

28 Trent Navigation

*Category: Commercial 88km & Cruising 21.5km
Map: Plate 27 Profile: Figure 20*

1. The Trent Navigation extends from Wilden Ferry at Shardlow to Gainsborough. Below this point, the river is currently the responsibility of the British Transport Docks Board. The natural river is followed except for the artificial cuts (totalling some 11km) at Sawley, Cranfleet and Beeston and the head and tail channels of the navigation locks. The length from Lenton Chain to Meadow Lane Lock, in Nottingham, was formerly part of the Nottingham Canal (24). Through Newark the navigation bypasses the major channel of the river in favour of a narrower branch, the Newark Dyke, which is joined by the River Devon before rejoining the main channel. Below Cromwell Lock the river is tidal. Connections to other waterways are numerous: the Trent and Mersey Canal (23) joins at Derwent Mouth; the Erewash Canal (26) and the Soar Navigation (27) join a few kilometres to the east; the disposed of length of the Nottingham Canal (24) and the derelict Grantham Canal (29) join in Nottingham; and the Fossdyke Navigation (30) joins the tidal reaches. The length outside the Board's jurisdiction is further joined by the Chesterfield Canal (31) and the Sheffield and South Yorkshire Navigation (34). Below Meadow Lane Lock the Navigation is a 'Commercial' waterway, above that point it is 'Cruising' category.
2. The river has been navigable since Roman times, but the first Act of Parliament to improve it was passed in 1699. The Trent Navigation Company dates back to the 18th century, but some of the present works were not completed until 1926. In 1937, the length of the Nottingham Canal, which forms part of the through navigation, was leased to the Trent Navigation Company by the L.N.E.R. and finally absorbed in 1946. Newark Dyke is owned by the Newark Navigation Commissioners and is leased to the Board.
3. Below Nottingham the locks are built to dimensions of 57m by 7.3m with 2.23m over the sill, although the latter figure can be reduced to 1.60m at Cromwell Lock when there is a very low tide. All seven locks are manned and four are fully mechanised. The other three have gates which are moved by manually operated worm gear, and one of these, Holme Lock has a small barge lock alongside the main lock. Above Nottingham, there are six locks, including a flood lock on the Sawley Cut. Sawley Locks are a pair of parallel locks, one of which was restored to use in 1972 to cope with increased pleasure craft traffic. These locks are much smaller at 26.2m by 4.47m with 1.24m over the sill.
4. There are nine river weirs on the Navigation and these include some large structures such as the Cromwell Weir, which is 105m long.
5. Although a number of the Navigation's locks and weirs have recently been repaired, an extensive engineering programme is still required to overcome the various problems arising from the erosion of the friable marl from under the original mass concrete structures. The structures requiring attention are more particularly Beeston, Stoke and Sawley Weirs, and Hazleford and Stoke Locks.
6. Of seventy four bridges crossing the Navigation and its associated channels, one public road bridge and fifteen accommodation or footbridges are the responsibility of the Board, one of the footbridges being a 'listed' structure. Most of the bridges are concentrated in the length above Nottingham. On the Newark Dyke, Town Bridge (maintained by the local authority) limits the headroom to 3.73m for vessels with a 4.57m wide wheelhouse.
7. Water supplies are derived from the natural catchment of the River Trent, supplemented by the various tributaries and canals that feed the navigation. This supply is, in general, more than adequate for requirements except at times of drought, when the combination of low river level and low tide can lead to a reduction of the available draught on the tidal length. At times of heavy rain the flood problem is very real and can lead to overtopping of the locks and the river banks rendering navigation impossible. The Nottingham Canal length of the navigation is the only stretch to suffer from pollution, caused by industrial discharges and individuals dumping rubbish in the canal. Water sales are heavy, though mostly on a 'sale and return' basis, and can be divided into two main groups. One of these is the sale of water to industrial concerns in Nottingham, the other is the supply of cooling water to a number of thermal power stations along the river.
8. The whole of the canal comes within the Nottingham Area. The 'Commercial' length is maintained by the Trent Section, based at Newark. On the same site in Newark is the Nottingham Area Repair Yard, which builds maintenance craft and also houses the plant hire section. The 'Cruising' length is maintained by the Upper Trent, Grantham and Cromford Section, based at Beeston, Nottingham. Freight warehouses and facilities are owned by the Board at Nottingham and Gainsborough.
9. Dredging is a major task on the river lengths, and the Trent Section operates three bucket dredgers with an additional one as required. These dredgers are serviced by a number of hoppers and tugs of various sizes, the spoil being dumped in one of three disused gravel pits alongside the river.
10. Bank protection is, in general, not the responsibility of the Board, the exceptions being the artificial cuts, lock channels, weir approaches and the Newark Dykes. Elsewhere, the work is undertaken by the Severn-Trent Water Authority. On the artificial cuts considerable work has been undertaken, but there are a number of locations where the towpath free-board could usefully be increased. Much work is also required at the approaches to some of the locks, where erosion of the island between the lock and the weir is often a serious problem.
11. Mining subsidence previously affected the Beeston Cut leading to serious settlement in places. This movement has virtually ceased as the coal workings have tended to move eastwards and some settlement has been experienced in the vicinity of Stoke and Gunthorpe Locks.
12. Commercial traffic is mostly concentrated on the length below Gainsborough and relatively little traffic now uses the length above Newark. Traffic includes gravel, petroleum products and general merchandise.
13. Recreational use of the Navigation is particularly intensive. The number of pleasure craft is so great that the Area employs two motor patrol boats to control pleasure craft and to check on licences. Around Sawley, the concentration of craft is probably the highest on any of the Board's waterways, leading to congestion at peak periods. The length of river above Meadow Lane, Nottingham is also very popular. Several marinas and boatyards cater for this traffic. Except for the polluted length of canal through Nottingham,

the Navigation is particularly popular with anglers, over 4,000 being counted in both of the Board's last two one-day counts of users. Some of the rural reaches of the river also offer very pleasant towpath walking. There has also been extensive recreational development of the gravel pits alongside the river (not in the Board's ownership) for power boating, water skiing and other pursuits. Perhaps the best known of these developments is the international rowing course at Holme Pierrepont, the scene of the 1975 World Rowing Championships.

29 Grantham Canal

Category: Remainder 52.5km

Map: Plate 28 Profile: Figure 19

confined to angling and casual towpath walkers. It does, however, flow through pleasant rural countryside and probably offers some scope for development.

1. The present terminus of the Grantham Canal is 0.5 km from the original basin. It falls through eighteen locks to the Trent Navigation (28) in Nottingham. The final 0.2km of the canal and the bottom lock are maintained by the Severn-Trent Water Authority. Although most of the canal is maintained in water, it is generally only 600 mm deep and the locks are unusable, thus preventing navigation to all but canoeists.
2. Authorised in 1793, the canal passed into the ownership of the Ambergate, Nottingham and Boston and Eastern Junction Railway, whose successor the Nottingham and Grantham Railway and Canal Company leased it, in 1861, to the Great Northern Railway for 999 years. The canal was legally closed by the L.N.E.R. in 1936. There is a Grantham Canal Society, which is pressing for the restoration of navigation, and discussions have taken place with a view to developing amenity aspects of the canal.
3. The locks all have weirs in place of the top gates. They are of dimensions 26.2m by 4.42m. Seven of the locks are in one flight at Woolthorpe, the rest are spread more evenly towards the Nottingham end of the canal. Some of the lock chambers are in a near derelict condition.
4. There are seventy nine crossings of the canal, including thirty culverted embankments. The Board's responsibility extends to three bridges carrying minor public roads, one footbridge and twenty eight accommodation bridges. Of the accommodation bridges, five are of brick arch construction, the remainder being low level concrete beam bridges erected to replace the original swing bridges.
5. The aqueducts, of which there are three, are all brick arch structures. One is of two arches, the others single arches.
6. In addition to considerable land drainage, water supplies can be derived from seven feeders, one of which is disused, and five streams or dykes. There are two reservoirs at Denton and Knipton feeding the 8km summit pound and the 32km pound below Woolthorpe Locks, respectively. Industrial sales are concentrated at the Grantham end of the canal and the present revenue accruing to the Board is over £4,000 per annum. There is a legal obligation to maintain a depth of 600mm throughout the canal, but this is not always met and parts of the channel have heavy sedge growth. Water levels are controlled by fifteen weirs.
7. The canal is in the Upper Trent, Cromford and Grantham Section based at Beeston in Nottingham.
8. Little bank protection has been carried out but dredging is effected as required, using land-based equipment which the towpath is generally wide enough to take. Hedging is generally overgrown, but some work has been undertaken, partly with volunteer labour.
9. Mining subsidence is now beginning to affect the western half of the canal as the workings of the Nottinghamshire Coalfield extend eastwards. This is likely to be an increasing problem.
10. Amenity use of the canal is at present mainly

30 Fossdyke and Witham Navigations

a) Fossdyke Navigation

Category: Cruising 18km

Map: Plate 29 Profile: Figure 13

b) Witham Navigation

Category: Cruising 53km

Map: Plate 29 Profile: Figure 19

1. After leaving the tidal River Trent (28) by a lock at Torksey, the Fossdyke Navigation is on one level until Lincoln, where it forms an end-on junction with the Witham Navigation. The navigation falls through two locks en route to Boston, where the Grand Sluice gives access to the tidal River Witham (not BWB) and the Wash. At Anton's Gowt, some 4km from Boston, a lock gives access to the Witham Navigable Drains which fall outside the Board's jurisdiction. Some of the other drainage channels which enter the river are also partly navigable by small craft. The Horncastle Canal, which formerly joined the Witham, has been abandoned and derelict for many years.

2. The Romans were responsible for building the Fossdyke (circa 120 AD) and also for improving the River Witham. From the Middle Ages onwards the Navigations had a variety of owners culminating in their being owned by the Company of the Proprietors of the Witham Navigation. Under a 999 year lease of 1850, the navigation rights were leased to the Great Northern Railway. When the waterways were nationalised in 1948, the Proprietors were not taken over and the Board, as the navigation authority, continues to make payments to them of over £20,000 per annum.

3. With the exception of the Grand Sluice at Boston, the minimum dimensions of locks are 24.7m by 5.33m with 1.98m over the sill except at Torksey, where the depth of the sill is only 1.52m. Torksey Lock has four pairs of gates, two of them being flood gates. One pair of gates is operated by conventional manual balance beams, the rest have quadrant racks operated by capstans. At Stamp End Lock the upper gates were replaced by a guillotine gate in 1950 as part of a flood relief scheme. This gate is maintained by the Anglian Water Authority although the lock, like all the others, is manned and operated by the Board's staff. The Grand Sluice at Boston is provided with a set of sea gates to exclude tidal waters. Although 9.14m wide it is only 15.2m long, thus severely restricting the size of craft passing to and from the tidal length of the River Witham.

4. There are thirty seven bridges across the navigations and the channels joining them. Ten are only minor footbridges of which the Board are responsible for six, in addition to four accommodation bridges. No bridges carrying public highways are maintained by the Board. The Board's bridges include a swing bridge, whilst those maintained by other authorities include a rolling bridge, a swing bridge and two hydraulically operated lift bridges.

5. Water supplies are solely derived from the natural drainage of the surrounding land. The low number of locks mean that this supply is adequate for navigation and for the moderate water extraction which takes place on a 'sale and return' basis, mainly in Lincoln. Although not yet in operation, a scheme has recently been completed whereby water will be pumped from the River Trent, at Torksey, and conveyed along the navigation to a pumping intake, at Bardney, feeding a pipe

line to the River Ancholme for subsequent distribution to a large industrial development in South Humberside.

6. The canal is in the Nottingham Area, and the Fossdyke and Witham Section Inspector is based in a small yard at Lincoln.

7. On the Fossdyke, the Board carries out bank protection works, but only meets a part of the cost. The remainder is contributed by other bodies such as the Anglian Water Authority and the Lincolnshire County Council. Most of the protection provided has been concrete piling which is in good condition, except that leaching out of the backfill has taken place in some locations and remedial work is needed there. Responsibility for the banks of the River Witham rests with the Anglian Water Authority except in the immediate environs of the locks, where the Board undertake protection as required.

8. Except for the length through Lincoln, the navigations pass through isolated rural surroundings. There are marinas at Boston and at Lincoln on Brayford Pool, which adjoins the Fossdyke, but is not the Board's responsibility. Many pleasure boats from other waterways use Lincoln as their destination, and the navigations' long lock-free lengths are attractive to casual boaters. Angling is particularly popular, and the Witham is perhaps the most heavily fished of the Board's waterways. The Board, however, only derive a small income from this source on the Fossdyke, and none on the River Witham.

31 Chesterfield Canal

Category: Cruising 41km & Remainder 25km.

Map: Plate 30 Profile: Figure 19

1. The canal rises from a junction with the Trent Navigation (28) to a summit 7km beyond Worksop. It then falls to an 11km valley pound before rising again to a terminus in Chesterfield. The canal is navigable only from West Stockwith to Morse Lock, Worksop, and this length is designated 'Cruising' waterway. Beyond this point it is 'Remainder' and totally unnavigable. As far as Norwood Tunnel the canal is largely in water, but beyond this point much of it is dewatered and some of it has been disposed of. The final 7km to Chesterfield remain in water and in the Board's ownership.

2. Construction of the canal was authorised by an Act of 1771. Brindley surveyed the route and supervised the construction of the canal until his death in 1772. The canal was completed in 1777, the delay being occasioned by difficulties in building Norwood Tunnel. In 1847, it was incorporated with the Manchester, Sheffield and Lincolnshire Railway Company, which became the Great Central Railway, and thus passed to the L.N.E.R. at the 1923 Railway Grouping. The section west of Worksop was greatly troubled by mining subsidence, particularly Norwood Tunnel which was closed in 1908 after repeated collapse. Traffic ceased at that time west of Worksop and on the rest of the canal during the 1950's. The entire canal was legally closed to navigation in 1962, but the West Stockwith to Worksop length was brought back into working order during the late 1960's, partly with aid from volunteer labour.

3. On the 'Cruising' section there are sixteen locks, with a further forty nine on the 'Remainder' length. The first six locks, rising from the River Trent, are 4.57m wide (that at West Stockwith is 5.72m), but narrow bridge holes restrict traffic to narrow boats of 21.9m by 2.13m, which can use the remaining locks to Worksop. Most of these locks are in a fair condition, having been repaired during restoration of the canal, but some still require attention. Beyond Worksop, fourteen of the locks lie within lengths of the canal which have been sold; most of the remainder have been cascaded for safety reasons.

4. West of Worksop, the number of bridges is gradually being reduced. At present the Board's responsibility extends to six public road bridges, three culverted road crossings and eighteen accommodation bridges and footbridges. On the 'Cruising' section, the Board are responsible for twenty nine of the fifty one bridges. Public road bridges account for thirteen of these bridges. Most are of brick arch construction and a number of these require attention in the near future.

5. There are four aqueducts on the navigable section, three of them being very close together where the canal crosses the River Idle. The other one crosses the River Ryton near Worksop. On the other lengths only one small aqueduct remains.

6. Only one of the two tunnels is open to traffic. This is at Drakeholes and is 131m long. At the south end, it has been strengthened with concrete lining where it is crossed by a road, but towards the northern portal the brickwork requires extensive repairs. Norwood Tunnel, 2.65km long, was the principal source of trouble on the western length. It has been closed since 1908 by a major collapse, caused by mining subsidence. Both ends are now seaied, with an opening left for

drainage water. Evidence of the collapses can be seen in the fact that there are several mining flashes in land above the tunnel.

7. There were formerly six reservoirs feeding the summit. Killmarsh and Woodall Reservoirs have been disposed of, whilst one of the three pools at Harthill had its level reduced after mining subsidence and was incorporated with another to form Harthill Upper Reservoir. This, Harthill Lower Reservoir, and Pebley Pool now feed the summit level east of Norwood Tunnel, the water being passed down to the 'Cruising' section. The terminal length at Chesterfield is fed from the River Rother to which it is returned via the Doe Lea Stream. Supplementary supplies to the 'Cruising' length can be derived from the River Ryton via the Brancliffe Feeder near Worksop. The final supply is at Retford where water is pumped from the River Idle. Sales to industry are concentrated in the length at Chesterfield and the length between Norwood Tunnel and Worksop.

8. The canal is in the Nottingham Area and the Section Inspector and his staff are based at Worksop.

9. Dredging is carried out where possible using land based equipment. Although the locks generally have a minimum depth over the sill of 1.14km, the maximum available at the centre of the channel is often only 0.9m. An increased effort is needed to make the channel suitable for two narrow craft to pass.

10. Little bank protection has been installed on the unnavigable lengths and little is required. On the 'Cruising' length, much of the original towpath stone walling is still in fair condition. Although steel sheeting has been installed at a number of vulnerable places, there are many more lengths which are prone to seepage and require constant surveillance, e.g. at Osberton, Kilton and Ranby.

11. The whole of the 'Remainder' section and the top 10km of the 'Cruising' section fall within a coalfield area. Subsidence, which has had such serious effects already, is likely to continue. Work may be necessary on the reservoirs, and also to raise some of the canal banks to counter settlement.

12. Except for the lengths through Retford and Worksop, the 'Cruising' section passes through pleasant rural scenery. There is a marina at Retford, and large river and sea-going cruisers make use of the sheltered moorings offered by West Stockwith Basin. Angling is also popular on this length. A working party is investigating the prospects of developing the length of canal above Worksop for amenity use.

32 Pocklington Canal

Category: Remainder 15.0km

Map: Plate 31 Profile: Figure 21

If this were achieved, it would undoubtedly increase the number of boats using the Pocklington Canal.

1. From the hamlet of Canal Head, some 1.5km from Pocklington, the canal falls through nine locks to a junction with the navigable River Derwent at East Cottingwith. There are short arms at the villages of East Cottingwith, Melbourne and Bielby. At the moment, the canal is navigable only from the River Derwent to Thornton Lock, a distance of 8.5km.
2. The canal was constructed by the Pocklington Canal Company under powers obtained in their Act of 1815. It was acquired by the York and North Midland Railway Company in 1847 and thus eventually became part of the London and North Eastern Railway. Traffic ceased in 1932 and the canal fell into a state of dereliction, but is presently being restored.
3. The locks are built to minimum dimensions of 18.4m by 4.5m with 1.6m over the sill. Most are now unusable, but the two lower locks, Cottingwith and Gardham, have been restored and work is continuing on the others.
4. All the bridges crossing the canal, twelve in number, are the responsibility of the Board. Eight of these are timber swing bridges which were fixed in position when navigation ceased. Some have been repaired or renewed and others will be similarly treated as restoration progresses. The other four bridges are masonry structures carrying public roads, and no less than three of these are scheduled as Ancient Monuments, namely Hagg, Walbut and Coat's Bridges. There is only one aqueduct, of masonry, which passes Bielby Beck under the canal.
5. The only supply is to the top of the canal from Pocklington Beck via a culvert at Canal Head. The bottom 9.5km of the canal have the benefit of an additional supply from Bielby Beck below Thornton Lock, but this stretch only contains two locks. If cruising were to be resumed throughout the canal it would be necessary to restrict it on the upper lengths in dry weather, due to the limited supply of lockage water. By contrast, in wet weather, the low lying areas near the River Derwent are prone to flooding, submerging the canal at times.
6. The canal is in the Goole Section of the Leeds area, the Section Inspector being based at Knottingly. Labour is transported to the canal as required.
7. Land based dredging and bank protection, where required, are being undertaken as part of the restoration scheme.
8. In view of the isolated nature of the canal and the short length that remains open to navigation, only a small number of pleasure craft use the canal. It does, however, flow through pleasant rural surroundings and is popular both with anglers and walkers.
9. The restoration of the canal is being undertaken with the aid of voluntary labour from the Pocklington Canal Amenity Society and financial aid from the Humberside County Council. There is a similar body, The Yorkshire Derwent Trust, active on the River Derwent. It was once navigable to Yedingham, over 15km east of Malton and there are plans to restore the length to Malton to navigable standards.

33 Ripon Canal and River Ure Navigation

- a) Ripon Canal
Category: Cruising 2km & Remainder 1.5km
Map: Plate 31 Profile: Figure 21
- b) River Ure Navigation
Category: Cruising 13km
Map: Plate 31 Profile: Figure 21

1. Commencing at a basin in the centre of Ripon, the 3.75km Ripon Canal leads to the River Ure at Oxclose Lock, which is followed for 13.25km through Boroughbridge to its confluence with the unnavigable River Swale. At Swale Nab the Board's jurisdiction finishes, but the river becomes the River Ouse a short distance further on, and it is possible to gain access to the rest of the inland waterways by this route. From the basin at Ripon to Littlethorpe Lock the canal is 'Remainder' category. The rest of the canal and the River Ure is 'Cruising'.

2. Two Acts passed in 1767 resulted in work which, from 1792, enabled vessels to navigate the Yorkshire Ouse above York and up the River Ure to Swale Nab. A third Act, passed at the same time, established a separate body of Commissioners to make navigable the River Ure from Swale Nab to Oxclose and to construct the canal from there to Ripon. This undertaking passed to a company in 1820 and was acquired by the Leeds and Thirsk Railway Company under their Act of 1845, becoming part of the North Eastern Railway in 1854, and eventually the British Transport Commission. The Ripon Canal was closed by the B.T.C. in 1955 and abandoned by an Act of 1956, but thereafter it was leased to a new limited liability company formed on behalf of the Ripon Motor Boat Club. This lease expired in 1968 and the canal was then taken into the control of the BWB. It is now navigable from the River Ure only as far as Littlethorpe Lock, i.e. little more than half its length.

3. There are five locks, generally to minimum dimensions of 18.3m by 3.7m with 1.55m over the sill, although the latter figure is variable in the two river locks. The two locks at the Ripon end are now totally derelict.

4. Only one public road bridge is included in the total of twelve bridges for which the Board has responsibility. In all there are twenty one bridges across the waterway and its feeder streams. Eight of the bridges are timber towpath bridges, some of which are in poor condition. The two river weirs are also in need of attention.

5. Water supply to the Ripon Canal is derived from the River Skell (a tributary of the Ure) via a 200m long culvert to the canal basin. Below Oxclose Lock, the sole supply is the natural flow of the Ure plus some land drainage. The supply is of excellent quality and adequate at all times, with a considerable amount of flood water passing at times of heavy rain.

6. The waterway is in the Leeds Section of the Castleford Area. Only one employee is stationed on the navigation, together with a small boat. For major jobs, men and equipment have to be transported from the Section Yard at Castleford, over 40km distant with consequent increases in the time and expenditure required to complete the works.

7. No problems are experienced with leakages, but there are some places where erosion of the banks is becoming

a problem, particularly on the cuts to the river locks. In these artificial cuts, and on the Ripon Canal, bank protection is the Board's responsibility, but elsewhere it is that of the Yorkshire Water Authority. Dredging, also the Board's responsibility, is constantly needed downstream of the river locks, where flood depositions soon lead to the build up of shoals.

8. Commercial traffic amounting to less than 3,000 tonnes/annum is confined to the movement of barges carrying gravel dredged from the navigation.

9. With over two hundred craft being noted during recent traffic counts, the popularity of this waterway is evident, both for its own attractions and as a base for craft cruising the Yorkshire Ouse. The Ripon Motor Boat Club has its headquarters on the canal and there is a boatyard at Boroughbridge.

10. Angling rights are held by adjacent landowners or let to angling associations. The fishing is of high quality throughout, being mainly coarse fishing though some trout and even salmon are found in the river. Walkers also enjoy the generally rural surroundings. The towpath is the responsibility of the Water Authority on the river lengths, but the Board maintain the footbridges. There are proposals to develop the 'Remainder' length for amenity purposes.

34a Sheffield and South Yorkshire Navigation

Category: Commercial 62.5km & Remainder 6.5km
Map: Plate 32 Profile: Figure 22

1. This waterway provides a link from Sheffield via the River Trent to the Humber Estuary. From a terminal basin in Sheffield, a 6km artificial cut leads to a flight of eleven locks at Tinsley which falls to a junction with the River Don. Hence the canalised river is followed to north of Doncaster, where an artificial cut leads to the junction with the New Junction Canal (34b) at Bramwith. From this point the artificial cut follows an easterly direction to Keadby on the River Trent. From Sheffield to the tail of Tinsley Locks, the waterway is classified 'Remainder'; otherwise it is all in the 'Commercial' category.
2. The Sheffield and South Yorkshire Navigation Company was formed in 1895 when it acquired the controlling interest, until nationalisation, from the Manchester, Sheffield and Lincolnshire Railway Company (which had itself taken over the constituent waterways in 1874). Of the constituent waterways, the oldest was the River Don Navigation extending from Tinsley to Fishlake near Doncaster. Vermuyden's 17th century Dutch River section of the tidal River Don was bypassed by the Stainforth and Keadby Canal authorised in 1793. The extension into Sheffield, the Sheffield Canal, was finally opened in 1819 under an Act of 1815. Meanwhile the Dearne and Dove Canal was authorised in 1793 to provide a link from Swinton to the Barnsley Canal. Always prone to subsidence, it has been largely closed for decades, but four locks and a short length remain in use at Swinton Junction.
3. There are twenty nine locks, including two flood locks on the Navigation and four on the remaining length of the Dearne and Dove Canal. They are of varying sizes and above Doncaster will generally pass craft not exceeding 18.7m by 4.7m, with a draught of 2.1m. Below this point, en route to the New Junction Canal, the locks are capable of passing half a train of compartment boats at a time, being about 65.5m by 6.9m with about 2.8m over the sill. On the Stainforth and Keadby Canal, Thorne Lock is a standard small lock, but the tidal lock at Keadby is slightly larger at 23.7m by 6.9m. This latter lock is, unusually, equipped with four pairs of gates to enable craft to lock up or down into the tidal Trent as required. On the short stub of the Dearne and Dove Canal the four locks are only 17.8m by 4.7m with 1.98m over the sill. All the locks are manually operated except Keadby and Long Sandall locks, the latter having been constructed in 1959. The condition of the locks is generally fair, but there are arrears of maintenance in the upper reaches and, more particularly, on the Dearne and Dove Branch.
4. Fourteen public road bridges and twenty accommodation or footbridges are the responsibility of the Board, out of a total of about one hundred and twenty bridges across the canal. There are eleven swing bridges towards the north end of the navigation, some of which are not in good condition. Elsewhere, there is a wide variety of bridges including service crossings and pipe bridges. At Keadby, the canal is crossed at low level by an unusual railway bridge, maintained and operated by the British Railways Board, which slides laterally to allow craft to pass.
5. There is one aqueduct at Attercliffe in Sheffield, of masonry arch construction, which is in reasonable condition.
6. Water supply is mainly from the River Don, that for the Sheffield Canal being pumped up the Tinsley flight of eleven locks. Supplementary supplies can be drawn from the Kirk Bridge Dyke (mainly surface run-off) and mine water from the Nunnery Colliery. This latter supply has a considerable ochre content, colouring the canal bright orange. Additionally this length is particularly prone to rubbish dumping. The River Don and its tributaries are liable to pollution from both industrial and sewage sources and the effect persists as far as Stainforth; the Yorkshire Water Authority is taking steps to improve the situation. Pumping also takes place at Swinton for the short length of Dearne and Dove Canal. Supplies are adequate to maintain navigation and the considerable water sales along the length upstream of Bramwith Junction. At times of heavy rain flood water causes problems in the river reaches of the Navigation.
7. Throughout its length, the canal is in the Doncaster Section of the Castleford Area. The Section Inspector is based at Thorne Yard, and there is a small workshop at Swinton Junction. The Board owns a modern depot at Rotherham and warehouses at the Sheffield Basin, the latter being 'listed' structures but no longer used.
8. Bank protection is mainly a mixture of concrete and steel sheet piling. In built-up areas there are long lengths where the offside consists of factory walls and yards: these lengths are the responsibility of the factory owners. Elsewhere, there are long lengths where protection has been damaged by mining subsidence, and as a result, there is no longer effective protection and serious erosion of the towpath has occurred, rendering it impassable in places.
9. Regular dredging is necessary on the artificial cut. Although ruling depths are generally maintained, not all of the available plant is suitable for the conditions prevailing and there are arrears, particularly on the Stainforth and Keadby Canal.
10. There are towing paths on most of the river reaches of the Navigation. On the artificial cuts, particularly in the industrial areas where access is difficult, the towpaths are in bad condition and virtually impassable in places.
11. Apart from the 'Remainder' length, commercial traffic is carried throughout the Navigation; little commercial usage is made of the length between Bramwith and Keadby. Coal traffic is carried in trains of compartment boats from Doncaster to Goole via the New Junction Canal. Above Doncaster, on account of lock limitations, coal and general traffic are carried in 90 tonne barges only. A private commercial fleet is based on the Dearne and Dove Canal at Swinton and there are two shipyards at Thorne, one of which builds ships of up to 300 tonnes.
12. Although there are a fair number of craft based on the Sheffield Basin, the Navigation above Doncaster holds few attractions for pleasure craft. The main concentration of craft is in the Thorne Area, where there is a marina, and the proximity to the River Trent gives access to the rest of the inland waterway network. The length between Stainforth and Keadby is also popular for other amenity pursuits.
13. Industrial pollution of the Sheffield Canal and the River Don means that angling is virtually non-existent south of Doncaster, whilst the industrial surroundings are as unattractive

to walkers as they are to pleasure craft owners.

14. This navigation has not been developed to the same extent as the Aire and Calder Navigation, and the present limited lock sizes mean that barge loads are far lower than on the Aire and Calder. Parliamentary approval has been obtained for a scheme to enable 700 tonne craft to reach the outskirts of Rotherham, and 400 tonne craft to the centre of Rotherham. As yet finance has not been forthcoming to enable the project to go ahead. The 'Remainder' lengths which have little cruising, pass through unattractive surroundings and the only features of interest are the basin and buildings at Sheffield.

34b New Junction Canal

Category: Commercial 9km

Map: Plate 32 Profile: Figure 22

1. Built jointly by the Sheffield and South Yorkshire and the Aire and Calder Navigation Companies in 1905, this artificial cut provides a more direct link from Sheffield to Goole and the Humber Estuary. From a short distance upstream of Bramwith Lock on the Sheffield and South Yorkshire Navigation (34a), it runs in a straight line, locking down at Sykehouse to a junction with the Aire and Calder Navigation (34a) at Southfield.
2. Sykehouse Lock, 2.8km from the junction with the Aire and Calder Navigation, is the only lock on the waterway. Its limiting dimensions, being about 65.5m by 6.9m with 2.82m over the sill, allow the passage of a half train of compartment boats. This lock is manually operated.
3. Five public road bridges and five accommodation or footbridges across the canal are the responsibility of the Board. Of these, all but the two footbridges are swing bridges, manually operated by capstans except for that at Sykehouse which is hydraulically operated.
4. Five aqueducts carry the canal in steel girder troughs across the various dykes and rivers along its length. Two of these, over the Rivers Don and Went, are quite substantial structures having two and three spans respectively. The former is provided with guillotine gates, at either end, for the purpose of protecting the canal in times of flood when the river can rise and overtop the aqueduct. A recent inspection by a firm of independent consultants revealed that four of these aqueducts were in need of early protective treatment and structural repairs.
5. The canal depends for its water supply upon the navigations at either end of its length i.e. the Aire and Calder below Sykehouse Lock and the Sheffield and South Yorkshire above that point.
6. The canal is in the Goole Section of the Castleford Area. The Section Inspector is based at Knottingley on the Aire and Calder Navigation.
7. Much of the canal remains as constructed but some lengths of the original stone pitching have been replaced with interlocking steel sheet piling. Generally the condition of the existing bank protection is satisfactory, although some local attention is required where the upper stone courses have been loosened and washed away.
8. Although ruling depths are generally maintained without the need for regular dredging on this canal, the removal of some silt from the toe of the side slopes is necessary in order to maintain the appropriate channel width.
9. A substantial volume of commercial traffic is carried on this canal. The major traffic is coal which originates from staiths and wharves on the Sheffield and South Yorkshire Canal, and is conveyed in trains of compartment boats to Goole for export or forward shipment.
10. The canal holds very little attraction for pleasure craft and only serves as a through route between the two navigations.

35 Aire and Calder Navigation

- a) Main Line
Category: Commercial 54.5km
Map: Plate 33 Profile: Figure 23
- b) Wakefield Branch
Category: Commercial 12km
Map: Plate 33 Profile: Figure 23
- c) River Aire & Selby Canal
Category: Commercial 19km
Map: Plate 33 Profile: Figure 23

1. The Main Line (a) of this Navigation runs from a junction with the Leeds and Liverpool Canal (45) at the tail of River Lock, Leeds, to Goole, where there are docks and an exit to the North Sea via the River Ouse and the Humber estuary. It is joined at Castleford by the Wakefield Branch (b), which provides a link with the Calder and Hebble Navigation (36). At Knottingley there is an alternative route to the River Ouse via the River Aire (c) and an artificial cut known as the Selby Canal (c). About 11km from Goole the New Junction Canal (34b) provides a link to the Sheffield and South Yorkshire Navigation (34a).

2. Initial improvements of the Rivers Aire and Calder commenced with the passing of an Act of Parliament of 1698, authorising the construction of locks and weirs and other navigation works. Over the years the Navigation has been constantly improved, starting with the cutting in 1774 of the Selby Canal from Haddlesey to avoid the unreliable and tortuous reaches of the tidal Aire. Then followed the construction in 1826 of a direct 34km link between the River Aire at Knottingley to, and the development of, the port of Goole. In 1865 the Calder and Hebble Navigation was leased for 21 years, during which time a number of improvements were undertaken, but the lease was not extended on its expiry. The Barnsley Canal, which formerly connected at Wakefield, was purchased in 1871, having been leased since 1854; it was abandoned in 1947. The New Junction Canal, which provides a link from the Sheffield and South Yorkshire Navigation to Goole was constructed jointly with that company in 1905. The whole of the Navigation was independent until nationalisation.

3. Lock sizes vary considerably. On the Main Line from Goole to Leeds there are nine primary locks and three flood locks. From Goole up to and including Bulhome Lock, Castleford, the locks are at least 139.3m by 6.32m with a minimum of 2.54m over the sill. Above this point the locks are of a similar width and depth, but of about half the length, necessitating the splitting of the compartment boats using the canal. Generally this length is passable by rigid craft of 500 tonnes with dimensions of 56.4m by 5.72m and a draught of 2.44m, except for Leeds Lock, where the restricted width and depth allow only 250 tonne craft to pass. The four locks on the Wakefield Branch will pass 200 tonne craft up to 59.4m by 5.26m with a draught of 2.13m. (Broadreach Lock normally acts only as a flood lock, and is twice the length of the others). On the Selby Canal the four locks are smaller, taking 100 tonne craft 23.9m by 5.03m with a draught of 1.83m, although slightly larger craft may enter Selby Basin. Most of the locks are mechanised, the exceptions being those on the Selby route, Broadreach on the Wakefield Branch, Leeds Lock and the smaller of the pair at Knostrop Fall on the Main Line. Near Haddlesey the lock which formerly gave

access to the tidal River Aire is now derelict.

4. The Board maintains forty eight out of a total of almost eighty bridges crossing the rivers and canals of the Navigation, twenty three of which are public road bridges. Three of the masonry bridges across the Selby Canal are 'listed' structures, and there are also a number of swingbridges.

5. Stanley Ferry Aqueduct, which carries the Wakefield Branch across the River Calder is the outstanding structure on the Navigation. 50m long it carries the water in a cast-iron trough flanked by cast-iron arches. The 6m wide waterway presents an important dimensional limitation to the size of vessels using this branch. Many of the thirteen other structures classed as aqueducts are little more than large culverts under the canal.

6. Water supply is from the natural catchments of the Rivers Aire and Calder. It is adequate at all times with a great excess at periods of heavy rainfall. At Southfields two adjacent reservoirs collect excess water from the canal and act as balancing reservoirs for water drawn off when the large ship locks are operated at Goole Docks.

7. There are heavy sales of water to industrial users, and more particularly to the C.E.G.B. as cooling water for the large power stations along the Navigation. Pollution is a persistent problem in the urban areas, indeed the detergent pollution of the Aire at Castleford is notorious. The Yorkshire Water Authority is responsible for quality control and steps are being taken to improve the situation.

8. The Navigation is in the Board's Castleford Area. Both the Wakefield Branch and the Main Line to Fairburn Railway Bridge near Ferrybridge are the responsibility of the Leeds Section Inspector based at Castleford. The Main Line below this point and the Selby Canal are maintained by the Goole Section, based at Ferrybridge. Additionally the Castleford Area Repair Yard and Plant Hire Section is situated at Stanley Ferry and the Board have commercial premises at Leeds and Wakefield. Goole Repair Yard, as well as repairing the Board's fleet of compartment boats, builds new craft for all parts of the BWB system.

9. The Board are not responsible for bank protection on the river lengths. Elsewhere, heavy steel piling is the most common form of bank protection. Increased dredging and scour caused by tug propulsion units has, in some places, undermined and eroded the toe of some of the earlier piling leaving it with little or no support. Where the Board own land on the offside it is their policy to widen the waterway and lay heavy stone pitching. Little bank protection has been provided on the Selby Canal with the result that the towpath has been heavily eroded. There is, however, hardly any traffic on this length and the water level is below that of the surrounding countryside.

10. Dredging on the Aire and Calder, and Sheffield and South Yorkshire Navigations is carried out using the resources of the Dredging Section under the direction of the Dredging Inspector. A variety of bucket and grab dredgers are used, but much of the equipment is old and a disproportionate amount of time is taken up by repairs. As a result of this, dredging and improvement of the channel depth have tended to slip behind programme in the past few years.

11. A large part of the Navigation falls within the York-

shire Coalfield, and subsidence is a continuing problem; remedial work has recently been undertaken on the Wakefield Branch near Stanley Ferry. The northern end of the Selby Canal will fall within the zone of influence of the new Selby Coalfield which commences operation within the next few years.

12. Commercial traffic is heavy over all of the navigation, except for the route to Selby. The major traffic is coal, either for export or as fuel to the power stations along the Navigation. Most of this traffic is conveyed in trains of up to 19 compartment boats, each boat carrying up to 38 tonnes of coal. For the traffic to Ferrybridge 'C' Power Station, an improved design of compartment boat, designed to carry about 170 tonnes, has been brought into use. The other principal traffic at the moment is oil, moving in tanker barges to the several petroleum berths on the Navigation. General cargo is also carried and 'BACAT' type barges were introduced in 1975, providing a through service to Rotterdam. Other commercial activities include several coal loading points at collieries and a private shipyard at Knottingley

13. By contrast, the number of cruising craft on the Navigation is only moderate. Mooring alongside the waterway is not encouraged and there are a limited number of places where sheltered moorings can be found, but facilities do exist at Goole, Selby and Great Heck. Craft are concentrated in the lengths east of Ferrybridge and there are very few on the Wakefield Branch.

14. Other amenity uses of the canal are limited. Southfield Reservoirs are heavily used by sailing dinghies, but are less popular with anglers. Elsewhere, the poor quality of water means that there is virtually no angling (a total of three in the 1974 one-day count, and two in 1973). The more rural stretches of the Selby Canal are popular with walkers, but the urban or isolated nature of the rest of the Navigation does not attract large numbers of people.

15. With the exception of the Selby Canal, on which there is virtually no traffic, the Navigation is maintained to modern standards. Whilst the river reaches are of adequate width, some of the artificial cuts are only about 20m wide and a length at Knottingley is even narrower, requiring the use of traffic signals to allow craft to pass in one direction at a time. The towpath is generally wide enough to allow access for maintenance vehicles and for tractor-mounted hedge mowers. Most of the locks are fully mechanised and equipped with colour light signals. The Navigation has its own internal telephone system, and there are proposals to install the 'ARCLAB' system of centralised lock control as part of a general up-grading of the channel to Leeds. This would enable 700 tonne craft to reach Leeds and Wakefield, with 1400 tonne craft on the lower reaches.

36 Calder and Hebble Navigation

Category: Commercial 25km, Cruising 20km & Remainder 1.5km.

Map: Plate 34 Profile: Figure 24

1. This length of river navigation and artificial cuts follows the course of the River Calder from a junction with the Wakefield Branch of the Aire and Calder Navigation (35b) at Wakefield, rising gradually to a terminus at Sowerby Bridge, where there was formerly a connection to the independent Rochdale Canal. There is a 1km branch to Dewsbury, whilst the Halifax Branch, formerly 2.75km long, has been shortened to 0.6km. From Fall Ing Lock, Wakefield to Greenwood Lock, the navigation is classified as a 'Commercial' waterway, above that it is 'Cruising'. The two branches, however are classified as 'Remainder'.
2. The first moves towards the construction of a navigation above the town of Wakefield began in 1740, but they did not come to fruition until the Bill received the Royal Assent in 1758. Work was delayed by flood damage and the canal was not opened throughout until 1770 after an additional Act had replaced the original Navigation Commissioners with a normal company structure. The connection to Manchester across the Pennines by the Rochdale Canal was opened in 1811. In 1865, the Calder and Hebble was leased to the Aire and Calder Navigation for twenty one years, but reverted to independent ownership at the expiry of the lease and remained so until nationalisation. The Huddersfield Broad Canal (37), which connects with the Navigation at Cooper Bridge, was acquired in 1943 and in the same year powers were obtained to abandon the fourteen lock length of the Halifax Branch.
3. Lock dimensions vary widely. During the tenure of the Aire and Calder Navigation a programme of enlarging locks was started but never completed. The standard lock size is 18.6m by 4.2m with about 1.8m over the sill. The three lowest locks have dimensions equal to, or greater than 39.5m by 5.5m with 2.8m over the sills, whilst some of the intermediate locks have also been increased in size. Two of the twenty nine locks are flood locks, and these are supplemented by a total of seven flood gates at the entry to the cuts. At the Salterhebble locks, the lower lock has a guillotine bottom gate, provided when the adjacent road was widened in 1938. In general the condition of the locks is unsatisfactory and attention is needed to staunch leakages within the chambers.
4. Only thirty six of the eighty seven bridges across the canal are the Board's responsibility, fourteen of these being public road bridges. The only aqueduct on the canal is a unique timber structure which crosses the River Hebble at Salterhebble. Although in reasonable condition at present, it is likely to need replacement of some timbers in the not too distant future.
5. The canal is fed from the Rochdale Canal above Brighouse, which has a statutory obligation to pass down 2.27 MI/day, from the River Hebble via the Halifax Branch, and from various other streams. Downstream of Brighouse, the artificial cuts are amply supplied with water from the River Calder and from the Huddersfield Broad Canal (37) at Cooper Bridge. Water levels are maintained by river weirs, but the main problem is excess of water, rather than lack of it. Flash floods are a problem on the length below Brighouse; the urban nature of the surroundings with their correspondingly brief run-off times, exacerbates the problem. All the flood locks and gates are manually operated and the rapid fluctuation of conditions at flood times necessitate round-the-clock manning on some occasions. There are substantial water sales all along the length of the navigation.
6. The waterway is in the Castleford Area and the Section Inspector, who is also responsible for the Huddersfield Broad Canal, is based at Sehpley Bridge Yard, Mirfield. At the Sowerby Bridge Basin there is a fine collection of 18th century warehouses, which are currently rented out by the Board.
7. Dredging equipment consists of a crawler crane and bucket on a pontoon and two hopper barges. This is not sufficient to cope with present requirements, especially as the plant is shared with the Huddersfield Broad Canal, and there is a considerable backlog of dredging, particularly on the 'Cruising' length.
8. The Board does not admit to any responsibility for bank protection or stabilisation works carried out or required in the river sections. Some of the drystone lining the towpath bank on the artificial length is in very poor condition and needs attention. On the length of contour canal above Salterhebble, a considerable length of steel piling has been driven, but some lengths remain unprotected. The towpath is only maintained in the vicinity of the locks to allow aqueduct access. Elsewhere it is somewhat overgrown and the boundary hedges and drystone walls alongside are also often in a dilapidated condition.
9. A large part of the 'Commercial' length falls within the influence zone of the North Yorkshire Coalfields and subsidence is a continuing problem; remedial measures have been undertaken in recent years at the lower end of the Broad Cut, near Horbury, and upstream towards Dewsbury.
10. Commercial traffic nowadays consists solely of the coal traffic from Horbury to Thornhill Power Station. There has been a dramatic upsurge of cruising craft in the past few years, both of craft based on the Navigation and those visiting the pleasant upper reaches. Several boatyards offer facilities to cruising craft.
11. Angling and other amenity pursuits are followed in the length above Cooper Bridge; below this point, the poor quality of the water does not encourage fishing, nor do the urban surroundings attract casual walkers.
12. Although there is still commercial usage of the canal, there would appear to be more scope for development of amenity usage. The Dewsbury Branch is mainly used for the mooring of craft and the remnants of the Halifax Branch could possibly be similarly developed.

37 Huddersfield Broad Canal

Category: Cruising 6km
Map: Plate 34 Profile: Figure 24

1. Sir John Ramsden's Canal, as this waterway is sometimes known, rises through nine locks from the Calder and Hebble Navigation (36) to a terminus at Aspley Basin, Huddersfield, where there was formerly a connection to the Huddersfield Narrow Canal (38). Apart from the first couple of hundred metres from Cooper Bridge, which are in the River Calder, the canal is an artificial cut throughout.
2. The authorisation for construction of the canal was an Act of 1774, and it remained independent until it was incorporated into the Huddersfield and Manchester Railway and Canal Company in 1845. Thus the ownership eventually passed to the L.M.S. Railway, who sold it, and about 0.75km of the Narrow Canal, to the Calder and Hebble Navigation in 1943, just 5 years before nationalization. In 1962, the connection with the Narrow Canal was culverted during construction of a ring road.
3. Of the twenty six bridges across the canal, the Board is responsible for three public road bridges and eight accommodation or footbridges. One is an unusual vertical lift bridge at Quay Street, Huddersfield, which is shortly due to be renovated. Most of the others are of masonry construction. The locks are wide being 4.4m in width, but only 18.6m long restricting the length of vessel able to navigate the canal to about 17.5m. Generally they are in a reasonable state of repair. There are no cuttings of note, but there are several places where the canal is on a steep sided embankment and these lengths require constant surveillance.
4. Water supplies can be derived both from the Narrow Canal and from the River Colne at Aspley Basin. Either of these supplies alone would be adequate for present needs which include water sales of 846 MI/annum of which 473 MI/annum are returned.
5. For maintenance purposes the canal is in the Calder Section of the Castleford Area. The Section Inspector and his staff are based at Mirfield and use is made of the Section's pool of equipment as and when required. Dredging is adequate for present usage of the canal.
6. There are no major leakage problems and bank protection is in generally fair condition. Typically it is of drystone or masonry construction, but there are long lengths of brick factory walls on the offside in Huddersfield.
7. Commercial traffic ceased a number of years ago and the canal is solely used by pleasure craft, which have increased in numbers since the opening of a marina in the Aspley Basin. Craft based on the canal predominate, since the urban surroundings offer little attraction to boats from elsewhere. Similarly there is little use of the canal for other amenity activities.

38 Huddersfield Narrow Canal

Category: Remainder 27km
Map: Plate 34 Profile: Figure 25.

1. This, the highest canal in the country with its summit 211m above sea level, joins the Ashton Canal (39) to the Huddersfield Broad Canal (37) by a channel some 31.5km long. From Whitelands Bridge, Ashton-under-Lyne, where it makes an end-on connection with the Ashton Canal, the canal rises by thirty two locks, now mostly cascaded, to a summit at Diggle. Thence it passes through Standedge Tunnel, the longest canal tunnel in the country, before falling by a further forty two locks to meet the Huddersfield Broad Canal in the centre of Huddersfield.
2. Authorized in 1794, the canal was not completed until 1811: the prolonged delay being due to the difficulties encountered in building Standedge Tunnel. In 1845, the company was incorporated into the Huddersfield and Manchester Railway and Canal Company, which amalgamated with the London and North Western Railway Company only two years later. This company eventually became part of the L.M.S. Railway, who closed the canal to navigation under an Act of 1944. Traffic had in fact, ceased many years before this and, in 1943, the lower 0.8km at Huddersfield had been sold to the Calder and Hebble Navigation (36), when they purchased the Huddersfield Broad Canal. Over the past twenty years, some 4.5km of the canal has been disposed of and piped.
3. The reason for the early closure, and indeed total commercial failure of the canal can be found in the number and size of the locks. There were seventy four in the short length of the canal and they were standard narrow locks, 21.3m by 2.13m, the same as the connecting Ashton Canal. The Huddersfield Broad Canal, however, had wide locks which could only take boats 17.5m long, so through traffic was limited to craft 17.5m by 2.13m. This was uneconomic, particularly as the competing Rochdale Canal was a wide canal taking boats of twice the width, and in one year, for example, carried eight times the traffic of the Huddersfield Narrow. Since closure all locks have been weired or cascaded and through navigation is not now possible.
4. The Board are responsible for forty of the seventy five remaining bridges, some of which have been culverted. Included in the Board's total are eighteen public road bridges. Like all but one of the eleven aqueducts, the bridges are mostly of masonry arch construction. The exception among the aqueducts is a cast iron trough across the River Tame at Stalybridge.
5. The outstanding feature of the canal is the Standedge Tunnel; at 4.99km long and 211m A.O.D., it is the longest and the highest tunnel in the British Canals. There are two falls blocking the canal at present and these should be cleared to provide a clear passage of water through the tunnel. There is also a tunnel some 176m long at Scout, which, unlike Standedge, is provided with a towpath; this tunnel is now closed and bricked up for safety reasons.
6. Nowadays, the primary purpose of the canal is for the conveyance of water to the adjoining waterways. Eight reservoirs feed the summit pound, the principal three being Marsh Haigh, Redbrook and Swellands with storage capacities of 240, 245 and 182 MI respectively, the remainder have in all a further 180 MI. With the exception of Diggle these feed the summit at the eastern end of Standedge Tunnel, by-passing Tunnel End Reservoir which is badly silted. Most of the supply is intercepted and fed to the Scammonden Reservoir of the Yorkshire Water Authority, who have an agreement with the Board to allow the canal about 1275 MI/annum. Lower down the Yorkshire side two further reservoirs are available. viz. Sparth (37MI) and Slaithwaite (310 MI). On the Lancashire side, there is a further feed available from the River Tame at Saddleworth and the canal gathers much land drainage.
7. Supplies to industrial users presently total about 3300 Megalitres per annum, of which about 2900 Megalitres are returned. Most of the water is supplied to the Lancashire side and a substantial amount is passed to the Ashton Canal for industrial use.
8. The canal comes under the control of the Area Engineer at Wigan and is in the Manchester Section. The Section Inspector has the use of some small workshops at Marsden.
9. Bank protection is not generally required as there is no traffic and many of the pounds have been lowered by about 300mm. Siltation is a problem at feeder entries and near bridge holes, but access is difficult and consideration will have to be given to economical ways to clear accretions. The Board also have an obligation to provide stock proof fencing. At present this is mostly drystone walling, but considerable lengths have been damaged, usually maliciously, and much remedial work is required.
10. Although pleasure craft cannot use the canal, sailing dinghies do use Redbrook Reservoir. Angling is available in Brunclough and Slaithwaite Reservoirs and throughout the canal, except near the summit where the peaty water is too acid for fish. Both anglers and walkers tend to be more prevalent on the Yorkshire side of the canal. Generally the canal and its reservoirs would seem to offer further scope for amenity development, but this must be measured against its relative isolation and the difficulty of access, particularly to some of the moorland reservoirs. The canal passes through a region of wild moors, which fall within the area of a tentatively projected 'Country Park', and some of the summit reservoirs are in the Peak District National Park.

39 Ashton Canal

Category: Remainder 15km

Map: Plate 34 Profile: Figure 25

1. The only substantial remaining length of the Ashton Canal is the Main Line. From its end-on connection with the Huddersfield Narrow Canal (38), at Whitelands, the Main Line falls in a westerly direction to meet with the independent Rochdale Canal at Ducie Street Junction, Manchester. A connection with the Peak Forest Canal (40) is made at Dukinfield Junction some 0.75km west of Whitelands. Formerly there was an extensive network of branches with a total length more than twice that of the Main Line; of these, only a length of about 1.75km of the Fairbottom Branch and 0.75km of the Hollinwood Branch adjacent to the canal remain. The rest of the Hollinwood Branch, the 8km Stockport Branch and various minor arms are either derelict or disposed of.
2. The canal was originally authorised by an Act of 1792, and the branches by four subsequent Acts during the period 1793 to 1805. This complex of canals was acquired by the Sheffield, Ashton-under-Lyne and Manchester Railway Company in 1846, which after subsequent amalgamations, became part of the L.N.E.R. at the 1923 Railway Grouping. The Hollinwood Branch was closed in sections under Acts of 1955 and 1961 and the Stockport Branch in 1962.
3. All eighteen locks remaining are on the Main Line and are of narrow gauge (2.13m). Some were formerly paired locks, but now only one of each pair remains usable, the others having been weired or filled. The locks on the Hollinwood Branch are derelict and partly infilled.
4. Of the eighty two bridges spanning the Main Line, forty are the responsibility of the Board including seven public road bridges. There is an unusual variety of bridges from lock foot bridges to girder bridges, with several movable bridges as well. Additionally the Board retain responsibility for the Bardsley Road Bridge over the Fairbottom Branch. There are four aqueducts, two of which are on the short length of the Hollinwood Branch and one of these is dewatered.
5. The Main Line is entirely dependent on water passed down from the Peak Forest Canal and the Huddersfield Narrow Canal, the feeder from the River Tame at Mabholes (Ashton-under-Lyne) being disused. This supply is of good quality and is more than adequate for present needs, even though there are considerable sales to industrial users. Excess water is passed to the Bridgewater Canal via the Rochdale Canal. The supply to the remaining lengths of the Hollinwood and Fairbottom Branch is a small natural lake, Crime Lake, which is not owned by the Board although the canal works raised its level. There are no water sales on these branches.
6. The canal is in the Wigan Area and comes under the control of the Manchester Section Inspector who has an office at No. 7 lock, Manchester. The workshops however, are at Marsden on the Huddersfield Narrow Canal.
7. After years of disuse, the canal was reopened to navigation in 1974 at the same time as the adjoining lower Peak Forest Canal. A large part of the cost was met by contributions from local authorities involved in the Tame Valley Improvement Scheme and by voluntary bodies. Over 100,000 tonnes of spoil was dredged and transported overland to temporary tips made available by the local authorities. There are at present no dredging tips on the canal, the nearest being on the Lower Peak Forest. Other work, some of which was carried out by volunteer labour, included: restoration of one of each pair of locks, lining an aqueduct with concrete and general environmental work. Some work remains to be done, particularly the raising of banks in several places where there is inadequate freeboard (the canal has been subject to mining subsidence in several places in the past). In common with all urban canals, substantial amounts of rubbish are still tipped in the canal, and considerable effort is required to control vandalism of various sorts.
8. Commercial traffic ceased before the Second World War and is unlikely to resume: but cruising traffic is likely to grow, particularly as it is part of the 'Cheshire Ring' of waterways. (The others are the independent Rochdale and Bridgewater Canals, the Trent and Mersey Canal, the Macclesfield Canal, and the Lower Peak Forest Canal). The canal is in urban industrial surroundings throughout its length, but the restoration has improved its amenity aspects considerably and the towpath is frequented by both anglers and walkers, particularly the latter.
9. The short isolated lengths of the Hollinwood and Fairbottom Branches are of no value to the canal system and are being disposed of to the local authorities, who may develop short lengths of them. The 0.8km length of the Main Line from Dukinfield Junction to Whitelands Bridge (start of the Huddersfield Narrow Canal) has not been restored, but fulfils an essential role as a water feeder to the canal and would be suitable as a site for pleasure craft moorings.

40 Peak Forest Canal

Category: Cruising 10.5km & Remainder 14km
Map: Plate 35 Profile: Figure 26

1. Constructed to provide an outlet for the limestone quarries of the Peak District this canal runs, falling in a north westerly direction, from the terminus at Whaley Bridge to Dukinfield Junction where it connects with the Ashton Canal (39). There is a short branch to Buxworth near Whaley Bridge and a connection with the Macclesfield Canal (41) at Marple. The Main Line of the canal from Whaley Bridge to Marple Junction is designated 'Cruising' waterway and the rest is 'Remainder' category.
2. The canal was constructed under an Act of 1794 and opened in 1800 except for the flight of locks at Marple, which were completed four years later, the gap between the two pounds being bridged by a 1.6km tramway. Along with its adjoining canals it passed to the Sheffield, Ashton-under-Lyne and Manchester Railway Company, which after subsequent amalgamations became part of the L.N.E.R. In 1831 the famous Cromford and High Peak Railway was opened, providing a connection with the Cromford Canal (24). A 10.5km tramroad connected the Buxworth Basin with quarries high in the hills. Both of these are now closed. This is a narrow canal, the beam being limited to 2.13m.
3. There are sixty two bridges over the canal and feeders; sixteen of them are maintained by other authorities, twelve of the Board's bridges being public road bridges. Most are of stone arch construction, but there are eight swing bridges. Of the eleven aqueducts, three are of considerable size, including Marple Aqueduct which is a three span, 27m high, masonry aqueduct with hollow spandrels, and is justifiably listed as an Ancient Monument. On the bottom pound there are two short tunnels at Woodley (153m) and Hyde Bank (282m). Both are in reasonable condition and the former is equipped with a towpath. The sixteen locks on the canal are all in the one flight on the 'Remainder' length at Marple, lowering the canal through 64 metres.
4. The canal is well supplied with water from the two reservoirs, Toddbrook and Coombs, near the Whaley Bridge terminus, with capacities of 1366 MI and 1539 MI respectively. In addition, secondary supplies can be received from the Macclesfield Canal, and the bottom pound can draw from the supplies brought down the Huddersfield Narrow Canal (38). Water supply is more than adequate and excess water is fed to the Ashton Canal or runs off over the 20m weir at Romiley. Although there is some abstraction for industrial use, there is scope for increased sales.
5. Much bank protection work has been carried out particularly on the upper pound, where the canal is carried in bench type construction along a steep hillside, with the channel less than 10m wide in many places. This length of canal has been particularly prone to leaks and slips, with two major breaches in the last forty years.
6. The Section Inspector is based in the yard at Marple Junction. Dredging equipment consists of a grab dredger, excavator, tug and six hoppers, the equipment also being used on the Macclesfield Canal. Activity has been concentrated on the lower section during the recent restoration, and the upper pound has not been dredged for a number of years. Dumping of rubbish in the Dukinfield area is a perennial problem.
7. Commercial traffic ceased many years ago, but the canal particularly the upper pound, is heavily used by pleasure craft. There is a marina at New Mills. In addition angling, walking and riding are all popular activities.
8. After being derelict for a number of years, the lower Peak Forest Canal was restored and re-opened in 1974. Restoration work was carried out by the Board with considerable practical and financial assistance from local authorities and volunteer bodies. Work included replacement of defective lock gates, dredging and restocking with fish. Although more urban in character than the upper Peak Forest canal, it does form an integral part of Cheshire Ring of waterways. The Buxworth Arm, which has also been unnavigable for many years, is likewise under restoration at the moment, with a lot of work being done by volunteer labour.
9. This canal is of great scenic and historic interest, the 'Upper Peak' in particular being one of the more popular cruising waterways in the North. At Buxworth, the complex of basins associated with the former tramway is of historical interest, whilst the former trans-shipment warehouse at Whaley Bridge is a 'listed' structure. Apart from Marple Aqueduct, the lower section is not as interesting, but is of considerable value as a through route.

41 Macclesfield Canal

Category: Cruising 44km

Map: Plate 35 Profile: Figure 26

1. The Macclesfield Canal was built to connect the summit level of the Trent and Mersey Canal (23) at Kidsgrove with the Peak Forest Canal (40) at Marple by an artificial channel nearly 44km long. The first 1.5km of the canal from Hardings Wood Junction, Kidsgrove to Hall Green was, in fact, built by the Trent and Mersey Canal Company, and the stop lock there, controlling only 0.3m difference in level, is a relic of this distinction of ownership. There are no branches or connections to canals other than those at the two ends and a very short arm at High Lane.

2. The canal was authorised by an Act of 1826 and opened in 1831. In 1846, the Macclesfield Canal Company was vested in the Sheffield, Ashton under Lyne and Manchester Railway Company, which after subsequent amalgamations became part of the L.N.E.R. at the 1923 Railway Grouping. The Canal is suitable only for narrow boats the ruling dimensions being 21.3m by 2.13m beam.

3. Of the one hundred and four bridges, all but ten are the responsibility of the Board. Most are stone arches but there are six swingbridges carrying minor roads or paths. Thirty three of the bridges are public road bridges maintained by BWB.

4. Being of comparatively late construction the canal employs several deep cuttings and passes over many high embankments. There are fifteen aqueducts, one at Congleton being a cast-iron trough, the others of masonry. The Red Bull Aqueduct carries the Macclesfield Canal over the Trent and Mersey Canal only a short distance from their junction at Hardings Wood. Another of the aqueducts, near High Lane, is maintained by British Rail. Apart from the stop-lock at Hall Green, the other twelve locks are grouped in one flight at Bosley and have the unusual feature of mitred top and bottom gates. Two of the aqueducts and one bridge are 'listed' structures.

5. The water supply is received from the Peak Forest Canal at Marple Junction and from reservoirs at Sutton and Bosley above the Bosley Locks, supplemented by some small streams and land drainage. In turn the canal discharges water to the Trent and Mersey Canal for which it is valuable feeder; there are also several industrial abstractors.

6. Much of the canal originally had unprotected clay banks, except at bends. Much of the drystone protection that did exist has been destroyed either by the wash from craft or vandalism. In general, embankments are now protected, usually with steel trench sheeting, but some of the earlier protection is showing signs of corrosion at the water line. Elsewhere, on lengths where there is no protection, the towpath is often eroded and cattle damage occurs on the offside. There have however, been few leakage problems except for some trouble with rats burrowing through unprotected banks.

7. The canal is in the Northwich Area and maintenance is carried out from the BWB Yard at Marple. This section has its own dredging fleet, which also works on the Peak Forest Canal.

8. Boundary protection is mostly by hedging on the towpath side and in parts by fencing or stone walling; the

hedging is generally overgrown. This, combined with erosion of the towpath, means that access is difficult in places, even for walking, let alone maintenance purposes.

9. There is no significant commercial activity, but the canal is much used for pleasure cruising, both locally and as a link between the adjoining canals. There are marinas and boatyards at Red Bull, Macclesfield and Poynton.

10. Angling rights are in the jurisdiction of adjacent landowners, but some revenue accrues to the BWB therefrom. With a summit level at over 150m above sea level, there are extensive vistas from the canal bank and it is in consequence very popular with walkers.

11. The Macclesfield Canal is of high amenity value, traversing attractive countryside, and the high embankments and aqueducts are notable features. Its upper pound shares, with the Upper Peak Forest Canal, the distinction of being the highest navigable waterway in use at the present time.

42 Caldon Canal

Category: Remainder 33km

Map: Plate 36 Profile: Figure 18

1. The Caldon Canal is a branch of the Trent and Mersey Canal (23), with which it connects at Etruria Junction, and from where it extends for 28.2km to Froghall. The canal leaves Etruria Junction in a north easterly direction and rises through nine locks to its summit between Stanley and Hazlehurst Junction. From the summit at Hazlehurst there is a level branch 4.6km long to Leek. The Main Line continues in a south easterly direction falling through eight locks to the terminus at Froghall; at one time it extended to Uttoxeter. For 2km of its length the canal follows the bed of the River Churnet; otherwise all of the waterway is of artificial construction.

2. The Main Line was opened to Froghall in 1779, the Leek Branch eighteen years later. The extension to Uttoxeter was only operative from 1811 to 1845, when it was transferred to the railway company for the construction of a new line. Ownership was in the hands of the Trent and Mersey Canal and thus its history of ownership is the same as that company's. In 1944, the Leek Branch was closed to navigation and the final 1.2km was disposed of to Leek Corporation in 1957.

3. All seventeen locks on the Main Line are of narrow gauge, taking boats 22m by 2.13m. There are no locks on the Leek Branch. Of the ninety odd bridges crossing the canal and reservoir feeders some sixty two are the responsibility of the board including eighteen public road bridges. Most are of masonry construction, but six are single-leafed wooden bascule bridges.

4. There are five small aqueducts on the Main Line and four major ones on the Leek Branch. Those on the latter include the three at Hazlehurst which carry the branch over the railway, Endon Brook and the Main Line of the canal. The other is at the extremity of the Leek Branch. Leek Tunnel, 120 metres long is the only one on the canal. Two structures are 'listed', namely Hazlehurst Aqueduct and Hazlehurst Iron Bridge.

5. For many years, the canal mainly served as a conduit to convey water to the Trent and Mersey Canal from its three large supply reservoirs, namely Rudyard, Knypersley and Stanley. Rudyard reservoir has a storage capacity of 3455 MI which is mainly derived from the River Dane; thence it is fed by a 5km channel to the Leek Branch near its present terminus. Knypersley reservoir with a storage capacity of 1154 MI impounds the head waters of the River Trent and feeds, by a 5km channel, into the Main Line at Norton Green. Stanley reservoir has a storage capacity of 611 MI and feeds along a 1km channel to the canal. These supplies, more than adequate for their own purposes, but an essential feed for the Trent and Mersey, are supplemented by several minor streams discharging into the canal. Very little water is abstracted from the canal for industrial usage.

6. When commercial traffic ceased using the full length of the canal in 1961, it fell into disuse and the length from Hazlehurst down to Froghall became totally unnavigable. During the late 1960's pressure grew for the restoration of the waterway. Work was started by the Board, assisted by volunteer labour and financial aid from Stoke City Council and Staffordshire County Council. This culminated in the re-opening of the canal to navigation in late 1974. Dredging

work was carried out using equipment from the central pool at Northwich.

7. Throughout its length the canal is of contour construction, in some cases with a steep fall to the valley below. This is particularly true of a 1.5km length at Abbey Hulton about 5km from Etruria and the final length to Froghall. In this latter length, some 100 metres was piped as a safety precaution during the 1960's, and the bed lined with concrete before re-opening. A major slip followed by further movements of the canal embankment occurred on the Froghall length earlier this year; the canal was dewatered and closed to navigation for a period of about six weeks whilst remedial works were effected. In the past, there has been coal mining subsidence at the Etruria end, but this is not a problem at present.

8. The canal is in the Potteries Section of the Northwich Area, the Section Inspector and his staff being based at Red Bull Yard, Church Lawton on the Trent and Mersey Canal.

9. Whilst the canal is used extensively for cruising there is some commercial traffic, mainly in pottery, over the first 7km to Milton. Except for the stretch of the River Churnet, which is heavily polluted by paper mill effluent, the canal and reservoirs are frequented by anglers. The reservoirs are also used by sailing dinghies, Rudyard Lake in particular being one of the most popular in the country for this particular activity (and also for angling). Walking is more popular in the urban area, perhaps because of the isolated nature of the rural areas. Outside the industrial Stoke area the canal can be regarded as a 'linear park' of great advantage to the district.

43 Manchester, Bolton and Bury Canal*Category: Remainder 9km**Map: Plate 37 Profile: Not applicable*

1. Originally 18.2km long this artificial canal connected the River Irwell at Salford to a terminus at Bolton with a 7.2km branch from Little Lever Junction to Berry.

2. The Canal was authorised in 1791. In 1838, the proprietors built a railway alongside the canal and in 1846 the whole undertaking was merged with the Manchester and Leeds Railway, later the Lancashire and Yorkshire Railway, passing in turn to the L.M.S. Railway. Following a breach near Little Lever Junction in 1936, the L.M.S. Railway obtained power to close the canal to navigation between Clifton Aqueduct and Bolton, and the part of the Bury branch where the breach had been piped. Most of the length towards Bolton was subsequently disposed of to Bolton Corporation. About 1km of the canal from Clifton to Agecroft was also piped in 1940. The remainder of the canal was closed to navigation by the B.T.C.'s Act of 1961 and much of it, 11.5km including an 0.8km length of the Bury Branch, has subsequently been disposed of.

3. The locks on the canal, which are now disposed of, were 22.25m by 4.4m with 1.22m over the sill. Some twenty seven bridges over the canal and the Elton Reservoir Feeder (4km long) are the responsibility of the BWB, nine of these being public road bridges.

4. Only one of the original three aqueducts on the canal remains fully in BWB ownership plus half of Clifton Aqueduct on the dewatered length. Additionally there are three aqueducts on the feeder.

5. The pound at Bury draws water from the Elton Reservoir which is fed from the River Irwell. The other short lengths in water depend upon land drainage. Water is supplied to several industrial concerns and is the principal remaining function.

6. The canal is in the Manchester Section of the Wigan Area. No dredging or bank protection has been undertaken on the canal for many years. The feeder channel to Elton Reservoir is a continual source of trouble. It is difficult of access, has been subject to breaching in the past and requires a gang of men to be employed full time on keeping it clear. Piping of the feeder would alleviate this situation.

7. There has been no traffic on this canal since 1950 and the fragmented nature of the waterway rules out any likelihood of its resumption. At present, land drainage and limited industrial supplies are the main functions of the canal, although there are proposals to develop a few short lengths for amenity purposes (in conjunction with local authorities). The major asset from the amenity point of view is Elton Reservoir, where, as well as the many anglers using it, there is a thriving sailing club with over one hundred boats.