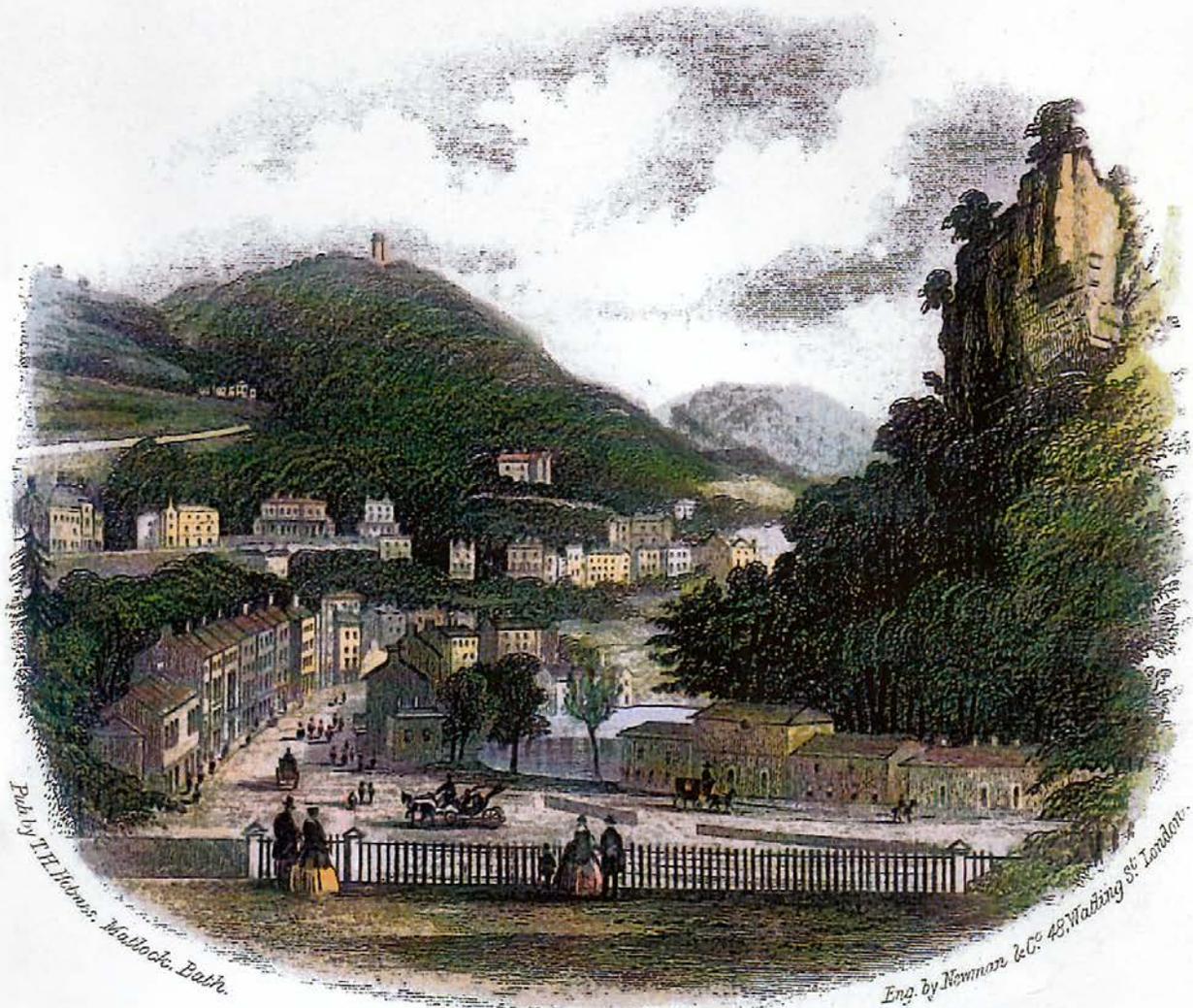


Vol 20

DERBYSHIRE MISCELLANY



Matlock, Bath from the Old Bath Terrace.

**The Local History Bulletin
of the
Derbyshire Archaeological Society**

Volume 20

DERBYSHIRE MISCELLANY

Volume 20: Part 2

Autumn 2013

CONTENTS

	Page
<i>Landowners of Aston upon Trent 1500-1924</i> by Miriam Wood	30
<i>The North West Derbyshire Limestone Industry: the supply of an essential raw material in the Industrial Revolution</i> by John Leach	40

ASSISTANT EDITOR
Jane Steer

EDITOR
Dr Dudley Fowkes

Copyright in each contribution to
Derbyshire Miscellany is reserved
by the author.

ISSN 0417 0687

LANDOWNERS OF ASTON UPON TRENT 1500-1924

(by Miriam Wood,

Introductory note

The following article is a condensed version of a more detailed study by the author which is available at the Local Studies Libraries at Derby and Matlock and at the library of the Derbyshire Archaeological Society. The longer study in particular includes more discussion of the evidence for the conclusions reached, especially where evidence may be incomplete.

Part 1: 1500-1727

Introduction

This article concerns the landowners of what was until 1838 the township of Aston upon Trent, one of the two townships of the ancient parish of the same name - the other was Shardlow and (Great) Wilne. In 1838 the two townships became separate parishes (although this was finalised only in 1850). References to Aston upon Trent (abbreviated to Aston in future) will refer to the old township until 1838 and the new parish after that date, unless otherwise indicated

Aston consisted of between 1750 and 1800 acres of land, probably nearer the latter figure. In the enclosures of the mid-18th century, some 240-250 acres of moorland and 1452 acres of arable and common meadow were enclosed, the former in 1757¹ and the latter in 1763.² The farmhouses and their yards (often called homesteads in the 18th century) and some already enclosed meadows made up the rest.

No attempt is made here to follow the fortunes of those who owned only a cottage or a small area of land which we would today describe as a smallholding, although there will be occasions when reference is made to such properties. The smallest property which will normally figure in this article will be a farm consisting of a messuage or house and at least one yardland before 1763 (pre-enclosure) or 20-25 acres of land after that date. Until 1763 and the enclosure of the open fields, the yardland was the basic unit of landholding in Aston.

A yardland in Aston normally consisted of about 20 or 21 acres of arable and around 3 acres of meadow, 24 acres or so in all, but over the years exchanges, sales and purchases of small areas of land did lead to some variation. Before 1763 a farm would be described as a messuage (house), with reference sometimes to its yard, outbuildings, garden and orchard, and one or more yardlands.³ These were made up of numerous strips of land intermingled with the strips of other owners in the huge unfenced fields and distributed over all of the fields (4 in the 17th and 18th centuries). Each owner also had rights of pasture in the common pastures and moorland.

The farmhouses were concentrated in the village, rather than standing isolated in the fields as their lands did not form a compact area for which the house could function as a geographical centre, and only after 1763 were a few farmhouses built away from the village. Because enclosure took place in 2 phases, the new farms were not so compact as might be expected, as they usually had a close (hedged or fenced-off field) formed from part of Aston Moor which was not necessarily near the unit of land created for an owner by the 1763 enclosure. Moreover, the farmhouses sometimes remained in the village. Nevertheless, from the mid-18th century Aston took on its modern aspect, consisting of hedged fields separated off from each other.

Aston and the Manor of Weston from the 16th century -1647

The largest landowner in Aston at the beginning of the 16th century was the Abbey of Chester, owner of the manor of Weston upon Trent. Before the Norman Conquest Weston, Aston, Shardlow and Wilne comprised one large estate, not far off 5000 acres, but by the time of Domesday Book (1086) it had begun to break up. Whatever comprised the manor of Weston by the late 11th century was given by William the Conqueror to Hugh Earl of Chester who in turn gave it or a large part of it to the Abbey. Additional gifts by the faithful may have been incorporated later into the manor, so that, judging by information from the 16th and 17th century, by the end of the Middle Ages it consisted of most of Weston with large areas of Aston, Shardlow and Wilne. As far as Aston is concerned, by the 16th century the Abbey may have held over 400 acres of the available arable and

meadow, together with pasture rights over the commons and wastes, that is, between a quarter and a third of the township.⁴

The greater monastic houses were dissolved in 1539 and 1540 and at first the newly created See of Chester, with its old Abbey church the new Cathedral, was endowed with the former Abbey lands. In 1546, however, the Bishop was forced to cede these to the Crown in return for rectories of much less value.⁵ The manor of Weston, with the advowsons of Weston and Aston churches, was then sold to Sir William Paget on 26 October 1546 for £5708 18s 5½d, a huge amount of money at the time - it was a valuable property, probably worth about £280 annually in rents etc.⁶ Paget was a privy counsellor and secretary of state in Henry VIII's last years and continued to be involved in politics until Elizabeth I's accession to the throne in 1558, dying in 1563. He settled Weston manor and the advowsons on his younger son Charles who came into his inheritance in 1578.⁷

Charles was a committed Catholic and his involvement with Mary Queen of Scots led first to the seizure of his lands and then in 1587, following the Babington plot and Mary's execution, to his being attainted of high treason and the confiscation of the Weston estate.⁸ He himself escaped capture as he was on the Continent. During the time the Crown held the property the hall at Weston and what were probably the demesne lands were leased (in 1594) to Edward Stanhope and this has led to its sometimes being said that they were sold to him.⁹ When Mary Queen of Scots' son James I came to the throne in 1603, he reversed the attainder and restored his property to Charles Paget,¹⁰ from whom it descended in 1612 to his great niece Mary Gerard and her husband Anthony Roper, like Charles both Catholics. Mary died in about 1623 leaving one child, a daughter also named Mary, the Weston property remaining in her father's hands until his death, probably late in 1647.¹¹

Aston Hall and its lands from the 16th century to 1648

Second in size to the Weston Manor estate in 1500, was the estate at the centre of which almost certainly was the predecessor of what would later be known as Aston Hall, although whether the 16th century house was called Aston Hall is not known. It is difficult to estimate the extent of the Aston Hall estate, as figures given in the 16th century suggest rather less than 300 acres, figures in the 17th century more than 300 acres.¹² All that can be said is that it may have been around 300 acres, which imprecise as this is, at least gives an idea of the scale of the property in the first half of the 16th century.

Little is known of the estate's origins, but it appears to have been associated with the smiths, later the Smiths, of Aston in the 13th and 14th centuries, before coming into the hands of the Tikhill (Tikhull) family, probably from Chellaston.¹³ Thomas de Tikhull in the late 14th and early 15th centuries added to the property,¹⁴ but there are few deeds relating to it between then and its sale, in 1513, to John Hunt of Overton in Ashover gentleman.¹⁵ The seller was Thomas Tikhill described as of Aston gentleman and it is evident from the conveyance that it was sold only because Thomas and his wife Elizabeth had no children. They no doubt went to live at Shardlow as, though they sold the manor of Shardlow along with the Aston property, they were to hold it for their lives. Why Hunt should have bought the Aston and Shardlow lands when they were some distance from Ashover and how he made the money to do so are alike unknown.

The Hunts were in financial difficulties in the latter part of the 16th century but there is no evidence as to why. They sold about half of their Aston property to Richard Harpur a justice of the Common Bench, a highly successful lawyer and the founder of the Harpur, later Harpur Crewe estate.¹⁶ In the early 17th century, the Aston Hall estate was further diminished by 3 sales, one of 24 acres of land (described later as a farm and yardland, see below) to John Hill husbandman of Aston in about 1601,¹⁷ another of probably also about a yardland to a person unknown around 1617-1619,¹⁸ and rather over a yardland to an Alice Almond widow, perhaps in 1629-1630, with which she established a charity for the benefit of the poor of Burton on Trent.¹⁹

As a result the Aston estate consisted only of 3½ yardlands generally said to contain 100 acres in the mid-17th century (bigger than was normal for 3½ yardlands in Aston), 6 cottages, 2 closes and 20 acres of meadow and pasture. John Hunt sold his Hall and lands to John Gregorie of Nottingham gentleman in 1630, with the proviso that he and his wife Anne were to live on the premises for their lives.²⁰ Three years later, Gregorie sold the estate to Anthony Roper's trustees,²¹ so both the Aston Hall property and the Weston Manor estate were in the hands of the same owner, although not, it transpired, for long.

The glebe

The Rector's living, that is the Rectory house and the lands making up his glebe, is first described in 1612, when the earliest glebe terrier was drawn up, but it would presumably have been the same at the beginning of the period covered by this article.

In 1612 there was a large house of 5 bays with barns and houses of office said to comprise of 19 bays and numerous strips of land in the common fields and common meadows. In the next terrier dated 1693 the glebe is described as 3½ yardlands, in all 80 acres of land with 8 ½ acres of meadow, 11 cow pastures every year and 13 every 2 years.²²

Smaller landholdings in the 16th century

Alongside the larger estates were a number of lesser properties. The oldest was almost certainly that held by the Sacheverell family of Hopwell for they had had a presence in Aston from at least 1327.²³ They probably had a little over 100 acres, but Henry Sacheverell, following the death of his Catholic father John in exile,²⁴ sold the whole of his Aston property on the same day in 1595. The timing of the sales suggests that his and his family's Catholicism and the financial problems it brought with it were the cause of the sales. In Aston, his lands were sold as a farm of 3 yardlands to Christopher Bancroft of Stapleford yeoman and a farm of 1 yardland to John Rolleston of Wilne husbandman and both the purchasers established families who were to remain in possession of these farms well into the 18th century.²⁵

There is some information on 3 other properties in the first half of the 16th century, none of them as large as those already mentioned. The first we know about is the property bought by Robert Cowper in 1555 from Edward Wynter gentleman described in a document relating to the conveyance (which has not survived) as 2 messuages, 2 cottages, one dovecote, 50 acres of land (probably meaning arable), 10 of meadow and 20 of pasture.²⁶ This was perhaps 2½ yardlands, judging from the amount of arable and meadow - the interpretation of the pasture figure in the document is somewhat problematic but may refer to common pasture rights. Nothing is known of Wynter, though he may have been of a Weston on Trent family.²⁷ Robert Cowper later divided his newly-acquired lands between his 4 sons, the older 2 receiving the messuages and the land, the younger 2 just cottages.²⁸ There remained 2 lines of the Cowper family active as landowners into the late 17th century and early 18th century respectively.

Rather surprisingly, lands and tenements were said to be held by Rowland Babington, a member of the family of Babington of Lea, in his inquisition post mortem of 1548.²⁹ Rowland or another of his name had in fact been connected with Aston for some years, for he was involved as a trustee in the conveyance of the Aston property from Thomas Tikhill to John Hunt in 1513.¹⁵ The history of the Babington lands is not at all clear, but it is possible that they were sold in 1563 by Rowland's son Michael to the Richard Harpur who was later to buy a large part of the Hunts' estate.³⁰ Certainly, nothing more is heard of the Babingtons and their Aston lands.

The last of the 3 smaller properties was the land, probably a yardland, held by the Sutton family in 1561,³¹ although nothing is known of when or from whom they acquired it. In 1566 it was conveyed by Clement Sutton alias Bell and his wife Margaret to Thomas Fayrbrother, described as a messuage with 20 acres of land, 3 of meadow, 6 of pasture and 40 of heath and gorse (again both pasture and heath and gorse may relate to common pasture rights).³²

The most remarkable evidence concerning the landowners of Aston in the 16th century is a report on the freeholders of the township drawn up by Edmund Eyre, the tenant of Weston Hall, for the Pagets, owners of the manor, probably between 1575 and 1577.³³ It lists the following: the Queen with 4 tenements and a husbandry, perhaps meaning a farm, and 3 cottages, Mr Justice Harpur 2 husbandries (suggesting they were surprisingly large) and 3 cottages, Henry Sacheverell of Morley esq. 3 husbandries, Thomas Hunt gentleman the hall place and 4 cottages, William Cowper, Robert Cowper and Thomas Fearbrother with one husbandry apiece, Thomas Pym of Eaton a tenement and yardland belonging to it, Robert Sore a yardland, and John and Thomas Cowper with a cottage each and Christopher Wright with 6 acres. The Weston estate and the glebe are omitted. The names not before recorded were Thomas Pym, Robert Sore and the Queen. The last-named is puzzling as it has not so far been found possible to trace any information about her property, neither its history before she held it nor what happened to it later.

The early 17th century

There is relatively information on the smaller landholdings in Aston in the early 17th century. The creation of 2 farms carved out of the Aston Hall estate and the possible creation of a third from the same estate have already been mentioned above and the will of John Hill proved in 1612 speaks of the farm and yardland which he had purchased although it does not say it had come, as it had, from the Hunt estate.³⁴ The accompanying probate inventory and the assessment on his goods in the subsidy lists show him to have been comfortably off,³⁵ yet he called himself only a husbandman and appears to have owned just this one yardland. William Cowper was assessed as highly as Robert Hunt gentleman, perhaps another indication of the Hunts' difficulties.

The only change which may be documented is the possible sale by Robert Sore together with his son Christopher of a house and farm described as 20 acres of land, 3 of meadow and 2 of pasture to Richard Sale clerk in 1602.³⁶ Sale was Rector of Weston and already the owner of the manor of Shardlow, which he had purchased from Thomas Hunt in 1593,³⁷ and was presumably building up an inheritance for his son. There is, too, a hint that Christopher Eyre of Aston yeoman, probably a descendant of the Eyres who had been tenants of Weston Hall in the 16th century, held lands in the township. This comes in his will proved in 1631³⁸ but they are not specified nor does he actually say where they were, although later evidence suggests that they were indeed in Aston.

The survey made by William Senior in 1632-1633 of Sir John Harpur of Swarkeston's property in Aston shows him to have held over 170 acres, rather more than one would have expected from the description of what he had bought from Hunt in the 16th century, although it is possible it includes some land acquired from Michael Babington (as above).³⁹ It is described by Senior as 3 farms of 41, 53 and 64 acres respectively (perhaps farms of 1½, 2 and 2½ yardlands) and a holding of 12 acres. Each farm included a messuage, the biggest also a cottage and the small property 'houses'. There were also 3 houses.

1646-1660

The years 1646-1648 saw the break-up of both the Harpur of Swarkestone and Weston Manor estates (the latter also including Aston Hall and its lands since 1633). First, came the sale of the whole of the Harpur lands, probably because Sir John, as an active Royalist in the Civil War, had been forced to compound for his estates for the huge sum of £4000.⁴⁰ He was one of the richest men in Derbyshire, but it still took him until 1649 to pay the fine off. The Harpurs do not seem to have suffered in the long term, but they were never to be a force in Aston again. The whole property was probably sold in May and June 1646. The largest farm described as 2½ yardlands went to Nicholas Prior of Aston yeoman, the sitting tenant, and the next to Thomas Sharpe of Stenson yeoman.⁴¹ The smallest was sold to Henry Jackson of Derby maltster and the 12 acres may have been sold to Thomas Raske of Bosworth, Leicestershire, yeoman.⁴²

The Weston Manor estate was divided in 1647 and 1648 between Robert Holden of Shardlow gentleman and his cousin Nicholas Willimott (later 'Wilmot') a successful lawyer, who was to become a serjeant at law and to be knighted in later years. His family were merchants in Derby in the 16th century. Holden was the son of Henry Holden, probably originally from Findern, who had farmed as a tenant of the Manor estate in Wilne from 1569⁴³ and prospered sufficiently to leave each of his 6 children by his second wife Alice Wilmot £100 apiece.⁴⁴ Robert, their second son, leased a farm from the Weston Manor estate in Shardlow and appears to have made a considerable amount of money dealing in cattle, which he traded as far afield as Essex. Although known as a yeoman in the early years of his career, by the end of it he called himself 'gentleman'.⁴⁵

Anthony Roper's will of 1643, proved in February 1648,⁴⁶ directed that the manor of Weston and the advowsons of Aston and Weston and properties purchased by him, other than those in Kent, should be sold by his executors. His purchased properties included the Aston Hall estate. The proceeds of the sales were largely to benefit his younger daughters, and to all intents and purposes robbed his daughter Mary, Anthony's daughter by his first wife Mary Gerard, of her inheritance of Weston manor. She stepped in quickly on his death in 1647 (before Anthony's will was proved) to sell a large part of the Weston manor estate to Nicholas Wilmot, but the sale did not include the manorial lordship, Weston Hall, the demesne lands or all of the lands of the manor.⁴⁷ It did include 7 farms in Aston, 4 of them said to comprise 2 yardlands each (although one of them may have only been 1½ yardlands) and 3 consisting of 1 yardland apiece, as well as 3 cottages in Aston.

In February 1648, Robert Holden bought from Roper's trustees the Aston Hall property described as Aston Hall together with its dovecote, garden, 2 orchards, malt mill, and 'connygree' (rabbit warren), 6 cottages, 2 closes, 3½ yardlands of arable and 20 acres of meadow and pasture.⁴⁸ Later in the same year, Holden bought out Anne Hunt's life interest in the Hall and its lands and, separately, bought from her 3 small closes and 2 cottages which

were her own property.⁴⁹ Then in March 1648, he purchased from Roper's executors and widow the manor of Weston and Aston (that is, the lordship), Weston Hall, the demesne lands of the manor, more than 280 acres of fields and closes in Aston and Weston, and 9 farms containing 15 yardlands in Aston, Weston, Shardlow and Wilne.⁵⁰ It is difficult to be precise about the extent of his purchase, but it may have approached 800 acres. The Aston part of this purchase consisted of part of 6 yardlands said to be in Aston and Weston (but later evidence suggests chiefly in Weston), various arable and meadow lands (perhaps 60-70 acres) and 3 farms of 1½ yardlands each. Later in 1648 Robert Holden bought the advowsons of Aston and Weston from Anthony Roper's trustees and executors.⁵¹

It is not possible to work out precisely what these transactions brought to Wilmot and Holden in Aston, but probably Wilmot had up to 260 acres (10½ or 11 yardlands) and Holden 310-320 acres of land (about 140 acres for Aston Hall and at least 170 acres for their Weston manor property - 4½ yardlands and about 60 acres of other land). Wilmot, however, sold most of his Aston farms almost immediately: a farm of 2 yardlands to Robert Lowne of Aston yeoman, one of 1½ yardlands to John Williamson, others of 2 yardlands each to Christopher Wright and Hugh Buckley, both of Aston, yeomen, and a yardland to Joseph Wright of Spondon, yeoman.⁵² For some reason 2 remained unsold for years - until 1705 - though why this should have been so is unknown. Robert Holden too sold one of the 3 farms which had been part of the Weston property - a farm of 1½ yardlands to Thomas Clementson of Aston, husbandman, the sitting tenant⁵³ - so reducing his former Weston manor property to 140-150 acres, but otherwise he held on to all his Aston purchases.

The 9 new individually owned farms created out of the Harpur and Weston estates were in addition to those already known from the 16th and early 17th century, those belonging to the 2 branches of the Cowper family, the Fayrbrothers, the Bancrofts, Rollestons and Hills, the Burton on Trent charity and (as will be seen) the Eyres. The will of John Pym of Aston yeoman proved in 1655 refers, without giving any detail, to land in Aston, the last known reference to his family's lands there.⁵⁴ The properties owned by the Queen and the Sale family are not heard of again, but their lands and those of John Pym must still have survived in others' hands. The ownership of the yardland sold by the Hunts in about 1617-1619 is also unknown.

There was to be another new landowner in Aston before 1660 whilst 2 former landowners disappeared. The new name was that of the Reverend Dr John Boilston, Rector of Weston, who built up a small property in Aston possibly through 3 purchases made between 1649 and 1658 - unfortunately, the evidence is not entirely clear. He was involved in a transaction in 1649 relating to 15 acres of arable and meadow in Aston which probably indicates that he was the purchaser of this property from John and Elizabeth Porter.⁵⁵ Again, a similar transaction in 1657 probably shows that he bought a farm of what looks to be 1½ yardlands from Christopher Eyre, a property whose existence had only once before been hinted at, in Thomas Eyre's will of 1630 (proved in 1631).^{38,56} In the following year Boilston bought the small area of land (about a half yardland) sold to Thomas Raske by Sir John Harpur in 1646.⁵⁷

In 1660, Christopher Wright, probably the same as the Christopher Wright who had bought 2 yardlands from Nicholas Wilmot in 1648, purchased a messuage and land from Thomas Fairbrother, his wife and son in 1660.⁵⁸ This may explain the size of the Wright property later, apparently at least 3 yardlands, which was, with the glebe and the property owned by the Bancrofts, the largest in Aston after the Aston Hall estate. The Fairbrother property no doubt is that bought by an ancestor from Clement Sutton as long ago as 1566 (see above).

Aston in 1660

The landownership of Aston at the beginning of this period it will be evident was in the main divided amongst many small owners. There may have been as many as 19 or so independently owned farms, as well as the special case of the Rector's glebe, with the Aston Hall estate the only large property. The biggest farms were owned by the Bancroft family and Christopher Wright, each approaching 100 acres, a similar size to the glebe.

Some owners' names of the late 16th and early 17th centuries have disappeared - the Queen, Pym and Sale - and 2 others from the sales of 1646-1648 are not heard of again: Thomas Sharpe who had bought one of the Harpur farms and Joseph Wright, purchaser of a yardland from Nicholas Wilmot. There are hints, however, that Wright's yardland might have passed to Edward Ward, one of the new Aston owners (see below). On the other hand, new landowners appear, but holding property for which there is no previous identifiable history. Presumably, old and new owners were connected by conveyances or inheritance though marriage, but there are no deeds or other documentary evidence surviving relating to the descent of their properties.

The Aston Hall estate 1660-1727

The land Robert Holden held at his death in 1660 was the core of the modern Aston Hall estate, eventually to comprise about two thirds of Aston (as well as property elsewhere). The Hall had become Robert and Margery's home in 1649, when they moved there from their farm in Shardlow,⁵⁹ and Robert settled it on himself and his wife together with the lands belonging to it for their lives⁶⁰. These did not include the lands in Aston which had been part of his Weston manor purchase. The Hall and its lands were then to go to Robert's second surviving son, Samuel (his eldest son Henry had been given Weston Hall and some of the demesne lands in 1651 as part of his marriage settlement).⁶¹ The manorial lordship Robert left jointly between Henry, Samuel and a younger brother John.⁶² He also stipulated that certain lands should be sold to pay his debts⁶³ and although most of these were lands in Weston, they included the 2 farms in Aston remaining from his purchase of the Weston manor property. He died early in 1660, leaving his widow in possession of Aston Hall and the lands belonging.

In fact, Samuel came into possession of the Aston Hall property before his mother's death, as she surrendered it to him in 1665 in preparation for his marriage to Mary daughter of Edmund Lathwell citizen and haberdasher of London.⁶⁴ It is evident that by then Samuel was in possession also of all the other lands in Aston which his father had bought, other than the one farm Robert had sold in 1648. How he had acquired them is not known, though it is possible that Samuel had bought the 2 farms which Robert had directed should be sold to pay his debts in 1664,⁶⁵ but as to the remainder of the former Weston manor lands in Aston (some 60-70 acres) one can only guess that Robert may have settled them on Samuel. The latter also held other lands in Weston, Shardlow and Wilne, but the history of Weston manor (that is, the lordship) is unclear in the late 17th century. It is only in the early years of the 18th century that it appears to have finally come into the sole ownership of the Aston Hall Holdens.⁶⁶

Samuel Holden was able to hand on intact to his son and heir Robert the estate he had held in the 1660s. It comprised Aston Hall and the lands which had belonged with it when the last of the Hunts had sold it in 1630 (about 140 acres) and the lands which had once been part of Weston manor, some 140-150 acres (the land left after the first Robert had sold one of the farms which he had bought in 1648). When Samuel died aged only about 56 in 1692,⁶⁷ all but one of his children was under age. His wife Mary was to hold Aston Hall and 'Hunts Lands' for her jointure and then they were to pass to their eldest son Robert. All Samuel's other lands were left to Mary for the maintenance of their younger children until Robert was 25, when they would become his. Mary lived until 1724⁶⁸ and it appears that Robert may never have lived at Aston until he built the new Hall in 1735, living instead at Foremark and in London as he pursued his extremely successful career in the law.

New landowners in the late 17th and early 18th centuries (1)

The first reference to the name Cowlshaw, so far as we know, is in the Aston subsidy list for 1641, in which Richard Cowlshaw was assessed more highly than anyone else, but the list does not indicate whether he was a landowner.⁶⁹ Then, in the 1680's we know of a William Cowlshaw of Aston husbandman, who died in 1682, and his sons Robert (died 1687) and William.⁷⁰ The latter owned or came to own 1½ yardlands in Aston,⁷¹ which he left to his brother's widow Mary⁷² at his death in 1721 to hold for her life and then to pass to her daughter, Sarah, who had married Richard Meysham (generally spelt Measham) of Repton about 1705.⁷³

The Bull family of Willington, of whom less is known, apparently owned land in Aston from at least 1672, when Thomas Bull and his wife Sara were involved in transactions relating to properties in Aston and Osleston,⁷⁴ but how much of the land was in Aston and how much in Osleston it is impossible to say. The Aston land may have been the more important and perhaps at least a yardland. The Hearth Tax Assessments show the family in Willington with a bigger house than the average,⁷⁵ but how they came to own land in Aston is not known.

A probably larger farm was held by Edward Ward of Thulston gentleman (died 1688) although the size of his property is only made evident in a survey made much later in 1730.⁷⁶ Edward's property he said in his will⁷⁷ was in part the lands of his ancestors and in part those he had earned by his own industry. The survey of 1730, when the estate had descended to Edward's grandson the Reverend Edmund Meymott⁷⁸ suggests that the Aston lands (there were also lands in Alvaston and Chellaston) were about 2½ yardlands. Except that it is possible some of his Aston land came from Joseph Wright⁷⁹ we know nothing of the origins of his property. As Joseph, so far as we know, had only held 1 yardland, whilst Edward Ward had about 2½ yardlands, there was obviously an additional source of his property.

Finally, in this group of hitherto unknown owners holding property without an apparent history is Patrick Cock (this name was to become in a century or so Cocks or Cox). The family was in Aston by the end of the 17th

century,⁶⁸ and occupied about 2 yardlands by 1708, but it is not certain whether they were already, as they undoubtedly were later, owners as well as occupiers of their lands.⁸⁰ Nothing is known of their history, when or from whom Patrick Cock had bought them. The Cock family was to remain owners of land in Aston for more than a century.

The other new names in the early 18th century became owners of property whose history is known. In 1705, Robert Wilmot, son of the Nicholas, later Sir Nicholas, who had bought a large part of the Weston manor lands in 1647, at last sold the remaining 2 Aston farms from that purchase. They were sold together to a William Shardlow of Makeney yeoman.⁸¹ He disposed of one of them to Thomas Bryan of Weston yeoman only 2 years later, but there is no direct evidence concerning the other farm.⁸² Thomas Bryan's purchase deed suggests, however, that it had already been sold before his purchase, that is, between 1705 and 1707. It had probably passed to Thomas Hickingbotham of Aston yeoman.⁸³

Another newcomer to Aston, Joseph Burton of Derby whittawer (a preparer of skins for making leather) in 1712 bought 27 acres of meadow or pasture grounds and arable together with 50 sheep pastures from John Pryor, part of the lands bought from Sir John Harpur by his grandfather Nicholas in 1646.⁸⁴ There was no house conveyed by this and it seems that Joseph Burton continued to describe himself as of Derby, so perhaps the purchase was simply an investment.

This, too, must have been the case with the last of the new landowners mentioned in this group – Leonard Fosbrooke owner of Shardlow Hall and lands in Shardlow and elsewhere, whose family had made his fortune from the lease of Wilden Ferry, near the site of the later Cavendish Bride, and from his control of river traffic upstream to King's Mills and Burton on Trent.⁸⁵ By 1725, Fosbrooke had purchased the property of Septimus Boylston, described as a messuage and 2 yardlands, a messuage or cottage with lands belonging and another cottage and a small piece of land, presumably the land bought by the Reverend Dr John Boilston between 1649 and 1658 (see above), together with a little other land from another source.⁸⁶ Despite the proximity of Shardlow, the Fosbrookes never bought more land in Aston, so far as is known, although they were to hold this for many years.

New landowners in the late 17th and early 18th centuries (2)

Other changes in landownership at this period often resulted from failure of male heirs or indeed of any direct heirs at all, leading to the division of farms or their descent to more distant relatives, in effect taking them into other families.

One small farm of a yardland, that owned by the Hill family, no doubt descendants of the John Hill who had bought a yardland from Robert Hunt in 1612, was divided between co-heiresses Mary and Anne probably after their father's death. Mary married Thomas Earp of Melbourne yeoman in 1694⁸⁷ and Anne married Joseph Brownhill in 1703⁸⁸ and later each of them held a half yardland, small holdings falling below the size of the properties normally dealt with in this study. Thomas Earp's lands were sold in 1717 to William Hickingbotham,⁸⁹ mentioned as the probable purchaser of one of the late-sold Wilmot farms (see above).

The farm of nearly 2 yardlands sold by Nicholas Wilmot to Hugh Buckley had a rather more complicated history than the Hills'. At his death without heirs in 1675 he left his property to his mother Mary for her life, then half for her to dispose of and half to his cousin 'Orselea' (later 'Ursula') Buckley.⁹⁰ Mary died in 1687,⁹¹ and in 1688 the Buckley lands were partitioned between her relatives Samuel and Benjamin Clarke and Ursula, now married to Gilbert Bull of Willington,⁹² whose family is referred to above as landowners in Aston from 1672. As far as the Clarke part of the property is concerned it was eventually sold to Mary Cowlshaw in 1704, the same Mary who was later to succeed to her brother-in-law William's 1½ yardlands after his death in 1721.⁹³ What happened to the Bulls' property in Aston is not clear, but its later possible history is referred to in Part 2.

Another former Weston manor farm, this time the 1 ½ yardlands sold by Robert Holden to Thomas Clementson in 1648, was divided because there were no male heirs rather than no direct heirs at all. Half was later bought by Thomas Bryan of Weston yeoman in 1701,⁹⁴ his first purchase in Aston, who in 1705, as already noted, was also to buy one of the small farms in Aston which had remained in Wilmot hands until that date. Some time in the 1720s his nephew and heir it seems was able to acquire the other half of the former Clementson farm, so owning 2 ½ yardlands in all.⁹⁵ Again one sees the break-up of these older properties benefiting newcomers – Hickingbotham, Bull, Cowlshaw, Bryan.

Perhaps the most notable changes occurred when the 2 Cowper families, both descended from the Robert Cowper who had bought lands from Edward Wynter in 1555, left the Aston scene. Again, it was lack of heirs, male or otherwise, which led to this. Thomas, probably the descendant of Robert Cowper's eldest son, settled his messuage and 2 yardlands on his daughter Mary and Jonathan Whitehead of Draycott yeoman in 1683 as a settlement on their marriage.⁹² Jonathan was to provide for Thomas and his sister Mary for the rest of their lives, and pay Thomas 40s per annum. What then happened to this property is uncertain, but it will be seen in Part 2 that it is possible to give a tentative account of its history in the 18th and 19th centuries.

The head of the other branch of the Cowper landowning family, Robert, left in his will proved in 1722, his property in Castle Donington, Aston and Shardlow to his kinswoman Grace Cowlshaw widow for life, then to her son John.⁹⁶ Robert was probably the descendant of the younger of the sons of the Robert Cowper who had founded the family's prosperity back in the 16th century. He, however, seems to have owned more property than the Thomas mentioned in the previous paragraph, probably 2½ yardlands in Aston as well as other lands, and to have been a man of some consequence. Grace was of the Shardlow Cowlshaw family and her descendants lived there rather than in Aston. The history of these lands can be traced into the 19th century.

Aston in 1727

Despite the various changes which had taken place, Aston was still essentially a township where the land was divided amongst small landowners, holding farms ranging from 3 yardlands down to 1 yardland in size, with only one larger estate, that owned by the Holden family. This was to begin to change in 1727 when, after a gap of almost 80 years during which nothing was added, so far as we know, to the Aston Hall lands, Robert son of Samuel and grandson of Robert Holden began to buy again. Other developments, too, combined to change the situation.

References

1. Derbyshire Record Office (hereafter DRO) Q/RI 8.
2. DRO, Q/RI 9.
3. The evidence for this includes eg the Rector's glebe described as 3½ yardlands consisting of 80 acres of land (generally meaning arable), 8½ acres of meadow (see note 22 below); Robert Sore's yardland (see note 33) later described as 20 acres of land, 3 acres of meadow (see note 36); John Hill's purchase described as 24 acres of land, but meadow not noted separately (see note 17) and later as a yardland (see note 34).
4. DRO, D 3155/Deeds 6427, D779 B/T 209.
5. DRO, D779 B/T 137.
6. DRO, D779 B/T 233.
7. DRO, D779 B/T 228-229, 231.
8. DRO, D779 B/T 231, 158.
9. DRO, D779 B/T 176, 235.
10. DRO, D779 B/T 158.
11. DRO, D779 B/T 172-175, 189-190, 206.
12. British Library Additional Mss (also known as the Wolley Mss, hereafter BL Add. Mss) 6710 f.51, f.126; DRO D779 B/T 109-110, D2375/63/53.
13. DRO, D779 B/T 50-71.
14. DRO, D779 B/T 72-92.
15. DRO, D779 B/T 94.
16. The National Archives (TNA), CP 25/2/102/1161 13-14 Eliz I Mich.
17. TNA, CP 25/2/104/1255 43&44 Eliz I Mich.
18. DRO, D779 B/T 109-112.
19. TNA, CP 25/2/405 6 Chas I Easter, *Victoria History of the County of Stafford*, Vol IX, *Burton on Trent*, 2003.
20. DRO, D779 B/T 114-115.
21. DRO, D779 B/T 118.
22. DRO, D2360/1/7/1-2.
23. Reverend J Charles Cox, 'Derbyshire in 1327-88 being a Lay Subsidy Roll', *Derbyshire Archaeological Journal*, Vol 30, 1908.

24. Philip Riden and David G. Edwards, ed, *Essays in Derbyshire History Presented to Gladwyn Turbutt* Derbyshire Record Society Volume XXX, 2006; Margaret O'Sullivan, *Notes on the Statham Book of Hours*.
25. DRO, D779 B/T 562, 608.
26. TNA, CP 25/2/68/568 2&3 Ph&MEaster.
27. H.J.H. Garratt, *Derbyshire Feet of Fines 1323-1546*, Derbyshire Record Society Volume XI, 1985, no. 1192.
28. Lichfield Record Office (LRO), B/C/11 Robert Cowper's will proved 1567, William Cowper's will proved 1607.
29. BL Add. Mss, 6710 £65d.
30. TNA, CP 25/2/102/1138 5 ElizITrin.
31. TNA, CP 25/2/102/1131 3 ElizIMich.
32. TNA, CP 25/2/102/1141 8 ElizIEaster.
33. Staffordshire Record Office (SRO), D(W) 1734/2/3/104.
34. LRO, B/C/11 John Hill's will proved 1612.
35. DRO, D3155/Deeds 6446, 6482.
36. TNA, CP 25/2/104/1278 44 ElizTEaster.
37. DRO, D3155/Deeds 6521.
38. LRO, B/C/11 Christopher Eyre's will proved 1631.
39. DRO, D2375/63/53.
40. Dr T. Brighton, *Royalists and Roundheads in Derbyshire*, Bakewell and District Historical Society, 1981.
41. DRO, D2375/54/22, 168/12.
42. DRO, D779 B/T 752, 924.
43. W H. Holden, *The Derbyshire Holdens and their Descendants*, 1930, DRO, D779 B/T 149
44. DRO, D3155/Deeds 6846.
45. Miriam Wood, *The Holden Family and the Aston Estate*, Aston on Trent Local History Group, 2011
46. DRO, D779 B/T 206.
47. DRO, D3155/Deeds 6427.
48. DRO, D779 B/T 121.
49. DRO, D779 B/T 211, 214.
50. DRO, D779 B/T 209.
51. DRO, D779 B/T 219.
52. DRO, D3155/Deeds 6364, 6387, 6861-6862.
53. DRO, D779 B/T 357.
54. LRO, B/C/11 John Pym's will proved 1655.
55. TNA, CP 25/2/543 1649Easter.
56. TNA, CP 25/2/544 1657Hil.
57. DRO, D3155/Deeds 6373.
58. DRO, D447/4, TNA CP 25/2/640 12ChasITrin.
59. DRO, D779 B/T 235-236.
60. DRO, D779 B/T 273.
61. DRO, D779 B/T 264.
62. DRO, D779 B/T 281.
63. DRO, D779 B/T 278-279.
64. DRO, D779 B/T 289-291.
65. DRO, D779 B/T 287.
66. DRO, D779 B/T 326.
67. DRO, D779 B/T 322.
68. DRO, Aston parish registers film M336 Vol 8.
69. TNA, E179/94/371.
70. DRO, D2977/2/118, 90a,b.
71. DRO, D2977/2/124.
72. LRO, B/C/11 William Cowlishaw's will proved 1722.
73. DRO, D2977/2/135.
74. TNA, CP 25/2/642 24 ChasIIMich, 25 ChasIIEaster.
75. David G. Edwards, ed, *Derbyshire Hearth Tax Assessments 1662-70*, Derbyshire Record Society Vol VII, 1982, (Willington p110).
76. DRO, D369 G/ZE 64.

77. LRO, B/C/i 1 Edward Ward's will proved 1692.
78. DRO, Trusley parish registers film M333 Vol 6; Lincolnshire Archives, Leadenham parish baptism register 1694.
79. Document 1683 in the possession of Aston on Trent Local History Group.
80. DRO, D2977/2/52.
81. DRO, D779 B/T 372-373.
82. DRO, D779 B/T 375-376.
83. DRO, D779 B/T 945.
84. DRO, D779 B/T 761-762.
85. John Heath, *A Look at Shardlow 's Past*, 1984.
86. DRO, D5129/12.
87. DRO, Weston upon Trent parish registers, film reference M340, Vol 7.
88. DRO, D779 B/T 783.
89. DRO, D779 B/T 939-940.
90. LRO, B/C/11 Hugh Buckley's will proved 1676.
91. LRO, B/C/11 Mary Buckley's will proved 1687.
92. SRO, D1798/HM/37/50.
93. DRO, D2977/2/125.
94. DRO, D779 B/T 365-366.
95. DRO, D779 B/T 381-382.
96. LRO, B/C/11 Robert Cowper's will proved 1722.

HIS MAJESTY'S LETTER PATENT

Is Granted to SAMUEL WATSON, of BASLOW, near Chatsworth, Derbyshire, for the Sole MAKING and VENDING his

NEW HAND-MILL,

Made of the *Derbyshire Burr* material, for Grinding Wheat, which so long has been wished for, as the Work is so easy and expeditious, and the Flour equally as good or rather superior to that which is ground on the French Burrs at the common Water or Wind-Mills, and so small Produce of Bran, and no Loss of Weight betwixt the Grain and the Produce, makes the Machine of great Use to all Families, Apothecaries, Druggists, etc.

ALSO FOR HIS NEW ROLLERS

Made of the Peak Mill-Stone Materials, for crushing Malt, Oats, Beans, &c.

The Power of one man with ease (by the great Improvement he has made in them) may crush TWENTY BUSHELS of Malt in ONE HOUR, which is found better for Brewing than when ground on the common Mill-Stones, or by the Steel Hand-Mills. By the same power, EIGHT BUSHELS of Oats or Beans may be crushed in the SAME TIME, and it need not be here insisted on, that Corn thus crushed affords more Nourishment to Horses or any other Cattle, than when given whole; besides they are not dried upon a Kiln, which is the usual Process before common grinding, which greatly endangers the Horses Wind, as they are always thirsty after eating Provender prepared in that Manner, and from the Simplicity and Strength of the Construction of the above Machines, they are not liable to be out of Order, or unfit for Use. The price at BASLOW for each Pair of ROLLERS, 5l. 5s.

N.B. Whoever attempts to imitate either of the above Machines, and impose upon the Public, will be prosecuted as the Law directs. Of the said WATSON may be had, Peak-Mill-Stones of any size. Also BOLTING-MILLS for dressing Flour of the best Construction may be had with the MILLS.

The Rollers may be seen at *Mr Geo. Richardson*, in the Irongate, DERBY.

The above Valuable PATENT To Be SOLD; A SHARE, SHARES, or ALL. Any Person desirous of purchasing the above, must apply to the PATENTEE.

Derby Mercury, 9 April 1779

THE NORTH WEST DERBYSHIRE LIMESTONE INDUSTRY: THE SUPPLY OF AN ESSENTIAL RAW MATERIAL IN THE INDUSTRIAL REVOLUTION¹

(by John Leach, M.A.,

1. Introduction

Fundamental to the rapid industrial expansion which occurred in Britain at the end of the eighteenth century was the supply of raw materials. E.A. Wrigley examined a range of such materials in 1976 and, more recently, the supply of non-ferrous metal minerals was described by R. Burt.² However, it is only coal production that has been studied extensively (by a number of authors) in the context of contributing to the process termed '*Industrial Revolution*'. Whilst coal's importance is undisputed, this article seeks to establish limestone as another important raw material in that process, and that north west Derbyshire was a major supplier of lime and limestone into Manchester and Merseyside during that important period.

The procurement, distribution and use of raw materials for industrial processes is a fundamental, but somewhat neglected aspect of economic history. Before the end of the eighteenth century, limited amounts of minerals and a host of animal and vegetable substances had been used in the various '*manufactures*'. These latter materials, particularly timber and animal fats, were deeply tied into the various agricultural cycles and any increase in production needed to be planned far in advance. Such an impediment restricted any rapid increase in industrial production and so the substitution of increasing amounts of diverse minerals became an urgent need. Seemingly infinite, minerals were used in their own right and, with the advent of the chemical industry, to produce synthetic alternatives to animal and vegetable products. Whilst much more research is needed into the use and production of minerals, their essential importance is undoubted. Speaking of the '*Industrial Revolution*' D.S. Landes has written:

'The abundance and variety of innovations almost defy compilation, but they can be subsumed under three principles:

'The substitution of machines for human effort.

The substitution of inanimate for animate sources of power.

The use of new and abundant raw materials, in particular, the substitution of mineral for animal or vegetable substances.

These improvements constitute the Industrial Revolution'.³

[My underlining]

Lime and limestone have varied and many uses, and it is hoped to demonstrate that their essential nature is reflected in increases in agricultural improvement, building, traditional industries (glass, iron, paper, soap and tanning) and in the new industries of bleaching and chemicals. The importance and value of building and traditional industries in the national economy has been established by N.F.R. Crafts.⁴ The importance of the '*clearly delineated economic region*'⁵ in the pre-railway period has been put forward by P. Hudson, and so this article focuses, in geographic terms, on the wider Manchester region which was supplied with lime and limestone predominantly from north west Derbyshire. An important side effect was the development of the transport network (turnpikes, canals and railways) to carry the enormous trade in lime and limestone. This, in turn, has allowed other smaller industries to prosper and the combined growth of the limestone and local cotton trades has led the towns of north west Derbyshire to look towards Manchester, and not Derby, as their regional centre.

The literature concerning the supply of this important raw material is limited. Describing the limestone trade in north west Derbyshire are two articles.⁶ The first by L. Jackson, published in a trade journal, outlines the history of the lime trade around Buxton, but says little about its distribution. The second by P. Boden, in the *Geographical Magazine*, briefly examines distribution, but it is a short account and does not adequately reflect the scale and impact of the early industry.

II. The uses of lime and limestone

Since at least 1535⁷ agricultural commentators have advocated the use of lime as a means of '*sweetening*' acidic soils. Lord Kames, a Scottish landowner, commented in 1779 that '*... limestone beat small makes an excellent*

manure and supplies the want of powdered lime where there is no fuel to burn the limestone'.⁸ Taking an opposite view the noted agricultural writer Arthur Young felt '... that this spirit of liming is not attended with the effects that many believe, except upon black moory soils'.⁹ His was but a lone voice and increasing amounts of lime were used in agricultural improvement and enclosure. The benefit of using chalk and lime has been explained by J.D. Chambers and G.E. Mingay. They were used:

'... to break down heavy clay soils to a finer texture and make their natural fertility more readily absorbed by plants; and by reducing the tendency to stickiness and to bake into hard lumps in dry seasons and make them easier to cultivate'.¹⁰

Lime also had a small scale use in the composition of early sheep dips.

The burning of lime (and chalk) for mortar and plaster for use in building is an age old process. Charles Leigh in 1700 described the plaster used in the Roman baths at Buxton as '... a mixture of Lime and powdr'd Tiles cemented with Blood and Eggs'.¹¹ Its use and durability is attested by the large number of surviving pre-Victorian buildings erected before the widespread use of cement. The preparation and properties of the various lime mortars are given by A.B. Searle;¹² the usual process being to form a 'lime putty' before mixing it with either sand or ground ashes. Stone used to make 'hydraulic lime' was only available in certain locations and the mortar produced had the property of setting in the presence of water rather than air, so it was primarily used in water related structures. Certain very hard mortars were known as 'Roman Cement', but it was not until 1824 that Joseph Aspdin developed the modern 'Portland Cement'. Despite the strength and quick setting properties of this new product, T.K. Derry and T.I. Williams state that it did not come into large scale use until the 1850s.¹³ Thus the massive expansion of towns and cities throughout the period of the 'Industrial Revolution', in terms of houses, factories, warehouses and civil engineering structures was dependent upon lime (and chalk) mortars. Building was also dependent upon other component supplies and H.A. Shannon's work on brick production¹⁴ is a good indicator of the expansion of the construction industry. As production of bricks (and building stone) increased, so there was a commensurate need to increase the production of mortar to bind them. The various aspects of building costs for the period 1792-1820 are given in C.W. Chalklin's comprehensive account of the economics of house construction. In this work he gives details of house building in Manchester, and building costs in Stockport, which are reproduced below:-

Table 1. House building in the Manchester township: 1796-1820

Period	Number of houses
1796-1801	599
1801-1806	1231
1806-1811	1766
1811-1816	770
1816-1820	1811

Source: C.W. Chalklin, *The provincial towns of Georgian England*, 1974, p289.

Table 2. Building costs in Stockport: 1792 & 1802

Price of a rod of brickwork in which a rod equals 272 square feet of wall 1.5 bricks thick.

Input	Cost in 1792	Cost in 1802
4,500 bricks	11s per 1,000 = £2 9s 6d	35s per 1,000 = £7 17s 6d
30 bushels of lime	6d per bushel = 15s 0d	6d per bushel = 15s 0d
2 cartloads of sand	6d per load = 1s 0d	1s per load = 2s 0d
1 man to mix mortar	1s 2d per day = 1s 2d	0.75 day at 2s = 1s 6d
5 days bricklaying	1s 8d per day = 8s 4d	3s per day = 15s 0d
5 days labouring	1s 2d per day = 5s 10d	2s per day = 10s 0d
	£4 0s 10d	£10 1s 0d

Source: C.W. Chalklin, *The provincial towns of Georgian England*, 1974, Appendix IV.

In a medium sized terraced house therefore (ground floor area - 442 sq. ft. including a small single storey rear extension) the requirement of lime is estimated to be 179.6 bushels or 5 tons 12 cwt. per building (one bushel of fully hydrated lime weighing 70lbs). Considering the enormous scale of building during this period, of which Table 1 represents only a small proportion, then the large demand for lime becomes apparent. M. Berg states that apart from woollen manufacture, the most important eighteenth century industries were leather and building.¹⁵

Lime has a vast range of industrial uses of which five traditional ones were glass, iron, paper, soap and tanning. It was a significant constituent (9%) in glass production,¹⁶ but this use of Derbyshire lime would be limited until its advent into Merseyside after 1800. Demand for iron was enormous, but the production process was hampered by the presence of impurities which affected the quality of the finished product. The use of limestone was vital to the process and was consumed in great quantities. In the lower part of the furnace the limestone decomposed, and the quicklime so produced combined with alumina, silica and other impurities present in the fuel and iron ore to form a slag, which could be separated from the molten iron.¹⁷ R. Samuel states that the normal charge of an early iron furnace was one barrow-load of lime to two of ironstone and three of coal.¹⁸ Paper production utilised lime in pulping, bleaching and surface processes,¹⁹ and hard soap was produced when soda was rendered caustic by treatment with lime.²⁰ Production of the latter was centred around Manchester and Merseyside, and D.S. Landes has stated that the output of hard soap on Merseyside tripled between 1820-35 whilst the national output rose by only 75%.²¹ In tanning, the hides were soaked in milk of lime to plump them and assist in de-hairing.²² Local production statistics are poorly documented but as P. Hudson states:-

"The "traditional" sectors were as much, if not more, a part of the dynamic of the industrial revolution as the factory although their qualitative changes are not well reflected in the quantitative indicators."²³

The increases in these traditional sectors on a national scale can be seen in Table 3, and from them an inference drawn for commensurate increases in lime and limestone.

Table 3. Growth of real output in industrial sectors (% per year)

	Building	Candles	Iron	Leather	Paper	Soap	Coal*
1700-60	0.74	0.49	0.60	0.25	1.51	0.28	0.64
1760-70	0.34	0.71	1.65	-0.10	2.09	0.62	2.19
1770-80	4.24	1.15	4.47	0.82	0.00	1.32	2.48
1780-90	3.22	0.43	3.79	0.95	5.62	1.34	2.36
1790-01	2.01	2.19	6.48	0.63	1.02	2.19	3.21
1801-11	2.05	1.34	7.45	2.15	3.34	2.63	2.53
1811-21	3.61	1.80	-0.28	-0.94	1.73	2.42	2.76
1821-31	3.14	2.27	6.47	1.15	2.21	2.41	3.68

* Included for comparative purposes.

Source: N.F.R. Crafts, *British economic growth in the industrial revolution*, 1985, p23.

Two new uses for lime were in bleaching and in chemicals. The rapid increases in textile production, caused by new mechanical and organisational practices in the latter part of the eighteenth century, caused a glut of fabric awaiting the traditional process of bleaching in crofts with buttermilk. This process was speeded up by the introduction of bleaching powder; Charles Tennant developed the process in 1788 by passing chlorine over lime.²⁴ With the close proximity of the cotton industry the demand for Derbyshire lime would have been very high. Bleaching, together with dyeing and various metallurgical processes caused an increased demand for chemicals. A principal material required in this industry was alkali, which had previously been produced from natural sources of potash. When demand began to exceed supply Nicholas Le Blanc patented a process in France, in 1791, where common salt was treated with sulphuric acid and the resulting 'saltcake' was mixed with coal and limestone to form an alkali derived from mineral sources.²⁵ This was a great success but its introduction to Britain was limited until after 1823 when the tax on salt was abolished. This process used substantial amounts of limestone and was in use until after 1872 when the 'Solvay' process was introduced from Belgium (which used even larger amounts of limestone).

Whilst evidence for the amounts of consumption is limited (see section IV), there is no doubt that as these industries expanded their production there was a *pari-passu* increase in the use of lime and limestone. Their uses are almost endless and included at this time very large amounts in road construction and non-ferrous metal ore smelting. Smaller uses included candle making and a vitally important use as a lime wash - a much used sanitary precaution against cholera and typhus.

III. The production of lime and limestone

Throughout the eighteenth century the demand in the Peak District for agricultural lime was enormous as the wastes and commons were being improved. Production was primitive with the stone being quarried by hand and burnt in small intermittent earthen 'pudding pie' kilns. Horizontal 'pye' kilns were subsequently introduced, and although producing purer lime were still intermittent in use.²⁶ The only major technological innovations were the use of blasting powder in the quarries and the advent of taller continuous kilns by the end of the century. Larger manufacturers utilised these, thus reducing the numbers of small kilns required and achieving greater fuel economy. Production was predominantly dispersed, but there is evidence for early clusters of kilns, particularly at Bradwell (10) and Dove Holes (14) in 1650²⁷ and at Grin Hill in 1662 (see below). By the mid-eighteenth century there were similar complexes at Ashover, Calver, Peak Forest and Stoney Middleton. All had large reserves of pure limestone and became early locations for the manufacture of 'landsale' (or retail) lime, for agriculture and expanding demands in building and industry. Their development was closely associated with the evolving turnpike system, and many roads were built specifically to carry the lime traffic. Proximity to a fuel supply was very important and this gave the Grin limeworks²⁸ near Buxton a particular advantage.

Situated on the extensive wastes and commons of the Manor of Hartington, Grin Hill was purchased by the third Earl of Devonshire in 1662. Existing 'time out of mind' before this date, was the common right of freeholders to dig and burn limestone for their own use but not for sale. This suggests that retail lime was being produced by others, and that was certainly the case in 1698 when the kilns were let to William Brock for £19 per annum; he also leased the nearby coal mines. In 1704 Bishop William Nicolson of Carlisle described the hill as being 'cover'd with limekilns',²⁹ and Dr. Thomas Short in 1734 described it as:-

*'... a mountain of easy ascent, consisting chiefly of a Limestone, which with a coarse Coal got near, is burnt and carried into Cheshire and Lancashire, and the Neighbourhood, both for Building and manuring of Land.'*³⁰ [my underlining]

Evidence to a House of Commons committee in 1766 revealed that there were twelve kilns on Grin producing lime for sale.³¹ A valuation of the same date, for the Duke of Devonshire, reveals that the Brock family had only eight of them.³² Adjoining the Brocks was John Dickenson, Lord of the Manor of Taxal (Cheshire), a Manchester lime merchant who in 1738 purchased:

*A small Freehold at Buxton lying within the Manor contiguous to his Grace's Lime kilns; and has erected Lime Kilns on the sd. Freehold so purchased by him, & got Limestone, and brings Coals from his estate ... to burn them into Lime, and sells great quantities of Lime into Cheshire and Lancashire, much to the prejudice of his Grace & his tenant of the Lime Kilns....*³³ [my underlining]

As Brock had eight kilns it is assumed therefore that Dickenson had the other four. The 1766 valuation is useful at this early date, for the information it gives on early production methods and is an important statement about the seasonality of the trade; all of the Brock's kilns were let for seven months in the year. The House of Commons evidence also reveals that, together with four kilns at Peak Forest, some 174,720 horse-loads of lime (approximately 11,235 tons) were being produced annually, involving an incredible average 907 daily pack horse movements, or equivalent waggon loads, per six day week in a thirty week year. This traffic was dispersed throughout north west Derbyshire and into Cheshire, Lancashire and Staffordshire. James Pilkington, writing in 1789, described a similar operation at Grin with eight kilns (5 men per kiln) each producing 120 horse loads each daily during the summer.³⁴ This is of great interest. Assuming a six day week, thirty week year as before, Pilkington's estimate would yield some 172,800 horse-loads per annum, which is almost the combined total with the Peak Forest kilns in 1766. Production was increasing.

Despite a more efficient and extensive turnpike system, much lime was still being carried by packhorse as John Aikin noted in 1795:

The country around Buxton is celebrated for lime of a very strong quality It is sent chiefly on the backs of small horses to considerable distances At Buxton, Peak Forest and Stoney Middleton, it [limestone] is of a light grey, and when burned is much used in agriculture. For this purpose much is disposed of in the Northern part of the county and also in Cheshire and Lancashire.³⁵ [my underlining]

The year 1789 marked the high point for the fortunes of Grin Hill and also the year when the Brock family relinquished their tenancy. Productivity and profits declined steadily thereafter for a number of reasons, the most significant being the loss of the Lancashire trade. For the period of decline the kilns were managed directly by the Devonshire estate which maintained comprehensive estate records. The lime accounts for 1805 can be abstracted as follows:

Table 4. Lime sales from Grin Hill, 1805

	Loads	Cash received @ 1.5d per load	Loads	Cash received @ 6d per load	Loads	Cash received @ 7d per load
Cheshire	56,609	£353 16s 2d	6,697	£167 8s 6d	23,261	£678 8s 11d
Derbyshire	4,078	£25 9s 9d	13,345	£333 12s 6d	11,144	£325 0s 8d
Staffordshire	1,096	£6 17s 0d	2	1s 0d	8,151	£237 14s 9d
	61,783	£386 2s 11d	20,044	£501 2s 0d	42,556	£1241 4s 4d

Total loads 124,283 (7,977 tons)

Total cash £2,128.93

Source : Chatsworth Library: T4 accounts.

The relatively small amount of the cheapest (agricultural) lime sold in Derbyshire can be accounted for due to the presence of many local field kilns. In total terms, the difference from the 1789 postulated production is 48,417 horse loads, the bulk of which is considered to be lost Lancashire traffic. The cause of this loss may have been the involvement of the Gisborne family of Whaley Bridge who had owned land at Dove Holes since 1742. Thomas Gisborne developed the family coal and lime interests, and produced lime at Dove Holes and later at Harpur Hill. D. Hodgkins has stated that, '*He dealt in lime in Manchester and represented the Manchester [lime] dealers in talks with the Peak Forest Canal*'.³⁶ It was possibly Gisborne who manipulated the transfer of the Lancashire traffic from Grin to Dove Holes and, in turn, this may have been the cause why the Canal (built for the lime and limestone trade) was focused on Dove Holes and not Buxton.

Central to the growth of the lime trade, was the improvement of the transport infrastructure necessary to carry such a bulky commodity. Demand was increasing as the processes of industrialisation gathered momentum. Improvement came in the form of the Peak Forest Canal (and tramway), opened in 1796, to link the *Ashton Canal* (also opened 1796) with the quarries at Dove Holes.³⁷ '*Premia*' (or incentives) were soon being offered by the Company to lime burners, to build kilns and launch barges. This had the dramatic effect of transferring lime production down to new large scale units at Buxworth and Marple, and smaller units at Disley, Romiley, Hyde and Ashton under Lyne. Dove Holes then became the principal centre for extraction of the stone required to meet the needs of the developing Manchester region. Production increased rapidly, and by 1800 the Buxworth kilns were producing 4,000 tons per annum; in 1802 some 720 tons were produced in one month alone.³⁸ The first Canal quarry at Dove Holes was soon exhausted and a committee was established to negotiate with local landowners for further supplies of stone and soon the quarries and tramway extended down Dove Holes Dale. One estate was leased in 1811 for a rent of £78 10s per annum and a nominal sum of £100 for the stone.³⁹ Due to its superior quality '*... it was to be sold at 2s 6d per ton which had just been agreed as the price of stone for use by iron masters and founders*'.⁴⁰ In 1816 the Duke of Devonshire agreed terms for access to his enormous reserves of stone, which yielded £640 royalties from 80,000 tons in 1825. In the ten years 1830-39 a total of 551,530 tons were extracted from his land.⁴¹ Success soon attracted other competitors and gradually lime burning resumed at Dove Holes with five kilns, each producing about 3-4,000 tons of lime per annum by 1840. Noticeable among the new producers were two from Lancashire - John Bibbington of Rochdale and Joel Carrington of Oldham. After the latter's retirement in 1879 his kilns were taken by Samuel Taylor of Runcorn. Traffic on the Canal increased rapidly after 1800 when the Ashton Canal was connected to the Rochdale Canal (itself extended to join the *Bridgewater Canal* in 1799), and so permitted the transshipment of lime and limestone

to Warrington, Runcorn and Liverpool. By 1808 stone traffic on the Peak Forest Canal was in the order of 50,000 tons per annum and, after 1823, with the development of the '*Le Blanc*' alkali process, traffic increased reaching 231,566 tons (all goods but principally lime and stone) in 1861.⁴²

After a short period at this level, traffic began to decline following the advent of the main line railways. This however stimulated the trade even further with many new quarries opening up along the lineside. To explore this expansion is beyond the scope of this study, but the effects of an earlier railway, the Cromford and High Peak Railway (CHPR), had a major effect. Opened throughout in 1831, it linked the Cromford and Peak Forest Canals and provided a connection between Manchester and the East Midlands. This line eventually revitalised the ailing Grin Hill kilns, and stimulated a new large lime burning complex at Harpur Hill which produced almost 30,000 tons in 1841.⁴³ Trade was such that Manchester lime dealer Robert Bibbery acquired a lime works there in the 1840s, and in 1874 Richard Briggs of Clitheroe opened a new quarry to the south at Hindlow. By the late 1850s the main Harpur Hill limeworks and the Grin limeworks had been acquired by the Buxton Lime Company. Evidence to a Parliamentary Select Committee in 1861 revealed that this one Company was sending 46,000 tons of lime and limestone into the Manchester region and a further 18,000 tons to St .Helens.⁴⁴ Traffic on the line between 1841-61 is given below:-

Table 5. Traffic on the Cromford & High Peak Railway (tons): 1841-61

	1841	1857	1859	1861
Merchandise	14,606	7,469	6,135	9,529
Coal	16,810	25,967	41,762	38,403
Minerals	32,983	73,143	109,447	116,223

Source : D. Hodgkins, 'Captain Moorsom & the C.H.P.R.', *Derbyshire Archaeological Journal*, CIII, 1983, p157.

The trade into south Lancashire (see section IV) was enormous and there were many other smaller suppliers not mentioned in the above text. The purity of the Derbyshire stone and an effective transport infrastructure enabled it to dominate the trade and eclipse the small south Lancashire supplies and the larger ones from Clitheroe and North Wales.

IV. Markets

In Derbyshire the principal demand for lime was in agricultural improvement. Arthur Young, in 1808, noted that one third of the County (239,492 acres) was '*wastes, not employed in husbandry*'.⁴⁵ Lime was in great demand to help reclaim these wastes; the amount being spread on the land depended upon the nature of the ground, the acidity of the soil and what was expected from it. In 1652 sixty horse loads per acre was spread on pasture in Carsington.⁴⁶ Later in 1813, John Farey recorded the following application rates: Buxton - 210 bushels per acre (on '*heathy ground*') Chatsworth - 260 bushels (or 6.96 tons at 60 lbs per bushel - see below), Chelmorton - 900, Glossop - 120-180, Newhaven - 120, Perry Foot: 210-300 and Pilsbury - 120-150.⁴⁷ A bushel of quicklime weighs 481b and one of fully hydrated lime weighs 701b. Which was used in agriculture is not known with certainty, but references to '*air slaked*' lime suggest partial hydration, and a bushel weight somewhere in between. For industrial purposes the quantities used are less certain, but bleaching, candle making, non-ferrous metal smelting, paper production and tanning are well represented in local trade directories. Unfortunately, these activities were too often undertaken by small entrepreneurs whose accounts have not survived - so the use of local lime can only be proposed by inference. North west Derbyshire was however, an early location for the mechanised cotton industry which would have generated a large demand for bleaching powder. Farey, in 1817, records '*bleaching houses*' at Bakewell, Hayfield, Marple Bridge, Tansley and Thornsett (2).⁴⁸ Research also reveals five candle making works, seven paper mills and at least ten tanneries in this area prior to 1830.⁴⁹ Least quantifiable is the amount of lime used in building although both it and limestone (for walling) were used extensively (see Tables 1 & 2 above). A further use was in turnpike construction which became extensive with the advent of '*macadamised*' roads. Below is an illustration of the use of limestone in one short length of road:

Table 6. 'Estimate for making the Improvements from Calver Bridge to the top of the hill above the toll bar'

Cutting & forming 4,033 yards at 3.5d per yard	£58 18s 0d
Walling 44 roods at 10s per rood [probably limestone]	£22 0s 0d
Walling 44 roods at 8s per rood [probably limestone]	£17 12s 0d

Covering the road with gritstone - 44 roods at 18s	£39 12s 0d
Covering the road with <i>limestone</i> - 44 roods at 10s	£22 0s 0d
Sough	£5 0s 0d
	£165 2s 0d

Source : R. Thornhill, 'Notes on some Derbyshire toll houses and turnpikes', *Derbyshire Miscellany*, Vol IV, Part 4, 1968, p193. [my italics - the estimate is not dated but comes from a source dated 1825-42.]

For the early part of the period under review the principal use of lime in Cheshire was for agricultural improvement. Henry Holland recorded rates of 70-140 bushels per acre (1.88 to 3.75 tons) in 1808.⁵⁰ Extensive amounts of lime were used and there is ample evidence from the Derby, Legh and Tatton estate papers concerning its use. To give one example, the Legh estate bought 1,348 loads of lime (cost £80 18s 11d) in December 1792 from Ralph Moreton of Buxton for its lands at Lyme Hall, near Stockport.⁵¹ To support this E. Kerridge has written:

*That the extent of up and down land in the Lancashire plain and Cheshire Cheese country was growing, as more and more land was won from heaths and mosses, is indicated by a greatly increased use of marl, until saturation point was reached and marling had to be dropped in favour of liming.*⁵²

The importance of liming is also expressed in its application becoming a condition of tenancy. C.S. Davies, in describing the agriculture of Cheshire in the late eighteenth century states that '*The spreading of the old fertiliser marl, and the new fertiliser lime was made a condition of tenure with fines for lapses*'.⁵³

The Peak Forest Canal permitted stone to be carried down to new kilns in Cheshire at Marple, Romiley, Hyde and Ashton under Lyne. The opening of the Ashton Canal permitted lime to be carried into Stockport, and on via the newly opened Rochdale Canal link to the Bridgewater Canal basin in 1799. The opening of the Macclesfield Canal to Marple in 1831 created further new outlets for Derbyshire lime. Export along the Bridgewater Canal carried lime well into central Cheshire both for agriculture and for extensive tanning industries centred on Altrincham, Knutsford and Lymm. Beyond the period of this study, after 1872, massive amounts of limestone were exported to Winnington for the Brunner-Mond Solvay alkali works. Cheshire had its own large limeworks at Astbury, near Congleton. It produced a hydraulic lime used for agriculture and tanning but primarily in civil engineering projects over a wide distance. Two notable uses were in the Harecastle canal tunnel and in the Liverpool docks.

In contrast to Cheshire, almost all of the lime sold in Manchester was for building and industrial purposes. Lime's fundamental role in the building process has been demonstrated above and a simple assessment of demand can be made by considering the sheer volume of houses, factories and other buildings erected during this period of Manchester's geographical expansion. Industrially the demand can be seen in Table 7 which records the numbers of lime burner/dealers and lime dependent industries in Manchester, Merseyside and South Lancashire.

Just outside Manchester was the Ardwick limeworks which generated £2,000 clear profit in 1789.⁵⁴ Like Astbury, in Cheshire, it produced a hydraulic lime and in both places the stone was mined and not quarried. Aikin recorded in 1795, that '*In water it becomes as hard and solid as stone, and is exported to most parts of the kingdom*'.⁵⁵ This was a specialist lime, produced in modest quantities and sold at a higher cost; as such it did not seriously challenge the import of Derbyshire lime and limestone. Within Manchester, the lime wharves were primarily situated on the banks of the Rochdale Canal at Piccadilly. One dealer based there was Robert Satterfield who, until he acquired his own kilns at Buxworth in 1811, had an almost weekly order of 210 horse loads (still measured as such despite transshipment on the canal) from the Marple kilns (burning Derbyshire stone).⁵⁶ Another significant wharf for lime was at Castle Quay on the Bridgewater Canal which had a limeworks as early as 1790. This burnt local and North Wales stone, but after 1803 used primarily Derbyshire stone (see overleaf).

The region surrounding Manchester has long been a great market for Derbyshire lime and limestone. P. Boden in his study of the industry estimated that fifty per cent of the lime exported along the Peak Forest Canal was destined for Bolton, Bury, Rochdale and Huddersfield.⁵⁷ Following reference to the supply of lime from Buxton in 1734, Aikin (in 1795) makes a number of references to the supply of Derbyshire lime to Ashton, Oldham, Prestwich and Royton.⁵⁸ In south east Lancashire lime was used extensively in agriculture, in the building of

Table 7. Limeburners, limedealers and lime dependent industries in southern Lancashire

	Lime burners/dealers		Manufacturing chemist		Glass	Iron*	Paper	Soap	Tanning
	1825	1856	1825	1856	1825	1825	1825	1825	1825
Bolton		4		9		1	6		
Bury		3		7			1		10
Denton & Gorton				8					
Farnworth & Widnes		1		7					
Leigh				4					
Liverpool	5	10	15	18	22	1	13	32	14
Manchester	4	16	31	53	7		8	5	4
Middleton				1					
Newton & Ashton				1	1				
Oldham		2		5			1		
Ormskirk								1	
Padiham				2					
Prescot				1					
Radcliffe				3					
Rochdale	2	3		2					1
St. Helens				10			1	1	2
Stretford		1							
Todmorden			3						1
Warrington		1		1	7			2	5
Wigan		4		9		1			2

* Unreliable due to lack of definition in source.

Source: Baines & Slater, *Directory and Gazetteer of Lancashire*; 1825 & 1856.

textile mills and many tens of thousands of houses, and in industry (Table 7). Of note are the large numbers of manufacturing chemists supplying the cotton industry with bleaching powder and other finishing agents. Aware of these markets were the proprietors of the Peak Forest Canal and their minutes are full of arrangements with other Canal companies and individuals to permit the export of lime to more distant markets. It was carried to wharves at Ashton under Lyne and Manchester from whence it was distributed around the canal network. Opened in 1798, the Manchester, Bolton and Bury Canal was promoted to carry coal down to Manchester and other goods, including limestone, inland from the rivers Mersey and Irwell.⁵⁹ It connected with the Mersey and Irwell Navigation in 1808, but not with the Rochdale Canal and the Peak Forest Canal until 1838. Evidence however, from the Peak Forest minute books indicates that 'drawbacks' (part reimbursements on charges already made) were being offered on its lime and limestone carried on the Manchester, Bolton and Bury Canal before 1838,⁶⁰ suggesting that Derbyshire lime was being carried overland through Manchester to its basin.

To the west of Manchester, the Bridgewater Estate was, prior to 1801, importing large quantities of stone for burning into lime from local (Bedford, Lancashire) and North Wales sources. After lengthy negotiations, the Peak Forest Canal Company agent agreed with the Duke's agent to deliver 400 tons of Derbyshire stone to Castle Quay (Castlefield) for 40 weeks commencing 1 October 1801 at 6s 6d per ton of 2,400lbs.⁶¹ By 1803 this had increased to 18,000 tons per annum at 7s 8d, but later decreased to 12,000 at the old tariff of 6s 6d.⁶² In this year all but 3,100 of the 147,000 measures of lime burnt at Worsley came from Derbyshire stone.⁶³ By 1806 and 1820 the trade was yielding profits of £748 and £627 respectively. Whether due to cost, or quality, or accessibility, the effect was dramatic; after 1803 it was primarily Derbyshire stone that was burnt.⁶⁴

Competing with Derbyshire lime was that from Clitheroe in north Lancashire. Whilst it had massive limestone resources, they were inferior in quality (category 4) to those reserves around Buxton and Dove Holes (category 1).⁶⁵ Bolton and Bury were on this economic watershed where competition was keenest, and, in 1839, an enquiry was made into the quality of lime supplied to these towns other than that by the Peak Forest Canal.⁶⁶ In the

following year Samuel Hargreaves, lime dealer, requested a reduction in the tonnage rate of Peak Forest lime to Bury.⁶⁷ Oldham had a small supply of its own lime, and lime pits and a kiln are recorded there in 1422-23 and 1474 respectively. The supply was insufficient however, and when a branch of the Ashton Canal was opened to Hollinwood in 1796, Derbyshire lime was soon being shipped along it. The Whitehead family controlled the trade during the 1820-50s, but they were joined by Joel Carrington who sought to control the source of his supply by acquiring a quarry near Dove Holes. Possibly due to the great expansion in mill building in the second half of the century, the lime trade burgeoned in Oldham with twelve dealers there in 1891.

The success of canal over road transport, and the dominance of Derbyshire over Clitheroe lime in this region can be seen at Rochdale. '*Limersgate*' was an ancient route from Burnley and the Clitheroe area by which large quantities of lime had traditionally been brought to Rochdale. The small Galloway horses that were used were known as '*Lime-gals*' and the most noted of their drivers was '*Ailse o'Fussers*' (Mary Ann Hartley).⁶⁸ The importance of the trade can be seen in a proposal in 1766 to connect Oldham, Rochdale and Todmorden by canal to the limeworks in Craven. This was not built, but the idea was resurrected when the Rochdale Canal was being promoted. John Rennie was instructed to survey a branch from Todmorden to '*the limeworks in Craven*'.⁶⁹ This branch was dropped in the second reading of the Bill and so the way was open for large amounts of Derbyshire limestone to be imported towards Rochdale, Littleborough and Todmorden following the connection of the Ashton and Rochdale canals in 1800. Tolls on the Rochdale Canal for lime and limestone were set at 0.5d per ton per mile, and following a proposal in 1806 to raise same the Peak Forest Company launched a vigorous opposition campaign. Tonnages of lime carried to Rochdale in 1812 and 1819 were 11,735 and 13,458 respectively.⁷⁰ Canal transport and the use of Derbyshire lime and limestone declined after the opening of the Manchester and Leeds Railway, when they began again to be imported from the north.

Supplies for Merseyside had traditionally been obtained from small workings at Halewood, Leigh (hydraulic lime) and Sutton, and from the much larger limestone coastal deposits in North Wales; the quality of the latter stone being rated category 2-3. Aikin recorded Welsh lime on the Sankey Canal in 1795, and also large quantities of lime (10-20,000 tons in 1786-88) being carried along the Leeds and Liverpool Canal eastwards from Liverpool.⁷¹ This indicates a well established lime burning trade in Liverpool supplying west Lancashire, and the presence of an economic watershed between the city and Clitheroe. Merseyside and south west Lancashire were opened for Derbyshire stone and lime after 1800, when it could be carried direct along the Peak Forest, Ashton, Rochdale and Bridgewater canals. Earlier, in 1801, the Mersey and Irwell Navigation was carrying an extensive limestone traffic at 1s 6d per ton,⁷² but the direction of flow is unknown. By this date, Derbyshire stone was being carried overland across Manchester, to the Bolton and Bury Canal (see above), so it may have also been carried across to the Mersey and Irwell basin. Construction of these navigations led to Runcorn becoming an important port. In the earliest years of the nineteenth century John Johnson established his '*Old Soapey*' there, and soon added a '*Le Blanc*' alkali plant. He was soon followed by three other alkali concerns and the development of an extensive tanning industry. A plan dated 1827, also records a limekiln at the mouth of the Mersey and Irwell Navigation at Runcorn.⁷³ Information regarding the details of individual consumption is not available, but in private hands is the account book of Samuel Taylor, coal and lime factor of Runcorn, for the years 1868-73.⁷⁴ During 1868, for example, he bought approximately monthly amounts of stone from Buxworth and Marple costing between £30-50 per order and sold it to a number of manufacturers, the most significant of whom are listed in Table 8.

Table 8. Selected customers of Samuel Taylor

John Bethell	Manufacturing chemist	Runcorn
J. Ockleston & Son	Tanner	Runcorn
Robert Pierpoint	Tanner	Runcorn
'Runcorn Soapey'	Soapworks	Runcorn
Weston Works	Chemical works	Runcorn
Lyon Bros.	Glass (bottle) works	St. Helens

Source : *The account book of Samuel Taylor; 1868-73*. Courtesy the late Mr. Frank Frith (grandson).

In a noted court case between Liverpool Corporation and James Muspratt (manufacturing chemist) in 1838, concerning pollution from the alkali process, it was revealed that in the immediate vicinity of his works (in Everton) there were one hundred factories including twelve chemical works, seventeen '*soaperies*', seven limeworks, three colour '*manufacturies*' and an unspecified number of tan yards.⁷⁵ Merseyside began to develop as a major chemical producer after the repeal of the salt tax in 1823 and the introduction of the '*Le Blanc*'

process of alkali production, which was at the heart of the heavy chemical industry. This process required vast amounts of coal, limestone and salt, and despite a large waste problem was more economical than producing alkali from imported sources of kelp and barilla. To produce one ton of alkali required 8.5 tons of raw materials including 1.75 tons of limestone.⁷⁶ James Muspratt introduced the process to Liverpool in 1823, and later opened another plant in St. Helens, where the extensive glassworks had already created an enormous demand for lime. To develop this market further, in 1842 the Peak Forest Canal Company authorised the free supply of one hundred tons of stone for an experiment 'to ascertain results in the most satisfactory manner'.⁷⁷ William Bromilow was the only lime burner in St. Helens in 1824, but by 1861 there were three other burners and lime agents. James Gayter of Warrington was also receiving his lime from the Peak Forest company in 1810.⁷⁸ Tanning was well established there, and in 1815 Joseph Crosfield opened his famous soap works. By 1856 the companies dependent upon lime had extended to fourteen tanners, five glassmakers, two soap works and one manufacturing chemist.⁷⁹ After some delay John Hutchinson opened his first chemical plant in Widnes in 1847 and was soon followed by other firms from Liverpool. A town grew up alongside this great centre of the chemical industry which consumed vast amounts of limestone in the 'Le Blanc' and other processes. By 1861 Widnes had eight major chemical firms and the Buxton Lime Company had installed an agency to supply them. Wigan also had a large lime burning trade, but it was probably supplied from north Lancashire along the Leeds and Liverpool Canal. However, Peak Forest stone was being carried to Leigh in 1833.⁸⁰ In the following year Messrs. Johnson of Runcorn (alkali and soap manufacturers) successfully applied to the Peak Forest Canal Company for a reduction in rates. In seeming contradiction the Company also offered 'drawbacks' to the Manchester and Liverpool Railway in 1832 and 1836, but this was to stimulate further trade. By the middle of the nineteenth century Derbyshire stone was major factor in the Merseyside market.

Of the smaller markets, Staffordshire received large amounts via the Buxton to Leek Turnpike of 1765. It had extensive litigation with the Macclesfield Turnpike Trust over access into the Grin limeworks, whose accounts reveal that in 1805 some 123 Staffordshire customers purchased 9,249 horseloads (595 tons). The Leek Trust encouraged this traffic by levying only half tolls at a number of its gates in 1770.⁸¹ The radius of this traffic extended south towards Morridge where there was competition with lime supplied from Caudon Low. After the opening of the Caldon Canal in 1778, lime and stone from this source were exported into all but the most northern parts of the County. Staffordshire was also a focus for the Peak Forest Company after the opening of the Macclesfield Canal in 1831. D. Hodgkins notes an increase of almost 14,000 tons of stone sold in 1833, of which 7,954 was to new customers, 'the greater part to two in Staffordshire'.⁸²

Tanning was an ancient industry in the Hallamshire part of South Yorkshire for, beyond the usual uses of leather, there was a big demand in their iron manufacturing industry for bellows, grinders' belting and sheaths for knives. D. Hey states that the lime for this industry 'was obtained from the White Peak'.⁸³ Much of this however, would have probably been supplied from the limeworks at Stoney Middleton. Such was the demand that a Sheffield and Peak Forest Railway was promoted in 1826. Its prospectus stated that 'Such a mode of Conveyance as this, keeping, near to the Derbyshire limestone, cannot fail to pay an ample dividend'.⁸⁴ This was not built however. A transport system which was built to carry the lime traffic into Yorkshire, was the Chapel-en-le-Frith to Enterclough Bridge Turnpike of 1792, which promoted the benefits of lime for the improvement of barren land around Glossop and Huddersfield.⁸⁵ Further improvements in this direction were made with the opening (throughout, in 1811) of the Huddersfield Narrow Canal. Higher tariffs were to apply to traffic travelling through the Standedge Tunnel, but an agreement for reduced rates for lime was agreed with the Peak Forest Company.⁸⁶ Increased 'drawbacks' were offered in 1842 following the recent opening of the Manchester and Leeds Railway. Major recipients of limestone were the Saddleworth kilns which in 1811 '... were now let, with a promise of a subsidy of 10s per 100 tons on all lime over 3,000 tons a year burnt, and a premium of up to £50 each for new kilns'.⁸⁷ Table 9 gives an indication of lime and limestone carried on this canal in its earliest days.

Table 9. Goods carried on the Huddersfield Narrow Canal; 1813-17

	1813 £	1816 tons	1817 tons
Merchandise	5,211	16,214	
Coal	391	11,106	
Corn	269	980	
Lime & limestone	189	3,646	2,027

Source : C. Hadfield & G. Biddle, *The canals of North West England*, 1970, Vol.2, pp279 & 331.

V. Conclusion

In examining the production of a range of traditional and new industries it has been demonstrated that lime and limestone were essential raw materials. Increases in manufacture depended upon greater supplies of this essential raw material and, as E.A. Wrigley has written:

*'Any great increase in the output of industry, such as began in England towards the end of the eighteenth century, must have as its counterpart an equally great increase in the input of industrial raw materials at the other end of the process of production.'*⁸⁸

In D.S. Landes' words, *'The use of new and abundant raw materials'*, in particular, the substitution of mineral for vegetable or animal substances, was one of the improvements that constituted the process termed *'Industrial Revolution'*.⁸⁹ This article has sought to demonstrate that limestone was such a raw material. It revolutionised both agrarian and industrial processes and, from the evidence advanced (both empirically and by extrapolation), it can be clearly seen that the scale of demand was enormous. Whilst limestone from any source would have contributed to the industrial expansion in the Manchester and Merseyside sub-regions, it was the proximity and high quality of the stone from north west Derbyshire, and the latter area's historic links with Cheshire and Lancashire, which assisted in the industrial development of these regions. Because of this demand, improvements were promoted to the transport infrastructure. This in turn, facilitated the wider use of limestone, permitted other smaller industries and commercial trade to benefit from these transport improvements and led to regional reorientation. Paradoxically, despite being an enabler in these industrial improvements, the limestone industry itself remained in a pre-industrial state until the end of the nineteenth century, with increases in demand being matched with the employment of additional labour using traditional techniques.

Whereas on a larger canvass, the important role of limestone could be demonstrated in a national context, this article has shown its importance in the development of the wider Manchester region. Due to the significance of this region in the processes termed *'Industrial Revolution'* the essential nature of limestone as a raw material is assured. Moving forward, beyond the period of the *'Industrial Revolution'*, the range of processes requiring lime and limestone would have included, in addition, ceramics, dyes, flour and sugar manufacture, paints, pharmaceuticals, plastics, road construction, rubber, and water purification. Both our historical and modern societies have depended upon it. To conclude therefore, it is considered that limestone was, and still is, one of the essential raw materials of industry whose supply, *'was the sine qua non of sustained growth on a large scale'*.⁹⁰

In preparing this article I would like to acknowledge the kind assistance of The Trustees of the Chatsworth Settlement, The British Museum, the Greater Manchester, Northampton and Preston Record Offices, the John Rylands University Library and the Central Library in Manchester, Buxton Library and The Alkali Museum. Also Dr A.F. Roberts, and the late Messrs F. Frith and B. Lamb.

Notes

1. This article is an abridged version of an M.A. dissertation of the same name submitted by the author to Manchester Polytechnic, 1992.
2. E.A. Wrigley, 'The supply of raw materials in the Industrial Revolution' in R.M. Hartwell, *The causes of the Industrial Revolution*, 1976, pp97-120. R. Burt, 'The transformation of the non-ferrous metal industries etc.', *Economic History Review*, XLVIII, 1, 1995, pp23-45.
3. D.S. Landes, *The Unbound Prometheus*, 1969, p41.
4. N.F.R. Crafts, *British economic growth during the Industrial Revolution*, 1985.
5. P. Hudson (ed.), *Regions and industries*, 1989, pp14-15.
6. L. Jackson, 'The Buxton lime trade', *Cement and Gravel*, 1950. P.K. Boden, 'The limestone quarrying industry of North Derbyshire', *Geographical Journal*, No 129, pt 1, 1963.
7. A. Fitzherbert, *The Boke of surveyinge and improvements*, 1535.
8. Quoted in H.W. Gardner & H.V. Gamer, *The use of lime in British agriculture*, 1953, p16.
9. A. Young, *A six month tour through the North of England*, 1771, p331.
10. J.D. Chambers & G.E. Mingay, *The Agricultural Revolution; 1750-1880*, 1966, p62
11. C. Leigh, *The natural history of Lancashire, Cheshire and the Peak of Derbyshire*, 1700, Book 3, p42.
12. A.B. Searle, *Limestone and its products*, 1935.
13. T.K. Derry & T.I. Williams, *A short history of technology*, 1973, p406.
14. H.A. Shannon, 'Bricks - a trade index; 1785-1849', *Economica*, 1934.
15. M. Berg, *The age of manufactures*, 1985, p39fn.

16. Derry & Williams, *op cit*, p84-86.
17. T.O. Jones, *The manufacture of iron and steel*, 1971, Vol 1, p65.
18. R. Samuel (ed.), *Miners, quarrymen and saltworkers*, 1977, pt 1, p6.
19. Jackson, *op cit*, p5.
20. Derry & Williams, *op cit*, p265.
21. Landes, *op cit*, p112.
22. Jackson, *op cit*, p5.
23. Hudson, *op cit*, p9.
24. A.E. Musson & E. Robinson, *Science and technology in the Industrial Revolution*, 1968, p321.
25. Derry & Williams, *op cit*, pp538-539.
26. J.T. Leach, 'Burning lime in Derbyshire pye kilns', *Archaeology Review*, XVII, 2, 1995.
27. British Museum, Wolley MSS, 6668, folio 35.
28. J.T. Leach, 'Grin Hill, Buxton: a major Derbyshire limestone quarry', *Derbyshire Archaeological Journal*, Vol CXVI, 1996.
29. C.W. Sutton, 'Bishop Nicolson's visit to Manchester, 1704', *Transactions of the Lancashire and Cheshire Archaeological Society*, Vol XXII, 1904, p189.
30. T. Short, *A history of the mineral waters etc*, 1734, p24.
31. W.H. Chaloner, 'Charles Roe of Macclesfield', *Transactions of the Lancashire and Cheshire Antiquarian Society*, Vol LXII, 1950-51.
32. Chatsworth, L/114/13/4/V.
33. Idem, L/94/13/VB/No.9
34. J. Pilkington, *A view of the present state of Derbyshire*, 1789, Vol 2, p292.
35. J. Aikin, *A description of the country from thirty to forty miles around Manchester*, 1795, p84.
36. D.J. Hodgkins, 'The C.H.P.R. in 1843', *Journal of railway and canal history*, Vol XXIV, 1978
37. For further information see C. Hadfield & G. Biddle, *The canals of North West England*, 1970, Vol 2, pp306-316.
38. G. Unwin, *Samuel Oldknow and the Arkwrights*, 1924, pp217-218.
39. Peak Forest Canal (P.F.C.), Minutes, 27 November 1811.
40. D. Hodgkins, 'The Peak Forest Canal - lime and limestone', *Derbyshire Archaeological Journal*, Vol CVII, 1987, p83.
41. Chatsworth, T series accounts.
42. G. Bradshaw, *Shareholders Guide and Railway Manual*, Public Record Office, RAIL Collection, 463/323, 1140/10, 1140/12.
43. D. Hodgkins, 'Captain Moorsom and the Cromford and High Peak Railway', *Derbyshire Archaeological Journal*, Vol CIII, 1983, p138.
44. *Ibid*, p154.
45. A. Young, *General report on enclosures*, 1808, p139.
46. D. Hey, *Packmen, carriers and packhorse routes*, 1980, p148.
47. Farey, *op cit*, Vol 2, pp403, 436-445.
48. *Ibid*, p483.
49. J.T. Leach, *The north west Derbyshire Limestone Industry: the supply of an essential raw material in the Industrial Revolution*, M.A. dissertation, Manchester Polytechnic, 1992, p120-23.
50. H. Holland, *General view of the agriculture of Cheshire*, 1808, p227.
51. Legh Papers, E17/35/4: Accounts and cash book, Greater Manchester Record Office.
52. E. Kerridge, *The agricultural revolution*, 1967, p219.
53. C.S. Davies, *The agricultural history of Cheshire*, 1960, p18.
54. Manchester Central Reference Library, M/C 146.
55. Aikin, *op cit*, p210.
56. Oldknow Papers, 752ii: Lime Accounts, John Rylands University of Manchester Library.
57. Boden, *op cit*, p58.
58. Aikin, *op cit*, pp227, 235, 237 & 238.
59. Hadfield & Biddle, *op cit*, Vol 2, p254.
60. P.F.C. Minutes, 18 August 1831.
61. *Ibid*, 18 September 1801.
62. *Ibid*, 11 May 1803 and 9 April 1806.
63. Bridgewater Trust General Accounts, 1790-1810, Lancashire County Record Office
64. Northampton County Record Office, EB1461, General state of his Grace the Duke of Bridgewater's navigation, colliery, lime and farm concerns in Lancashire and Cheshire, 1759-1806.
65. *British Geological Survey*, Mineral Assessment Reports.

66. P.F.C. Minutes, 23 March 1839.
67. *Ibid*, 27 March 1840.
68. W. Robertson, *Rochdale and the Vale of Whitworth*, 1897, pp193-95.
69. Hadfield & Biddle, *op cit*, Vol 2, pp263-264.
70. *Ibid*, Vol 2, p279.
71. Aikin, *op cit*, pp111 & 370.
72. Hadfield & Biddle, *op cit*, Vol 1, p87.
73. Manchester Central Library, plan, Misc. 87/17.
74. In the ownership of Mr Frank Frith, formerly managing director of Taylor-Frith Ltd, lime producers at Peak Dale. Viewed by the author before Mr Frith's death.
75. G.W. Roderick & M.D. Stephens, 'Profit and pollution', *Industrial Archaeology Review*, XI, 2, 1974.
76. Information courtesy The Alkali Museum, Widnes.
77. P.F.C. Minutes, 17 November 1842.
78. *Ibid*, 12 March 1810.
79. Slater, *Gazetteer and Directory of Lancashire*, 1856.
80. P.F.C. Minutes, 9 May 1833.
81. A.F. Roberts, *Turnpike roads around Buxton*, 1992, p115.
82. Hodgkins, 1987, *op cit*, p85.
83. Hey, *op cit*, p174.
84. Henry Sanderson, *The Sheffield and Peak Forest Railway*, 1876, page v.
85. Act of Parliament, 8 George III, cap.47.
86. P.F.C. Minutes, 26 September 1811.
87. Hadfield and Biddle, *op cit*, Vol 2, p329.
88. Wrigley, *op cit*, p97.
89. Landes, *op cit*, p41.
90. Wrigley, *op cit*, p97.

Derbyshire Archaeological Society Publications

The *Derbyshire Archaeological Journal* is published annually and contains articles on all aspects of the county's archaeology, history and architecture. It is free to members. *Derbyshire Miscellany* is published twice yearly and provides a slightly less formal forum for local history articles and notes.

Subscriptions:	One or more members of a household at the same address (includes <i>Journal</i>)	£18.00
	<i>Derbyshire Miscellany</i>	£6.00
	Student membership - persons under 25 years in full time education (includes <i>Journal</i>)	£13.00

Application forms are available from:

The Membership Secretary, Mr K. Reedman, 107 Curzon St, Long Eaton, Derbyshire NG10 4FH
Tel: 01159 732150

Back copies of *Derbyshire Miscellany* and list of available issues (send sae) are available from:
Dr Dudley Fowkes, 11 Sidings Way, Westhouses, Alfreton, DE55 5AS

Registered charity no 225031