys uncovered with the signs of metal corrosion very much in evidence on them. While three are of a general type the remaining five are small and were used for small box security or similar purposes, in fact some differ little from present day types.

Of the personal finds made it is thought that some are of late medieval date, they include strap end, a

dagger chape and swivel, bronze pin and bronze tweezers. Other very small pieces of bronze were fixed to part of a small piece of leather which had somehow managed to survive the elements of time. One coin, a silver penny of John 1208 - 1215, was found in good condition, close to the water pit and this specimen is now in Norwich Museum. In an attempt to determine the limits of the cobble wall and pathway two of the square were extended but the results did not reveal any further continuation of the features. However it did uncover what appears to be part of either a floor or external yard surface made up again in consolidated chalk. The pottery finds here were well scattered, apart from one area where a number of coarseware sherds belonging to different pots were uncovered. The surface mentioned that has been exposed measures up to 10 feet with more continuing under the perimeter of the squares. Another fine area has been uncovered some twenty feet away from the first and this time it appears to be an upturned part of a millstone used as the hearth. A small part of straw marked brick was lying with broken fragments of millstone, the first piece to be observed on the site. The millstone pieces have all been small as yet being broken off a piece which measures 3½ inches thick, there is however a second type with carefully fluted edges and decidedly thinner than the former. It is possible that this type may have been grooved out locally as several pieces of worn millstone grit have been encountered during excavations. The work force at Raveningham has been extremely thin which has not done justice to the site, it is an extremely hard site to work upon, bearing in mind that we have been digging during the weekends, thus leaving the site to dry out in very humid conditions all week. The rate of vegetation growth after a lapse of time is quite extraordinary with the undergrowth it seems eager to reclaim back that which we have investigated. It is a site where one can learn a great deal from both by conditions as well as the basic archaeological knowledge. The local farmer Mr. Playford and his wife have been very kind and very helpful while we have been working here and I cannot over emphasise my appreciation for their kindness shown during the last few seasons. I would especially like to thank my good friend Mr. C.G. Rye for his help and patience during the project. I am very much indebted to him for his knowledge of the medieval picture. He has continually supplied me with information and I know I would have omitted much through lack of knowledge.

Finally I would like to express my thanks to the small group of people who have assisted at College Farm often under very bad conditions and I hope that they too have had an interesting session during the last seasons work at Raveningham.

P.M.D. 1974
