2. HISTORY OF PEAT EXPLOITATION

2.1 Unrefined peat fuel from Thorne Waste

In 1626, during the reign of Charles I, an agreement was drawn up between the Crown and a Dutch entrepreneur Cornelius Vermyuden, to undertake the drainage of Hatfield Chase. The chase and its purlieus stretched from the River Aire in the north to Bawtry and north Nottinghamshire in the south, and from near Doncaster in the west to the rivers Don, Torne and Idle which form the boundary with Lincolnshire. The Isle of Axholme lies to the east, extending as far as the River Trent. The main causes of flooding were the meandering, sluggish courses of the Rivers Don, Torne and Idle, which could not cope with heavy rains in their western catchments. In addition, the River Trent, the main outlet for the three rivers, and the Don itself, were strongly tidal. To the north lay the tidal rivers Ouse and Aire and the smaller River Went. A side branch of the River Don, known as the Turnbrigg Dike, was man-made, having been constructed northwards from Thorne to the River Aire, at some time before 1323 (Gaunt 1975, 2008).

Vermuyden's plan for alleviating the floodwaters partly involved river course alterations. The Don was dammed near Thorne, so that all the waters of the river were concentrated into the Turnbrigg Dike, discharging into the River Aire. In addition, new straight channels were cut for other rivers, to replace their inefficient winding courses. Thus both the Idle and Torne had their links with the Don severed, and were diverted eastwards into the River Trent.

Unfortunately, the settlements of Fishlake, Sykehouse, Snaith, Cowick and Rawcliffe became inundated by water from the Turnbrigg Dike, which was inadequate to deal with the extra flow. To remedy this, parallel relief drains, completed in 1636-37, were dug from Turnbrigg to Goole. Following events apparently dated 1689 and variously attributed to a severe storm or a sudden thaw, a much larger channel was scoured out and eventually became known as the Dutch River (e.g. Radley & Simms 1970, Jones 1994, Gaunt 2008). By these successive waterways, the River Don was connected directly with the River Ouse; the Turnbrigg Dike to the north of Turnbrigg was rendered redundant. However, as the Dutch River had a drainage rather than navigational function, it was always a challenging and even dangerous waterway for boatmen.

The regional drainage extended from 1626 to c.1638 (Byford 2005). It provided the first unified drainage scheme for the lower Don and Trent region, and although unsatisfactory in major ways, it initiated the conversion of a large and complex area of wetlands and traditionally-farmed acres into land supporting tillage and pasture. By 1640, the landscape of the low grounds was one of "regularised streams, large rectangular enclosures, shrunken commons and unimproved moors" (Robinson 1969). However, Robinson's implied efficiency of the drainage and land allocation belies the more chaotic results of what has become characterized as the 'Vermuyden' years (Byford 2005).

The largest of these "unimproved moors" was Thorne Moors. Here, existing rights of turbary, of medieval date, were preserved – even reinforced – along with adequate access to the peat workings themselves. These rights were finally confirmed in 1758 when an appeal by the Lord of the Manor of Hatfield was dismissed by the House of Lords (Bunting 1969, Byford 2005).

The export by water of the Thorne peat to other parts of northern England, for both domestic use and industrial processes, could also continue. This had long been achieved by conveying the won peat northwards for transhipment to the River Ouse (Beresford 1986). As the edge of the peat had thus been receding southwards, it required a lengthening cart journey to the river.

By affecting the land around the south-western part of Thorne Moors, the early 17th century drainage rendered the peat of Thorne Waste itself more accessible. The course of Blackwater Dyke divided the peat resources allotted to the medieval centres of Thorne and Snaith (Beresford 1986). The early focus of extensive exploitation was north of Blackwater Dyke, utilizing the proximity of the River Ouse. However, the effects of the regional drainage transferred the centre southwards towards Thorne, from where the exported peat was taken to the River Don for transhipment.

George Stovin, writing of the mid-18th century, quoted via Collier (1905-07), stated that by rendering its parish turbary more accessible, Thorne became "Greatly Inriched". A secondary result of the regional drainage was the beneficial effect of the Dutch River in providing a navigable – though difficult – channel from the River Don to the River

Ouse. Although constructed to move water more efficiently from Hatfield Chase, the enlarged waterway also expedited trade in bulky commodities like peat.

Byford (2005) noted that the limited area of townland agriculture at Thorne was compensated for by cultivating the areas of cleared peat. Thus both the peat itself, and the land beneath, were of value to the settlement. All the townships of the Manor of Hatfield had been allotted turbaries on Thorne Moors and Hatfield Moors, though only at Thorne was the allocation situated close by.

The regional drainage defined land allocation around Thorne Waste, and this could be extrapolated to moorland division as well. Thus, in 1651 a formal division of Thorne Waste was undertaken (Collier 1905-07). This apportionment of the turbary was superposed on to an older framework of strip reclamation, and reflected the pattern of ownership on adjacent land. It extended peripheral land possession based on property width, to determine the position of division ditches on the moors. These marked the redefined strip holdings – known as 'cables' – across the Waste to the parish boundary. As the peat was removed, the edge of the moorland receded fitfully eastwards, and the exposed land could be prepared for agricultural use.

In the adjacent Isle of Axholme, the right to cut peat "in the common", it was claimed in 1675, "drawes multitudes of the poorer sort from all the counties adjacent to come and inhabite in this Isle" (Neave & Neave 1990). The relevance of this to Crowle Moor is uncertain. However, during the 17th and 18th centuries, Crowle was consistently amongst the five largest settlements in north Lincolnshire, gaining 40 new households between c.1590-1640 (Miller 1997).

Accelerated peat usage and land reclamation is demonstrated by examining Thorne manorial rentals from the 17th century. Tomlinson (1882) quoted a 1694 rental in which "turving rents" became a more frequent designation than hitherto. These were plots of newly reclaimed moorland on which cottages or other buildings had been erected. Commenting on the 1694 rental, Tomlinson stated that although the number of cottages listed as recently built on the "turvings" was relatively numerous, the rents were low, reflecting the poor initial quality of the reclaimed land. A list of Thorne landowners and tenants dated 1741 refers to property on reclaimed 'moors' between Thorne and its remaining peat, with further allusions to "Turvings" (Anon 1993).

Of 17th century origin was the 'Participant' turbary on Thorne Waste. The 'Participants' had been involved with the regional drainage. Cornelius Vermuyden was Dutch, and virtually all the 'Participants' were Dutch or Flemish, their adventure capital being secured against land allocation on the drained levels. However, most of the settlers were not the financiers of the scheme, but their tenants, or even squatters. In addition to the new lands, the tenants were also provided with non-commercial rights to cut peat, involving an area of 400ha (1000 acres) on Thorne Moors, and half this extent on Hatfield Moors (Tomlinson 1882, Korthals-Altes 1925, Bunting 1969). These turbaries were to be "set out by Metes and Bounds [measurement and boundaries] by the Consent of the said Parties, or by Persons appointed" (Korthals-Altes 1925).

The positioning of the Thorne turbary on the eastern part of Thorne Waste was probably indicative of a lack of contemporary claims in that remotest part of the parish. Casson (1869, 1874) stated that "None or very few of the Participants had for many years occupied the right, and, practically, it was valueless to them as a source of procuring fuel". Tomlinson (1882) and Bunting (1969) went further, the latter stating that those who held the turbary "had never been able to exercise this right". It is unclear whether the 1651 division of the Waste extended over the 'Participant' allocation or ended short of it. An unidentified mid-19th century plan [**1**] labels "1000 Acres over which the Participants have graven Turves", and it depicts the Thorne cables extending across it to the parish boundary on the eastern side.

In the 19th century, the slow and irregular peripheral reclamation of Thorne Waste became overshadowed by large scale plans for extensive improvements. However, the 'Participant' turbary proved a hindrance. This mainly concerned the turbary holders' claim to ownership of the ground as well as the peat, and therefore their perceived right to initiate reclamation themselves in 1842 (*Doncaster Gazette* 26 November 1858). Against this, the strip holders, the so called 'Moor Owners', maintained that the turbary was void through non-usage. Because of this, the 'Moor Owners', who asserted that they had rights to the ground beneath, considered they could legitimately extrapolate their cables eastwards as a prelude to their own reclamation of the turbary. This conflict was eventually concluded by the Thorne Moor Improvement Act, 1861 [**2**], which inter alia extinguished all 'Participant' claims in return for a payment of £1500. Yet, despite ambitious plans, and reclamation on other parts of Thorne Moors, much of Thorne Waste remained "in almost hopeless abeyance" (Casson 1869, 1874). There was some

drainage achieved, and ownership became concentrated into fewer hands. The main effect of these changes was, perhaps, to facilitate the eventual development of the early moss litter industry.

During the 17th century, and notwithstanding the seeming lack of interest in the 'Participant' turbary as a subsistence resource, peat remained a significant fuel for Thorne. The export trade, by water, continued to figure in the local economy; in 1652 a "loade of Turves & wood" was stolen from a vessel at Fishlake (Goodchild 1971-73, Rotherham 2010). However, change became inevitable, precipitated by the growing availability of coal. For example, the local importation of 'sea-coal' from north-east England during the 17th century is illustrated by Robinson (1858). His lists and prices of commodities and other articles, based on probate records, encompass the river-side parishes of Snaith and Whitgift, to the north and north-west of Thorne. From 1609 to 1693, there are 15 years entered in which references to "coals" or "Newcastle coals" were discovered in inventories. There are many references to peat within the same time-span. Like peat, 'sea-coal' persisted as a regular cargo in the region until overshadowed by the 'pit-coal' of the West Riding.

In both quantity and quality, there was no possibility of peat retaining more than a marginal effect on the region's growing fuel needs. Nor was peat especially favoured. In Cox (1731), as republished by Sheppard (1914), describing the West Riding in the early part of the 18th century, are detailed the three types of fuel then produced: pit-coal, wood and peat or turf. Of the latter Cox remarked "Turf, as it is the most unwholesome, so nothing but Poverty and Necessity can oblige even the meaner Sort of People to use it for Firing". In the Thorne district itself, where some peat continued to be burned as a relatively cheap local fuel, the availability of coal was taken advantage of. Coal was, for example, purchased by Thorne's churchwardens in 1758 and 1777, though in the former year it was also recorded that the "turf house" belonging to the parish poorhouse was repaired. It was presumably still employed as a peat store (Taylor 1953). An 18th century inventory of the poorhouse itself shows that it had need of a "Coal baskett" and a "coal rake" (Taylor 1957).

Until the end of the 18th century, the diminution of the Thorne peat trade was a repercussion of the growing prevalence of coal. In the 1790s, Thorne peat still retained a market sufficient to allow over 40 families (Casson 1829) to earn at least a part of

their livelihood by owning or renting land, or perhaps just labouring, on Thorne Waste. The winning of peat was a seasonal occupation, and at least some of those involved were also farmers. Many families owned a small boat to use as they would a horse and cart to convey goods to market, bring in crops and collect their peat turves (Casson 1869, 1874, Byford 2005). Available evidence (Casson 1829, Collier 1905-07, Hey 1980) suggests that this may be regarded as an economically viable combination in the 17th and 18th centuries.

The peat was loaded on to long, narrow vessels, described thus by Casson (1829):

> The boats employed in transporting the turf from the moors are clinker built, about 27 feet long, and 13½ wide; they are sharp at both ends, and made to work either stem or stern foremost, the drains being too narrow to allow the turning of such boats in them.

In the two later editions (Casson 1869, 1874), the beam was given as a more reasonable 6ft, and must actually have been slightly less (Jones 2010b). The vessels were hauled along the Boating Dike [**3**] from the moors towards Thorne. There was an inlet to the Market Place (Casson 1829, Taylor 1987), with a small landing place where turves were unloaded for sale. This area was known as 'The Settings', being the place where some peat was set down and sold (J.S. Taylor in litt.). The Boating Dike extended to Thorne Waterside on the River Don, where the remaining water-borne peat was transferred into larger craft for export. Some peat was also moved locally by cart (e.g. Casson 1869, 1874, Taylor 1953). In the middle years of the 18th century, George Stovin remarked (Collier 1905-07) that the peat turves were distributed to York, Selby, Leeds, Wakefield, Hull, Gainsborough, Lincoln and other towns where, despite coal, there was still a "ready sale for them".

Following the Act of Parliament authorizing the construction of the Stainforth and Keadby Canal in 1793 [**4**], it was opened during 1802-05. Its creation caused the severance of the Boating Dike, impairing the latter's role as a waterway for the peat trade, but it facilitated the transportation of West Riding coal. Henceforth, peat no longer enjoyed an unhindered boat journey into Thorne for township use, or on to the River Don for export. Despite this, the Boating Dike seems to have retained some waterway functions until the 1830s (Jones 2010b), when the peat trade was approaching its nadir. The assent to sever the link is indicative of the over-riding importance accorded the canal, and its potential to convey "Coal, Lime, Lime Stone, Corn, Timber, Iron, Lead and other Kinds of Goods and Merchandize". In mitigation for the loss of

free transportation by water, the peat from Thorne Waste was exempted from the payment of rates on the canal, providing the peat was being conveyed to its customary destinations within Thorne parish, including Thorne Waterside for transhipment. In addition to Thorne Waste, peat obtained at Crowle and Keadby was also exempted from rates. However, peat from any source being shipped on the canal to the River Trent was subjected to a levy.

William Casson, with memories of Thorne from c.1803, recollected the Boating Dike "when navigable for boats with Turf from the Moor to the river Don" (*Goole Times* 29 January 1886). Casson (1829) described the Boating Dike as "an ornament to the town" in its heyday. As it flowed *from* the river, and simply supplied water for boating, with the decline of the latter the waterway gradually shrank and became stagnant. Ultimately, it retained no known transportation significance, with the reach through the town becoming treated merely as an open sewer. Casson (1829) regarded it then as "a nuisance to the town".

There is, nevertheless, evidence of the tenacity of the vestigial peat trade. In the 19th century, much of the attention directed at Thorne Moors arose from ambitions to drain and reclaim the peat, linked on occasion with abortive plans for a railway or canal across the Moors. For much of the century, peat was perceived as a hindrance to prosperity and health, regarded only as an "unwholesome" fuel and a resort for game. Its partial transformation to agricultural land by reclamation has a relatively complex history, yet peat within six parishes – especially Thorne – escaped reclamation long enough to be saved by agricultural depression in the 1870s, and thus available for later utilization.

The Act for enclosing lands in the parishes of Hatfield, Thorne and Fishlake, passed in 1811 [**5**], stipulated the exemption of the whole of Thorne Waste and the preservation of the parish turbary. This further isolated Thorne Waste from the flanking countryside, and emphasised its intractability. Cooke (1818) described Thorne as "inconsiderable but improving", and added that "The marshes surrounding this town have during the last ten years been completely drained". With the peatland exempted from this activity, in that same year Cosmogenes (1818) was able to note that Thorne Moors itself was "so soft and rotten as to be almost impassable in the driest weather", adding that in the middle "are several large pits of water, one of which has been ascertained to be thirty

feet deep to the solid ground". Nevertheless, that writer acknowledged that drainage was causing the peat to become perceptibly lower and firmer.

The signing of the enclosure award in 1825 confirmed and reinforced ownership titles to the land abutting Thorne Waste, and the extrapolation of those titles across the peat. It is recorded that Thorne Waste "was staked out by the Enclosure Commissioners at the request of the Owners of the moor. It was set out for the purpose of drainage. That was in 1825 or 1826" (*Doncaster Gazette* 4 August 1848). Earlier, in 1815, the Commissioners had authorized the construction of New Drain, later Thorne Waste Drain, along the south-western side of Thorne Waste (Casson 1829). By linking with the northern soak drain of the Stainforth and Keadby Canal, the drain was able to function as a means of getting peat to the canal and the Boating Dike. In so doing, it demonstrates the significant viability of hauling peat by water at that time. Boating was given further contemporary emphasis by the acceptance of a high water level in the drain, reducing its immediate value as a means of land drainage.

Cosmogenes (1818) observed:

> The peats or turves which are dug here, when thoroughly dried, afford fuel to the poorer inhabitants; and being conveyed by water to York and other places, are sold at a high [sic] price for the purpose of lighting fires.

However, the declining volume of the peat trade, the injury to land drainage, and an increase in land prices at that time, led to the termination of peat carriage along Thorne Waste Drain. This was in the 1830s (Casson 1869, 1874), and allowed water levels to be lowered. At that time, and for the next 30 years or so, attention was significantly focused on reclamation of the peat.

Casson (1829) wrote that the principal markets for peat in the late 1820s were York and Hull: "...several vessels are constantly employed in the trade to the former place". At that time, eight or nine boats were still conveying peat within Thorne parish. Others witnessed the wider decline in the trade with York, Hull, even Sheffield, Nottingham and perhaps other places (White 1837; *Goole Times* 1 September 1893, 3 March 1899). White (1837) recorded that the fleet of 30 or so boats once employed in moving the Thorne peat to its destinations entered the Victorian period reduced to a mere seven or eight.

The uses of the peat were stated on a poster, published at Thorne in 1842 by Mordecai Casson [**6**], father of William Casson. He urged the restitution of peat traffic on a stretch of the Boating Dike, as "getting Turves from the Moor" was, he argued, prohibitively laborious or circuitous:

> It would create much remunerating labour, in providing fuel, peat dust or ashes for manure, and compressed peat. Each acre of peat, when cut up and dried, sells for no less a sum than Three Hundred Pounds, when near three yards deep – leaving the land clear for tillage or warping.

In that decade, an interesting item occurred in the *Doncaster Chronicle* of 23 May 1845:

> CAUTION. – Persons pretending to come out of Cambridgeshire or Huntingdonshire, are now hawking small turves as Cambridge turves. They buy them at Thorne or Hatfield, and, having cut each turf into several, offer them at four times their value.

Tomlinson (1882), in apparently recalling a period before c.1854, when he was a resident of Thorne (Ballinger 1891), observed that the Thorne trade still then employed about 12 families. It survived through the 1860s (Anon. 1867, Casson 1869), William Casson commenting that the peat had to be carted into Thorne, or to the Stainforth and Keadby Canal for shipment to Hull and elsewhere; "the trade is in three or four hands".

Thorne's first railway connection was laid in 1855 (Platt 1991), so by the 1860s peat was also having to compete with rail- as well as water-borne coal. Peat was becoming only a minor fuel in Thorne. For example, the newly established Thorne Church Girls' School in its first half year (1867-68), had expenditure for "Coals and Turves". In its second half year (1868) there is only reference to "Coals", and in 1870 it again seems to have relied only on coal [**7**]. A short biography (Anon. 1876) of the Hatfield eccentric L.S. Pilkington ('Jack Hawley'), who lived 1828-75, commented that he burned wood and "bricks of turf" on his fire, though the latter presumably originated from Hatfield Moors. However, at this time, peat may have been of greater significance in the Isle of Axholme, dug from the local turbaries there. Tomlinson (c.1860) visited Epworth and wrote:

> We could smell Epworth at two miles distance – a peculiar smell as of burning wood – which may be explained from the great quantity of peat consumed there.

The horticultural business of W. & J.C. Casson (e.g. Limbert 1991, 1998, 2000a) provides the first example of Thorne peat for horticulture, an early illustration of

diversification away from fuel peat. The horticultural undertaking had its origin in the 1830s and was based on the edge of Thorne Waste. Casson (1869, 1874) noted that "Some peat is annually sent off from the moors to nurserymen or gentlemen at a distance, either by rail or vessel". In an 1874 advertisement for W. & J.C. Casson's horticultural stock (Hogg 1874), it was noted that in addition to plants, a supply of peat could also be provided from Thorne. The horticultural venture ended in the late 1880s (Limbert 1991, 2000a).

This usage persisted beyond the years of the Casson enterprise, being taken up by the later moss litter companies as a minor product. In the *Goole Times* of 3 March 1899 it was observed that although London was the principal market for the peat produced by the British Moss Litter Co., "there is a considerable demand being created in places nearer home by nurserymen, who find it extremely useful for potting purposes". Taylor (1953) wrote that much unrefined peat from Thorne was used in horticulture, a term employed with uncertain accuracy. By the 1930s, the British Moss Litter Co. was already selling "patent manures" (Pontefract and Hartley 1939), although composts did not become truly significant until Fisons entered the Thorne peat trade.

The overall decline in peat usage was inexorable. In the mid-1870s, Thomas Bunker [**8**] noted that "[peat] stacks may be seen near the waste edge", and he further commented:

> Some of the peat is cut and dried for use, but very little is disposed of that way. If there were a market for it, it could readily be dug and then the site warped.

Fortune remained unchanged in the early 1880s; peat had "dwindled into insignificance" (Tomlinson 1882, Limbert 1983; *Doncaster Gazette* 5 October 1883). The *Goole Times* of 16 July 1886 commented:

> We may note that turf in late years has been of little value, coal, the carriage of which is [priced] so low, having taken its place.

This was even true in the relatively isolated Marshland parishes, where the inhabitants had utilized Thorne Moors peat for centuries. Having a frontage on to the River Ouse, they were – despite their comparative remoteness by land – able to import sea-coal, with 'Shipcole Clough' appearing on the first edition of the one inch scale Ordnance Survey map of the area. However, the local fuel had been abandoned by the mid-1880s (West 1886).

The last year of substantive information is 1881. In both the *Doncaster Gazette* and *Doncaster Chronicle* of 27 May, the effects of a fire were recorded. The former newspaper stated that:

> A working man named William Chappell, of Thorne, is unfortunately a great sufferer by the fire. For many years he has made a rather large business of graving "turves" for sale, and on Tuesday morning last had a stack ready for immediate disposal.

The *Chronicle* added that "the whole of his large stock of turves" was destroyed; "Mr. Casson had also a large quantity of turves destroyed". Later, on 15 July, recording a visit to Thorne Moors by members of the Yorkshire Naturalists' Union, the *Gazette* recorded:

> On the extensive moors of Makin Durham [entrepreneurial landowner]...a number of men were engaged stacking the peat for fuel; this is sold for domestic and other purposes for about 8s. [40p] per load in Thorne, and a considerable [sic] quantity is sent to Hull and other places. Mr. Casson also uses the peat in a similar manner.

It was commented that once the peat was removed, "the land it occupied is brought into cultivation".

2.2 Peat charcoal in the 19th century

Although the peat fuel trade had been largely a victim of the increasing availability of coal, the years of final decline were also characterized by the development of potentially more profitable uses of peat. This diversification was part of a wider interest in finding new and better ways of exploiting peat, the Industrial Revolution being extended to peat bogs as well as mines. In 1839, William Casson delivered a lecture to the Thorne Literary & Scientific Association entitled 'The district about Thorne, and the formation of peat mosses' (*Doncaster Gazette* 26 April, *Doncaster Chronicle* 27 April). In it:

> The nature and appearance of the timber dug up [on Thorne Moors] was described and specimens shewn; the incorruptibility of peat and its chemical properties noticed; and the cause of its incapability of supporting land vegetables described. Also schemes for compressing peat for fuel, and the admixture of it in a charred state with equal proportions of pitch or rosin [residue after the distillation of turpentine] for the use of the Atlantic steamers, &c.

A similar theme was employed by C.W. Hatfield (*Doncaster Gazette* 3 December 1863; Hatfield 1866) over 20 years later:

> With reference to the utilization of peat and its application to various purposes, we have had the opinion of the scientific and the learned, and experiments of a valuable character,

> but still the great secret of success has not been reached. The employment of labour to a vast amount, the invention of ingenious machines for expelling the water, by centrifugal force, and consolidating it (previously cut and partially dried) by hydraulic pressure, in preparation for charcoal; but these processes have proved to be unremunerative. Several other schemes might be mentioned, but as one is now in operation for converting peat into charcoal, there are good reasons to believe that the efforts made will be gratifying to the promoters.

As Hatfield added these comments to an account of Thorne Moors, it is likely that the charcoal venture, at least, originated from there. In the same decade, Casson (1869) referred vaguely to experimenting with peat for "manufacturing purposes", though any Thorne intention is not known. Irish peat charcoal was advertised in the Doncaster district in at least 1851: "Patent Peat Charcoal" recommended as a manure and for sanitary purposes (*Doncaster Gazette* 14 February-25 April). However, there are no certain data on local peat charcoal until the 1870s.

The Crowle Charring & Condensing Co. was formed to exploit peat for manufacturing charcoal and the products of peat distillation (*Doncaster Gazette* 4 August 1876). The charcoal was produced as an antiseptic agent where animals were kept, for mixing with animal refuse to form a fertilizer. It was also placed with stored vegetables to prevent rotting. The charcoal was being advertised locally in 1876. The company was given a London address, but its Crowle connection must indicate its reliance on local peat. The reason for the demise of the company is unknown, but it had probably failed before the production of moss litter could be seen as offering an alternative market for the company cf. Medge Hall, on the southern flank of Thorne Moors.

The Medge Hall venture involved Wells & Co. This firm was apparently established c.1876 (*Goole Times* 19 February and 16 July 1886). The Thorne parish rate books for 1879 and 1881 [**9**] note the existence of Wells & Co.'s "Peat Works" on 9 acres of moorland owned by them. Significantly, by owning the peat, they were at liberty to exploit peat at all depths, including the lower, humified deposit for charcoal.

In 1884 they were reformed into the Moss Litter, Charcoal & Manure Co. in response to the growing commercial possibilities for moss litter, to augment their peat charcoal output. The Managing Director of the new company named it, as reported (*Goole Times* 19 February 1886), the "Moss Litter and Charcoal Manure Company". In view

of the advent of moss litter production in 1884, charcoal may thus have conceivably been the only earlier product, at least of any commercial significance. Charcoal was at that time a well-established product from Medge Hall. A description of its manufacture there (*Goole Times* 22 January 1886) observed:

> The method of carbonising peat is simple, quick and economical. Blocks of peat are loaded on iron trucks or waggons, which are run into brick-arched chambers, the carbonisation being effected by means of superheated steam driven through the ovens. The time occupied in turning the peat into carbon is about 4½ hours. The peat on being withdrawn from the charring ovens, is run into cooling chambers freed from atmospheric air, and is ready for use as charcoal, in about 4½ hours. The charcoal thus obtained is ground to powder and sold for sanitary and agricultural purposes.

The output of the works in July 1887 was described as "peat moss litter and charcoal, &c." (*Doncaster Gazette* 15 July). The charcoal was alluded to again, seemingly in December 1888 (*Goole Times* 23 August 1889, quoting the *Yorkshire Post*):

> A patent charcoal is also made from the peat, a tramcar loaded being run into the furnace and out again in a few moments. It is then passed into a cooling place, where it is subjected to the influence of carbonic acid.

It seems likely, though the wording is insufficiently explicit, that an average of about 1 ton of peat per hour could be employed in the process.

There are other allusions to the manufacture, or intended manufacture, of charcoal from Thorne Moors peat. Payne-Gallwey (1886), apparently quoting information predating the establishment of moss litter production, observed that from the peat, "charcoal is now extensively manufactured and sold for agricultural purposes". A further, similarly dated reference (*Goole Times* 16 July 1886) observed that a proposed moss litter company at Creyke's Sidings also thought it worthwhile to enter the charcoal trade:

> The Peat Moss Litter Company will be able not only to prepare litter but also fuel, not that it would pay to specially work for the latter object, but that portion of the peat not found suitable for either, will find a paying market as fuel. Peat charcoal, too, is in increased demand, and this will also be an item of production.

Ussher (1890) was perhaps thinking of Medge Hall when he referred to a factory on the edge of Thorne Waste erected for converting wood ("great numbers of trunks and stumps" being available) into charcoal, used as a manure. In referring to the preserved timber, Ussher might have been under a misapprehension about the nature of the raw material used for charring. However, it is also possible that experiments with the

abundant timber may have been tried at Medge Hall. Notwithstanding this, suitable wood could never have been readily available in commercial quantities to sustain a factory from that single source.

2.3 The Paraffin Mill

A "Peat Mill" is marked on an 1868 geological section of Thorne Moors [**10]**. A plan [**11**] of the same part of the moorland, also dated 1868, includes the same building (or one on the same site), but labels it "Steam Engine". It was situated next to model cottages built in 1866 [**12**] along Durham's Warping Drain at the top of Warp Farm (grid ref. SE705172). The mill was described as "recently erected" in 1870 (*Doncaster Gazette* 14 October), though as with the earlier references, the specific uses of the mill were not volunteered. Mill Drain was dug post-1862, and was named after this mill. The Thorne scheme was contemporary with the model cottages built along Durham's Warping Drain. Significant access would not have been possible until the success of land reclamation and the creation of an agricultural infrastructure, following the opening of Durham's Warping Drain in 1856 (*Doncaster Gazette* 16 May 1856, 3 December 1863, 8 May 1908; Hatfield 1866).

Subsequently, Thomas Bunker, writing of the site c.1876, remarked (Limbert 1983):

> a tall chimney marked the spot where buildings were erected in which paraffine was to be made from the peat; it proved an unfortunate affair.

There are several supporting sources. In his reference to Thorne Moors, Ussher (1890) affirmed that an apparently unsuccessful attempt had been undertaken to produce paraffin from the peat, though he did not precisely localize the venture. There is an 1899 reference (*Goole Times* 3 March) to the "Paraffin mill" at Moorends. What was almost certainly the same enterprise was alluded to (*Doncaster Chronicle* 10 June 1927) almost 30 years later, noting that paraffin had been extracted from the peat but not in a financially viable way.

However, a more helpful reference is an appraisal of the life and work of the Thorne entrepreneurial landowner and civil engineer Makin Durham (*Doncaster Gazette* 8 May 1908). This notes that he attempted to manufacture paraffin and derive an artificial fuel from the peat:

> He was a great believer in the future value of peat, and experimented a great deal. He built a large mill, and equipped the same with machinery for the manufacture of paraffin

> from peat, which ended unsatisfactory, the mill now being used for moss litter purposes...He also produced a very good fuel by the admixture of peat, coal dust, etc.

In 1911 it was observed (*Yorkshire Daily Observer* 25 April) that Durham had established and equipped a large mill for extracting paraffin from the peat, but was "unable to produce satisfactory results". The principal clue to the precise date of establishment of the mill is given in the *Doncaster Gazette* of 27 June 1930. This reported on the demolition of the Paraffin Mill chimney-stack on 24 June:

> The stack was originally built for a plant to extract paraffin from peat, but as the enterprise was not altogether successful, the stack had been in disuse for many years.

As it was described as 68 years old, it was built in 1862 [**13**]. Conversely, the precise demise of the paraffin venture has not been ascertained. However, as it was extinct by c.1876, it had probably been terminated for several years.

The vague allusions by C.W. Hatfield (*Doncaster Gazette* 3 December 1863; Hatfield 1866) and Casson (1869, 1874) to "schemes" and "experiments" were perhaps more applicable to the paraffin/fuel venture than with early charcoal manufacture. Even today, the moss-covered bricks and rusting iron marking the site are known as the "Paraffin Mill/Works" (not the later Moorends peat works at the same site), a remarkable case of nomenclatural inertia recalling a failed use almost 150 years ago.

It is presumed that Makin Durham's scheme was to have profited from the isolation of the volatile constituents of the peat. This technology was centred on the distillation of paraffin wax from the peat for making products like grease, lamp oil and – especially – candles. "The paraffin of commerce, a beautiful, translucent, snowy-white, wax-like substance" (Leask 1881) was ideally suited to the production of candles. However, ultimately peat paraffin was never a serious commercial competitor to paraffin from its major successive sources, cannel coal, oil-shales and petroleum. From the 1860s, the Scottish oil-shale industry suffered increasing competition from American petroleum. In the succeeding decade, this was further compounded by the importation of American paraffin wax (Conacher 1927).

Although paraffin wax did become a commodity of importance, especially when mixed with stearine (a preparation of purified fatty acids) to make good quality candles, the raw material was derived largely from the oil-shales and petroleum that became overwhelmingly available in the second half of the 19th century. From 1851, J.C. & J.

Field, a London company, attempted to make use of paraffin wax and refine it for candle making, with a method of paraffin candle manufacture being patented by them in 1854 (Field & Field 1895; *Doncaster Gazette* 10 October 1862, quoting *Court Circular and Court News*). The first paraffin candles sold in England were made by Field in 1857, contra Gregorius (1908) who believed that the first paraffin candles on the market were those made by Price's Candle Co. Field derived their paraffin from Irish peat (*Doncaster Gazette* 10 October 1862, quoting *Court Circular and Court News*). Interestingly, Michael Faraday, in his famous lecture series 'The Chemical History of a Candle', given at the Royal Institution during 1849-60, had examples of paraffin candles. These were "made of paraffin obtained from the bogs of Ireland", and were supplied by "Mr. Field, of Lambeth" (Faraday 1960). However, Field's Irish peat source failed, and paraffin obtained from Scottish oil-shales was substituted (*Doncaster Gazette* 10 October 1862, quoting *Court Circular and Court News*). In the same period, Price's Candle Co. also began marketing paraffin candles, their raw material being Burmese naphtha (Barlow 1858). At the time of London's International Exhibition of 1862, peat paraffin was generally regarded in Britain as uncommercial (*The Times* 9 September).

Yet it was in 1862 that the Thorne venture was launched. It is intriguing to speculate on Makin Durham's inspiration for it, and on the source of the expertise. Equally unknown are the precise mode of operation and the reasons for failure. Durham's enterprise was approximately contemporary with one in the Outer Hebrides, spanning 1857-74 (Crabbe 2000), also trying to make a viable business from peat distillation. Crabbe (2000) described the Hebridean operation as "the world's first technically successful and economically viable peat distillation plant built on a semi-industrial scale". It was described contemporaneously by Paul (1862), and might conceivably have been a partial inspiration/model for Makin Durham.

2.4 The end of peat as an unrefined fuel

From the first decade of moss litter production, the 1880s, until the 1960s, there are occasional published references to the use of peat as a local fuel (Wheeldon 1894, Taylor 1953, Hyde 1953) [**14**], and there were frequent recollections. The local existence of peat-burning hearths is also significant [**15**]. Even until comparatively recently, peat was employed somewhat routinely as a means of eking out coal supplies. Instances of this latter involve peat usage on farms, from boiling potatoes for pig food

to powering a threshing machine. At village forges, blacksmiths at least sometimes preferred the heat generated by peat turves. Peat was used in dwellings, for example on the edge of Crowle Moor and at Medge Hall, the latter until the closure of the peat works there in 1966. Peat workers conveyed a turf or two home for the same purpose. Generally, coal was augmented – especially overnight – by a mixture of turves and coal 'slack'. The same must have been true of Hatfield Moors. Potter (n.d.) [**16**] is typical, recalling life on the edge of Crowle Moor in the 1920s:

> Groceries and coal were delivered each fortnight although a lot of our fuel was the black peat. These turves made a hot fire, to scorch our faces & legs but they smelled herby & pungent & very pleasant once we had become accustomed to the reek. They succeeded in making us a messy hearth full of grey ash & there was always dusting to be done.

Of related interest, moor edge householders had problems in summer with biting nematoceran flies (Limbert 1998). A smouldering turf on a doorstep provided a compromise, by keeping many of the flies at bay, and allowing a draught of cooler – but inevitably smoky – air.

In addition to the small scale usages of peat as fuel, there were occasional episodes in the 20th century when peat briefly had wider importance. This occurred when coal prices became inflated or fuel of any kind was hard to come by. At the beginning of the century, Wheeler (1901) wrote:

> The difficulty in obtaining coal for industrial purposes, and the high price that has had to be paid for it recently, especially where works are situated at long distances away from the mines, has led to more attention being paid to the use of peat for fuel.

In 1911, the *Yorkshire Daily Observer* (25 April) commented that some Thorne peat "is used for fuel, so far as there is a demand for it". Dobson (1912), working on the Axholme Joint Railway at Reedness Junction, north of Crowle Moor (Judge 1994), stated that "During the recent trouble in the coal world, several people in this neighbourhood obtained peat turves to burn when they had no coal"; he added that the "engines at the peat works are regularly fired with this fuel".

During and after World War I, a time of fuel shortages, the only traced evidence of a greater role for peat from Thorne was its hawking around Goole streets (*Goole Times* 20 May 1921). Subsequently, peat received some prominence in 1921, during the national coal strike of that year. In the three months of strike, coal famine and unemployment, the Doncaster newspapers contained a regular advertisement [**17**] for Dunston &

Polden, Doncaster coal merchants, who were offering sacks of peat turves from Thorne Moors. At Goole, turves obtained (illegally?) by the town's unemployed found "a ready sale in the streets" (*Goole Times* 20 May). During April-May 1921, peat received some publicity in the *Doncaster Gazette*, with 'Carmelite' observing (22 April) that the "dwindling of domestic coal stocks had brought the peat cart again on the streets". It was stated on 29 April that two Doncaster firms were deriving peat supplies from Thorne Moors. A spokesman for Dunston & Polden extolled the virtues of peat as an unrefined fuel, adding that it was excellent when mixed with coal 'slack' that would not otherwise have been used. In addition to "hundreds of customers" locally, "large supplies" of peat were also going to neighbouring districts.

After the events of 1921, fuel peat from Thorne Moors seemingly returned to its economically marginal status until 1926. Although the General Strike of that year lasted only from 4-12 May, coal miners continued their struggle until poverty and starvation forced a return to work six months later. The first evidence of fuel peat becoming available locally is an advertisement in the *Doncaster Gazette* of 28 May, by Poldens Ltd of Doncaster. It continued to 11 June. The *Doncaster Gazette* of 4 June remarked on "small quantities" being offered for sale in the town, and also in Thorne where the peat was "keenly sought after as the supply of coal is meagre". On 25 June, the same newspaper reported that "a quantity of peat at a 1/- [5p] per bag has been sold". Published memory (Tuffrey 1992) of Doncaster at that time includes that of Harry Watling, who recalled "people coming into [Cartwright] street, during the 1926 General Strike, and selling peat". An article in the *Doncaster Gazette* of 30 July investigated the local peat industry at that time, and commented:

> Even in Doncaster it needs a shortage of coal, and the appearance at our doors, of itinerant merchants offering bags of peat as a substitute fuel, to remind us that only a few miles from the centre of the town are extensive peat moors, where the cutting of peat for commercial purposes has been a local industry for generations...under the light peat...lies the black peat which served formerly, and still occasionally serves, as fuel.

Pontefract and Hartley (1939) observed that although peat was still cut extensively on Thorne Moors, "little is sold for fuel now". Subsequently, and more widely in Yorkshire, the coal shortages associated with World War II led to a revival of interest in peat fuel (Illingworth 1947). However, no advertisements or notices offering local peat have been discovered in Doncaster's wartime newspapers. Announcements backed by

the Ministry of Fuel and Power exhorted frugality in the burning of coal and the maximum exploitation of "Coke, Wood or other solid fuels". Taylor (1953) stated that peat had horticultural and other uses "as well as fuel".

It is likely that the last occasion when peat was taken in an attempt to use it as fuel occurred during the 1984-85 coal strike. Miners removed peat (and timber) with the intention of burning it as a free fuel, reinforced by a vague belief that they were exercising their common rights on Thorne Moors. This included lumps of peat dug from the surface, and the purloining of sod-peat cut by Fisons for horticultural use, neither source being suitable for a domestic fire.

An interesting survival of the right of some Thorne property owners to take peat as a fuel, was documented in the *Doncaster Star* of 16 August 1989, and referred to again by Caufield (1991a, 1991b).

2.5 Peat coke and distillation

Following the construction of the first Thorne gas works in 1836 (White 1837, Casson 1869, 1874), it is recorded that an experiment was undertaken whereby local peat was employed – presumably as peat coke – in the retorts of the Thorne Gas-Light & Coke Co. Ltd. It was, however, found to be unsatisfactory as the pipes and jets were quickly obstructed and needed much cleaning (Taylor 1953, Dallas n.d.). Perhaps from this experiment, Casson (1869, 1874) derived the following:

> The peat...is very combustible, and when submitted to the action of fire in an iron retort produces gas capable of supporting a clear white flame, tar, and ammoniacal liquor, and other products. Pipes through which turf gas has been passed acquire a very peculiar smell, quite different from that emitted from coal gas, but not less pungent and offensive.

Anon. (1900) noted that peat production for conversion into fuel as a substitute for relatively expensive coal was leading to the exploitation of peat reserves in Ireland and Cumberland, "while other stores of peat are to be exploited in Yorkshire, Devonshire and other counties". There are two known instances of interest in Thorne peat for coke production and associated distillation in the early 20th century.

Peat coke was well-known in parts of Europe as an artificial fuel and source of by-products. It was used both domestically and in iron smelting and gas production. Although high in carbon content, peat coke is low in ash content, sulphur and

phosphorus, being thus, for example, well adapted for tempering some types of iron. At one time, peat coke was of significance in Austria, Germany, The Netherlands and Russia, though often with little recovery of associated by-products (Hausding 1921, Appleton 1954). The relative lack of interest in Britain was principally due to the large supplies of accessible native coal, and the greater yields of by-products from it. To this was added the difficulties of storing and transporting bulk peat economically, when again in direct competition with more valuable coal.

In the later 19th century, a renaissance in peat carbonization on the Continent saw plans for the improvement of the process put into operation. Most schemes were given up as failures, but one of the more significant has some relevance to Thorne. Dr Martin Ziegler, a civil engineer and chemist from Berlin, invented a way of coking peat by applying and modifying a method that had been successfully used for coking lignite. The process was trialled at Oldenburg, in Lower Saxony, from 1894 to 1897, and was patented in the latter year. It remained in use there, in improved forms, until 1913, and further factories were built, for example in Bavaria and Russia. Details of Ziegler's process are available from Turnor (1905), Anon. (1907), Nyström (1908), Gissing (1909, 1920), Davis (1911) and Hausding (1921), this attention reflecting its relative success. Stress was laid on the distillation and utilization of the condensable substances like tar, ammonia and acetic acid, carried over in the waste gases, for without this the coke would undoubtedly have proved uneconomic. It was also important that the retorts should be in continuous use, and that the coke obtained should be compact and suitable for smelting. In this latter respect, Ziegler's process did produce a good coke for metallurgical use, providing that suitable dense peat was employed. Once the peat-carbonizing oven had been charged with its raw product, it was initially peat fuelled, but this could be replaced after 48 hours by the combustion of the gases given off, with no other fuel required. The peat-coke produced was a substitute for wood-charcoal, and in many cases even for coke from coal. The poorer types of peat could produce "peat half coke" or "semi-peat coke" without modification of the plant. This was peat not entirely coked, and had application in firing boilers, including those of locomotives.

The marketable compounds derived from the peat were illuminating oil, creosote, paraffin wax, ammonia, acetic acid and methyl alcohol. The saleability of the peat coke, and the commercial value of the whole process, depended on five identified factors. These were the availability of economically won, suitable peat, the cost of

production of the peat coke (including transportation), the scale of production, the selling price of the by-products, and the prevailing market prices of the competing wood-charcoal and coal. Ultimately, these variables rendered the peat coke and associated products insufficiently worthwhile, despite their proven chemical and technical worth.

In Britain, despite some optimism, Ziegler's peat coke did not achieve any tangible result. A syndicate was formed to promote the product, and contact was made with the British Moss Litter Co. in 1901 (Goodchild 1971-73). It was proposed to build two furnaces locally, to consume 36 tons of peat daily. The peat required was the deepest, more humified 'black' peat. The British Moss Litter Co., taking the upper, 'litter' peat as bedding, delayed a decision on the proposal until its own right to the 'black' peat had been established. In March 1902, the company agreed to the coke syndicate operating on Hatfield Moors. Here, the 'black' peat was regarded as better quality (presumably fewer paludified tree remains) than on Thorne Moors, though in 1903 negotiations were entered into to take 'black' peat at the Moorends and Medge Hall moors as well. Despite this, the local plans failed to reach fruition.

Anon. (1907) stated that the proprietors of the British Ziegler patents were "making arrangements for the manufacture of peat-coke and chemicals at works to be established in Ireland". Subsequently, in 1908, the West of England Peat Syndicate Ltd was formed to acquire the British patent rights to Ziegler's peat coke, and it was planned to erect a trial plant on Dartmoor, to demonstrate the practicality of the process (Gissing 1909). This was attended "with great fanfare...but, predictably enough perhaps, without great success" (Crabbe 2000), and Ziegler peat coke was finally abandoned in the British Isles.

Besides Ziegler's peat coke, in the first half of the 20th century there are other instances of Thorne peat being made available, or apparently so, for experimental processes (e.g. Perkin 1914b, Hinchley 1922, Quarendon 1941). An example that reaped some success is the second known instance of interest in Thorne peat for coke production and associated distillation. This was centred on Leadbeater peat coke. J.W. Leadbeater launched the Peat, Coke & Oil Syndicate Ltd, of Doncaster, in 1912, with Crowle Moor as the Syndicate's source of peat. Research on this peat coke and its by-products is continuing by the writer. However, some information is already published inter alia by

Perkin (1914a). He referred to the Peat, Coke & Oil Syndicate as carbonizing peat to produce briquetted coke:

> The peat is not briquetted previous to being carbonised, the briquetting operation being carried out with the peat coke obtained in the process. This is mixed with certain binding materials, some of which are obtained from the peat by-products.

These latter were described as "water-free crude oils", ammonium sulphate, "spirit (petrol)" and "spirit 160°-200°". He added:

> Apparently the methyl alcohol and phenols had not been worked up. The paraffin was left in the pitch, which makes a good insulating material. The briquettes produced by this process are very hard and have been well reported upon for steel smelting.

It was noted that it was proposed to erect a plant capable of dealing with 100 tons of coke per week. Preliminary tests were said to show that the by-products alone would easily cover the costs of the process, ensuring that the sale of the coke could be regarded as all profit. Gissing (1920) alluded to the same venture:

> In the "Leadbeater" method of making briquettes, the fuel is composed of about 40 to 50 per cent. of peat, mixed with about 15 to 25 per cent. of pitch, and from 25 to 45 per cent. of coal or coke. These quantities may be varied within the limits specified, according to the nature of the peat used. The pitch and peat are first mixed together, then the coal or coke is added, and the whole well mixed. This mixture is first placed in a mould and transferred to a retort which has been heated to a suitable temperature – about 800 to 1000 degs. Fahr. – in order that the pitch may be melted so as to remove the tarry matters from the coal and form a porous substance. The fuel thus produced is practically smokeless. It will give off a greater heat than the ordinary briquette, and with little or no waste or ashes.

The Leadbeater process was also capable of providing charcoal for decolourizing purposes. Under this heading, Gissing (1920) wrote:

> The "Leadbeater" process necessitates the admixture of dried peat with good ground caustic (unslaked) lime. The addition of lime assists in breaking up and disintegrating the peat fibres, and enables a charcoal of low density and specific gravity to be produced in a granular friable state, possibly only when a dry mixture is used in the course of distillation. It is not necessary to grind the carbon produced by this process before proceeding further, and the volatile products (oils, acetic acid, methyl alcohol, and ammonium sulphate) exceed slightly the amount obtained when peat alone is distilled.

At the time of these allusions, the Peat, Coke & Oil Syndicate moved to Earlestown, at Newton le Willows in Lancashire, taking over and converting the premises of the

Earlestown District Council Gas Dept. Peat coke, peat carbon and associated by-products were subsequently produced, the raw peat being derived from White Moss, Radway Green, close to Alsager, Cheshire.

2.6 The early moss litter companies

Until the 1880s, peat exploitation on Thorne Moors was peripheral, with the workings remaining relatively close to lines of communication, which advanced as the peat receded inwards. An essentially new industry emerged in the 1880s, as new uses for peat became translated into viable products with a mass market. By far the most important of these new uses was as bedding litter for domesticated animals, mainly horses. As bedding, it was elastic and comfortable, absorbent, a deodorizer and natural disinfectant, which had a favourable effect on the health of animals.

The establishment of the moss litter industry at Thorne effected a radical change, with the whole peat surface, much of it far beyond the marginal workings, becoming divided up by the various litter firms. Organized transportation was required to traverse and exploit this formidable terrain. In parallel, the bog surface had become relatively consolidated. This dated from the digging of major drains and boundary ditches following the Thorne Moor Improvement Act, 1861. The drains were Shearburn & Pitts Drain, Mill Drain, Cottage Dyke, Angle Drain and Swinefleet Line Dyke. Thousand Acre Drain, along the western edge of the 'Participant' turbary, may date from this time, although it could have originated differently, as an aggregation – at least in part – of boundary ditches across individual strip holdings. Casson (1869, 1874) observed that, following the very dry summer of 1868, the peat had lowered and compressed amazingly. He was optimistic about future prospects for reclamation. However, Byford (2005) added that 1868 was followed by "the very wet years of the 1870s when much of the optimism of British arable farming was washed away". Reclamation for agriculture on a large scale was no longer worthwhile, and once again attention was transferred to exploitation of the peat itself. The drainage initiated in the 1860s offered the potential of peat winning and transportation on a significantly wide scale.

Horses remained an integral part of all aspects of daily life until World War I, providing an immense European market for an economically priced bedding material. The first peat litter factory in Germany was built in 1879 (Göttlich et al. 1993), with the first in Britain and The Netherlands both in 1882 (Anon. 1885, van de Griendt 2002) [**18**].

Given the market potential, the widespread availability of the raw material and ambitions for its exploitation were sufficient to ensure a period of intense competition.

As a part of this development, interest in Thorne peat for moss litter commenced in 1884. At that time, much warpland had been put on the market, as a response to poor growing seasons in the 1870s and the more fundamental problem of underlying agrarian depression. The efficacy of reclamation by warping at Thorne was still being extolled in 1884 (*Goole Times* 8 August), but there was already a shift to regarding peat once again as an intrinsically marketable commodity, and not merely a hindrance to land improvement. The potential of peat carbonization and distillation had led the way, with the reality of moss litter production elsewhere fulfilling the restored belief in Thorne peat.

Despite some initial scepticism and difficulties (Nunn 1905, Gunnill 1908), arising from vested interests, the acceptance of moss litter was stimulated by the success and prevalence of imports from Germany and The Netherlands. There was confidence in the prospect of undercutting the price of imports, aided by customer resistance to litter originating from Germany (Nunn 1905). The inferior quality of some of the earlier imports fuelled the growing dissatisfaction. Nevertheless, in the mid-1880s imports from Europe eclipsed infra-national competition, and even two decades on, Gunnill (1908) was able to note "large stocks of foreign imported [litter]" at Goole docks, almost within sight of massive production at Thorne.

In the 1880s-90s, before the creation of the British Moss Litter Co., a succession of companies became established on Thorne Moors. There was also one on Hatfield Moors. Additional concerns and individuals set themselves up on Crowle Moor. Work by the writer on these early peat companies (sections 2.6 and 2.7) is ongoing, and the following information is preliminary and incomplete. No individual accounts are offered for the two local concerns with Dutch links. The first of these was the Newman & Owston Moss Litter Co., which acquired the Paraffin Mill for conversion into a peat litter works. The second was the Griendtsveen Moss Litter Co., which took over the Newman & Owston Moss Litter Co. and thereby inherited the 'Paraffin' site.

In the 1880s, the recast order was viewed with hope in a region dominated by the retrenchment in farming, the *Goole Times* (15 March 1889) considering that Thorne was

entering “an era of prosperity”. By March 1889, the “four moss litter works [that] had just been started in the neighbourhood” employed 326 people, with this figure predicted to rise to 1000 (*Goole Times* 22 March 1889).

Medge Hall became the first works to manufacture moss litter, when Wells & Co. reformed in 1884 to become the Moss Litter, Charcoal & Manure Co. Presaging the immigration of Dutch peat workers in the following decade, in 1886 about 100 unemployed London labourers were encouraged to march 200 miles to take up work with the Moss Litter, Charcoal & Manure Co. However, many of the “London bog men” quickly left the employment (*Goole Times* 20 February; *Doncaster Gazette* 26 February, 2 April; Scrivener 1886). A fire on the company’s moor in 1887 saw up to 140 men trying to extinguish the blaze (*Doncaster Gazette* 15 July), and in 1896 a similar emergency was attended by c.200 men (*Doncaster Gazette*, *Goole Times* 15 May). On the latter occasion, 8000-10,000 tons of drying peat was lost. The Thorne Parish Rate Books [**19**] note the existence in 1887-88 of “The Moss Litter Co. Ltd” and the “Peat Moss Litter Co. Ltd” respectively. These were clearly generic names for the Medge Hall company. References to the ‘Britannia’ moss litter company are also allusions to the same business [**20]**, derived from a trade name.

In the *Crowle Directory* of 1888 [**21**], an advertisement placed by the Medge Hall company for their moss litter, “For Bedding Horses, Cattle, and Pigs, instead of Straw”, included testimonials by two users from Crowle. The company’s business address was given as 19, Leadenhall Chambers, London.

Confusingly, a company named the Peat Moss Litter Co. *did* exist, from 1885 (*Goole Times* 2 October), and was apparently the second of the Thorne Moors concerns. Initially, it was reported that it was to be named the British Improved Peat Litter & Tillage Co. (*Goole Times* 2 October 1885, 29 January-20 February 1886), with works at Creyke’s Sidings. This was to utilize 1000 acres of moor leased from the Creyke family of Rawcliffe Hall. The company prospectus (*Goole Times* 29 January-20 February 1886) sought to demonstrate the viability of the venture by projecting prices based on those of the Moss Litter, Charcoal & Manure Co. It was initially estimated that the new company would clear 20 acres annually, yielding 10,000 tons of dried peat (*Goole Times* 2 October 1885, 29 January-20 February 1886). These respective figures were later revised to 33 acres and 20,000 tons.

Retrospectively, the Peat Moss Litter Co.'s greatest interest lies in its apparently unique intention to employ a steam-powered peat cutting machine manufactured by John Fowler & Co. (Leeds) Ltd [**22**], though there is nothing to indicate that it was even built. It was also noted that the company proposed to employ its own steam vessel to convey the peat, adapted for travelling on canals and the River Thames, to effect a saving on railway rates. It was further noted that the peat dust created in the process of litter manufacture was to be used as a basis for tillage and as an absorbent in earth closets. The company was still in existence in 1889 (*Goole Times* 23 August, 8 November), though it is known that there was a successor company at the Creyke's Sidings Works by 1893.

H.T. Bennett, "one of the pioneers of the local peat moss industry" (*Goole Times* 19 September 1919), formed the third of the Thorne Moors companies, Bennett's Moss Litter Co. This was the origin of the Swinefleet Works, initially known as the Marshland Peat Works. Its machinery was completed in 1886, at which time 40 people were employed in "cutting and carrying off the turfs" (*Goole Times* 20 February 1886). The company had buildings and a wharf at Swinefleet Clough on the River Ouse, which were linked by narrow gauge rail to the Swinefleet Works. This riverside property was for the storage and transhipment of peat for water and other conveyance.

A new Bennett's company was formed in 1888, apparently marking the sale of the original company by H.T. Bennett to John Bennett (*Goole Times* 24 August, 7 December). J. Bennett & Co. acquired additional land and added machinery and plant within the year of purchase. This gave an output of 40 tons of moss litter for each 8½ hour day (*Goole Times* 7 December 1888). Despite this confidence, a receiver was appointed in 1891, and the following appeared in the *Doncaster Gazette* of 9 December 1892:

> The Peat Works of J. Bennett and Co. (Limited), which have been closed over a year, have been sold during the last week (buildings, plant, and moors) to a firm who intend to commence working again as soon as possible...We hear that the moss litter trade is now good, and we wish the new firm success.

A company given as Bennett's Moss Litter Co. was in operation in 1893, but its precise fate is not known.

The next company based at the Swinefleet site was the Goole Moss Litter Co., which was registered in 1894, with its office at 33, King William Street, London (*The Colliery Guardian, and Journal of the Coal and Iron Trades* 11 May). Within a year, the company claimed to have satisfactory trade, and planned to double its works output (*Goole Times* 1 March). In 1896, the Goole company was producing c.10,000 tons of moss litter annually (*Goole Times* 14 February), and worked its plant until November of that year (*Goole Times* 10 March 1899). One of the products was peat made up in canvas bags, fulfilling Government orders, believed to have been employed in fortification work (*Goole Times* 3 March 1899).

William Smith & Co existed from at least 1893 to 1896, occupying works at Old Goole and Creyke's Sidings, the *Goole Times Illustrated Almanack 1896* noting that the former works had been "recently erected" for the company. It is not known if William Smith & Co. directly followed the Peat Moss Litter Co. at the Creyke's Sidings Works. Adjacent to the latter there was a small works manufacturing at least some peat-based products, like firelighters and 'charbonite'. Apparently managed by William Smith & Co., it was doing very little business by the early years of the 20th century. Goodchild (1971-73) considered that the company may only have been partially taken over in the formation of the British Moss Litter Co., as in 1904 rent was paid to Smith's by the British Moss Litter Co.: "Old Goole Mill for storing tillage".

The first litter company at the Paraffin Mill was the Newman & Owston Moss Litter Co., from 1889 (*Goole Times* 1 March, *Doncaster Gazette* 20 December). In 1893, this company was taken over by the Griendtsveen Moss Litter Co. There are two published histories of the latter company (Wasser 1968, van de Griendt 2002).

2.7 The Hatfield Chase Peat Moss Litter Company

In 1889, it was said that the old peat fuel trade on Hatfield Moors had "practically died out" (*Doncaster Gazette*, *Goole Times* 23 August). The *Doncaster Chronicle* (23 August) referred to "One "old inhabitant", who has known the moors for an extended time, and has been employed upon them for thirty years". However, he may have been a gamekeeper, or involved with land reclamation, and so not necessarily removing peat.

The Hatfield Chase Peat Moss Litter Co. obtained a lease from the Wright family, owners of Hatfield Moors, known as the Lindholme Estate. The directors of the new

company included Charles Wright and Lord Scarbrough. The company had secured c.3000 acres of moorland on a 50 year lease. The works, on the northern edge of Hatfield Moors, were opened (by Mrs Wright) in August 1889, when 500 acres were being actively exploited, and the amount of cut peat already equated to c.10,000 tons of saleable litter. Peat dust was also sold, as a substitute for sawdust in slaughter-houses. Between 50 and 60 men were employed on the moors and at the works when it opened, this being a great boon to employment in Hatfield Woodhouse and Hatfield (*Doncaster Gazette* 23 August 1889, 23 December 1892; *Doncaster Chronicle*, *Goole Times* 23 August 1889).

It was noted in 1892 (*Doncaster Gazette*, *Doncaster Chronicle* 23 December) that from August 1889 the company had exported its peat to Maud's Bridge station on the Manchester, Sheffield & Lincolnshire Railway. To do so, five horse-drawn drays were employed, each weighing 16cwt and able to carry a load of 2 tons. It was also stated that the company "carried about 8,593 tons in a year" (*Doncaster Gazette* 23 December). Two of the companies exploiting the Thorne peat also carted along highways, William Smith & Co. and Bennett's Moss Litter Co. They carted for about 2 miles each, using drays, through Goole.

Six plans survive [**23**] of the Hatfield Chase Peat Moss Litter Co. Five of them show inter alia the company's peat workings, situated in the north-western sector of Hatfield Moors, to the north of Lindholme Bank Road. This evidence spans November 1888 to August 1896, implying that the original lease was obtained in the former year. The sixth plan, entitled 'CONCRETE FOUNDATIONS FOR HYDRAULIC BALING PRESS', dated 11 October 1893, shows evidence of an existing press. This latter was presumably that built for the original works by Ladd & Co. of London, producing 1.5cwt bales (*Doncaster Chronicle* 23 August 1889). This same source stated that "there is a large engine house fitted up with a powerful [steam] engine supplied by Messrs. Marshall and Sons, of Gainsbro'".

In 1896, when the Hatfield company became a part of the British Moss Litter Co., it (together with its modest stock of peat) was bought for £19,000, cf. the Griendtsveen Moss Litter Co. whose partial interest was bought out for £58,000, and the Moss Litter, Charcoal & Manure Co. bought out for £27,000 (Goodchild 1971-73).

2.8 The British Moss Litter Companies

The British Moss Litter Co. was incorporated in 1896 as an amalgamation of the Hatfield Chase Peat Moss Litter Co. and parts or all of the interests of the companies then exploiting the Thorne peat. The *Doncaster Gazette* (6 January 1899) noted that since the partial amalgamation of the smaller companies, "the suicidal competition has ceased", and the shareholders had received a good return on their investment. Aggressive price competition had begun in the spring of 1895, and although arrangements were entered into from the beginning of 1896 to avoid price cutting, events dictated the union of most of the Thorne and Hatfield companies later that year. Early in 1899, the British Moss Litter Co. of 1896 was described as the largest moss litter producer in England, "having about 8000 acres of peat land, with seven factories, and practically controls the English trade, which is yearly becoming more important" (*Doncaster Gazette* 10 February). However, one of the smaller companies, the Goole Moss Litter Co., was not actually purchased for a further three years, though it ceased trading in 1896 and agreed to its works being leased to the British Moss Litter Co. under a working agreement (*Goole Times* 10 March 1899). The *Goole Times* (3 and 10 March 1899) and the prospectus of a restructured British Moss Litter Co. noted the eventual amalgamation of the British Moss and Goole companies, "with a view to the sale of the amalgamated company to a new company".

The new company was confusingly also known as the British Moss Litter Co. This restructured namesake, formed in 1899, had a virtual monopoly of the Thorne/Hatfield industry, and also inherited a mill at Glazebury, processing peat from Chat Moss, Manchester. The latter had been originally set up by the Newman & Owston Moss Litter Co., and the British Moss Litter Co. also acquired other properties in Lancashire and Cheshire.

With increasing trade, the British Moss Litter Co. of 1896 required restructuring on a broader basis, with a view to obtaining a Stock Exchange quotation for its shares and debentures. The company was also in need of additional working capital (*Goole Times* 10 March 1899; *Doncaster Gazette* 12 January 1900). The new British Moss Litter Co. of 1899 commenced at a seemingly auspicious time for the trade, its prospectus being markedly optimistic. It advised that the company's peat deposits in Yorkshire were "of the finest quality, and well situated for supplying the manufacturing towns of Yorkshire and the Midlands, as well as being conveniently situated for supplying the great London

market, both by rail direct, and by water carriage". The area supplied with Thorne peat 1898-1901 included much of England and parts of Scotland, but especially northern England and the north-east Midlands. The *Goole Times* (3 and 10 March 1899) described the industry as successful and profitable, and in support quoted from the prospectus of the company the Thorne and Hatfield – but apparently not Glazebury – output figures from 1893 (39,444 tons) to 1898 (74,948 tons). However, at that time, market competition from home and foreign moss litter was intense, and a heavy straw 'crop' could depress the market for moss litter.

The British Moss Litter Co. was enjoying an abundant raw material, that was relatively concentrated and accessible, providing easier monopoly conditions. This favourability was enhanced by access to the national railway and waterway networks, with large, though variable and internationally coveted, British markets to compete for. Nunn (1905) stated that the peat moss industry was by then chiefly worked by the British Moss Litter Co., and he added that the firm then held over 10,000 acres of peat in Yorkshire (and marginally Lincolnshire) and north-west England.

Despite its withdrawal from direct exploitation at Thorne, the Griendtsveen company maintained an interest in the British market, and in 1900 agreed with the British Moss Litter Co. to form a jointly-operated and -owned distributive concern, the Peat Moss Litter Supply Co. This became enlarged as other companies joined. Goodchild (1971-73) listed the London & Provincial Moss Litter Co., Richardson's Moss Litter Co., and from Drenthe in The Netherlands the Klazienaveen Moss Litter Co. In its later years, the supply company was based at Carlisle, reflecting the influence of Richardson's Moss Litter Co., formed in 1883.

Although there was a legacy of optimism from the restructuring of the British Moss Litter Co., the Edwardian decade witnessed a lessening demand for moss litter. The former general dependence on horsepower was becoming gradually replaced by new forms of energy, and transportation by motors and electric trams all became commonplace. For the peat industry, with its major outlet to horse owners diminishing, there was no large scale replacement in prospect, with the existing subsidiary uses of peat remaining relatively insignificant.

At the end of the 19th century, the British Moss Litter Co. had 370 workers on Thorne Moors (*Goole Times* 3 March 1899): 150 at Medge Hall, 100 at Moorends and 60 at both Old Goole and Creyke's Sidings. The works at Hatfield and Glazebury added 60 and 50 respectively. This was hardly more at Thorne than the total working on the moors ten years earlier. However, the Old Goole Works was soon abandoned, and merely used for storage until about the time of World War I.

The effect of this intense exploitation on Thorne Moors was substantial, with an estimate of 2000 acres of workings there in 1898 (Bunker 1898) and 1500-2000 acres stated by Bunker (1905). A fire in September 1896 devastated 1000+ acres of Thorne Moors, and according to Woodruffe-Peacock (1920-21) "ten thousand tons of cut and stacked peat" was destroyed. Another fire occurred in 1898, and the *Doncaster Gazette* of 12 January 1900, in noting the consequent rebuilding and improvement of the Moorends Works, hinted at refound success: "That the output is large anyone may see by taking a glance at the railway siding on any day of the week". At the end of 1898, stocks of cut and dried peat on Thorne Moors amounted to 138,000 tons. Bunker (1905) stated that of the c.6000 acres of moor at Thorne, "a quarter if not one third of the Waste" was being exploited. Nunn (1905) observed that c.200,000 tons of cut peat were stacked on Thorne Moors, ready for removal to the peripheral works, "which stock would at the present rate of consumption last without renewal for three years, but the practice is to make up what is taken away, so as to be prepared for the eventuality of a bad [peat] harvest or other unforeseen occurrence", usually a very wet season or a serious fire. He further commented:

> Properly to appreciate the magnitude and value of this novel and unique industry, it is necessary personally to inspect this huge property, its industrious workers scattered over miles and miles of land formerly counted valueless, and now the source of a large and rapidly increasing commerce, and its adjacent factories, giving a remunerative and healthy livelihood to hundreds of people.

Gunnill (1908) stated that by 1907 there were 300,000+ tons of cut peat ready for processing. It was also added that the British Moss Litter Co.'s works were "fitted with up-to-date machinery, capable of meeting almost any demand made upon them". Information on the operation of the works is not frequent. Bunker (1905) observed:

> Trains of small trucks laden with turves are drawn by horses along tramways to the mill where the peat is passed from a hopper through toothed rollers, by which it is torn up, and

> carried by buckets on an endless chain to the press. When the proper weight for a bale, two and a half hundred-weight, has been delivered, the machinery stops till the bale has been properly wired and released from the press. Much of the material is reduced to dust, but that is still useful for sanitary and other purposes.

At each of the Thorne Moors works, fire was a constant hazard. The Moorends Works was destroyed by fire in December 1898. This allowed the old wooden baling presses to be replaced by superior wrought steel ones manufactured by the Goole engineers Webster & Bickerton [**24**], creating "probably the best equipped moss litter works in the country" (*Goole Times* 4 August 1899; *Doncaster Gazette* 11 August 1899). The replacement Moorends plant, with its four new presses to compress the disintegrated peat into bales of litter, was described in 1899 (*Goole Times* 10 March, 4 August; *Doncaster Gazette* 11 August). The steel presses had a combined output of c.120 tons daily, which was almost double the production of the former wooden presses, and the cost of manufacture was 30% cheaper. The *Goole Times* of 3 March 1899 noted that "it is anticipated that the new machinery at the [Moorends Works], when completed, will be equal to 200 tons in the twenty-four hours". The motive power was supplied by a 40hp peat-fuelled steam engine, though later the works had its own (oil-powered?) generator. Steel presses were also installed (two at each) in the works at Creyke's Sidings, Swinefleet and Medge Hall, the latter – "running night and day" – having an output of 160 tons of prepared peat per day (*Goole Times* 3 March 1899). This productivity necessitated an extensive shipment operation, as noted in the same article:

> ...a long string of trucks, drawn by a light locomotive, conveys the bales from the mills either to the railway siding or the depot from which they will be taken by train to the railway station. Probably no traveller who passes Goole, Thorne, or Medge Hall, stations, but is thoroughly familiar with the peat moss litter in the last stage, for the industry is an extensive one, and consignments are constantly being transported to their destination.

It was reported (*Goole Times* 14 October 1898; quoted from the *Daily Mail* 11 October) that for stabling in London, peat moss litter was regarded as superior to straw, particularly because of its antiseptic qualities. It was more readily disposed of after use (to market gardeners) and it cost roughly half as much as straw. However, a heavy straw 'crop' depressed the market for moss litter. This was easily the most important usage of peat, though there were others. Peat dust, or mull, for packing, disinfecting, mixing, poultry-keeping, and as a filler for animal feedstuffs, was one of the more

significant applications. Wheeler (1901) stated that the local industry was "drying and preparing the peat for litter for stables and cow-houses. Its antiseptic properties make this litter very valuable". Nunn (1905) described the British Moss Litter Co. as "successful in the litter and dust trades". The *Doncaster Gazette* of 8 May 1908 noted the company as producing "moss litter, molassine for feeding cattle, peat dust for fruit-packing, etc.". Stephenson (1912) remarked that local peat was "sent all over the country for litter, and for the sugar-refining industry, and for other purposes". It is unclear if the sugar reference was to peat molasses, or to peat as a fuel, being converted into producer gas to heat boilers. However, the former is more likely.

For peat molasses as cattle food, the peat dust was manufactured specially (though preferably dried naturally) as the filler with the molasses. The latter is a treacle that is drained from sugar during refining, regarded as a waste product from refineries. In order to make the molasses solid and easy to handle, it was heated and mixed into a stiff past with the peat dust, though it could also be dried for storage. The peat acted as a constipating agent, thus the animals' stomach had time to extract the maximum nutritional value from the molasses. A trade name for peat molasses was 'Molassine', manufactured by the Molassine Co. Ltd.

As noted, peat retained residual use as a fuel. It also had a profile in horticulture (*Doncaster Gazette* 27 June 1930; Taylor 1953). There were other minor uses. Of marginal interest is a childhood memory (born 1907) from St James Terrace, Doncaster. "When anyone was ill in the Terrace Peat was laid on the Road outside the House to deaden any noise" (V. Flindall in litt. to P. Tuffrey). Pontefract and Hartley (1939) observed:

> Peat is still cut extensively on the Hatfield and Thorne moors, but little is sold for fuel now. It is made into peat-moss litter, packing, and patent manures, and a certain amount is sold wet for [Harrogate's] medicinal baths.

Another use of peat was the production of 'charbonite', a mixture of peat and iron ore employed in purifying coal gas, although it was eventually deemed unsatisfactory for the purpose [**25**]. As already noted, at Creyke's Sidings there was a separate works, for grinding wet peat, which was mixed with the ore and then loaded loose into wagons before being despatched to gas installations. Later, the peat turves themselves were despatched to be mixed with the ore elsewhere. The "charbonite mill" was the same as

the “Firelighter and Disinfectant Works” marked by the Ordnance Survey in 1904 [**26**]. The premises probably closed soon after this. However, beyond that closure, wagons of very light, relatively unhumified, peat continued to be sent to firelighter manufacturers elsewhere [**27**].

In the years after World War I, the British Moss Litter Co. was once again disrupted by fire. The Medge Hall Works burnt down c.1919 (*Doncaster Gazette* 20 January 1922), which caused temporary dislocation until the rebuilding was complete. Shortly after production recommenced, a major fire in 1922 destroyed the Moorends Works (*Doncaster Gazette* 20 January 1922). This event caused about 20 men to be thrown out of work, including “peat-getters on the moors”. Although it was stated that much valuable machinery had been devastated, perhaps significantly – in line with the relatively small number of badly affected workers – the destroyed stock of peat in a finished or semi-finished condition amounted to only a few tons. However, as peat was only processed at the works as orders were secured, stocks may always have been small. The 1922 fire signalled the end of production at the Moorends Works, and therefore also the abandonment of the barges. The surviving buildings and sheds were kept as a maintenance centre for the Moors, with a blacksmith’s/joiner’s shop. Also, the associated cottages remained occupied until 1958. Medge Hall Works became the operational headquarters until its own closure in 1966, becoming replaced by the Swinefleet Works. The other works, at Creyke’s Sidings, was burned down in the 1930s, but was rebuilt and remained in production until 1950-51 (being substantially demolished in 1970-71).

As the scale of the industry relentlessly diminished, the deepening problems began to seem insurmountable in the 1920s. The adjacency of the newly-opened Thorne Colliery, offering great hope for future employment and prosperity, must have reinforced the pessimism in the peat industry. At that time, much of Thorne Moors was owned by The Yorkshire Land & Warping Co., which had been formed in 1904, to take over the estate of the late Makin Durham as a registered company. The British Moss Litter Co. leased moorland from it, in addition to owning some parts. Removing the peat commercially was an acceptable way for the Warping Co. to get the level of its land lowered to facilitate flood-warping. The last active warping was undertaken from Swinefleet Warping Drain in 1934, and the company went into voluntary liquidation in December 1947 [**28**]. It was an optimistic expectation that the whole of the remaining

peatland would be eventually warped, either directly on the Warping Co.'s land or by charging other moor owners for the service. As a result, financial arrangements had been entered into between the litter and warping companies, each of which increasingly found itself in difficulty, as to survive each needed to prolong a situation that was ending. The depressed state of the peat market was directly threatening the future of the British Moss Litter Co., and indirectly compounding the problems facing its warping counterpart. In addition to seeking lower rents, and furnishing fewer royalties, the litter company could not be relied upon to remove enough peat to lower the surface, to enable any feasible warping to follow.

A letter from the Yorkshire Land & Warping Co., dated 11 April 1928 [**29**], illuminates the problem facing the peat industry:

> The demand for moss litter is now very much reduced...There is no doubt that the [British Moss Litter] Company are in a very bad way and [Frederick] Hind [the Warping Co. foreman], who has a good knowledge of the work, is surprised how they carry on at all. They have one mill working out of four and that on short time and so far as the Thorne and Hatfield moors are concerned the business does not seem to be carried on as well as it might be considering the bad state of trade.

A further letter, from the British Moss Litter Co. to the Yorkshire Land & Warping Co., dated 1 March 1933 [**30**], requested a reduction in rent on their leased moor. It was alleged that the British Moss Litter Co. directors "will have to consider the question of recommending to their shareholders that the Company be wound up", unless it proved possible to make a satisfactory arrangement about land rents. The letter adds:

> You will appreciate the position of the peat industry is far from what it was when the leases were originally entered into and the rapid progress of motor transport during the last few years and consequent decline in horse traffic has made a considerable difference to the position of peat moss litter manufacturers.

The application for rent reduction was successful, but the British Moss Litter Co.'s fortunes required more fundamental change. Some horses still remained in servicing, merchandising and industry, and their bedding needs were still based on moss litter, for which the British Moss Litter Co. remained the principal national supplier. In agriculture, horsepower remained important, but farms could often supply their own bedding needs. Other products derived from peat could in no way make up the shortfall in litter demand.

As a measure of its lingering significance, during World War II peat winning was a reserved occupation. The war reinstated a short term revival in demand for moss litter, but the subsequent years saw a resumption of falling demand. Perhaps bolstered by the remaining effects of wartime, a contributor to the Goole Rural District Council's *Official Handbook* issued in 1946, stated with optimism that "present demands cover many and varied uses, chief among which are gas purification, horticulture, poultry runs, and as an absorbing element in the manufacture of cattle foods and manures" (Anon 1946). During the 1950s, the uses of peat produced by the British Moss Litter Co. were said to include baled raw peat for horticulture, horse-bedding, and minor uses like firelighter manufacture, fruit packing and protecting the roots of shrubs for sale. Some loads went to Harrogate's medicinal baths, and others to a Bridlington maltster. The peat was separated after works processing into different wagons: dust, litter and tailings, in order of increasing coarseness. It was baled accordingly, and this was done until the closure of the Medge Hall Works in 1966.

The 20th century decline in the Thorne industry was relieved only by the temporary circumstances of fuel shortages and war, and was further disrupted by the immediate effects of fires. Following World War II, mechanisation of peat transportation gradually became accepted as a major feature in the future of the industry. In parallel, peat was increasingly sustained by expanding horticultural demands, and this was the key development in securing the revival of the industry in the 1960s. The company intent on doing this nationally was Fisons Ltd.

2.9 Fisons Ltd

Fisons Ltd originated from the family business of Joseph Fison, who began trading in Ipswich in 1843. He was principally a manufacturer and supplier of agricultural fertilizers, which continued to remain a major part of Fisons' business for many decades. In the second half of the 19th century there were several fertilizer companies operating in East Anglia, among them Joseph Fison & Co., James Fison (Thetford) Ltd, Edward Packard & Co. and Prentice Bros Ltd. In the years of economic depression following World War I, these companies, after decades of competition, were obliged to amalgamate. In 1919, Edward Packard & Co. merged with James Fison (Thetford) Ltd, and then in 1929 the new company combined with Prentice Bros Ltd and Joseph Fison & Co. From that point, the undertaking was known as Fison, Packard & Prentice Ltd, until 1942 when it was renamed Fisons Ltd.

Fisons' Horticulture Division originated from Fisons' agricultural fertilizer interest. In the years immediately after World War II, a need was identified for specific, specialized fertilizer formulations for use on high value commercial crops, and for sale to amateur gardeners. By 1948, Fisons' factory site at Bramford had been converted from conventional agricultural fertilizer production to the manufacture of horticultural products. The administration of Fisons' horticultural interests was initially part of the Fertilizer Division (based at Felixstowe), and then of the Agrochemical Division (Cambridge), before becoming a separate Division in 1978.

Fisons' expansion of its UK horticultural fertilizer and chemicals operation began with the acquisition from Ulvir Ltd of its 'Liquinure' business in 1959. This was followed by Clay & Son Ltd (1961) and International Toxin Products Ltd (1965). There were other acquisitions from 1973 (Limbert & Roworth 2009).

Expertise in peat-based composts became one of Fisons' Horticulture Division's major strengths. This stemmed from fundamental research carried out in the early 1960s by scientists at the Research Station at Levington, between Ipswich and Felixstowe. Having entered the peat trade, the company had realised that peat-based composts were not meeting the increasingly sophisticated demands of commercial plant producers. This led to the introduction (alongside sales of pure peat) of the 'Levington' range of potting and seed composts in 1966. These were aimed at a wide range of customers. Fisons had become a part of the British peat trade in 1961, with the purchase of the Eclipse Peat Co. Ltd, of Meare, Somerset, for the utilization of its peat reserves in Somerset and Cheshire. Fisons acquired inter alia the Eclipse 'No-Soil' brand of peat-based products, but discontinued them in favour of the 'Levington' range. The Eclipse Peat Co. and its subsidiaries owned the freeholds not only of their Somerset moors, but also of White Moss, Alsager, Cheshire, Lindow Moss, Wilmslow, Cheshire, and Aushaw Moss between Bolton and Blackburn, Lancashire. Fisons disposed of these Cheshire and Lancashire properties.

In 1963, Fisons gained the British Moss Litter Co.'s freehold properties on Thorne and Hatfield Moors and on Dane's Moss south of Macclesfield in Cheshire, though the latter ceased production three years later (Jeuda 1984, Oxenham 1988). Legal ownership of these properties was not formally conveyed to Fisons until 1968. There were also leasehold strips of land on Goole Moor. Other sites, like Risley Moss, near Warrington

in Cheshire, were once associated with the British Moss Litter Co., but at the time of Fisons' takeover, the company no longer had a legal interest in them. Fisons' process of acquisition of varied commercial peat deposits in Britain was completed in 1979, with the purchase of deposits in Cumbria and elsewhere from T. Howlett & Co. Ltd.

When Fisons acquired the British Moss Litter Co. in 1963, only the Medge Hall Works was operational on Thorne Moors. The Swinefleet Works was, however, rebuilt during the same year following a major fire. The Medge Hall Works never received peat for compost production, its only output being raw, baled peat. Also, this works only had restricted access for road transport following the severance of its rail link in the mid-1960s. Although some peat continued to be sent to the Medge Hall Works, other peat from Medge Hall's moorland territory (south of Mill Drain) was added to the Swinefleet Works quota. At the latter, raw peat was initially also prepared for despatch in bales, until the production of the 'Levington' composts from 1966. Following the launch of the 'Levington' range by Fisons, the Medge Hall Works was finally closed, with all production then permanently centralised at the Swinefleet Works.

For further details of the subsequent history of Fisons' Horticulture Division, and their successors, Levington Horticulture Ltd, The Scotts Co. and The Scotts Co. (UK) Ltd, see Limbert and Roworth (2009). The British Moss Litter Co., as a dormant subsidiary of The Scotts Company (UK) Ltd, was formally dissolved on 27 February 1999, exactly a century after its formation (Limbert & Roworth 2009).

2.10 Notes

[1] It is an original manuscript plan, held at Doncaster Museum & Art Gallery, showing parts of the Thorne Moors area at a scale of 1in ≡ 1 mile. It is untitled, and its origin and purpose are unknown. The plan shows Thousand Acre Drain

[2] An Act to make further Provision for the Draining, Warping, and Improvement of *Thorne Moor* in the West Riding of *Yorkshire*. [28 June 1861]

[3] The origins, history and description of the Boating Dike and other 'boating dikes' in the Thorne district have been the subject of much recent research (Taylor 1987, Thorp 1993, Jones 1994, 2005, 2010a, 2010b, Gaunt 2008, Overton 2009). These waterways are complex and confusing. No attempt is made here to present a summary, as the research continues (Jones in prep.)

[4] An Act for making and maintaining a Navigable Canal from the River *Dun* Navigation Cut, at or near *Stainforth*, in the West Riding of the County of *York*, to join and communicate with the River *Trent*, at or near *Keadby*, in the County of *Lincoln*; and also a Collateral Cut from the said Canal to join the said River *Dun*, in the Parish of *Thorne* in the said Riding. [7 June 1793]

[5] An Act for inclosing Lands in the Parishes of *Hatfield*, *Thorne*, and *Fishlake*, in the Manor of *Haitefeld*, in the West Riding of the County of *York*. [11 April 1811]

[6] The poster is headed 'THORNE MOORS. BOATING DITCHES AND ROAD, THE ORIGINAL AND ONLY USES OF THE HIGH BRIDGE ACRE'. It is dated 14 February 1842. A photocopy was provided by Public Rights of Way, Directorate of Development and Transport, Doncaster M.B.C.

[7] Sheets entitled 'Thorne Church Girls' School. School Opened Monday, October 28th, 1867. Statement of Accounts' (dated 1 March 1869) and 'Thorne Church Girls' School. Statement of Accounts For the Year ending December 31st, 1870' (dated April 1871). Both sheets are held in the G.W. Thompson archive (un-numbered), Doncaster Museum & Art Gallery

[8] A manuscript by Thomas Bunker held at Goole Library entitled 'A Visit to Goole Moors', which can be dated to c.1876, was intended for publication ("my object in writing this paper is not to give your readers..."), though a published version has not been located. An incomplete, but apparently later, draft is also held by Goole Library. A transcript of the complete copy was published by Limbert (1983), with additional notes on the incomplete copy

[9] Doncaster Archives holds four copies of the Thorne parish rate books 1876-87: 1876, 1879, 1881 and 1887 (RD.Tho/3/229-232). The other years are lost

[10] Held at the Brotherton Library, University of Leeds, referenced MS [Deposit] 1957/1 37. It is entitled 'Section from the turn in the Warping Drain near the Peat Mill across the edge of the Waste to the North East Corner of W. Whaley's Farm, thence to M. D[urham']s Cottage', dated 10 October 1868

[11] Entitled 'North Eastern Railway Company and M. Durham. 1868'. Drawn by Frederick Durham, Thorne. Copy seen in private hands

[12] This dating has two sources. First, it is taken from an original sheet of plan and section views of the cottages, in private hands, entitled 'Plan &c. of two Cottages erected at the top of Mr Durham's Warp Farm [grid reference SE693169] 1866". Second, when the cottages were demolished in 1974, the year "1866" was found marked into one of the roof support timbers. Reinforcing this dating, Bothamley (2009) noted that the contemporary cottages built by Makin Durham further along Durham's Warping Drain, at Whaley Balk, date from 1866

[13] A piece entitled 'Thorne Landmark' described the razing of the old Paraffin Mill chimney on 24 June. The octagonal structure was "100ft. high, 68 years old, weighed 200 tons and contained 52,000

bricks". On the day, it "was felled 40 minutes earlier than anticipated, and it fell gracefully to earth and measured a distance of 120 yards". The chimney had earlier been described (*Doncaster Gazette* 20 January 1922) as a "landmark for miles of bleak, open countryside". This chimney was the first in the immediate vicinity of Thorne Moors. The second was that of the "charbonite mill" at Creyke's Sidings. The third and final chimney was at Thorne Colliery; it was demolished on 6 October 1979

[14] The actual evidence is rather thin. Wheeldon (1894) stated that at Huggin Carr Farm, Hatfield Woodhouse, the kitchen hearth had a "blazing crackling fire of peat and hissing logs", but may this have been fanciful? Hyde (1953), although writing children's fiction, based one of his chapters on Hatfield Moors, which he visited as a lepidopterist. He wrote of a peat cutter and his wife:

> The fire in the low grate was not very bright, but it gave a lot of warmth. It was a peat fire, for Mr. Cheshire was a peat-cutter on the moor, and his wife used very little coal either for baking or boiling water.

The reliability of this description, embedded within fiction, is unknown. The third source, Taylor (1953), noted vaguely that "Much [Thorne] peat is still used for horticultural and other purposes as well as fuel"

[15] C.A. Howes refers to peat-burning hearths in Thorne (Howes 2003), and also notes (pers. comm.) the survival of such hearths in houses there in the 1970s

[16] A photocopy was held by Natural England, Wakefield office

[17] 22 April-17 June

[18] The prospectus of the British Moss Litter Co. of 1899 (Doncaster Archives, referenced DZ.Tay 3/1) commented that "manufacture of Moss Litter in this country was commenced about the year 1879", which appears to confuse the origins of moss litter manufacture here with those in continental Europe. The 1882 venture, "on a peat-bog between Edinburgh and Glasgow", was unsuccessful (Anon. 1885)

[19] See note 9

[20] The *Doncaster Gazette* referred on occasion in 1896 to the "Britannia Moss Litter Co.", or similar, intending the Moss Litter, Charcoal & Manure Co. The [*Doncaster*] *"Gazette" Commercial and General Doncaster Directory 1897*and *1898* refer to the "Britannia Peat Moss Litter Co., Ltd.", but were clearly – and erroneously – referring to the British Moss Litter Co.

[21] Full title not known, partial photocopy only seen, in private hands

[22] The *Goole Times* of 2 October 1885 observed:

> Messrs. J. Fowler & Co., the eminent engineers and steam plough makers have inspected the Moor, and express themselves satisfied that there are no difficulties in working the machine already referred to.

Nothing further is known of it, which was described as “novel” and “new”. There is no reference to it in Lane (1980), nor is there anything in the Fowler Archive held at the Rural History Centre, University of Reading

[23] Six plans relating to the Hatfield Chase Peat Moss Litter Co., spanning 1888-96, are held at Doncaster Archives. Five are plans depicting peat workings/drains (DY.BML 4/12), showing how the moor was laid out and worked. The sixth, entitled ‘CONCRETE FOUNDATIONS FOR HYDRAULIC BALING PRESS’, is dated 11 October 1893 (DY.BML 4/13). The skill of the land-surveyor and draughtsman can be overshadowed by the often appalling condition of the plans

[24] Webster & Bickerton issued an undated trade catalogue entitled ‘Peat Plant’, which details the various components manufactured by them in Goole. Copy seen in private hands

[25] Post-war allusions to the “charbonite mill” are minimal, describing it as a ruin. A. Eastwood (in litt.) stated that it was “falling down when I first saw it”. He recalled a brick chimney and “some railway lines on one side”

[26] Ordnance Survey 25in scale County Series Yorkshire (West Riding) sheet 252/11 (revised 1904, published 1906)

[27] Information on the manufacture of firelighters at Thorne is surprisingly hard to quarry. In the *Thorne & District Gazette* of 20 July 1995, childhood memories from the earlier part of the 20th century were recorded in a letter (“Mr Holt remembers”) including the following:

> when I was a kid in Church Street – every Saturday I would go for fire-lighters for nearly everybody in the street. I had to go through Staniland Boat yard to get to the Mill...the man who managed it was called Mr Burr...
>
> The fire-lighters were lumps of turf dipped in paraffin.

The “Firelighter & Disinfectant Works” of William Smith & Co. is shown cartographically (note 26), though it is not known if Smith firelighters were on sale in Thorne. They were recalled as “sticks” of peat “dipped in creosote etc.” (A. Eastwood in litt.). Dobson (1912) noted that peat was “used for making firelighters”, although he did not explicitly connect this statement with Thorne Moors.

Elsewhere in Britain, blocks of dried fuel peat were turned into firelighters by being impregnated and bound with combustible materials like naphthalene, tar or resin; or by being sprayed with petroleum or coated with other highly flammable material, and then given an inflammable glaze. The best known were produced at the Palacerigg Labour Colony, Cumbernauld (Lanarkshire) in the 1920s-30s

[28] Archives of the Yorkshire Land & Warping Co. Ltd, Brotherton Library, University of Leeds, referenced MS [Deposit] 1956/1

[29] See note 28

[30] See note 28