An Archaeological Resource Assessment of Modern Nottinghamshire (1750 onwards)

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Introduction

For no other period do we have so much physical evidence, so much in the way of material culture. Because of the sheer numbers of remains, industrial archaeology tends to fix on firsts and lasts. The first use of prestressed concrete, the first bobbin net machine, the last remaining example of a conical tip, or the last set of pithead buildings. However, the bulk of the material culture of this period is neither a first nor a last, and is therefore at an even greater risk of loss. At the other extreme from those who concentrate on the "wheels and widgets", are the historians, who are set about with vast amounts of fresh primary evidence, but still capable of wildly differing interpretations of the same black and white texts, according to their own political shades. Archaeologists usually steer well away from the very recent past, except where dealing with the aboriginal cultures of native peoples. However, of all the lessons that the Industrial period teaches, the one we should take to heart is that change can happen at staggering speed, resulting in a near total loss of significant parts of the past without record. The archaeologist should consider what needs to be preserved, and what should be recorded for the future, for this period just as much as for any other period. The other role of archaeology should be to enable the understanding of the recent past through the study of its material culture- again, just as for any of the preceding periods. The Industrial period is the one which most non-archaeologists think they understand; it is their world or the world of their parents, and grandparents, it is the most accessible bit of the past for the majority of the population. This very accessibility makes it easy to misrepresent, and undervalue.

Looking after the recent past faces us with real problems; how do we choose which sites to protect, and by what means do we protect? MPP work in 1994 has led to one set of bell pits being scheduled in addition to the already scheduled winding engine at Bestwood. One colliery in Notts., Annesley, was designated a conservation area last year, through the efforts of the County's conservation officers. 1 colliery buildings is listed. This is the sum total of the statutory protection for the Notts. coalfield. When the MPP work was carried out, Notts. had 15 or so collieries. Of the 9 collieries photographed by the County Council in 1992 only a handful remain; the rest have since been demolished, and now there is a conservation area consent application for the complete demolition of the colliery buildings at Annesley. Listing, scheduling and the designation of conservation areas are the only statutory means of protecting industrial remains, but to be effective, the processes have to be responsive; Decisions should not be made on the basis of data which is fifteen years out of date. There is a heavy responsibility on us as curators, to ensure that we also make the right decisions about which sites to protect, and above all, about the methods of protecting these sites. What do you do with the colliery buildings once you have them protected? Mothballing such sites will rarely be an answer. Reuse may be a partial answer, but then one has to achieve the appropriate balance between the needs of modern usage and the very material one is attempting to preserve. Aesthetics often play a significant part in the listing of a building or in the designation of a conservation area. Yet few of the important remains of the industrial period are perceived by us as having any real aesthetic value. We need to be imaginative, and to take an holistic approach

It is easy to concentrate on the staples of the industrial revolution in Notts, coal, hosiery and lace. While we do not know all we should about these, and although we do not have sufficient remains of these protected or recorded, we should not lose sight of the fact that there was tremendous variety in the range of industries actually undertaken in the County. The industries were symbiotic; they relied upon each other. Thus, Notts. was not only a centre for framework knitting, but the making of the frames was an important part of Notts. life. Once export restrictions were lifted they were exported to France, Germany and Spain. Thus,Hargreaves' mill in Nottingham was concerned not only with spinning but with making jennies for sale. And thus, steam power, fuelled by coal was an essential part of the growth of the textile industry. The coalfield expanded to supply the industrial towns with coal. The nascent industries attracted workers, who supplied the markets with goods and coal, and were themselves markets for the finished products. During this period the County, particularly in the West, entered a cycle of self sustaining supply and demand which changed beyond recognition every aspect of the landscape.

The Industrial period was a time of massive change; it was not one, but many revolutions. The obvious revolutions were in industry, agriculture, communications, and society. However, there were other vast, but less obvious revolutions, in land control, for instance, or in the role of women. The impacts of these revolutions archaeologists have not yet really begun to consider. Despite the rapidity and thoroughness of the changes themes of continuity are still apparent, but transition and change have the upper hand.

This period also sees the development of Nottinghamshire's two modern faces. The County is split by a line which runs up the current A614. The west of the County, on a zone concentrated on a strip effectively from West Bridgford to Mansfield, becomes a major industrial zone, only relatively recently developing into a depressed post industrial landscape with all the attendant social problems. Beyond this zone there is industrial development around the bigger market towns, but by and large these were service centres for the surrounding agricultural landscape (and remain so despite the best attempts of the modern planners). The differences are social, political. They can be seen in the distribution of road and rail services, in house prices, in the form of settlements. Any modern day Celia Fiennes would be struck even today by the very real differences between the two zones if she were to journey through Newark and Mansfield. Differences in development across the County were for the first time not linked primarily to differences of soil and microclimate.

Evidence

The evidence for the period is vast, but not without dangers. There are census returns, the evidence of the various Royal Commissions into the states of trades and workers. There are maps (In Notts. we have a range of County Wide Maps, Chapman, 1774, Sanderson's map of 1835 and of course the Ordnance Survey maps). In addition to the text books produced by historians, which are of varying qualities, we have surveys undertaken by or in partnership with the County Council. These include Newark's Industrial Archaeological Resource, a Rapid Photographic Survey of Notts. coalfield, and the Monuments of War survey. Lastly, although the SMR and HBR do not claim to be complete for the period, the archaeological remains of this period have always been regarded as worthy of record and study.

Transport

At the beginning of the period the County was distinguished by a road infrastructure in lamentable state of disarray, with no real difference in the appalling state of the roads between East and West. Between 1750 and 1770 most of the major routes in the County were converted to turnpikes. In 1766 the Great North Road was re-routed away from the Forest, to run through Retford, and was carrying 90 coaches per day plus stage wagons and packhorses. The rerouting had a major impact on the towns now along its route, Retford, Tuxford, and Newark. A series of flood events in the last half of the 18th C caused major disruptions to passage along the Great north road by Newark, and a major loss of business to the town. John Smeaton was commissioned to find a means of allowing traffic to continue unimpeded and yet allow the floodwaters to drain. He came up with the brilliant notion of building a causeway punctuated by arches across the Trent Floodplain. The work was completed by 1800, it involved a causeway 1 kilometre or so long, crossing three parishes, and a grand total of 125 arches.

The improvements to the road system secured by turnpiking (such as they were) were largely unsustainable in the clay and coal districts, where the traffic was heaviest. Indeed the early exploitation of the exposed coalfield happened almost in spite of the problems of transporting the end product. The difficulties of transport must have acted as a brake on development until the construction of the canals in the latter part of the 18th century.

The Trent had been the core of the transport system in the County for centuries. If the early industrialists could gain passage for their goods to the sea via the Trent they would secure markets all over the country. **The Nottingham canal completed in 1796** was built largely to provide an alternative to **the Erewash Canal**, and feed coal directly through Nottingham to the Trent. Prime movers behind the Nottingham Canal were the coal masters Barber and Walker. The Nottingham canal linked existing collieries, and other industries, effectively joining the dots of the individual scattered industrial concerns across the landscape to an efficient means of transport for their goods. Those sites which were not directly adjacent to the canal infrastructure soon put in tramways to effect the connection. At the same time as the Nottingham canal was under construction, the **Grantham Canal** was being built. This was to provide a direct route from the Notts. coalfield to Grantham. **The Chesterfield Canal,** the oldest in the County,

construction of which started in **1771**, passes from Derbyshire across the north of the County, through Retford, joining the Trent at the port of West Stockwith.

There is a qualitative difference between the industrial expansion along the Nottingham, and Erewash canals, compared with much of the length of the Chesterfield and the Grantham, as they pass through the County. The Chesterfield and Grantham generated a certain level of industrial and commercial expansion in the towns or villages through which they passed, whereas the reason for being of the Nottingham and Erewash canals was to exploit existing industry.

The canals were prime movers in the development of the coalfield, but their importance dwindled as the railways grew.

By 1819 the Mansfield and Pinxton line was carrying coal to the Cromford Canal. The Kings Mill viaduct in Mansfield was built in 1817 to carry coal to and stone from Mansfield. The coal masters Barber and Walker were instrumental in setting up the Midland Counties Railway, which opened in 1839 and connected Nottingham with new markets in London and Birmingham. By the late nineteenth century the West and South West of Nottinghamshire had a complex railway network, with rival coal companies each attempting to achieve access to the rapidly expanding coalfield. At one point the Nottingham suburb of Bulwell had 4 stations. The Great Northern Railway of 1846 went via Grantham and Newark helping a little to balance the focus of transport infrastructure on the coalfield and in the City. Passenger transport began to be of more importance too. By 1880 Nottingham suburban railway ran as far as Daybrook, and by the turn of the century there were electric trams in the City. Consequently work and residence no longer needed to coincide and the development of commuter settlement in the suburbs of Nottingham and surrounding villages was initiated.

In the early part of the 20th C, and particularly immediately after the First World War, the internal combustion engine was beginning to have an impact. While at first its main uses were for industry or limited private use, firms such as Barton's Charabancs soon provided public passenger services, linking towns and villages in a way which had been unimaginable only thirty years before. The County Council was surprisingly quick to respond, with a number of road improvements being undertaken in the 1920's and after to remove dangerous bends and corners from the existing road system, and to supply Nottingham with its ring road. Interestingly, some of these had been designed as early as 1910, implementation having been delayed by WW1. The growth of the use of the "self propelled vehicle" for private and public purposes lead to the old turnpike roads being widened, straightened and improved. The M1 arrived in 1964, and at about the same time the Great North Road was improved and dualled. The 1960's brought other road improvements, with road building schemes in the City which swept away a significant section of its Mediaeval street pattern, making a nonsense of the remainder, and in Mansfield, which swept away a significant portion of its Victorian municipal centre, to name but two.

As the roads took more and more of the burden of transport, rail began to suffer, and many services were cut through Beeching's rationalisation. Water transport also suffered, canals became routes for pleasure craft and tourists. The use of the Trent for transport also diminished. While it still carried sand and gravel, oil, fertilisers, and grain, it was no longer the backbone of the County's transport system.

INDUSTRY

The main manufacturing industries of Notts. were those of the preceding period, coal and textiles, but these stalwarts were joined by other industries, including light engineering. In many areas of these Nottinghamshire led in technological innovation, development and production.

Coal

At the beginning of the period coal was the most important export from Nottinghamshire. The industry was changing rapidly. The relatively small scale mining exploits of the period up to the late eighteenth century on the exposed coalfield were transformed during the nineteenth century into the major deep pits of the twentieth. Technological development, particularly the use of steam engines, enabled the exploitation of the concealed coalfield. By 1850 Shireoaks was 150 yards deep, and had reached the Top Hard seam. Chapman's 1774 map identifies 14 coalmines confined to a narrow outcrop of coal extending from Wollaton to Eastwood. In 1860 there were 21 collieries, spread over a much wider area. By 1867 coal output was over 1, 500,000 tons per annum, by 1897 this had risen to over 6,000,000 per annum, and by 1910 to 11,000,000 tons. From the late nineteenth century up to the interwar period, the concealed coalfield was the subject of massive investment from companies such as Barber-Walker. In the 1920's 8

new pits were sunk in the Dukeries area. As old markets for coal died away, new markets came on stream in the mid- twentieth century through supply to the power stations lining the Trent. In 1972 there were 33 collieries. Of these only Clipstone, Harworth, Thoresby and Welbeck Collieries are still working today. The oldest colliery in the country, Annesley has recently closed and is under threat of complete destruction.

Colliery Villages

Integral to the interwar collieries were colliery villages, planned company owned settlements, viewed alternatively as benevolent paternalism or a cynical means of worker control. The colliery villages grew out of a tradition of colliery owners providing housing. Some of the first were built in the 1840's by Thomas North, one of the biggest coal owners of the time, near his Cinderhill colliery. Of note is his Napoleon Square, a quadrangular block of 54 houses. Rows of closely packed and undistinguished terraces were soon being built in the expanding villages and towns of the concealed coalfield. Occasionally the planning of these settlements was imaginative, for instance at Rainworth, with its gardens to front and rear and a move away from the strictly regulated rectangular terrace blocks. But it was really with the Dukeries pits sunk in the interwar period that the colliery village as model village reached its apogee. The houses at New Clipstone are grouped in pairs or threes, with generous gardens front and back. At the centre of the settlement are the Church, Methodist Church, Miners Institute, and bowling green. In these villages, the companies exerted a level of control that is difficult to fully appreciate. Companies maintained their own police force. Fines were levied on those whose gardens were not kept up to the required standard. Occupation of the houses was strictly based upon satisfactory performance at the pit, widows were evicted promptly, and subversive activities might be expected to meet with the double adversity of unemployment and eviction. Nevertheless, with the housing, whether in planned colliery village or one of the earlier grid iron pattern terraces often came other benefits, such as free hot water, gas, and coal.

Power stations

After the Second World War the Notts. coal industry, found a tremendous boost through the construction of the power stations that line the Trent, Ratcliffe on Trent, West Burton, Staythorpe and Cottam. These power stations revolutionised the use of power by providing clean and relatively cheap electricity. Since their construction their cooling towers have dominated the Trent, particularly the stretch downstream from Newark. The switch to using gas, and the provision of new gas turbines has already begun to have an impact, and one may expect the familiar sight of the cooling towers to disappear within the next twenty years.

Gypsum

The gypsum extraction industries continued to grow. By 1908 Nottinghamshire produced half of the total UK output, and has remained at around that level ever since. In the early part of the period the gypsum was used primarily for lime ash floors and plaster, but gradually differing qualities of gypsum were graded for medicines, fertilisers, bleaching, and the production of plaster of Paris for ornaments, including ceiling decorations, while countless tons of the white rock adorned rockeries throughout the country. The vast increase in building over the period increased the demand for plaster products of all sorts, while the exceedingly fine gypsum from the Newark area was an early food additive. The extraction methods during the nineteenth century included both open casting , and deep mining. This industry is now focussed on the Jericho works at Balderton, a late twentieth century processing plant. Of the earlier industry, and of its pioneers, men such as Cafferata, a few odds and ends of buildings survive; most have been destroyed without record.

Brick and Clay

Brick making remained effectively a small scale craft industry until the mid 19th C., carried out wherever suitable clays were to be found, which effectively meant on the Mercian mudstones or on the coal measures. The greatest intensity of brick making industry was however, on the coal measures and in the vicinity of Nottingham (for example in the Mapperley area) since these areas were the closest to supply the demands of industry and settlement growth. One may assume that there was a difference between the scale of brick making in the industrial West and the agricultural East of the County. However, not only was there a vastly increased demand for bricks through the rapid growth of towns and many villages, but the improvements in agricultural methods meant that thousands of tile drains were needed for the

improvement of poorly drained fields. We have no clear idea of the total numbers or distribution of the small scale brick kilns. Related to brick making was the flower pot manufacturer, Sankeys at Bulwell.

Iron working

Although the Iron industry was never particularly significant in Notts., during this period there were 7 blast furnaces in Nottingham, 3 in Awsworth, and 4 in Bestwood. By 1907 the County was producing 205 tons of iron, from pyrites. (VCH)

TEXTILES

Cotton.

The use of cotton in the hosiery business had been hampered from developing by the problems of maintaining the supply of thread of suitable quality. Hargreaves, and his spinning Jennies therefore found themselves welcome when he moved to Nottingham after attacks from hand spinners in his home County of Lancahire. By 1773 Hargreaves was in partnership with Thomas James, and their mill in Nottingham was employing around 100 people both spinning, and making Jennies for sale. Arkwright too moved to Nottingham, and went into partnership with, amongst others Jedediah Strutt. Arkwright's first mill was built in 1769, and he was employing 300 by 1771. From the very beginning Arkwright had a problem maintaining the power supply to the mill; the water supply was inadequate, and had to be supplemented by horse power. In 1771 he moved his business to the Cromford, on the Derwent valley. By the 1790's there were; 4 cotton mills in Nottingham; 6 mills, the Robinson's, on the Leen; at least 3 mills in Mansfield; 1 at Langwith; and one on the border with Derbyshire at Pleasley. There was also one mill, Unwins, at Ashfield , which is worth a particular mention because its power supply was drawn from three sources. There was water, steam, and, on the Mill roof, a windmill.

The lack of suitable waterpower was a major drawback to the early development of mechanisation in spinning in the County. However, it also meant that the Nottinghamshire mill owners were quicker than, say, their Lancastrian counterparts to see the benefits of steam. The Robinson's mills on the Leen were the first cotton mills to have steam in the Country. And many other of the Nottinghamshire mills soon followed suit. 15 years after Arkwright had left Nottingham because of the problems of power supply, the problem was solved. While cotton spinning lent itself well to mechanisation and the development of the factory system, the main market for the end product, the hosiery industry remained basically domestic for decades.

Hosiery and Lace

The peak of hosiery manufacture was between 1781 and 1811. Cotton yarn of a suitable quality became available, and Jedediah Strutt's Derby Rib machine, patented in 1758, had allowed whole new ranges of goods to be made including gloves, underwear, and breeches. As a result new markets were secured. In 1750 there were some 1500 frames in Notts., contracted out to the framework knitters by some 50 "putters-out". Each frame gave employment to an average of three workers. By the end of the century there were 200 of these putters out, with a concomitant rise in the number of frames and workers employed, and a decrease in the number of knitters who owned their own frames. The hosiery industry is usually described as a domestic industry. This description is probably a misnomer in that individual framework knitters were unlikely to own their own frames, but is true in that the industry remained outside the factory system until at least the mid nineteenth century. The core of the industry was Nottingham, but many of the surrounding towns and villages, such as Calverton and Ruddington became heavily reliant upon framework knitting. The outward demonstration of its domestic nature is in the framework knitters' cottages, with their typical long "stockingers" windows. While there has long been interest in these cottages, far too few have survived. In addition to the cottages which housed one or two frames, there are a series of houses often described as belonging to "master hosiers". These tend to have fairly generous accommodation; attached to which were workshops that could have held ten or more frames. Despite the long held interest in framework knitting in the County, we simply do not know how many cottages there were, nor how many of these "master hosiers" houses there were, or what the relationships between those who worked in the two sorts of house were.

Hosiery in Notts. remained outside the factory system until the 1850's, when Hine and Mundella's factory opened in Station Street, in the City. From there, the use of steam and the factory system spread into the framework knitting villages, effectively developing them into small industrial townships. Between 1844 and 1866 the number of domestic frames and knitters dropped by only one thousand, but compare this with an increase of over three and a half thousand factory based knitters over the same period. By 1871

there were 45 steam driven hosiery factories in Nottingham. By 1892, only 50 out of the 400 hand frames in the village of Ruddington were still in operation.

Jedediah Strutt's machine had also been instrumental in the development of machines for lace knitting. Robert Frost had invented a square net for the manufacture of lace gloves, purses and other goods in 1771; warp lace was introduced in 1784, and in 1810 a machine for the creation of bobbin net was invented by John Heathcoat. The latter was of particular importance, because the finished product more closely resembled hand made lace, than any other had previously achieved. By 1810 there were some 15,000 people employed on the local lace industry, on around 1800 frames. The circumstances under which lace was made were more varied than in the related hosiery industry. The frames themselves were generally wider, so workshops and factories tended to suit production more than the simple domestic scenario. By 1820 steam engines were in use for lace manufacture. By the middle of the nineteenth century factories such as Fisher & Robinson's at Radford had 170 machines. As with the hosiery industry, expansion took place outside the city's limits particularly in the boom in lace making in the 1870's. At Beeston the gloriously gothic facaded Anglo-Scotia Mills were built, manufacturing lace curtains and fine Shetland type knitwear. Although this complex of mill buildings was owned by Wilkinson and Co in the late nineteenth century, by 1922 it had become a tenement factory, a development of the factory system of particular significance to the lace industry, where a number of firms shared the space and thereby the capital and running costs of the mill.

The Lace Market is probably the single best-known monument to the Nottinghamshire lace industry. Between 1851 and 1877, 71 factories and 41 warehouses were built in the city, most in the area of the Saxon Burgh, an area which in the eighteenth century had been dominated by genteel houses, set in fine gardens. These symbols of gentility were increasingly bought up by hosiery and lace merchants who had made their mark on the industry, and the properties became foci for their enterprises. The residential accommodation was gradually cleared away, and space was at a premium by the mid-nineteenth century (a time when Nottingham was facing other problems in its expansion). The top floors of the many of the new multistoryed buildings had the continuous windows necessary for mending and finishing goods. In the 1850's the architect TC Hine took the foot print of one 18th C house with its grounds, and came up with the S shaped Broadway, a satisfying mix of functionality and good design, well in advance of its date.

Frame Making

From the very start of the period, there was an industry in Notts. which made framework knitting machines, and, indeed exported them widely abroad. The speed of technological innovation in this field was significant, with new machines and new modifications being patented at such a rate that a machine might only have a useful life of tem years, before it had been completely superseded. This industry became part of a tradition of design and build in light engineering.

Cycle Making

William Campion began cycle manufacture in 1860 as an addition to his hosiery concern. An employee of his, Thomas Humber set up on his own in 1875 making tricycles, and the business did so well he was able to build a factory devoted to cycle manufacture in 1880, in Beeston. By 1898 the firm employed 1800, and were moving into making motor vehicles. In 1908 Humber moved to Coventry.
The Raleigh Cycle company grew out of a small cycle making firm based at Raleigh Street in Nottingham, which was bought up by Frank Bowden in 1888. In 1890 the firm moved to a tenement factory in Russell Street, but by 1896 they had outgrown this and moved to the Lenton site. The Raleigh Cycle Company became one of the leading cycle manufacturers in the world.

Boots, Players, and Others

Boots grew out of the herbalist's shop set up by Jesse Boot's father. In 1866 the shop moved to Goosegate, and by 1877 the 17 year old Jesse Boot had effectively taken over its running. Boots' philosophy was to buy in bulk and sell cheaply, and a wide range of goods were sold in this manner. He also started to sell his own preparations. By the 1890's a number of Boots' shops were in existence. Factories were opened to supply the Boots' brand preparations; the main one at the Island Street in the City, but with extensive later development at Beeston, close to the University, of which Boot was a significant benefactor.

Players Tobacco company grew out of a seed merchants on Beastmarket Hill in Nottingham. The young John Player found a developing market for ready rolled cigarettes, and he bought an existing tobacco factory in Broadmarsh in 1877. Player opened his Radford factory in 1884, enabling future expansion of the company by building factory space and renting it to other, notably lace, manufacturers until required.

These two firms are the firms usually selected for mention when considering the industrial period in Notts. Yet they are one-offs, isolated and not part of the overall trends of industry in the County. They are deemed significant because at the time when most of the text books on the subject were written, these firms had major significance within the County. But there were other significant industrialists in the County whose work has received little, if any, recognition or study. Cafferata, gypsum mine owner, boiler maker, brick-maker at Newark is one such. Study of the archaeology and history of this period has to be aware that the present and current perspectives can have too much influence in deciding what was important in the past.

Malting

During period 1750 - 1920, malting grew from a small scale, and often village based industry into large urban commercial enterprises. Newark was probably the most active of the towns involved in the malt trade, but malting was also important in Nottingham, Mansfield, Retford and Worksop. The new big maltings of the nineteenth century were focussed on transport routes, in particular water and rail. A few examples of the characteristic maltings architecture can still be seen in these towns, (except Mansfield) but most have been demolished. Of the ones that remain there is probably not one which is not under threat from demolition or reuse.

Brewing

Newark was exporting beer via the Trent all over Europe by the late eighteenth century. Indeed, it was reported that the Empress Catherine of Russia was partial to the dark beer imported from the town. By the mid nineteenth century, Newark was regarded as a national centre for brewing, being blessed with the same gypsum laden water which made Burton on Trent pre-eminent.. There were hopyards in many parishes, particularly round Tuxford, Southwell and Retford. By 1800 there were 1000 acres under hops. By 1905, hops were not grown on any scale in the County, but were imported via the Trent from Holland and Germany. The twentieth century development of the brewing industry has had a major impact on the brewing towns, with successive mergers between firms resulting in the control of brewing into the hands of a handful of firms, and the inevitable rationalisation and "downsizing". The breweries of Newark and the other towns gradually went out of business. Since the closure of the Home Brewery in Mansfield in 1998 there are now only a handful of small, newly founded, family run breweries to carry on the tradition.

Urban development

While from the beginning of the period Nottingham was experiencing a considerable growth in its population, the growth accelerated sharply from the mid nineteenth century, in response to the impact which the factory system and the use of steam power had on all branches of industry. The population of the city grew, but the town itself could not expand until 1845. In the late 18th C Nottingham covered 876 acres. It remained this size until the middle of the following century. Expansion beyond the limits of the town was impossible until the estates and the corporation that owned the surrounding land allow its enclosure and development. The result was that land parcels within the town were split and split again. By 1840 most of the population of Nottingham were slum dwellers. The social conditions were appalling; as an example the life expectancy in the Broad Marsh area went down to under 18 years. Once the restrictions on the areal growth of the town were lifted, it expanded apace, quickly filling in the areas between the town of Nottingham, and those villages close by which had taken some of the pressures of expansion, places such as Radford, Hyson Green and Sneinton.

Population size

29k		74k	187k	210k
1801		1841	1881	1891

1		1	1	1

Year

By 1831 one quarter of the population of the County lived in Nottingham. By 1901 half of the County lived in the City. After 1900 the population rise slowed, and by 1960 the population had begun to fall.
This same kind of pattern of population growth can be found in the towns and villages on the West of the County which expanded rapidly through industrial growth or through expansion into the concealed coalfield. Mansfield, which benefited from both textile industry and the coalfield, (but was not incorporated until 1891) had been growing steadily through the nineteenth century, and shot up from 16,000 in 1891 to 45,000 in 1900. The growth in Nottingham and in its satellites was not just a natural increase, but reflected complex patterns of in-migration, notably from the surrounding agricultural areas. The population of Newark, on the agricultural east, did not rise at any significant rate through the nineteenth century; indeed, at times there was simply no population growth. By 1901 Nottingham was five times the size of Newark. By 1780 there were only ten markets left in the County, and most of these were in the agricultural East. The development of these markets is of interest, because while some, such as Newark and Retford retain their importance, others, such as Bingham and Southwell continue to dwindle. In the agricultural East, the patterns of urban growth or stagnation are complex and incompletely understood.

With growing urban populations came a growing need for the provision of services; clean water, drainage, power. Nottingham had its own waterworks company by 1845. By 1857 three beam engines were producing 2,000,000 gallons per day from wells sunk off Haydn Road. Boughton Pumping Station was built in 1871, but the supply was still inadequate. Papplewick Pumping Station was built in 1884. The cost of the work was over-estimated, and the monies remaining were re-invested in the building, which resulted in a glorious piece of Victorian architecture, complete with stained glass, ornate brickwork on the exterior, highly coloured tiles on the interior, and set in landscaped grounds.

While the pumping stations stand out as the highpoints of the growth in public services, little information is available on the other services. The development of gas is complex, its supply was of huge importance in nineteenth century Britain, but appears to have been little studied, and all too frequently its remains are lost without record. By the late 19th century the Nottingham Corporation was developing its model sewage farm at Stoke Bardoloph, which was held up nationally and internationally as an exemplar. One must wonder why subjects like this are avoided. Is it simply because Papplewick pumping station is much more aesthetically pleasing than the average gas works or a world class sewage farm?

Rural Settlement

Beyond the towns settlement remained predominantly concentrated in villages. However, there was increasingly a difference between those villages whose inhabitants were primarily concerned with agriculture, and those where industry supplemented or replaced agriculture as the main employment. As the towns grew, and the industrial villages with them, the purely agricultural villages declined. 150 parishes in Notts. contracted, and at least one village, West Burton, was finally deserted in this period. At Laxton the 1831 population of 659 had fallen to 394 in 1901. The process of population decline was protracted and severe; these areas held 23% of the population in 1831, compared with a mere 6% by 1931.
In some areas where marginal lands where taken into cultivation in the late 18th and early 19th C, isolated farmsteads, graced with names such as Rushmoor Farm, or Blackmires, or more exotically Jerico or Crimea, appeared. Dispersed settlement of this nature seems to have happened sporadically, possibly as the result of specific agricultural improvement schemes generated by individual land-owners.

Agriculture

During this period agriculture itself became a fully mechanised modern industry.

The second half of the 18th century and the first half of the 19th saw the virtual completion of the process of enclosure.
Effects of enclosure -
1. Sandlands most advanced agricultural area of the county by 1800
2. The claylands saw the survival of open fields well in to the 19th century (still extant at Laxton), because they were held back by the problem of drainage. This was changed by tax relief on tile drains and loans for underdraining brought in during the 1840s.
3. New farm sites outside of the historic village envelopes

4. Investment in farm buldings, technology, new crops and animal breeding, especially on the great estates.
5. The development of model farms on large estates and their replication in other farm building introducing new patterns of building layout into both open countryside and villages - changing the plan form of some villages.

Enclosure suited the bigger landowner and the trend of the time was the elimination of the small freeholder or tenant. In general terms, enclosure and growth in the size of farm units went hand in hand. From 1764 the Duke of Newcastle's estate rents begin to increase, and the number of tenants to decrease. Smaller owner-occupiers disappeared most quickly in the mixed farming areas, and survived better in pasture areas. The Nottinghamshire claylands saw a relatively rapid turnover of farmers, but no overall decrease in their number. Enclosure seems to have taken longer here. Lowe 1790 comments on the rate of agricultural improvements, but not until the 1830's did much change on the claylands. By 1800 almost 33% of the best arable remained unenclosed, as opposed to 13.5 % of best pasture. In the latter half of the 18th C there was a decrease in arable of almost 2000 acres, a trend promptly reversed in the early nineteenth century, by the need, supported through enclosure, to produce more grain during the Napoleonic wars.

Agricultural improvements were also making their mark on farming practices, reaching the height of innovation in the 1840's. The bigger estate owners were prime movers in agricultural improvements. The Duke of Portland was instrumental in the creation of 400acres of water meadows in Sherwood Forest. 6000 acres of waterlogged ground was claimed for agriculture at Hatfield Chase by steam drainage. Tile drainage was introduced from 1820s, and the Peel government in 1840s/1850s gave loans for underdrainage. The Duke of Portland was described as "an energetic tile drainer". Bare fallows became increasingly replaced by the cultivation of root crops such as the turnip, and by temporary grass leys. This meant that what would otherwise have been bare fallows were now used for stock provisioning. By the mid 1850s there were forest farms of 300 acres which now sustained flocks of 500-700 sheep, where there had only been 50 sheep at the turn of the century. On the Duke of Newcastle's land at Clumber 2000 acres were brought under the plough, the light soils being managed through improved crop rotation and livestock management practices. Use of fertilisers other than manure and including bone meal began to become widespread, and there was increasing use of farm machinery . During the period of high farming the overall proportion of pasture to arable declined in Notts..

Following the period of high farming, from about 1880 there was serious agricultural depression, caused in part by a flood of cheap food imports from abroad. Cereals and wool suffered most, livestock and dairy less so. In certain areas, particularly around Southwell, there were early attempts at farm diversification with the planting of new orchards.

The needs of the two world wars had a tremendous impact on the state of agriculture, with almost every available piece of ground being converted into food production, including, in Notts. the walled gardens of country houses. Since the Second World War the history of agriculture in Notts. has been a dismal tale of agribusiness. Some 1,640 kilometres of field boundaries have been lost outside urban areas in the last 40 years; field sizes in most of the County have trebled or quadrupled. Outside of Rushcliffe in the South of the County, and areas of market gardening around the City, arable production, admixed with livestock, dominates. However, at Laxton, we have the last open field settlement in the Country, and while the fields are smaller than in the past, and the farmers complain about the difficulty of working the strips with modern machinery, the village remains a functioning piece of the past.

Woods.
From 1780 there was a huge increase in the demand for and supply of leather goods. The bark used for tanning came from oak underwood, and before the markets were stabilised with the import of tan bark from Europe up the Trent, the demand for bark was met from the existing woods. This affected the balance between underwood and oak timber. Between 1780 and 1850 there was a tremendous use of oak, particularly for building and shipbuilding. It has been stated that the output of timber ships in the period 1800 – 1860 probably equalled the rest of history put together (Rackham). There was also replanting on a substantial scale, particularly in the larger estates. Such new plantations often included a wide range of tree species and were frequently planned with recreational purposes as well as practical ones in mind. There seems to have been less interest in new planting or in forest management in the early part of the twentieth century, possibly as a result of the break up of the large estates. In the period after the Second World War the creation of the Forestry Commission saw the substitution of conifers within existing broad-leaved woods and the creation of totally new coniferous plantations on marginal land such as for instance the acid heaths of Sherwood Forest.

The Great Estates

This period sees the power of the great landowners reach its height, and then decline. A significant proportion of the County's country houses were built, rebuilt or improved in the period up to 1900. For instance, Thoresby Hall was rebuilt in 1770, improved in the early 19th C, and then completely rebuilt between 1864 –75. Clumber was started in 1770. Welbeck went through improvement and restoration. The great estates were still acquiring land as well. 1000 acres were added to Notts. parks between 1790 and 1820, and by 1873 the five largest estates controlled 137,000 acres, 27% of the total acreage of the County. The tide began to turn at the turn of the 20th century, and accelerated after the First World War. Many of the big estates were sold off, their land holdings divided. Parts of some, such as Wollaton, and Rufford ended up in local authority hands, their land holdings much reduced. Others, such as Ossington, were demolished. Nottinghamshire has lost 14 Country houses since 1900.

It is estimated that one quarter of the Country as a whole changed hands in the decade or so following the First World War. A significant proportion of the land changing hands will have been previously part of the bigger estates. Although a recent change, its impacts have been little studied.

World War I II remains

Nottinghamshire was part of the key military base area of the nation in both World Wars and during the Cold War. This is recognisable largely through isolated features in the historic landscape, such pill boxes, search-light and ak-ak batteries (now mainly visible only on aerial photographs), command and observation bunkers. and in the airfields which erased large tracts of landscape in a number of localities. The military structures and remains from these periods have been and are being recorded as part of the Defence of Britain project.

Agenda

The needs of research into the period 1750 to 1960 touch almost every area of human activity and every locality. Amongst these the following appear to have particular priorities.

Settlement Development and Settlement Patterns, especially :

the growth of settlements beyond their historic cores through the location of industrial developments and their associated housing on the outskirts of towns. Associated with this is

the creation and expansion of new settlements.

the development of commuter settlement related to transport and commercial infrastructures.

the relationship between factory, workshop, stables, housing, shop, church and chapel, and streets as integral complexes.

shrinkage of villages

estate villages

the origins and history of development of services and other activities within existing villages, the shop, the smithy, the post office, the pub.

the influence of poor laws and other controlling factors (open and closed villages) on plan form and other village characteristics.

Buildings

form and function in all building types in relation to social structure and organisation of acivities.

farm types, especially model farms and their derivatives.

workers cottages and agricultural buildings.

variation in building types and chronology across the county.

Industry

the organisation of industry and its effect on structures and settlement

the tenementing and multiple usage of factories and mills

pottery and brick making

the coal industry

rural, local agricultural industries, such as materials and food processing, and light engineering.

Landscape

woodland

changes to field systems

parks and gardens

Overall

As before, it is necessary to point to our lack of detailed knowledge about so much of the physical heritage of this period. We need less concentration on the special and spectacular, and more survey and recording, and more dissemination of the results of research, in order to characterise the mass between the firsts and the lasts. This may be a huge task, and experiential based sampling may therefore be necessary, but without this there can not be any characterisation. Without this there is no means to develop the sustainability approach which is in turn our best hope of being able to manage this huge heritage.

Conclusion

The period 1750 to 1960 has much potential for research using archaeological methods and approaches. This period saw the last phases of great change to create our current environment, as is shown by the extent of urban settlement on the Nottinghamshire Historic Landscape Character Map. The fact that these changes involve the recent past and consequently a wealth of evidence should be a matter for delight to archaeologists, and it should not be spurned as being the province of other students of history, or as being one to which archaeology can bring little. If either of the latter were true, then the questions which these authors wish to ask of this evidence would have answers. We will not have those answers unless we engage with this period now, for the physical evidence is fast disappearing. In witness to this, we again cite the Nottinghamshire Historic Landscape Character Map, which shows that taking urban and rural change together over 60% of the landscape of 1850 has been transformed, erasing both old and not so old features. With post-industrial re-construction growing apace, little of the physical world into which our parents were born may survive our life-times.