as a boy). The snuffbox presented to George IV in Edinburgh in 1821 was made by the son. The father retired to Johnstone, where there were other Craigs employed as millwrights and where his daughter and son-in-law were then living. The son-in-law, William Porteous, was a pattern-drawer and artist, but **his** son, Dundas S. Porteous, was afterwards alleged to have dropped his profession of pattern-drawer (after serving his full time) and become an engineer because of the engineering contacts he made in Johnstone on visits to his father. All this gives off a strong smell of probability that Daniel Craig was related to the millwright Craigs of Johnstone, but so far no confirmation of this has turned up. (2)

Timber played a very important part in the establishment of early engineering firms. Not only was there a good deal of it in early textile machinery, but all branches of the wrights' and timber-merchants' community were strongly organised in the various local Wrights' Societies and are found intermarrying and forming partnerships. The wrights' organisation seems to have been almost as powerful in early 19th century Renfrewshire as the masons' is alleged to have been in the Middle Ages. Among the local "timber dynasties" were the Allisons, the Hunters, the Vallances and certain Smiths. (This excludes Greenock and Port Glasgow from consideration.) The biggest timber merchants were importers owning their own ships; joiners and house-wrights went into speculative housebuilding and became considerable property-owners at a time when the population of Western Scotland was increasing rapidly. (5) Some wrights became architects and surveyors. As housebuilders they sometimes developed an interest in the iron trades; as makers of wooden apparatus they were familiar with lathes, sawing-machines and other ancestors of the machine tool. Because it has been so much superseded now by other materials, it is easy to overlook how strategic a material timber was even at a much later stage of history than Mumford's "Eotechnic".

The circle around Sneddon Bridge began to develop industrially within a relatively short time of that bridge being opened in 1766 (in face of bitter opposition by the Town Council: it was probably not only the relatively trivial loss of tolls from the older bridge, which the new bridge-builders were willing to lease at a valuation, but the threatened movement of trade out northwards into the Earl of Abercorn's territories, that alarmed them). (6)

In 1784 **Paisley Foundry** opened next to the Town's Quay on the West bank of the Cart and within the burghal boundary. Porteous in 1868 patriotically described it as the first Scottish iron-foundry west of Carron, (2) but a glance at the site (approximately NS484683) will suggest that it was hardly in the same bracket with Carron. Paisley had its own sources of ironstone but did not smelt it; that from Blackhall was carried to Clyde Foundry in its early days. (7) Paisley

foundry was started by Baird (or Braid) and Maxwell, who by 1812 had become Braid and Thomson and by 1823 Thomson and Laird, and in 1851 were bought out by Joseph Bow, who at first described himself as a loom-maker. The last foundry buildings there were burnt while standing derelict about ten years ago and the site is currently a car-park beside Christie Lane.

The next firm recalled by the admirable Porteous, engineer and antiquarian, was **Hunter and Walkinshaw**, opened at the foot of Stony Brae, in the Underwood area, in 1793 to take advantage of the re-equipping of Adelphi Mills after a fire in 1792. This was a machine-making branch of a timber-merchants' firm. Hunter was the expert on timber (his family much later entered partnership with one of the Seedhill Clarks in the firm of Clark and Hunter whose cooperage branch has lasted until the present day). Walkinshaw was a capitalist who invested in a number of different businesses. (1) Neither can have had any appreciable experience of machine-making and they ran the works through a series of managers. James Hunter acted as manager briefly towards the end. They clearly did not scrimp the initial expenses. Not only did they employ thirty men, of whom Porteous was able to name twenty-four first-rate craftsmen and apprentices, but they introduced to Paisley the idea of powering a lathe by a steam-engine. Porteous's list illustrates the range of trades which contributed to an early machine-shop: fitter, wright, smith, boardsmith, clocksmith, clock-maker, iron-turner, brassfounder. Several of them in turn managed the concern, though there is no evidence of their being partners in it.

The first manager, William McNaught, described as a fitter (which suggests apprenticeship in some existing machine-shop) left to set up for himself in New Sneddon. He is said to have made the steam engine for Carlile's thread works in New Sneddon, the first powered thread works, (8) in fact the biggest until the Coats and Clark empires developed some years later. Later he went to Johnstone. It was his son who added the verb "to McNaught" to the vocabulary of manufacturing Britain, meaning to compound a beam engine by placing a cylinder at each side of the fulcrum.

Andrew Crawford, fitter, and George Taylor, wright, then ran the shop jointly until the two set up their own millwright business in the Croft. Although described as a fitter, Crawford came from a clan of Paisley wrights.

After James Hunter's spell of management Alexander Vallance, very much a timber man, took over; but the timber merchants Hunter and Walkinshaw pulled out in 1808 and Vallance then turned the place into a sawmill, building afresh on the vacant part of the site and experimenting with novel sawing machinery: vertical framesaws powered by the steam engine. They "did not make good work", and he finally

sold up in 1815. The machinery was sold to the West Indies; the engine continued its career in Montgomerie's (Peockland) Mill in Johnstone, where John McDowall may perhaps have tended it during his apprenticeship there, (9) and Alexander Vallance flourished into his nineties, the doyen of the Paisley Wrights. (2) The site seems to have been taken over by the Carswell's thread works (later Farquharson's), who had the land on both sides of the foot of Stony Brae.

It looks as though there was not enough demand for a sophisticed machine-making firm in Paisley to keep so large an establishment afloat during the Napoleonic depression. Its site, obviously chosen with an eye to the big factories in Sneddon and Underwood, was not a good one for a more general trade; access to the weavers' quarters was through the narrow and busy lanes round the Cross or up the trying hill of Lonewells Street (Well Street). Stony Brae itself is to this day a thoroughfare for pedestrians only with a slope of about one in four, stone setts and handrails. A site at its foot was used again for engineering eighty years later, but that was after the Ayrshire Railway had transformed its possibilities.

Engineering developments were to be looked for mainly in the Croft for the first quarter of the 19th century. This area, which originally referred to what is now Smithhills Street and some land to the north of it, was between the "Laigh Parks" and the Abbey wall.

Towards the end of the 18th century the Earl of Abercorn feued part of the Laighparks including a rectangle called the North, East, South and West Croft Streets, of which only North Croft Street and a fragment of South now retain their identity; the railway viaduct covers most of South Croft Street and Weir Street was built to replace it in the 1890s. Some of the land on the north of this rectangle was feued to William Barr, a successful manufacturer whose sons were prominent figures and extensive house proprietors in Paisley, and he leased a plot "at the foot of the Towing Path" to **John Motherwell**. This was the **Abercorn Foundry**, on whose site the Wallneuk Church now stands. The Croft was an eligible engineering quarter, served by the Abercorn or New Town quay, which was just across the street from Abercorn Foundry, facing the Town's Quay on the other side of the river, where the Paisley Foundry was already established. It was connected with the centre of Paisley, the Cross where the High Street and the weavers' quarter came together, by the short and almost level New Smithhills (modern Smithhills Street), while South Croft Street formed the thoroughfare from Sneddon Bridge to both the Glasgow and the Renfrew highways. There was one minor drawback; the Earl had laid down that the occupiers here must carry on no offensive trades nor use steam engines. This restriction was observed for about twenty years and then John Motherwell got his neighbours to sign a joint petition asking for the ban on

steam engines to be lifted. That presumably succeeded (and before many years had passed there was also a soapworks in Abercorn Street). (10)

Motherwell at first made hollow-ware and iron plates at Abercorn Foundry, and also had a nail-making business and an ironmonger's shop at other addresses in Paisley. By 1812 he was making textile machinery and implements. He did better than his Glasgow brother, whose ironmongery business failed. The brother's son William came to live with John in Paisley and became a literary man (literary men were another well-known Paisley product), editor ultimately of the Glasgow Courier.

Just to the south of Abercorn Foundry there were two other firms describing themselves as engineers. Nothing is on record about **James Lambie** except his changes of address, which suggest satisfactory progress by a small firm. In 1812 his address was South Croft Street and in 1820 Old Smithhills; this could mean that his works lay between those streets, at first opening to the north and later acquiring a southward access to what is now part of Gauze Street. The second would be a much more advantageous address. After John Motherwell's death in 1826 Lambie briefly moved into North Croft Street before disappearing from the record. Motherwell's son had given up the foundry but kept up the nailery and the shop. (11)

A larger concern in the same square of land between Gauze Street and South Croft Street (now mostly occupied by Arnott's buildings and car-park) was the machinery and millwright firm of **Andrew Crawford and Co**, whose partners had managed at Stony Brae for a time. They had no engine, but prospered for about fifty years, Andrew being succeeded by Matthew Crawford in 1834. Around 1852 Matthew was succeeded by James, who described himself only as a wood-turner and seems to have vacated the site in favour of Hanna, Donald and Wilson, of whom more will be said.

By 1860 James was an "engineer and woodturner" in Abbey Close, with the help of his sons Alexander and Peter; by 1862 James and Alexander were at the **Thistle Engineering Works**, Bridge Street, on the south side of the town, while Peter and Alexander had opened in South Croft Street on a smaller site, as cartwrights, timber merchants and bowls makers. In 1872 Bow, McLachlan and Co. bought the Thistle Engineering Works and when that firm moved down-river to Abbotsinch as marine engineers in 1884 they took the name with them. Confusingly, Peter and Alexander Crawford also called their place in South Croft Street the Thistle Works. By the time of the First World War they were specialists in coachbuilding.

To return to the Croft of 1832: in that year **Barr and McNab** took possession of Abercorn Foundry, which had been standing empty. John Barr was a grandson of the William Barr

who originally feued the property, but he did not own it himself. His uncles William and James were the wealthy members of the family. James was described at his death as the most extensive owner of house property in Paisley. William, a successful lawyer, bought land outside Paisley and was a prominent and forceful figure in local politics. John's brother Hugh was a distiller. Relatives by marriage included the thread magnate Carlile and J.J. Lamb, hereditary wright and architect, iron merchant and another local pundit.

Andrew McNab, the other partner, was one of five brothers, of whom two shortly afterwards became owner and manager of the well-established Midton Bleachworks above Howwood, and another two owner and manager of a considerable new marine engineering business at Greenock. The Greenock McNab was an inventive and imaginative person who suggested a premature plan for recycling the town's industrial water-supply.

Barr and McNab, then, were not hereditary experts on either wood or metal, but examples of a new tendency for bright young men with some capital to take up engineering as a career. It is not known where either of them learnt the trade; John Barr at least had certainly learnt it. They came in on the beginning of an upswing in the economy and their luck held longer than Hunter and Walkinshaw's had done.

They began as textile machine-makers, producing, for instance, a cheaper version of Vergniaud's ingenious French shawl-clipping machine. Then they provided the Paisley Police Commissioners with a fire-engine, which saved Hugh Barr's distillery once. Two years after opening they built a 20 hp mill engine for the Cumberland Factory off Causeyside, just north of the Old Laigh Kirk; this was at that time a place where room and power were let out. The New Statistical Account calls this the first steam engine to be built in Paisley, and has been copied by some later historians. Porteous, who was 25 years later but perhaps better informed on engineering history than the parish ministers, avoids saying this (though he used the Statistical Account for some things) describing it only as the first large steam engine built by Barr and McNab. He says earlier that McNaught built an engine for Carlile's mill, but not whether this was built when McNaught was in New Sneddon or when he was in Johnstone, some time after 1812. The present writer can only be equally non-committal. The Cumberland engine clearly did mark the establishment in Paisley of a heavier class of work. (12)

At this time a new factor, unconnected with any traditional Paisley manufacture, began to influence the scene: water transport. (13) In 1830 the well-established blacksmiths **Reid and Hanna** (of Orr Square, off the High Street) were commissioned to construct a boat, 70 ft long, 4 ft 9 ins wide and 2 ft 3 ins deep, out of sheet-iron one-sixteenth of an inch thick, copying a wooden prototype built

by John Wood of Port Glasgow by the usual ship-wright method. This was for William Houston of Johnstone, the energetic director of the Paisley Canal, who was bidding for a greater share of the passenger traffic between Paisley and Glasgow. Canal travel was cheap, comfortable and safe, but the stagecoaches were widening the difference in speed and frequency which made the regular traveller prefer them.

William Houston's ideas justified themselves. A fleet of the new boats, drawn by pairs of spirited horses in relays, maintained an hourly service and raised the number of passengers to an average of four figures daily. Other canals copied, and for about ten years the iron boat business was the mainstay not only of Reid and Hanna in Paisley but of a rival engineer in Johnstone and two fitting-out firms, one in each town. By 1838 it was obvious that these good times were unlikely to last when railways replaced stagecoaches as the main competition. Reid and Hanna applied their experience of curved sheet-iron to the building of gasholders. In 1839 they provided the Paisley Gas Co with one which set a record for Scotland (56,500 cu ft) and three years later they set a new record with the Partick gasholder. This was to be their best-known speciality in the 1840s. (14)

Reid and Hanna had no interest in moving machinery, but their temporary rival, John McDowall of Johnstone, had a great interest in it. In 1830 he had constructed a road locomotive and an amphibious steamer, and when he undertook to build canal boats (most probably on the prompting of William Houston, who had fallen out with William Reid) he was not thinking only of horse traction; he had a plan for steam propulsion by means of a long cylindrical screw under the hull. (13) But the nearest he actually got to steamboat production was when he made the hull for a little vessel, 45 ft by 9 ft by 5 ft and weighing 3 tons, into which the new Clyde firm of Tod and McGregor put an engine for an unnamed foreign buyer, in May 1835. Both Paisley and Johnstone followed with great interest the various experiments with steamers on the Forth-Clyde and Union Canals in the early 1830s. The Paisley Canal, little more than 4 ft deep, was not well suited to engined craft. But Paisley's other navigable waterway, the River Cart, was much more promising.

When the first "Reformed" Town Council met in Paisley in 1833, it was determined to blaze a trail of civic improvement. Schemes often discussed in the past for making the town a port were at last embarked on with vigour; and the projected improvement of the Cart dominated the activities of Barr and McNab as Canal transport did those of Reid and Hanna. They obtained the contract for the mechanism of the new lifting bridge at Inchinnan, and in the process they commenced machine tool designing and manufacture; initially to provide themselves with a planing machine to finish the plates on which the bascule turned, but later there are references, for example, to drilling machines of their make

appearing on the market second-hand, and their name was evidently a recommendation at least locally. They also contracted to supply and maintain the dredging apparatus (probably on the model of some of the Clyde Trust's recent steam dredgers) but not the vessel on which it was mounted.

This "punt" was of wood and was supplied by a Greenock firm, and as soon as John Barr saw it, he pronounced it inadequate and refused to carry out the maintenance and servicing. This was the first rumble of a storm (in which William Barr was one of the loudest thunderers) which broke over the River Trust (an alias of the Town Council) as their accounts ran into the red in the years leading up to the Hungry Forties.

This article is not the place to go into the complex history of the burgh's bankruptcy, a disaster which it shared with some other ambitious riverside burghs at that time; but the bankruptcy and the indefinite postponement of the half-finished harbour and channel improvements are relevant to Barr and McNab's history. (16)

In 1836, when they were engaged on these works and the prospects for Cart navigation were still bright, the firm's abilities were the converse of Reid and Hanna's; they could make engines but not hulls (it was a pity they did not get Reid and Hanna to make the dredge-boat; flat-bottomed vessels were among their products). (17) Perhaps the trouble with that boat decided them to rectify the inability; at all events they equipped themselves appropriately and in 1838 they built a complete Clyde steamship, which they dragged on rollers for some distance from the foundry, and launched opposite the new harbour works - a point in the river where a greater width was naturally available and was being increased artificially.

The ship was named, with her Majesty's gracious permission, the Royal Victoria, and was a floating advertisement for her builders, who intended to operate her themselves as a pleasure excursion steamer from the new harbour. Of 58 tons register, 125 ft long overall, with 70 hp engine, she was fitted up with style by W and R Walker, who had learnt their business on the Canal boats, and her coloured glass stern window displayed the Queen's portrait and the Paisley Burgh coat-of-arms. A combination of general economic recession and delay in deepening the Cart led to the operation becoming unprofitable before the end of that summer, and the ship was chartered to ply between Glasgow and Largs, and in March 1840 advertised for sale at an upset price of £1,000, having alledgedly cost £3,000 to build. She was bought by Thomson and McConnell to use as a tender from Glasgow to the Liverpool packets at Greenock. This was the most expeditious way for Glasgow passengers to embark on the deep-drawing Liverpool ships. What happened to her after the Greenock Railway took over that traffic has not so far

emerged. But Barr and McNab's £3,000 was money well laid out, for it led to orders for more steamers. (18)

A little over a year after the launching of the Royal Victoria, they laid down the Maid of Leven on the field from which the first had been launched, which now became the **Abercorn Shipbuilding Yard** and was equipped with a slip for regular broadside launching. It probably belonged, like the Foundry, to the Barr family. On this site they afterwards built seven more vessels successfully, though on one occasion the slip gave trouble; the "ways" yielded under the Lady Brisbane and threatened the larboard paddle-box with disaster. (19) (see the Appendix for list of launches).

However, no vessel immediately succeeded the Maid of Leven. From 1839 to 1842 the firm's prestige undertakings were to do with the railways. During those years they constructed a skew cast-iron bridge across East Croft Street (now part of Renfrew Road) for the Glasgow-Paisley Joint Line, a job they were well-placed for, since it was less than a hundred yards from their foundry, and then they commenced as locomotive builders. They built one small locomotive (the Hawk) for Thomas Brassey, the railway contractor, to use on the completed stretch of line, and this was the first engine to run on that railway. It could run right from Paisley to Kinning Park in ten minutes. It was afterwards put into the railway companies' stock; and in honour of Paisley enterprise it headed the little procession which marked the opening of the Glasgow end of the line.

About the same time Barr and McNab made a canal boat - the only one they ever did make - of an experimental small size, for economical running with fewer passengers in anticipation of a changed pattern when the railway opened. Perhaps the quarrel between William Reid and William Houston had flared up again for a time. However, once the Railway Companies' ruthless intentions had displayed themselves, the Canal men might well regard any firm who worked for the railways as being in the enemy camp. It was Reid and Hanna who made the last boats before the Canal surrendered. (20)

Barr and McNab next built two full-sized locomotives, Firefly and King Coil, for the Ardrossan Railway. This railway had the blessing of the Earl of Eglinton, who had become greatly disillusioned about the Canal and might almost be said to be in the enemy camp himself. Next they obtained a contract to make railway wheels for a French company, which enabled them to take on 300 workers for several months, at a time (early 1842) when this was exceedingly welcome in Paisley - and probably in Govan too, since they used Dixon's iron. (21) While they were completing this order they began on the first of three steamships for the Glasgow, Paisley, Largs and Millport Steam Packet Company which were to bring them particular acclaim. At this time Alexander Denny, of a well-known Dumbarton dynasty, was a junior partner in their

firm, and he was the architect of these ships; their fitting-out and plan of accommodation were supervised by a Mr Young of the steamship company. They won praise even from rival engineers for their consistent high speed and sweet running, which were attributed to their excellent lines and meticulous workmanship. There were no technical innovations; high pressure steam was not used, and compared with Napier's products for example the engineering was conservative. None the less, the second of these ships, the Lady Kelburne, was being tipped to break the speed record for the Clyde even before she was laid down. Her launch was an occasion for great excitement and some poetry in the spirit, though not quite in the metre, of the future bard McGonagal.

> While the thundering cannons crack the ears
> The wondering sky astonished hears
> The booming guns, the gladsome cheers
> As the Lady Kelburne with grace appears
> Afloat, and looks as if she had ears
> And was pleased at the loud and rapturous
> cheers ..... etc, etc

More soberly the Advertiser commented:

> The beautiful model and excellent workmanship of this vessel afford fair grounds of hope that ere long we shall have as good a name for constructing river steamers as we at present have for building canal passage boats.

Such a name would be more welcome because Paisley's traditional staple, handloom weaving, was sunk in its worst depression ever, and unlikely ever to regain its former glory. It was also noted that the firm were constructing a patent slip at Ardrossan Harbour - further evidence of the approval of the Earl of Eglinton.

A rival for the speed record appeared in the shape of Napier's highly scientific ship Engineer, with its high pressure engines. A race was arranged between the Lady Kelburne and the Engineer, from Gourock around Ailsa Craig, for £100 a side put up by William Napier senior and William Walker (of the woodwork side). It was expected to be a close-run thing, but, to the disappointment of a great many steamship fans, the Engineer was damaged in an accident just before the race was due. (22)

During the weeks between the launch and the abortive race, a less triumphant occasion was recorded. The gig-boats and post-horses of the Paisley Canal were sold by auction in July 1843. The railways had won the price-cutting war of the preceding two years and forced the Canal directors to accept an agreement (later pronounced by parliamentary investigators to be contrary to the public interest) not to carry any more traffic at a rate exceeding 4 mph and to pay a fine to the

Railway for every passenger carried, in return for an annual compensation payment. (23)

Immediately afterwards, Reid and Hanna were making the hull of a steam launch, the Spitfire, 28 ft by 5 ft 3 ins and weighing half a ton, for the private use of Mr Young of the G.P.L. & M. Steam Packet Co. Mr Young's two sons were themselves responsible for her twin two-horse-power engines. Reid and Hanna were also involved in the experiments of James Whitelaw with pneumatic propulsion and of John Kibble with a chain-drawn paddle system. They still had for some years their customers for horse-drawn gigs on the Forth-Clyde and other canals. In the end, however, it was the gasholders that provided their staple. (24)

The Joint Line devastated the entire range of transport undertakings around Paisley: stagecoaches, canal gigs, horse and steam river transport down the White Cart to Renfrew, and the Renfrew railway line which had only recently been opened. This was because the greater part of the Renfrew traffic was connected with Clyde ships going to Greenock or further. The first leg of a journey from Paisley to Liverpool, London, America or simply the Clyde coast, was down the Cart to Renfrew Wharf or, if the trip was by boat, straight out to meet the bigger vessel in mid-channel. The existence of railways to Greenock and the Ayrshire coast eliminated that leg altogether. The boat services ceased; the Renfrew railway sold its locomotives and shrank to a horse-drawn freight line.

The Canal had hoped to retain the cheaper end of Johnstone-Paisley-Glasgow traffic, since it was a worthwhile choice for all those to whom speed was not the prime consideration. Third-class railway travel was experienced standing up in an unroofed conveyance so exactly like a cattle-pen that local travellers spoke of going on "the buchts".

On the Canal you sat down and were sheltered from the weather, and there was no soot and no jolting. But the railways won by a remorseless campaign of uneconomic price-cutting. After their victory, of course the fares rose again. William Barr was one of those who repeatedly expressed the resentment of the Paisley commuter. (25)

This did not stop John Barr from building three steamers - Pilot, Pioneer, and Petrel - for the Greenock Railway's subsidiary steamship line. They also built a steam yacht for the Earl of Eglinton and in early 1844 they were providing work for 500 men and boys. (26)

But the Cart Improvement movement was completely at a standstill, all its affairs in the hands of Trustees for the Creditors, who had no intention of throwing good money after bad by making any further outlay, and the river was rapidly

silting up again. Alexander Denny joined his brothers in Dumbarton, and Barr and McNab only waited to see the Petrel in the hands of her owners before transferring their own operations down to Renfrew, in May 1845. There they invested in a large shipyard of their own (Abercorn Foundry and Shipyard had been Barr family property) and much new equipment, suitable for the Big League of Clydeside builders which they were now entering. A considerable part of the capital was evidently contributed by Andrew NcNab. All was going favourably until he suddenly died, and his heirs or trustees seem to have called in the money he had invested. This call could only be met by the sequestration and sale of the shipyard. John Barr went to Otago, the Free Church colony in New Zealand, and spent the rest of his life farming and writing very competent verse. James Henderson bought the yard.

The Barr family made an effort to realise on some of its house property, but the times were bad and several lots failed to reach their upset price. The Paisley engineering works could not be sold, and were leased to a firm who did not last long. (27)

In the neighbouring industrial village of Johnstone, about five miles from the centre of Paisley, the staple was cotton-spinning, about half of it water-powered and half steam, and there was the crop of machine-makers and millwrights that might be expected. Some of them came from Lochwinnoch, a small cotton-mill village to the west. Among these the most notable were the Donald brothers, one of whom was encouraged by the laird, George Houston (William's father), to open the village's first independent machine-shop in 1815. George Houston owned at that time two mills and an important colliery and was able to provide a fair stream of work himself.

He also, of course, had his own mill mechanic, who by the time of George Houston's sons was a responsible engineer in charge of three mills in separate parts of Johnstone. This man's name was Archibald Craig, and he too belonged to a family network. Another Archibald Craig was for a time a mill engineer at Lochwinnoch; and a James Craig who kept the Cross Keys Inn had a son Archibald who in 1834 moved into Paisley with William Donald, a junior member of the family from Lochwinnoch, to make clipping machines. They took some Johnstone workmen, including Matthew Hodgart who was to be their foreman and shortly a partner. The Hodgarts were a varied Johnstone clan, including at that time two innkeepers, a lawyer, and several in responsible jobs in the Quarrelton coalmines. A brother of the engineer who went to Paisley rose to be master of the Mint in Bombay and came home to run his own engineering business; he died before long, but his son was one of the founders of Thomas White's Paisley firm. (28)

The new firm, **Donald and Craig**, started in Abercorn Street, close to the quay and to their already-established competitors Barr and McNab. Like them they moved from textile machinery to railway wheels. Then they moved to the west side of Renfrew Road, at the corner of Hamilton Street, starting a complex of engineering buildings which has only recently been demolished. (29)

They gained some good publicity by being the first makers of Whitelaw and Stirrat's Patent Horizontal Watermill, an elegant little turbine, "reaction" in the literal sense like a lawn-sprinkler. It was not robust but useful for small volumes of water with a high fall, and it carried a regulating mechanism unusually sensitive for a water-engine of the time. It had a fair success for about ten years from the time when William Donald made the prototype in 1838. The only other licensees were Randolph and Elliott of Glasgow. Whitelaw was a Glasgow inventor with several other ingenious patents, including the pneumatic boat already mentioned, and a form of ship's screw. Stirrat, his backer, was the proprietor of Nethercraigs Bleachworks in Paisley, a water-oriented person who collected rainfall statistics and was the first advocate of what became the Gorbals Gravitation Waterworks scheme. Among the odder things for which Donald and Craig installed Whitelaw turbines was a barge incline on the Chard Canal in Somerset; among the more expected, textile machinery for McNab of Midtonfield. (30)

The period from 1840 to 1860 was full of comings and goings in the area around Sneddon Bridge. In 1841 Alexander Turiff moved into the Abercorn Street building which Donald and Craig had just vacated to go to Renfrew Road. He seems to have been an incomer to Paisley. Cast-iron was his line, and it was probably he who gave the name **Vulcan Foundry** to that building. At the end of 1843 he was joined by Alexander Fullerton junior from the prosperous coppersmiths' family in the High Street, and bought No. 3 Hamilton Street, adjacent to the Donald and Craig premises. The Abercorn Street shed was turned into Paisley's first permanent theatre. The new Vulcan Foundry in Hamilton Street may have supplied Donald and Craig with castings. (31)

William Donald died about 1847 and his eldest son James did not carry on with Archibald Craig but departed temporarily to Glasgow. It may have been James's brother John who was an iron merchant in the Croft but also left for Glasgow shortly. In the following year the Johnstone Donalds started an offshoot called **Craig and Donald**, but the mysterious Mr Craig of that firm is said to have gone to America soon after. Archibald **Craig** of Renfrew Road in due course got a new partner; Alexander **Fullerton** left Alexander Turiff, bringing with him the ownership of the Vulcan Foundry in Hamilton Street and the impulse to build more extensions; their new turning shop is mentioned in November 1850. The other partners were Matthew Hodgart and John Barclay, the

latter from a Paisley family. (32)

Alexander Turiff built a new foundry, called the **New Town Foundry**, in the same area where the Crawfords had had an engineering shop. This space, once rectangular and bounded on the north by South Croft Street, had been reduced by the railway viaduct built in 1840, and the New Town Foundry occupied roughly the site of the present car park behind Arnott's, with an access through a railway arch (NS48556422). Turiff's new firm was **Turiff, Sharp and Co** and financially it must have looked very sound. The Sharps were among the leading manufacturers of embroidered muslin, and to transfer capital from that trade to engineering would seem a sensible step in 1850. But since Turiff's Sharp was only a younger son, he had the apparently good idea of bringing in as third partner his acquaintance Thomas Risk, the very enterprising Paisley agent of the Western Bank. Mr Risk seems to have felt a compulsion to live up to his surname. It was characteristic of him that he invested £60,000 of his bank's money in this firm and took a partnership in it himself, and judging by the role he played in luring several other hopeful young firms into deep water, it was most likely he who encouraged Turiff to embark on an ambitious scheme of vertical integration, if he did not actually suggest it. Turiff, Sharp and Risk started a company called the New Cumnock Iron Company to produce the raw material. They also had a small steamer of their own, the Tubal Cain, with which they delivered castings from Paisley to distant customers. They were said to have a contract for 3,000 tons of castings for a London customer, and certainly had a contract, or sub-contract, for 300 tons of ironwork for the Crumlin Viaduct in South Wales, rightly noted as a small triumph for hard-pressed Paisley. (33)

The Tubal Cain was one of the first products of the latest occupants of Abercorn foundry, **Blackwood and Gordon.** They, and their predecessors Kincaid and Gordon, had been machine-makers in Gordon's Loan (Gordon Street) in the heart of the weaver's quarter. (The name is mere coincidence.) The technical man was Andrew Gordon, described as a man of humble origin and homely speech. Blackwood came from a timber-merchant family. In 1851 they committed themselves to marine engineering and stepped into the gap left by Barr and McNab. Shortly afterwards they bought a yard on the other side of the Cart, where the kink in the river at **Cartvale** and the contracted and deeper river-bed make it possible to construct a slip facing along the channel. Here they launched 38 ships in addition to making a number of engines for other builders; and at the same time they joined in the pressure which was beginning to be put on the Council to take up Cart Improvement again. (34)

It was urged that to liquidate the long-standing debt and redeem control of the River Trust, and then complete the long-suspended improvement programme, or a bigger one, would

be the best way to utilise the funds available in some of Paisley's prosperous years as an insurance against recurrent disaster in the lean years. The weaving trade was visibly done for. Heavier industries were where the profits lay for the forseeable future. But the initial taxation was going to press upon those who could least afford to pay it and also, unfortunately, stood to gain least from the improvements, the impoverished weavers and ex-weavers who had struggled desperately to retain their own houses in Charleston and other weaving quarters. The issue of Cart improvement almost became a political war between the engineers and their workmen on one side and the weavers and the owners of weaver-occupied property on the other. The matter was postponed again and the gleams of economic sunshine clouded over and no improvement took place. In 1861 Blackwood and Gordon, declaring that the Cart was not deep enough for the ships they were now required to build, left for Port Glasgow, and the disgruntled pro-improvement faction declared Paisley lost £3,000 weekly by their going. It was the question of draught rather than of width or length that settled their going.

Blackwood and Gordon's steamers were less showy than those which Alexander Denny had designed for Barr and McNab to meet Clyde competition, but were well appreciated as practical craft in coastal and river services round Ireland, Spain, South America, the Baltic and latterly Bombay. For their introduction to the Bombay market the firm were indebted to Captain Hodgart, ex-Master of the Mint there. (35)

By 1850 the iron boat trade had almost vanished and, as the sons of Reid and Hanna approached maturity, there must have been much discussion of future policy. William Reid saw himself entirely as a gasholder builder and left to carry on an independent business, for which he bought a yard between North and South Croft Streets (now under Forrest's works). Presumably the Hannas intended to keep on the other branches of the blacksmith's business. James Reid, William's son, joined a new firm called Donald, Wilson and Co, whose other members were James Donald, the son of the deceased partner in Donald and Craig, and Robert Wilson, an incomer to engineering who had been a junior partner in Blackwood and Gordon but dropped out at about the time when they changed to marine engineering. The proclivities of these two suggest it was a machine-making firm. But this neat apportionment of interests was upset when William Reid's health gave way. Someone had to look after the gas engineering. The young men's firm did so. Robert Hanna's own health may not have been good: he seems to have taken no active part in anything from this time onwards; about his son, Robert junior, nothing is on record except that he died young in 1854. He, too, may not have enjoyed good health for the months preceding his death. At all events, the Hannas allowed the young firm to take them over too. It was **Hanna, Donald and Wilson** who built the new Paisley gasholder in 1853 and entertained the

Councillors to a banquet inside it. Their works, **Abbey Engineering Works**, stood immediately to the south of Newtown Foundry, opening onto Old Smithhills.

Within a year of the celebration in the gasholder, young Hanna and William Reid were both dead; the older Hanna seems to have been a sleeping partner, and James Reid left the firm and Paisley as soon as he had cashed his patrimony. There is no hint of any quarrel; ambition and melancholy associations would account for it.

One of the first things Hanna, Donald and Wilson did was to build and engine a steamship, almost as though that were some kind of qualifying test for a leading Paisley engineering firm. In October 1854 their 100-ton Pioneer was trundled through the streets from Smithhills to the Town's Quay (without her paddle-boxes, one would imagine) to be lowered into the water. Perhaps this was Robert Wilson's flourish of challenge to his old mates watching (along with half Paisley) from the Abercorn bank. But it was a long time, and outside the period covered by this article, before the firm showed any more interest in shipbuilding. The negative outcome of the debates about Cart Improvement must have determined them to keep to general engineering, in which they had plenty to do. In fact structural ironwork formed a large part of their output, although that was probably not what had been foremost in the minds of the young men starting the firm. Besides the gasholders, they were to make many bridges and roofs, including the roof of Waverley Station and Hay Market in Edinburgh. In course of time they took over Abercorn Foundry and the old Abercorn shipyard, but not Cartvale, which became the quay for a brickworks. (36)

In Renfrew Road expansion brought friction between the Craig family and their partners. In 1853 Archibald's brother James set up separately in Lady Lane (NS477637) with an Abercrombie, whose brother was a shawl manufacturer and afterwards one of Paisley's very few powerloom millowners. They made that old standby, the clipping machine for shawls. Their site looks eccentric, but it was near both Abercrombie's factory and a wharf on the Canal. In 1867 Archibald's eldest son, Archibald Fulton Craig, moved to the now developing Caledonia St area, across the river and near the railways. The Caledonia Foundry was the last of all the great Paisley engineering works to survive. Its engineering side was sold up by the receiver in December 1982. Archibald left the firm he had founded and it became Fullerton, Hodgart and Barclay (Fudgie, Hudgie and Budgie of still recent local memory). (37)

Meanwhile the condition of the engineering industry around Sneddon Bridge was reassuring in 1854. Two firms were launching steamships; Craig, Fullerton and Co were not only thriving but hiving off; Turiff, Sharp and Co appeared to outward view to be achieving national prominence (their

examination in bankruptcy took place early in 1855); Joseph Bow had bought the freehold of his premises in New Sneddon, dissolved his former partnership and embarked on a programme of expansion which took him into marine engineering, and that year he was Dean of Hammermen and given a complimentary dinner at which there were toasts to Robert Hanna and to the shipbuilding interest, and much congratulation on the brighter days which engineering was promising to Paisley. (38)

There was only one important firm outside this area, except for the newly-established Abercrombie and Craig which had not yet proved its importance. The important exception was the firm of A and W Smith of William Street, out to the west of Paisley proper and serving the suburbs of Ferguslie and Maxwellton.

Hugh Smith, machine-maker, had moved there from Cotton Street in 1829, when Ferguslie Mills were developing. He died in 1842 and his son Alexander in 1846, but Alexander's brother and son employed 60 men and were ready to enter new fields; it was they who brought to Paisley and demonstrated a specimen of the McCormack reaper. Rising engineers included Dundas Smith Porteous, who had graduated from the weaver's quarter to New Sneddon in 1851, and perhaps David Dick, who had been a jobbing smith just off the High Street, had moved into Blackwood and Gordon's old premises in Gordon's Loan to be a machine-maker, and was about to move into a corner of New Town Foundry (where Turiff and Sharp would be struggling to save themselves by retrenchment and contrivances) to be a general engineer. (39)

Two years later Paisley was again in the depths of depression which more than decimated the textile firms. But the engineers stood the blast considerably better. Turiff, as already indicated, was ruined in a big way, along with the Western Bank shareholders. He died six years later in Detroit. The hopeful David Dick, in the same building, was sold up too and reverted to a more modest career as jobbing machine-maker in the weavers' quarter. A and W Smith, not liking the appearances, migrated to Glasgow. The others were not permanently damaged and with the next upswing of the economy their numbers were added to. (40)

With the next upswing, however, a new part of Paisley began to develop as an industrial quarter. The railway sidings on the west side of the Cart were throwing out spurs which developed the St. James area, and the emphasis of New Sneddon also moved from textiles to engineering. At this point a new chapter logically begins.

APPENDIX

PAISLEY STEAMSHIPS 1838-1861

(N.B. these were all iron-hulled)

This is an incomplete list, derived from reports in contemporary Paisley newspapers. Additions to the list or the information would be very welcome - S.C.

I. **BARR AND McNAB**, ABERCORN FOUNDRY 1832 -1847.

The shipbuilding side of this firm was transferred to Renfrew in 1845. The list of steamships here given is probably complete, since local pride ensured publicity for every launch. Alexander Denny of the Dumbarton family joined this firm as designer, probably January 1842.

ROYAL VICTORIA, built in the Foundry, launched broadside 1.3.1838 from a field. Operated by the builders themselves as a pleasure steamer for Rothesay, Largs, etc, for three months. It was then said that the trips were not sufficiently patronised and the vessel was advertised for sale and then set to ply between Glasgow and Largs. (It is of interest that the Paisley Steam Navigation Co was formed four months after that to cover the Paisley-Largs run, using a smaller second-hand steamship built by John Wood and engined by Napier; this ship met with two accidents, one by colliding with the Swing Bridge at Inchinnan, and was sold). In March 1840 the Royal Victoria was offered for sale again at £1,000, having allegedly cost £3,000 to build, and was soon afterwards bought by Thomson and McConnell to carry passengers down Clyde to board their Liverpool steamers at Greenock when the tide was unfavourable to boarding at Glasgow.

Dimensions 125' overall (keel 102') x 15' (without paddle-boxes) x 9'. Hull at launching estimated 45 tons and 14" draught. Later advertised as 58 tons register, 3' 3" draught.
Engine 70 hp, cylinder 43.625.
Passenger Accommodation 25 ft of seated deck and a cabin 12 ft wide.
Decorations Coloured glass stern window showing Queen's head and Paisley arms.

Refs: Paisley Advertiser 3.3.1838, 10.3.1838, 14.4. to 12.5.1838, 9.6.1838, 23.6.1838, 14.3.1840, 22.8.1840.

MAID OF LEVEN, launched second week in June 1839 down a slip at the same spot.
Dumbarton Owners, to ply to Glasgow. Completed in two months.

Dimensions 100' x 19' (35' with paddle-boxes) x 8' 6". Plates three-eighths and one-quarter inch thick on lower and upper hull respectively.
Engine 80 hp.

Refs: P.A. 16.2.1839, 13.6.1839

(During the next three years the firm executed several orders for railway structures, locomotives and wheels).

LADY BRISBANE, launched 9.6.1842 from Abercorn Shipbuilding Field after being taken to the Foundry for installation of engine (but not boiler, which was added from the quay after launching). Christening by John Barr's sister and guns fired. A near-accident when the launching ways collapsed and the ship seemed about to fall on her larboard paddle-box. Keel laid about 20.3.1842; was to have been called the Prince of Wales but another ship got in first with that name.

Owned by the Glasgow, Paisley, Largs and Millport Steam Packet Company. Designed by Alexander Denny. Fitting-up to plans of Mr. Young (a director of GPLMSP Co).
Dimensions 140' overall (123' 6" keel) x 18' x 9' 3".
Engine 90 hp, 4' stroke, cylinder 39". Averaged 15 mph on trial run.
Rumoured to be high-pressure, but this was contradicted.

Refs: P.A. 11.6.1842, 9 to 23.7.1842, 1.10.1842.

LADY KELBURNE, launched about 1.3.1843; "many thousands" attended. Firing of cannon (one burst injuring several people), bad verse, etc. Expected to be swiftest on Clyde.

Owned by the G.P.L. and M. Steam Packet Co.
Dimensions 140' overall (123' 6" keel).
Engine 90 hp, 17 mph. Race proposed (£100 a side) with Napier's ENGINEER, but prevented by an accident to the latter.

Refs: P.A. 1.4.1843, 8.4.1844, 6 to 20.5.1843, 7.10.1843

COUNTESS OF EGLINTON, launched 20.4.1844. Consort to two previous ships.

Dimensions ?
Speed of 18 knots. Denny ran a celebratory pleasure cruise before handing over. Met with disaster the following year and written off.

Refs: P.A. 20.4.1844, 11.5.1844, 18.5.1844, 7.6.1845

PILOT, launched 11.5.1844. No details except that she was smaller than the PIONEER.

Owned by the Bute Steam Packet Co. (Glasgow, Paisley and Greenock Railway).

Refs: P.A. 6.4.1844, 11.5.1844, 1.6.1844

BLUE BONNET, yacht, launched about 15.5.1844. No details.

Owned by the Earl of Eglinton.

Refs: P.A. 6.4.1844, 18.5.1844

PIONEER, launched 18.6.1844 on spring tide. Fast and notably sweet-running.

Owned by the Bute Steam Packet Co (Glasgow, Paisley and Greenock Railway).
Dimensions ?
34 strokes per minute. In service steamed Rothesay - Greenock via Toward Point, Dunoon, Kirn, Gourock, 18 miles in 1 hour 6 minutes.

Refs: P.A. 4.5.1844, 22.6.1844, 6.7.1844, 28.9.1844

CAMBRIAN, launched 8.3.1845.

Owned by Pryce and Hunter, Liverpool, to run Liverpool-Bangor.
Engines, twin, 100 hp.

Refs: P.A. 8.3.1845, 19.4.1845, 26.4.1845

PETREL, launched about 25.6.1845. Warranted to beat the PIONEER.

Owned by the Bute Steam Packet Co. (Glasgow, Paisley and Greenock Railway).
Dimensions 175' x 18'
Engine 120 hp. Largs - Greenock in 59 minutes.

Refs: P.A. 9.7.1844, 8.3.1845, 26.4.1845, 7.6.1845. The last ref. notes other comments made in the Glasgow Constitutional.

This was the firm's last ship at Paisley; the Renfrew yard was already at work. Alexander Denny had left them to join his brothers in Dumbarton at the beginning of the year.

II. **BLACKWOOD AND GORDON,** CARTVALE SHIPBUILDING YARD, 1852 - 1861.

At the supper for Paisley employees given when Abercorn Foundry was sold in 1863, it was said that 38 ships were built at Cartvale. The following list is therefore far from complete.

BEST BOWER, first vessel built; laid down 1.1.1852, launched 5.6.1852. Barque-rigged screw steamer, launched with 3 masts standing.

Owned by Hull and Leith Steam Packet Company, for Leith-Hamburg trade.
Dimensions 215' overall (keel + fore-rake 190') x 26' x 16'. 675 tons "as stated" (builder's measure?). Screw 10' 6" diameter, 12' 6" pitch.
Engines 2 x 60 hp.

Crowd of "perhaps 20,000" present at launch, with Paisley engineers Hanna, Turiff and W. Smith in places of honour. This made record run of 46 hours Hamburg-Leith with 500 tons cargo in November 1852.

Refs: Glasgow Saturday Post quoting North British Mail, 12.6.52, and again 20.11.52.

REINDEER, laid down 5.6.52, launched 25.9.52. Paddle steamer.

Owned by Glasgow and Gourock Steam Packet Co. for Kilcreggan - Cove - Strone - Kilmaurs service.
Dimensions 175' x 16' x 17' 3".
Engines 70 hp direct-acting.
Decoration carved reindeer, highly decorated interior.

Refs: PA 28.9.52 and GSP 2.10.52

TUBAL CAIN, launched 10.2.52. Screw steamer, to carry cargo of iron castings.

Owned by Turiff, Sharp and Co of New Town Foundry, Paisley.
Dimensions 150' x 20' 13'. 400 tons burthen (later reported 500 tons register).
Engines 2 x 25 hp.

Refs: GSP 2.10.52, 12.2.53, and PH 6.8.53

DANIEL, forecast GSP 12.2.1853

DOURO, launched 6.8.1853, for Liverpool owners, to trade with Oporto. Barque-rigged.

Dimensions 150' x 23' 13'. 400 tons.
Engines twin = 50 hp. Screw

Refs: PH 13.8.53

MINHO, launched 15.2.54, built under superintendance of Captain Bank.

Owned by Bibby, Sons and Co, Liverpool.
Dimensions 156' x 23' x 13' 6". 400 tons.
Engines twin steeple = 90 hp. 30" cylinder, 30" stroke.

To carry 30 first-class passengers. A sister ship to follow.

Ref: PH 18.2.1854

IRISHMAN, reported 3.6.54. Clipper built. Screw.

Owned by Glasgow and Dublin Screw Steam Navigation Co.
Dimensions 150' x 21' x 13' 8". 325 tons.

Ref: PH 3.6.54

CINTRA, reported 28.10.54

Owned by Bibby, Sons and Co.
Dimensions 175' 10" x 24' x 16' (keel 166' 6"), 500 tons "builder's measure".
Engines 100 hp.

Ref: PH 28.10.54

ANGLESEA, paddle-steamer. For Liverpool, Beaumaris and Menai Bridge.

Owned by Price and Cox, Captain Hunter.
Dimensions 161' 6" x 22' x 10'.
Engines 120 hp.

Ref: PH 24.3.55

ANT, paddle-steamer, "sharp at both ends".

Owned by Liverpool Ferry.
Dimensions 120' x 18' x 8'.

Engines twin = 50 hp.

Ref: PH 9.6.55

BEE, sister to ANT, followed. No date.

HYDRA, launched 21.1.56, screw, schooner rigged with tall masts and provisions for "a great press of sail". Accommodation for 20 passengers.

Greek-owned, for Greek islands service.
Dimensions 150' x 22' x 12' 6". 353 tons "old measurement".
Engines twin = 70 hp.
Passenger Accommodation 20 berths
Decorations Much carving: figurehead of Ceres by M. and J. Allen of Glasgow: multi-headed Hydras on the quarter.

Ref: PH 26.1.56

STOLP, launched 19.4.56, screw, 2-masted schooner rig.

Owned by Theodore Hertz, merchant, Glasgow, for Baltic trade.
Dimensions 119' x 18' x 8'. 200 tons.
Engines 40 hp direct-acting.

Ref: PH 26.4.56

An anonymous 300 ton ship said to be just started, 26.4.1856.

Another for same owners as STOLP anticipated, same date, about 300 tons.

RIO VERMEJO, for River Plate navigation. Left 12.1.57 as 2-masted schooner with engines, paddles and funnel shipped; also carrying two large iron barges in sections. Though to be the heaviest cargo yet shipped out of Paisley.

Dimensions 102' x 198' x 7' 6". 170 tons.
Engines twin steeple = 60 hp.

Ref: PH 17.1.57

SEVILLANO, launched 13.3.57, screw passenger and cargo ship for Spanish coastal trade.

Dimensions 110' x 18' x 8'.
Engines twin oscillating = 40 hp.

Ref: PH 14.3.57

ENCHANTRESS, launched 14.3.57, screw, 3-masted schooner rig.

Owned by W.N. Depledge and Bros. of Hull, to trade to Rotterdam.
Dimensions 160' x 20' x 12'. 400 tons.
Engines twin direct-acting = 70 hp.

Refs: PH 21.3.57, 18.4.57

HOLYROOD, for Leith - Rotterdam. 3-masted schooner rig.

Owned by Gibson and Co of Leith.
Dimensions 500 tons.
Engines 70 hp.

Ref: PH 27.6.57

BUENOS AYRES, launched 5.12.57, paddle boat like RIO VERMEJO but with rudder at each end.

Owned by Buenos Ayres Government; to carry two swivel guns.
Dimensions 100' x 19' x 6' 6".

Ref: PH 5.12.57

BERLIN, designed for large cargo with moderate draught. Screw.

Dimensions 300 tons.
Engines twin inverted direct-acting - 35 hp.

Ref: PH 6.3.58

Anonymous Mersey paddle-steamer launched about April 1858.

Engines 70 hp.

Ref: PH 6.3.58

SOUTH-WESTERN, trading from Cork to Skibbereen and Youghal, about end of 1857?

Dimensions 27 tons.
Engines 45 hp.

Ref: PH 1.5.58 (quoting an Irish paper)

KURRACHEE, for shallow river service in India.

Owned by Bombay Steam Navigation Co. (recommended by John Hodgart, Bombay).
Dimensions 185' x 25' x 15'.
Engines 120 hp.

Ref: PH 12.2.59

TAPTEE, also for Bombay via the Hodgart family. 2-masted schooner rig. Name may have been changed later.

Dimensions 125' x 13' x 9' 1".
Engines 30 hp.

Ref: PH 9.4.59

MINCIO, 2-masted schooner rig.

Dimensions 125' x 18' x 9'.
Engines direct-acting, 30 hp.

Ref: PH 9.7.59

TUSKAR, for Glasgow, Cork and Waterford. For economical freight. Schooner rig (1 square, 2 fore-and-aftrigged masts).

Owned by Glasgow Screw Steamship Co, Captain Charles Calder.
Dimensions 174' x 24' x 13' 6". 375 tons register, 467 tons builders' measure.
Engines direct-acting, 70 hp. Made $10^{7}/_{8}$ knots on trial.

Refs: PH 14.1.60, 17.3.60

EARL OF ARRAN, paddle steamer, Ardrossan-Arran. A Miss Jackson christened.

Dimensions 148' x 18' 6" x 9' 6".
Engines direct-acting, 80 hp. 14 mph.

Ref: PH 28.4.60

ROYAL TAR, last ship built at Cartvale.

Owned by the builders.
Dimensions 140' x 20' x 10', 280 tons.
Engines direct-acting, 2 = 45 hp.

Ref: PH 20.10.60

III. **HANNA, DONALD and WILSON,** ABBEY WORKS (8 SMITHHILLS), 1853.

Only one vessel seems to have been built at this site. The next shipbuilding attempt connected with this firm was made ten years later in New Sneddon.

PIONEER, launched first week of October 1854, by block and tackle from Sneddon Quay, after being transported through the streets and across one of the bridges.

For the coasting trade.
Said to weight 100 tons.

Ref: PH 7.10.54.

REFERENCES

(those for the list of ships are incorporated in the list)

Abbreviations: PA = Paisley Advertiser; PH = Paisley Herald; PRG - Paisley and Renfrewshire Gazette; GSP - Glasgow Saturday Post; RS = Renfrewshire Sasines. Statements about names, places and dates not otherwise accounted for are from the Paisley and Johnstone Directories. Abbreviated dates are 19th century.

1. Crawford and Semple, Renfrewshire, Paisley 1782.

2. Material communicated by Dundas Thomas Porteous, engineer in Sweden, concerning his ancestor Dundas Smith Porteous, including the latter's notes for an address to the Paisley Engineers' annual supper in 1868 on the subject of the origins of Paisley Engineering.

3. Boulton and Watt Collection, Pf 1748.

4. PA 17.8.1833

5. RS passim

6. Memorial of 21.2.1759 in Paisley Pamphlet collection, Paisley Local History Library.

7. J. Wilson, Agriculture of Refrewshire, 1812.

8. W. Wield, Thread Spooling, Inst. Mech. Engs. 1861.

9. F. Taylor, Johnstone and Co-operation, 1916.

10. RS vol. 1 many entries and 2/2619, 2/4571-4581, 3/3262, 3/5264-7.

11. PA 24.5.26 (obituary); 28.1.36; and R. Brown Paisley Poets, 1889.

12. PA 2.7.42 (J. Barr's obituary), PH 8.9.60 (J.J. Lamb's obituary); RS 4/2642, 6/188; R. Brown, History of Paisley, 1886; PA 28.1.32, 9.2.33, 7.6.34, 11.2.37; PRG 6.11.97.

13. Jean Lindsay,"Passenger Traffic on British Canals", in Transport History vol. 9, no. 3 and Sylvia Clark, "Flyboats and Firms", ibid, vol. II, no. 1.

14. PA 14.9.39, 22.10.42.

15. PA 16.5.35, 5.3.30, 9.7.30, 17.9.30, 10.6.31, 8.10.32, 13.9.34.

16. PA 13.2.36, 9.4.36, 25.6.36, 5.11.36, 26.11.36, 21.1.37, 29.4.37, advert Jan. 1834. Letters, PA 6.1.38, 1.9.38, 11.8.42, 20.12.44.

17. PA 22.11.34, 11.2.37.

18. PA 3.3.38, 14.4.38, 9.6.38, 23.6.38; adverts 21.4.38 et seq.

19. PA 13.6.39, 11.6.42.

20. PA 27.3.41, 26.2.42, 18.3.43.

21. PA 28.7.38, 23.11.39, 18.4.40, 18.7.40, 1.8.40, 29.8.40, 26.2.42, 16.4.42.

22. PA 11.6.42, 9.7.42, 23.7.42, 1.10.42, 5.11.42, 1.4.43, 8.4.43, 7.10.43, 14.10.43, 0.4.44.

23. PA 1.7.43, 15.7.43; Jean Lindsay, Canals of Scotland, 1968.

24. PA 20.8.42, 18.3.43, 7.10,43.

25. PA 26.2.42, 29.7.43, 22.2.45.

26. PA 6.4.44, 27.4. to 18.5, 1.6, 2.6, 6.7, 28.9, 9.11.44.

27. Brown, History of Paisley, 1886; PA 25.1.45, 8.3.45, 28.6.45, 6.7.46; GSP 2.1.47, 9.9.47, 13.11.47, 11.12.47, PA 29.6.50; Brown, Paisley Poets, 1889.

28. F. Taylor, op.cit; PA 7.11.46 (obit. of Archibald Craig, Johnstone mechanic); RS 4/2951, 4/3167-9, 5/17 , 6/2243.

29. Taylor, op.cit., many RS and particularly 4/120-3, 4/3101 (properties in Renfrew Rd and adjacent streets)

30. Paul N. Wilson, "Early Water-Turbines in the United Kingdom", Trans. Newcomen Soc., XXXI, 1958-9; PA 13.4.39, 20.4.39, 18.9.40, 26.6.41, 19.2.42, 22.10.42, et seq. J. Burnet, History of the Water-Supply of Glasgow, 1869.

31. PA 3.8.44, (New Theatre Royal, Abercorn Street) RS.

32. Taylor, op.cit. GSP 23.11.50; PA (John Barclay's marriage) 10.7.55.

33. First OS map; GSP 2.10.52, PA 6.8.53 (orders for castings); PH 27.2.58, 16.10.58 (affairs of the Western Bank). Among other Paisley firms which over-extended in partnership with Risk were William Marshall (PH 12.11.59) and the Ronalds of Glenpatrick and Castlehead (a long saga, PH 16.3.61 et seq.).

34. PH 3.1.52, 24.12.59, 2.4.64; reminiscences at soiree PH 28.2.63; reports of launches as in Appendix.

35. PH 19.5.55 (meeting), 4.7.63 (letter).

36. PH 28.2.63 (Blackwood and Gordon supper); first OS map: PH 6.3.52 (dinner to W.R. on dissolution), 22.10.53 (gasholder), 20.5.54 (obit. R.H. junior), 12.8.54 (obit W.R.), 16.12.54 (dissolution, D.W. and Co); PH 9.10.54 (launch) Brit. Ass. report, Industries of W. Scotland, Glasgow 1901; jubilee of Ronald, Jack and Co at Nethercommon, RG 4.1.1913. (They ultimately acquired the site.).

37. Jubilee of A.F. Craig and Co Ltd, RG 30.11.1918.

38. PH 5.12.53, 31.12.53, 20.12.54.

39. RS 2/3432, 4/1207, 5/269, PA 5.4.46; PH 30.9.53.

40. PH 3.3.1855, 17.11.55, 31.5.56, 1.3.60, 31.5.62. The Report of the Paisley burgh Water Committee on the purchase of the Waterworks, 1857 (Paisley Local History Library) contains details of the fate of a number of Paisley firms in the slump of 1855-7.

THE INDIVIDUAL IRONWORKS II

by

George Thomson

DUNDYVAN

Dundyvan Iron Works, comprising both a blast furnace plant and a malleable iron works, is one about which very little has been written. Its life was short. Forty-two yeas after its first furnace had been completed the whole site had been so completely cleared that St. John Day could write 'a vestige of this vast establishment does not now remain'. (1) Yet there had been developed there a complex of nine blast furnaces with their ancillary equipment and a malleable iron works with 44 puddling furnaces and 8 rolling mills, a works 'in their entire state at the time the largest and most advanced in Scotland'. (2)

Its founders were **Dunlop, Wilson and Company**, otherwise the **Dundyvan Iron Company.** Colin Dunlop, a son of James Dunlop of Garnkirk, was the owner of Clyde Iron Works which he had purchased in 1810. He had been bred to the law and was called to the Scottish bar in 1799 but never practised. In 1835 together with James Oswald he was elected to represent Glasgow in Parliament. He died unmarried in July 1837. (3) His partner John Wilson came of farming stock. Born in 1787, he assisted his father on the family farm until in 1805 he went to Clyde Iron Works concerned at first, it is said, with managing coal pits. He pursued studies, became a competent draughtsman and ultimately manager of the works. At Clyde he and Dunlop had encouraged J.B. Neilson in his experiments in developing hot blast and together with Neilson and Mackintosh they constituted the firm formed to exploit Neilson's invention. (4)

In 1833 Dunlop and Wilson selected the site for their new iron works, apparently originally intended for production of pig iron only. Foundations for furnaces were begun in March 1834. Two furnaces were completed that year and the first went on blast on 4 November 1834. A third was built in 1835 and a fourth in 1836, completing the first section of the works, blown by an engine procured from Glamorganshire. (5) After the death of Colin Dunlop an Edmund Buckley appears to have joined Wilson but he retired in June 1839 leaving John Wilson as sole proprietor. (6) A start was made on the second section of the works in 1838 when a fifth

furnace was erected; three followed in 1840, one in 1841 and one in 1842. For this second section the blowing engine was supplied by Murdoch and Aitken of Glasgow. (7)

Meantime, on the west side of the blast furnaces, Wilson, towards the end of 1839, had begun to lay down an extensive malleable iron works which when completed had 44 puddling and 12 heating furnaces, one helve hammer and two steam hammers, eight rolling mills - three forge mills and five finishing mills (including one guide mill and two plate mills); they could turn out 350 tons of finished iron a week. This vast establishment when complete was said to have cost little short of £300,000. (8) In 1845 it had the first Nasmyth steam hammer in Scotland. (9)

John Wilson expanded his kingdom beyond Dundyvan. He was the first of the Monklands ironmasters to venture into Ayrshire where in 1841 he became a partner in the latest Muirkirk Iron Co.; in nine years he was sole partner. That works had three blast furnaces. In 1845 he secured from the Duke of Hamilton a lease of Kinneil for 31 years from Whitsunday 1843 at a fixed rent of £7,000 a year. This lease required him to erect, within the first five years from the inception of the lease, not fewer than four blast furnaces

> 'of the most improved construction and dimensions and all the machinery of proper arrangement and adequate power for blowing at least six such furnaces and which total number of six furnaces shall be erected and put in operation within six years from the date hereof with power and liberty to the said John Wilson and his foresaids to erect as many more furnaces as he may desire alongside of the original furnaces.'

Wilson was also bound to use in these furnaces only minerals mined at Kinneil. Neither in John Wilson's lifetime nor after his death did the Duke insist on the erection of the fifth and sixth furnaces, but in 1854 his factor wrote to Wilson's Trustees objecting to two of the four furnaces being out of blast and calling attention to the obligation imposed by the lease to erect a total of six furnaces.

In 1845, in association with James and Colin R. Dunlop (the owners of Clyde Iron Works) he built four blast furnaces at Lugar in Ayrshire. Of these he became sole owner in 1850. Moreover in company with Alexander Christie he owned the Devon Iron Works in Clackmannanshire. So, with control of twenty-two blast furnaces and a large malleable iron works, he had purchased the estates of Arden and Barblues about three miles east of Airdrie and these were to prove a valuable source of minerals for Dundyvan. (10)

Two of the original Dundyvan furnaces were torn down in 1850 and rebuilt on a new plan with provision for drawing off

the waste gases for use in heating the blast. In this he was far ahead of the other Scottish ironmasters. The redesigned furnaces were reported to be giving an increased output. (11)

John Wilson died on 9 November 1851, survived by his wife, four sons and two daughters. Two sons and one daughter were still minors. For the regulation of his succession he had executed a Trust Disposition in 1846 to which a codicil was added in 1850. (12) The provisions of the document were complicated. By a post-nuptial contract he had secured to his wife, after his death, an annuity of £500 to which his Trustees were required to add a further £500 making a total annuity of £1,000 to be secured out of the first realised portion of the Trust Estate. Also they were to lay aside and invest a capital sum of £5,000 for her in liferent 'and any parties she may nominate in fee'. To each of his brothers, Alexander and Thomas, he left annuities of £100 and to his sister-in-law one of £30. To a married niece he left a legacy of £1,000. His own children were liberally provided for: to Colin Dunlop Wilson, his third son, he left £30,000; to George James Wilson, his fourth son £20,000; and to each of his two daughters £10,000. To his eldest son John as heir-at-law went the iron works at Dundyvan, Lugar and Muirkirk and their associated leases. Kinneil Iron Works were bequeathed to his second son William, subject to the express burden of payment of £20,000 of Colin Dunlop Wilson's legacy and an obligation in favour of his successors at Dundyvan

> ' to deliver annually at Kinneil from the mineral fields there for the purpose of being conveyed to and used at my ironworks at Dundyvan an annual supply of ironstone sufficient for the consumption of four blast furnaces, my successors in the said Dundyvan Ironworks being bound on the other hand to pay for the said ironstone the cost of the output thereof together with the Lordship thereon but in the event of the Lordship on the ironstone so taken not amounting to Two Thousand Pounds sterling per annum my successors in Dundyvan shall be bound to make up the same to Two thousand Pounds per annum so as to relieve my successors in Kinneil ironworks to that extent of the yearly rental payable under the lease of Kinneil.'

The whole residue and remainder of the Trust Estate were to go to his eldest son John Wilson Jr. Much trouble was to be caused his Trustees by the provision about Kinneil. (13)

All these provisions for his family were on a grand scale but on his death it became evident that almost all of his capital was sunk in his various iron works. As the Trustees put it:

> 'He had no floating capital. The yearly rent of his current leases amounted to £20,000 and he was

indebted to Banks and former Co-partners to the extent of £95,000. His works were unsaleable and the only hope of providing anything for his widow and children was to carry them on.'

The seven Trustees nominated were James Dunlop of Tollcross; Alexander Christie; John Wilson, silk merchant, Glasgow; Andrew Bannatyne, writer in Glasgow; John Houldsworth of Cranstonhill; and his two sons John and William Wilson. Little wonder that four of them Dunlop, Bannatyne, Houldsworth and William Wilson declined to serve. The Trustees assumed three others who were willing to act - George Stirling, merchant, Glasgow; John Miller, civil engineer, Millfield, near Polmont; and Robert Aitken, accountant, Glasgow. John Wilson Jr. died on 3 September 1852, only ten months after his father, leaving his affairs in the hands of another group of Trustees.

The Trustees submitted to the widow of John Wilson Sr. a full statement of her husband's estate and she agreed to their proposal to carry on the works. Next they got the landlords of the mineral leases to agree that the carrying on of the works should not create any personal obligation against the Trustees. They persuaded the creditors to consent to the works being carried on and to agree to postpone payment of their debts. Further the banks agreed to provide the funds necessary for carrying on the works on the credit of the Trust Estate.

For a time their trading seemed successful. The balance sheet for the year ended 15 May 1854 showed:

Profit from Dundyvan works	£25,324	4s.	10d.
Kinneil works	8,002	0s.	6d.
Muirkirk works	9,420	7s.	7d.
	42,746	12s.	11d.
Loss on Lugar works	10,473	6s.	1d.
Nett profit	£32,273	6s.	10d.

It was not, however, a high rate of return on the total capital employed, which the same balance sheet put at £462,096.

In March 1853 they had made their first attempt to sell Muirkirk and Lugar. Exposed at £70,000 they attracted no bidder. Ultimately on 7 May 1856 when the upset price had been reduced to £50,000 there were a number of bids and a sale was effected at £61,000. The purchasers were the Eglinton Iron Co. (alias the Bairds of Gartsherrie). Attempts to dispose of Devon Iron Works met with no success until June 1854 when they were sold to Andrew Christie (brother of Alexander) for £15,709 16s. a price that included stocks of pig iron, ironstone etc.

In October 1855 they were able to report that they had reduced the debt from £95,000 to £30,000 but they had not been able to pay any of the annuities or legacies save the secured annuity to Mrs Wilson.

Their running of Dundyvan works was greatly impeded by deficient supplies of ironstone, attributed to want of enough waggons on the Monklands Railway. In fact sometimes the furnaces were stopped for lack of ore. Some ironstone was available in the Airdrie district (Springwells and Colliertree) but they were in a large measure dependent on supplies from Kinneil in terms of John Wilson's deed of settlement. These supplies, however, fell short by some 15 per cent of what was needed for four furnaces, though it was pointed out that the Dundyvan furnaces had been rebuilt and were larger than when John Wilson Sr. had imposed his stipulation. In 1855 William Wilson raised an Action of Declarator to have the trustees forthwith convey to him the Kinneil works without inserting in the conveyance any obligation to supply Dundyvan with ironstone. Litigation dragged on and in 1862, shortly before his death, William Wilson cut off supplies from Kinneil, contending that his choice lay between blowing out the Kinneil furnaces or stopping supplies to Dundyvan. Neil Robson in June 1858 had quantified the importance of Kinneil. Assuming that Kinneil was bound to supply to Dundyvan sufficient ironstone for four furnaces he valued Dundyvan works at £97,161 17s 11d. Without such supplies his valuation was reduced to £65,384 17s 11d.

For the financial year ended 15 May 1861 the loss incurred in running Dundyvan was 'about £5,000' and for the following financial year 'nearly £3,000'.

A report in January 1861 by John Mackenzie the manager at Dundyvan makes interesting reading.

> 'We are at present blowing four furnaces. The bar works are capable of converting the make of three furnaces but as furnaces cannot constantly be kept making forge iron it is necessary to have one more furnace in order that they may have a change to foundry iron. Therefore four furnaces is the proper number required in blast to serve a bar works that converts the make of three: but as orders cannot be got for much more than the half of the bar works I propose to blow out the fourth furnace as it is requiring repairs at any rate. In this case there will be a surplus of coal and as it is always a dead loss to stop pits I would advise that as much coal be sold as the furnace would consume, being at least 300 tons per week, especially as the price of coal is high at present. The prices for bar iron at present are such as

would yield a profit, averaging (i.e. the prices) from £7 [a ton] for common to £9 for plates or an average of less 5 per cent or £7 12s nett per ton delivered Glasgow. On the quantities we make with pig iron at the cost price here 47s 6d a ton and coal at cost price 5s 3d and present wages the average cost of all the qualities of malleable iron will be about £6 12s a ton at the works, exclusive of deterioration, and adding carriage to Glasgow and charges there 3s 6d makes £6 15s 6d thus showing an apparent profit of 16s 6d per ton. But unfortunately we cannot get orders for much more than half the quantity the works are capable of producing. The principal demand is for plates and angle iron for boat building and the plate mill is pushed with orders almost beyond its power. All the other mills have not half work. With all the mills at work we can turn out 1,200 tons per month but our average quantity for the last eight months has been little more than 600 tons per month. This half work greatly increases the cost of iron and every effort should be made to get as many orders as will keep all the bar iron mills regularly at work.'

In September 1861 he comments on the 'pig iron branch being in such a reduced and hopeless state from the exhausting of the ironstone field'. There remained, he said, three small fields - Whifflet, Springwells and Holehills - ironstone from which cost 21s 6d a ton whereas that from Kinneil cost only 15s 5d. a ton. Furnace coal had gone up in price by 4d a ton and for pig iron which cost 50s 3d a ton to produce the price got was only 48s. Bar iron mills working only half time resulted in an increase in costs of about 7s a ton. Works, he said, capable of producing 16,000 tons a year had produced only 8,843 tons resulting in a loss of £3,095 on the years working. Demand for plates was high and the plate mill had turned out 3,086 tons. In the current year wages had been reduced so as to bring down the cost of pig iron by 2s 6d a ton and of bar iron by about 6s a ton.

About this time further exploration of the minerals on Arden estate, on which the blackband ironstone had been worked out, revealed a seam of Clayband ironstone, much of it of workable thickness, and also oil shale. A start was made with the sinking of pits to work both of these minerals and in 1866 a small oil works was erected to distil the oil shale. The oil works were sold in 1870 but continued in operation till 1874.

In 1863 John Mackenzie reported that Arden would not yield a supply of ironstone of any consequence for a further eighteen months whilst the small remnant of Blackband in Dundyvan lands (yielding a diminishing output which was then about 400 tons a month) would be exhausted in twelve months.

Only three furnaces were in blast. Even so supplies of ore had to be bought in, about two-thirds of it haematite from Cumberland. Adequate coal supplies were available from fields leased in Dalziel, Whifflet and Drumpellier but these leases were about to run out, Dalziel at Candlemas 1864 and the other two at Whitsunday 1866. With ore costing on the average 19s a ton and coal 5s a ton the cost of pig iron at the works was now 52s a ton.

William Wilson had died without issue in 1862, Colin Dunlop Wilson a few months later and Kinneil works passed to their youngest brother George. In 1860 he had married Miss Halkett of Cramond and in the same year with his brother-in-law J. Craigie Halkett had formed the Cramond Iron Co. to take over Cramond Iron Works which the Cadells had just given up. On his succession to the Kinneil works George retired from the Cramond partnership.

Under constant pressure from the legatees the Trustees had decided in September 1862 to sell Dundyvan works. William Wilson's death delayed implementation of that decision but at monthly intervals from March to October 1863 the works were exposed for sale, at an upset price that started at £55,000 and came down to £25,000, without attracting a single bidder. At £25,000 they were withdrawn as this was reckoned to be little more than the breaking-up value. Prospects for carrying on the works, however, seem to have brightened and on 13 November 1863 the Trustees authorised the purchase of a new steam hammer and a machine for punching holes in rails - the total cost not to exceed £1,200. Moreover they debated whether it might not be better to build a new, larger and more modern blast furnace instead of spending money on putting two furnaces in order.

Early in 1863 the Trustees had recovered the sum of £37,000 that had been consigned **in medio** in an action of multiple pounding involving William Wilson and his co-legatees and were in a position to make the first payments to the remaining legatees. The estate of Colin D. Wilson got £7,000, the amount outstanding for ironstone from Kinneil. Miss Wilson's representatives got £13,963 11s 6d (of which £7,450 4s represented arrears of interest and the remainder was to account of principal). The remaining £16,636 9s 6d was divided equally between the only three remaining legatees Miss Wilson, her sister Lady Chamberlain and their brother George Wilson.

Still the dispute about Kinneil was dragging on. The agents for the trustees of John Wilson Jr. continued to press for Kinneil to be freed from the obligation to provide ironstone for Dundyvan. The Trustees of John Wilson Sr. were still carrying on Dundyvan works, with some hopeful prospect, it would appear, for in December 1866 a credit of £10,000 was given by the Clydesdale Bank. But there was no one to succeed to Dundyvan and carry it on and the only prospect of

satisfying in some degree the requirements of John Wilson's trust settlement was to sell the works and sell or feu the lands and such mineral rights as were owned and not merely leased.

Accordingly in April 1867 a further attempt was made to sell the works as a going concern, and the whole properties were offered in five lots as follows:

		Upset price
1.	Works, workmen's houses, lands of Dyke	£25,000
2.	Dundyvan Academy, Muirend Cottage and ground	4,000
3.	Lands of Dundyvan, Dundyvan Cottage, Provision Store, Office, etc	10,000
4.	Workmen's houses in Buchanan Street	4,000
5.	Minerals in Cuparhead	2,500

It was agreed that in the event of failure to sell lot 1 the other four lots would be withdrawn. No bids were forthcoming and in December 1867 it as decided to break up the malleable iron works. Only two offers were received and in January 1868 the malleable iron works went to R & J Easton, metal merchants, Glasgow, for £10,950. In February 1869 it was resolved to close the pig iron works at Whitsunday and an agreement was made to sell the blast furnace department to Easton, Hanson and Co. for £4,750; of this sum £2,000 was payable on or before 1 June 1869 and the site was to be cleared within six months after that date. By this time there was only one blast furnace to sell and it is rather puzzling that no mention has been found of demolition of the other eight furnaces.

Once the works had been disposed of, the other parts of John Wilson's estate were realised: the shares he had held in various companies were sold and sundry parcels of land were disposed of notably to Thomas Ellis (for his new North British malleable iron works) and to George Miller, rivet manufacturer, (for the site of Stobcross Rivet, Bolt and Nut Work). In 1873 Henderson and Dimmack of Drumpellier Iron Works bought the workmen's houses on the south side of Buchanan Street for £5,289. At the same time Henderson took a 19 year lease of the remaining Dundyvan minerals.

The Trustees finally achieved their discharge on 21 November 1877 after a stewardship that had lasted twenty six years. So ended the bold venture that brought the beginnings of malleable iron manufacture to the Coatbridge district.

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5. Airdrie Advertiser 8 January 1870

6. Edinburgh Gazette 29 June 1839

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8. Miller, op cit, p. 117

9. Glasgow Herald 31 March 1845

10. Miller, loc cit

11.

12. Signed 22 June 1846 and 21 March 1850. Registered 21 November 1851

13. Information about the intromissions of the Trustees is derived from their Sederunt Books, Strathclyde Regional Archives, TBK 127, 128, 129

CALDERBANK AND CHAPELHALL

Ironworking at Calderbank began in 1794 when John Aitken and Robert Dick established a forge there on the North Calder Water on ground feued from Andrew Stirling of Drumpellier.

To begin with the forge was known as Faskine Iron Works (1) but in advertisements in 1801 it is referred to as Monkland Forge. (2) In June 1804 the estates of both John Dick and the **Monkland Forge Company** were sequestrated and in 1805 the undertaking was purchased by the **Monkland Steel Company** - Malcolm McGregor, John Buttery, Francis Murray and James Neilson - (4) who had been carrying on the manufacture of steel and of files and spindles in a works situated on Glasgow's Molendinar Burn. At Calderbank these activities were continued and before long their output of steel was some 100 tons a year.

In 1826 they began production of iron from its ores. Their first blast furnace was erected in 1826 on Lauchope Water below Chapelhall. A second followed there in 1829 and a third in 1831. In 1835 they built their first blast furnace at Calderbank; in each of the years 1836, 1837 and 1838 they added another; in 1840 two more were built so that the company now had three blast furnaces at Chapelhall and six at Calderbank. (5)

Rapid growth of railways and the consequent demand for malleable iron rails induced them to abandon steelmaking and begin manufacture of malleable iron on a large scale. In 1839-40 they built 24 puddling furnaces and in 1845 on the opposite side of the North Calder they laid down another complete new works with 42 puddling furnaces and all ancillary equipment. In that same year they purchased Gartness Malleable Iron Works and proceeded to extend them.

McGregor and Neilson had retired in 1816. Francis Murray died in 1836 and was succeeded by his son William Murray. At the same time a younger son James Murray was assumed as a partner as was Alexander Warren Buttery, son of John Buttery, and the name of the first was changed to the **Monkland Iron and Steel Company.** (6) To accommodate their workers the firm built upwards of 500 houses in Calderbank whose population increased from 1,064 in 1841 to 2,872 in 1851. (In the latter year the population of Motherwell was only 1,274). By 1850 the company's works were capable of producing 1,100 tons of malleable iron each month. (7)

It is especially interesting to note the provision made by the firm for the education of their workers. In 1838 they established a school in Calderbank; by 1842 they had one in Chapelhall also; in 1850 it was reported that there were six

male schools and one female school. Some of these must have been associated with their colliery villages. Something like an Education Rate was levied on workers. Every adult male working at either Calderbank or Chapelhall and living within a mile of these works was required to pay 2d. a week towards maintenance of the school. This payment entitled him to send one child (his own or a neighbour's) to any of the works schools (either day school or night school). If he sent more than one of his own children he paid 1d. a week extra for each aditional child. The schoolmasters concerned met once a week and sent in to the pay office their lists of pupils receiving for each child 2d or 1d as the case might be. There was a reading room provided by the Company who also paid the wages of a man to supervise it and supplied the coal for heating. The principal Scottish and English newspapers and periodicals - 38 in all - were available. For use of the reading room members paid 2d a week. In addition a library had been established in 1848; its members paid an entry fee of one shilling and a subscription of two shillings a year. (8)

There was, of course, no legal obligation on the firm to provide any of these facilities. That they recognised such responsibilities towards their employees and their families is greatly to their credit. But such attitudes were more widespread than is generally recognised. Libraries and reading rooms are known to have been founded at Gartness and at Calder and the number of schools founded and maintained by coal and iron masters before the Education Act of 1872 has never been properly appreciated. In the case of the Monkland Iron and Steel Co. it may have been significant that William Murray was educated at the 'Grammar School of Glasgow', became a Glasgow town councillor, and was President of the Andersonian University from 1845 until his death in 1859. (9)

The firm was hard hit by the depression in the iron trade which lasted for six years from 1857; in July 1861 they had to suspend payments. Attempts to sell Gartness works were unsuccessful and they lay disused till 1864. Trustees were appointed and work was concentrated in Chapelhall and Calderbank works which in 1869 were again working to full capacity with some 2,000 employees. (10)

An interesting analysis of the cost of production of various types of iron and their cost delivered at Glasgow is found in a report prepared in 1861 by John Mackenzie (of Mackenzie and Moore, engineers, Glasgow) for James MacClelland, accountant, Glasgow. (11)

Pig iron at the works cost 46s 2.17d. a ton to produce.

Bar iron costs were:	At works	At Glasgow
Refined	60s 2.40d	

Double puddled ($\frac{1}{4}$ pig $\frac{3}{4}$ refined)	91s 3.49d	
Single puddled ($\frac{3}{4}$ pig $\frac{1}{2}$ refined)	83s 3.29d	
No. 2 or scrap bars	109s 1.59d	
No.2 or roughed-down bars	108s 4.39d	
Common merchant (made at mills 1, 4, 5)	111s 5.79d	115s 3.79d
Small sizes (made at guide mills)	122s 5.81d	126s 3.81d
Nail rods (no 2 mill)	117s 1.20d	120s 11.20d
Angle, beam and other heavy bars (mill 6)	126s 4.60d	130s 2.60d
Plates	144s 10.58d	148s 8.56d
Forgings	£12 15s 9d	£12 19s 9d

These figures suggest that there must have been at least seven rolling mills.

The same report has the following record of actual production in one four-week period. Prices are per ton.

	Output (tons)	Cost	Price realised	Profit
Common bars	450	£5 15s 3d	£6 2s 6d	17s 5d
Nail rod	330	£6 0s 11d	£7 0s 0d	19s 1d
Small sizes	510	£6 6s 3d	£6 15s	8s 9d
Heavy sizes	870	£6 10s 2d	£7 0s 0d	9s 10d
Plates	240	£7 8s 8d	£8 3s 4d	14s 8d

The abstract of his valuation of the works is as follows:-

	As going concern	For removal
Chapelhall pig iron works	£10,917	£3,152
Calderbank pig iron works	21,799	4,701
Old mill bar iron works (Calderbank)	15,562	3,484
Old forge (Calderbank)	3,522	709

Haugh mill (Calderbank)	32,059	6,687
Gartness mill	7,901	2,545
Moffat forge	3,338	1,029

A newspaper article in 1869 described Calderbank works as having six blast furnaces, three refining furnaces and a slitting mill for making nail rod. Adjacent, in the 'Old Mill' was a malleable iron works with 27 puddling furnaces and two steam hammers. Across the North Calder in the new 'Haugh Forge and Mills' were 40 puddling furnaces, another slitting mill, two steam hammers (one of 3 tons, the other of 2 tons), two rolling mills and a rail mill. The din, it was said, beggared description. (12)

Soon the firm ceased to be a family concern. In 1871 London financiers floated the **Monkland Iron and Coal Co. Ltd.** to purchase the whole properties from the trustees (Andrew Simpson McClelland and William Mackinnon). The purchase price was to be £400,000 of which £90,000 was to be payable in 7 per cent guaranteed preference shares, £80,000 in cash on allotment of shares and the balance of £230,000 in cash in three quarterly instalments in 1872. In consequence of this sale the trustees were able to pay all creditors of the Monkland Iron and Steel Co. in full with interest at the rate of 4 per cent. (13)

Each year the Monkland Iron and Coal Co. had to report losses. The final blow was dealt by a prolonged miners' strike in the autumn of 1880. By 31 December 1880 the position was hopeless. Preference dividends were £41,000 in arrears; £9,000 had been borrowed on security of the company's rolling stock and £95,000 on debentures; the accumulated debts of the company were no less than £144,567. The disgruntled shareholders appointed a committee to report on the position. An independent valuation of the works and stocks assessed the works as a going concern at £317,964 instead of the £414,000 at which they were entered in the balance sheet for 1880, and the stocks at £80,000 instead of £96,159. (14) There ensued a series of stormy meetings and a series of indignant letters to the editor of the Glasgow Herald. (15) The directors explored various devices for the alleviation of the position, all of which proved illegal. The shareholders' committee proposed formation of a Monkland Debentures Ltd. with a capital of £200,000 in £5 shares. In return for providing this amount of new capital the proposed company was to hold as security the whole works, plant and stocks. The proposal met a cool reception : only 5,000 shares were applied for. (16)

In a last desperate attempt to raise funds and avoid

liquidation the directors proposed a reconstruction of the company into one with a capital of £1,000,000 in 200,000 ordinary shares of £5 each. Half of these were to be issued in exchange for the existing shares; 60,000 (nominally £300,000) to the holders of guaranteed preference shares in exchange for their holding of £200,000 of existing stock and resignation of their rights to preferential dividend and to accumulated arrears; and 40,000 shares (nominally £200,000) to the ordinary shareholders in exchange for their holdings, also amount to £200,000. The remaining 100,000 shares of new stock were to be offered for purchase by existing shareholders at the price of £1 a share, shares so bought to rank as fully paid. But the directors had completely lost the confidence of their shareholders: the proposals were rejected by an Extraordinary General Meeting and the company went into voluntary liquidation. (17)

The prospectus of the proposed Monkland Debenture Co. Ltd. helps to give a picture of the extent of the undertaking at this time.

Pig iron works — 9 blast furnaces, 7 blowing engines, 5 smaller engines, 33 boilers.

Bar iron works — 68 furnaces, 4 steam hammers, 3 forge mill trains, 3 merchant mills, 3 rolling mills with ample engine power for the whole.

Dwelling houses — Upwards of 500 workmen's houses, schools, stores, etc. mansion houses of Cardarroch and Woodville.

Railways — About 40 miles of private lines.

Rolling stock — 9 locomotives, 400 railway waggons, 310 narrow gauge waggons

Pits — The fittings of 44 pits; 61 winding and pumping engines; boilers, pumping and winding gear; rails and about 4,000 hutches.

By this time all the blast furnaces had been completely rebuilt on William Ferrie's patent method of construction (18) that had been hailed as 'beyond question the most advanced step yet made in Scotland'. (19) Ferrie's patent sought to utilise some of the energy of the waste gases. The upper part of his furnace contained vertical retorts, usually four in number, surrounded by flues in which part of the waste gases was burned. As the charge passed down through the retorts the raw coal was coked and the lime and ironstone calcined. A substantial saving in fuel resulted. Moreover the furnace was able to carry a column of charge some 83 feet in height instead of the usual 40 to 70 feet.

About two months after liquidation had been decided

upon, another special general meeting was called to consider yet another proposal. It had been learned that it was the liquidator's intention to offer the whole heritable property at the low upset price of £75,000 on condition that the purchaser would also take over the other assets (stocks, etc.) at a fixed price of £82,000 and assume responsibility for the continued payment or the capitalisation of the two annuities with which the Monkland Iron and Coal Co. was burdened. Some of the larger shareholders, still convinced that the works could be made to pay, proposed that a new company with a capital of £200,000 in £5 shares should be formed to acquire the works. Shares in the new company would be offered in the first instance to shareholders in the Monkland Iron and Coal Co. in proportion to their holdings in that company; any shares not taken up in this way would be offered to the public. So the **Monkland Iron Co. Ltd.** came into being. (20)

The **Monkland Iron Co. Ltd.** was no more successful than its predecessor. Accounts for the first year of trading showed a debit to revenue of £9,009; by 1886 the accumulated debits amounted to £77,412. (21) This was a deplorable record for a company that had acquired its works and plant if not 'for next to nothing' - as one shareholder put it - certainly for a fraction of their original cost. Admittedly conditions had been bad in the iron trade but several shareholders openly declared that they had been the victims of a conspiracy on the part of the chairman, George Wilson, and his clique to gain possession of the works. (22) At its fifth Annual General Meeting Wilson announced that the company was no longer able to meet its obligations.*

Following Wilson's announcement that liquidation was inevitable, representatives of the holders of three-quarters of the shares offered to buy all the rest of the shares at £2 a share; they set a time limit of two months for acceptance of their offer. It was rejected. Wilson and his clique then called an Extraordinary General Meeting for 23 November 1886 and forced liquidation without, so far as can be judged, making any effort to retrieve the situation.

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* Just over five years earlier, as chairman of the Monkland Iron and Coal Co. Ltd., he had made a similar announcement. If his shareholders then had realised the manner of his dealings in the company's shares the meeting might well have been a much more stormy affair. In 1872 he had acquired 2,000 shares; in the course of the next year he had disposed of 750 of them. In 1874 his holding had dropped from 1250 ordinary shares to 500 ordinary and 500 preference. He disemburdened himself of more shares in 1879 and 1880 until in 1881 he held only 100 ordinary and 200 preference. It was strange behaviour for the chairman of the company.

First attempts to sell the works were unsuccessful but ultimately on 9 November 1887 a sale was effected for the reduced upset price of £50,000. (23) By March 1888 the liquidator could announce that they had 'reduced into possession' all the available assets of the company, had paid practically the whole of the cost of liquidation and had about £50,000 available for the creditors. In November 1888 all creditors were paid in full with interest at 5 per cent from 23 November 1886 to 26 October 1888. The unfortunate shareholders, however, got only 3s 9d for each £5 share. In the short space of 15 years almost the whole of £600,000 invested in these works had been lost.

The purchasers, a 'group of people prominent in the iron trade', assumed the name 'The Owners of Chapelhall' and proceeded to scrap the works.(24) Calderbank became a scene of desolation. Workers had moved away in search of work and over 200 houses were empty and boarded up. The only sounds from the works were those of the demolishers. The old filemaking shop, one of the earliest erections on the site, was one of the last to be demolished. (25) For some unknown reason Chapelhall blast furnaces escaped demolition at that time.

On 4 June 1890, about two years after clearance of the site of Calderbank works, the **Calderbank Steel and Coal Co. Ltd.** with a capital of £250,000 in £10 shares was registered to acquire the site and erect a steel works. It had been proposed to overhaul the Chapelhall blast furnaces and restart them to provide iron for the new works and with this in mind a report on the Chapelhall works was prepared by William Armstrong and Son and presented on 22 February 1890 to P and W MacLellan, Glasgow. The blast furnaces, which had not been operated for four years, were reported to be badly situated and antiquated: extensive repairs were necessary and the stoves for hot blast required complete renewal. The three blowing engines, (built between 1876 and 1878) of inverted tandem type with 48 inch steam cylinders and 84 inch air cylinders, were said to be too small to drive the furnaces efficiently. The conversion of the furnaces from 55 feet high to 85 feet in order to utilise Ferrie's patent had been a failure. Since these works had formerly been carried on at a loss, Armstrong assigned them only a breaking-up value not exceeding £7,000. (26)

The newly-formed company took over the Calderbank site, the railways and the unexpired mineral leases. They proceeded to re-equip the collieries and to build at Calderbank a steel works with seven Siemens-Martin open hearth furnaces and two mills for rolling plates. The furnaces could produce 700 to 750 tons of steel a week, only sufficient to keep one mill going. Steel production did not

begin until 23 March 1891; with frequent interruptions it continued until 23 March 1892. In that twelve month period the works operated only six and a half months and the loss on steel making was £7,055. In the course of 1893 some reconstruction of the works was carried out. Additional railways were laid down; a new casting pit was made and locomotive cranes were installed; new coal-fired heating furnaces with waste-heat boilers attached were erected. The prevailing depression in trade enabled reconstruction to be effected at a very low cost but on the other hand prices for steel plates were so low that the directors decided it would be unwise to re-start the works. In the event no steel at all was made for over four years and production did not start again until September 1896. An Extraordinary General Meeting on 3 December 1897 agreed that the company must go into liquidation. The steel works had cost £154,000 (including £8,000 for the site) and a further £72,000 had been spent on the collieries and the workmen's houses. For the preceding year the loss on the steel works had been about £22,000. On the Ordinary shares the only dividend paid had been 2 and a half per cent in respect of the period up to 30 June 1891. In its short life of seven and a half years the works had been in actual operation for less than two years altogether. Their properties, on which some £226,000 had been spent, were sold by roup on 30 November 1898 and realised only £41,184 including £6,184 for loose tools etc at valuation. The liquidators presented their final report on 29 August 1900. So ended another unfortunate Calderbank company. (27)

The properties were purchased on behalf of a proposed new company the **Calderbank Steel Co. Ltd.** registered 7 February 1899 with an authorised capital of £100,000 in £10 shares, half of which were 5 per cent Preference shares. Only 3,007 Preference and 1,000 Ordinary shares were issued. None had been offered to the public: all were allotted to the six partners of James Watson and Co. iron merchants, Glasgow, two of whom were already directors of James Dunlop and Co. (1886) Ltd. who carried on the old-established Clyde Iron Works at Tollcross and were also engaged in mining on a considerable scale. The new Calderbank firm appears to have been only a holding company: on 25 July 1900 it was resolved to put it into voluntary liquidation.

Meantime, on 19 May 1900, a new public company **James Dunlop and Co. (1900) Ltd.** had been registered with the object of acquiring the coal mining and iron and steel making interests of the two private firms James Dunlop and Co. (1886) Ltd. and the Calderbank Steel Co. Ltd. The properties of the latter company were sold to the new company for £84,575 - rather more than twice what had been paid for them less than two years earlier. For the first time in the history of Calderbank the works had been re-sold for more than they had cost the vendors. It is probably significant that the sale was to a company about to offer shares to the public. (28)

The works now settled down to production of boiler and ship plates. In 1901 it had five melting furnaces, two of 50 tons capacity, one of 40 tons and two of 25 tons. (29) By 1930 there were six furnaces, one of 70 tons and five of 50 tons capacity. (30)

In 1920 the whole share capital of James Dunlop and Co. (1900) Ltd. was acquired by Lithgows the shipbuilders in Port Glasgow.

Following formation in 1930 of **Colvilles Ltd.**, by fusion of the major iron and steel making activities of David Colville and Sons Ltd. and James Dunlop and Co. (1900) Ltd., Calderbank steel works were closed and later scrapped. Beginning in 1935 the site of the works was cleared and it had not been used since although the former office building on Calderbank's main street is used by a motor engineering firm.

The 6-inch Ordnance Survey map of 1859 shows the general lay-out of the works at that time but only the six blast furnaces can be identified with certainty. Two are clearly of the old type with square cross section at the base; the other two are of the modern circular cross section. The map of 1914 shows that the steel works occupied the site of the blast furnaces and of the earlier part of the malleable iron works.

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5. Miller, Coatbridge, p. 20
6. Sasine Register, GR 1890 142
7. Glasgow Herald 3 June 1850
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9. John Macarthur, New Monkland Parish (1890) p. 184
10. Airdrie Advertiser 18 December 1869
11. Strathclyde Regional Archives, TD 443

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16. Ibid 20 April 1881

17. Ibid 30 April 1881

18. William Ferrie's patent June 1868

19. British Association Handbook 1876 pp. 4142

20. Airdrie Advertiser 16 July 1881; SRO BT2/1022

21. Stock Exchange Yearbooks 1883 to 1887

22. Report of Extraordinary General Meeting Glasgow Herald 24 November 1886

23. Airdrie Advertiser 12 November 1887

24 The "Owners of Chapelhall" were:

George MacLellan Blair Graham Hardie Thomson James MacLellan Blair Walter Thomas MacLellan William Turner MacLellan	)))-))	the partners of P & W MacLellan, Glasgow
William Anderson Donaldson Thomas Neil MacKinnon John MacLellan Peter Donaldson	))-))	the partners of James Watson & Co, Glasgow

William McKinnon, C.A., Glasgow

25. Airdrie Advertiser 21 December 1888

26. Strathclyde Regional Archives, TD 443

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28. S R O, BT2/4545/1

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30. Private communication from the late Mr Robert Borland.

A GLOSSARY OF THE COAL OF GLADSMUIR

by

W S HARVEY

The following has been compiled from entries setting out the accounts of a small colliery in the parish of Gladsmuir, East Lothian, during the years 1759 to 1762. The account book is amongst the archive of the University of Glasgow, and an example of the vernacular of the period. (1) It is hoped the glossary will be of interest in the way it reflects the working of an eighteenth century coal pit. It is also hoped it will encourage useful debate. Although some of the mining terms are still in use, the particular meaning of others is uncertain or ambiguous.

The colliery was near the village of Penston. It was a small enterprise, employing around 13 colliers and producing about 3,400 loads of coal a month, 300 tons. (2)

Breaking ground. "Paid cash to ye Sinkmen and Wrights for breaking ground at ye new sink. 2/-"

A generic term for excavating. (N) At Gladsmuir it was particularly applied to the opening of each new pit.

Couping. "Paid cash to Thomas Brown and Son for couping ye Gin buckets. 6/6."

To overturn or empty. (B)

Darg. "Paid cash 3 Gaitmen each 6 darg. 18/-"

A days work. (B) The workers were also paid on a daily or a weekly basis.

Fail / Fell. "Paid cash a berrer for carreing doun fails to dam water. 4d."

"Paid cash for casting and carreing a fell dam. 8d."

A piece of turf. (SND) See Leaveing below.

Flag. "Paid cash John King for laying flags for carreing air. 1/-"

Flags could be pieces of green swarth, (SND) but the entry is more likely to have meant flagstones. The objective was a covered channel along which air flowed by

convection. See Lamp below.

Foul Coal. "Paid cash Adam Ferm for working through a sime (seam) of foul coal. 4/-"

Coal mixed with clay or rock was described as foul. (B)
The colliers basic wage was for saleable coal, and any other work was paid for as an overhead.

Gaiting. "Paid cash Arch. Houleson 6 darg at gaiting. 6/-"

A gate is the main passageway in the mine. (N) Gatemen keep it clear by gaiting. That is, cutting away enough of the adjacent rock to give a degree of headroom.

Gin. "Paid cash Carniebie Teat for draveing ye gin. 2/6".

A colliery gin was usually a winding drum mounted vertically and turned by a horse. References in the Account show the Gladsmuir gin must have been turned by hand. It may have been a sort of crane for it had a treiss (trestle) and a winles (windlass). These parts suggest the gin was a construction of three legs with a winch drum between two of them. (OED)

Lamp. "Paid cash ye colliers for turning the air gait and working some coals for ye lamp. 4/6".

The lamp seems to have been a brazier suspended in the pit shaft to induce ventilation. I have found no reference to this being called a lamp, but in the Leicestershire coal fields it was known as a lantern. (3)

Coal was removed from the Gladsmuir pit by bearers who climbed a succession of stairs. By having a brazier at one side of the shaft to create an up draught, air would flow down the other and could be conducted, or coursed, through the workings.

Leaveing. "Paid cash John Fermer for leaveing water. 3/-"

Leaveing or laving was a traditional way of moving water by bailing with a shovel. (B)

Where there was no drainage level to carry off the water, a series of dams were made, one set above the other, and the water raised from the lower workings by laving via interconnecting gutters. (4) The practice is a very ancient one for a medieval MSS referring to even older mines in the Leadhills area states water was removed by 'Castynge' as the miners did not know 'the use of shaftes and bucketes.' (5) (6)

Leven Room. "Paid Wm Cornwall for draveing 2 fathoms of ye leven room. 2/-"

I have not found any reference to 'leven room'. It may have been a local variation of level room, that is a passageway cut across the seam from the shaft bottom. (B)

Ludge. 'Paid cash James Macferlin 6 days building walls of ye coal ludge. 3/6"

The lodge was the cabin at the pit head. (B)

Mats. "Paid Wm Nesbit making and mending coal mats. 2/-"

Probably containers of a woven construction. (OED & SND). The entry could either refer to the baskets used by the bearers, or some form of crib used to hold coal at the pit head.

Pailling/ Pilling "Paid cash ye colliers assisting at pailling in ye leven room. 1/-"

"Paid cash 2 colliers at pilling ye new sink. 1/4"

There seems at least three possible definitions. Viz
Pell - to strike violently. (OED)
Pail - to drive in wooden posts. (OED)
Pale- to pierce with a pale to sample cheese. (SND)

The latter could have had a mining connentation as being a device driven ahead of the work to try the ground.

Reed. "Paid cash 8 berrers for carreing reed. 4/6".

"Paid cash David Brown for reeding ye stairs. 1/11"

Reed or Redd was the rubbish and debris in the mine. (B)

It was also used as a verb meaning to set in order. (SND)

Sell. "Paid cash Geo Beard spreading ye sell hill. 2/-"

A word for which I have not found any relevant definition. May just refer to the yard where the coal was sold.

Sink. "Paid Wm Nesbit putting in a stair in ye new sink 2/11"

The pits at Gladsmuir were always referred to as sinks.

Spout. "Paid cash Bengerman Brown for mending ye water spouts. 1/8"

Wooden gutters. (SND) See Leaveing above.

Stoup. "Paid cash Bengerman Brown making stoups. 3/-"

In Scottish mines the stoups were the pillars of coal left to support the roof. However, Bengerman Brown was a carpenter, so he was probably making wooden pit props. This usage is given as peculiar to the English Midlands. (G)

Thirling. "Paid cash 3 colliers for thirling a dik (dyke) 10/6."

A term still used for cutting a passage to connect two points in a mine. (N)

Throwart. "Paid cash John Reed for reeding a throwart. 1/-."

Probably a variation of throughher, a passage driven to provide ventilation. (B)

Well. "Paid cash for boring the well at Hdges and got coal there at 35 inches thick 10 fathoms 2 ft below the surface. £1-12-6."

Not a term I have found in mining references, but it was used to describe a pit sunk by the defenders to seek the enemy's mines. (OED)

Yet. "Paid cash John Howie for supporting a yet. 1/-"

A gate. Variations in spelling point to different interpretations of what was essentially a spoken vernacular.

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OED. Oxford English Dictionary

SND. Scottish National Dictionary

1. Glasgow University Archives. UGD.11/1/1. Account of the Coal of Gladsmuir.

2. The Gladsmuir load was of 200 pounds. Statistical Account Vol. 7. Parish of Gladsmuir. p. 318

3. I am indebted to G. Downs-Rose of the Wanlockhead Mining Museum for this information.

4. The practice of leaving is well described inthe New Statistical Account, Volume 2. Parish of Tranent. p.285.

5. There is a transcript of the MSS in R.W. Cochrane-Patrick, Early Records relating to Mining in Scotland. Edinburgh. 1878. p. xxxii.

6. Since completing the above my attention has been drawn by G. Downs-Rose to the similarity of 'leaving' and 'leven', and we have discussed the possibility that the two words have some common origin in the business of removing water from a mine. I have found no reference to support this, but it could be that the leven room was not, as suggested, at the shaft bottom but was the lowest, and therefore wettest, part of the mine.

The research on which the Glossary is based was carried out during a History Workshop arranged by the University of Glasgow, Department of Adult and Continuing Education during 1982/3. I am indebted to the tutors, Mr M. Moss and Dr. D. Dow, for drawing my attention to the Gladsmuir MSS and for their assistance in its interpretation.

It is intended that a detailed account of the Gladsmuir colliery will be published in the journal, British Mining in due course.

THE AVON STEEL WORKS

by

James Sommerville

The Avon Steel Works were situated in the County of Stirling, Parish of Muiravonside, on that part of the north bank of the River Avon known as Wallace's Cave, approximately 1,200 yards upstream from Torphichen Bridge. (Ordinance Map. 6" Stirlingshire, Sheet XXXVI. 1860).

In the extracts from the Valuation Rolls (see appendix III) there are houses at Hill occupied by Wm Hawksworth (place of birth England) a steel maker, from 1855 to 1862 for a yearly rent of £35. In 1862-1863 Hawksworth is occupying premises known as Avon Steel Works for the same rental of £35.

From the Valuation Rolls three questions now arise:-

1. How did the works come into the possession of John Calder?

2. Were the £35 yearly rented houses at Hill and the £35 yearly rented Avon Steel Works one and the same?

3. Although John Calder owned the works did he take any part in the manufacture of goods made from steel or did he simply lease the premises to persons or companies engaged in the steel industry?

In answer to these questions. Firstly, in 1831 when John Calder inherited the lands of Hill from his father William Calder, there is no mention in William Calder's will (Register of Sasines, Scottish Record Office) of a mill or a steel works. In John Calder's will (Meadowbank House) there is a specific mention of the Avon Steel Works. Therefore, it could be assumed that the Works came into being while the lands of Hill were owned by John Calder.

From a study of the Sasines Register it can be seen that John Calder provided money to various people. Again a reasonable deduction could be made that if he did not actually build the works, John Calder was involved in financing the project.

Secondly, the Avon Steel Works are mentioned in the Government Survey map of 1860, that is two years before they are mentioned by name in the Valuation Rolls. Extracts from the 1841 and 1851 Census of Scotland, County of Muiravonside provide this information. In the 1851 census (appendix II)

the Avon Steel Works are mentioned as the address of two families, those of Mr Kyne and Mr Stone who is described as a steel refiner; Mr Hawksworth's address is given as Compston which lies about two and a half miles from the works, but his year old son had been born at Crawhill, Linlithgow, a dwelling on the south bank of the Avon about 500 yards from the works. The birth place of Stone's four year old son is given as Muiravonside. His six year old daughter was born in England. Which beggars the questions - was Stone an Englishman like Hawksworth resident and working at the Avon Steel Works in 1847? Was there an Avon Steel Works as early as 1847? From the 1841 Census (appendix I), a Spaid Forge existed on John Calder's property of the Hill. Following an exhaustive search of the lands of Hill I could find no other location for a Spaid Forge other than the works. Anyway why use money and manpower to build a separate steel works when there was a works already in action capable of easy conversion for the production of steel?

Thirdly, from a deposition dated 31st March 1875 in the Sasines Register, whereby John Calder sold the mineral rights of Hill to John C. Lees, Crawhill, some of the conditions for sale read as follows,

> "..... and in the second place. All and whole that Forge of steel work at Hill, belonging to me, with the dwelling houses, ground and whole buildings and erections connected with the works and the whole machinery, fitting and plant therein, as also, the leads, ponds, and aqueducts supplying the water for driving the machinery and free right of access to the works by the existing roads and whole privileges and pertinents therewith connected all as recently let by me to the Coatbridge Tinplate Company conform to lease between them and me dated 30th January and secondly, 12th February 1874 and that for and during a period of thirty eight years."

From a study of the Valuation Rolls it would appear that John Calder let the Avon Steel Works throughout its working life to various steel producers.

Mr John Anthony of South Street, Armadale, who had gone at the age of the five years in 1912 to live with his grandmother, Mrs Vivers, in Avon Cottages, told me that the products of the works were mainly pick-axes, sledge-hammers, and steel wedges. From Mrs Allen, aged 80 years, living in Avonbridge, a grand-daughter of Calder of Drumboider (the same family as John Calder) I learnt that her brother who now lives in Australia has in his possession two curling stones the handles of which were made at the works. He has also a shepherd's crook with the curved part having been fashioned at the works.

On page 201 of volume 1 of Sir John Sinclair's

Statistical Account of Scotland, 1791, Parish of Muiravonside, we read,

> "There are several coal mines and a great quantity of ironstone in the district".

It would seem that the basic ingredients for making steel were easily obtainable.

John Calder had the haulage contract for taking the finished products from the works - this information was imparted by Mr Morton, Hill Row. Because the road from the steel works to public road (Ordinance map, 1860) passed through John Calder's land, and as he was already carting the produce from the works it is more than likely that Calder brought the raw materials to the works.

On the death of John Calder in 1890, the Avon Steel Works ceased to function (extract from the Valuation Roll).

As a practical step in the investigation of the Avon Steel Works I have visited the site on several occasions, taking care not to disturb in any way the remains. The approximate length and breadth of the works was 65 feet by 60 feet with a mill lade running through the centre. The following items have been found (1) an earthenware crucible for holding molten metal; (2) some pieces of charcoal; (3) metal slag; (4) some wedges of various sizes; (5) parts of roofing tiles; (6) a small section of a wall still standing that formed part of the works; (7) the mill lade as defined in the Government Survey map of 1860; (8) the remains of Avon Cottage.

In conclusion, sometime around 1840 a forge was in existence on that part of the banks of the River Avon known as Wallace's Cave, about 1850 the forge was adapted to make small steel objects and continued doing so until the death of John Calder in 1890.

Miscellaneous observations:-

(1) There was a mine known as the "Tinplate" (Coatbridge Tinplate Co. ?) about 400 yards from Hill farm, the home of John Calder. This mine ceased production around 1926. The waste bing was flattened a few years ago.

(2) An excerpt from an article entitled "The Avon and its Historical Memories" in the Grangemouth Advertiser 14th March 1914 reads:

> "Between Avonbridge and Torphichen Mill Bridge a peculiar formation in the rock of the river bed is called Wallace's Cave. A wooden footbridge carries a footpath over the river."

The article then goes on to describe the cave. From "The Avon and its Historical Memories" it is said that:

> "Wallace crossed the Avon here on his way from Torphichen Priory to the Battle of Falkirk. Here are the ruins of the Old Mill where the present Polmont Steelwork was commenced."

As will be seen in the excerpts from the Valuation Rolls from 1910 to 1916 the Polmont Steel Works never came into being. Mr J. Anthony states that the works were never in production while he was living in Avon Cottage and who after leaving Avon cottages was a regular visitor to his grandmother.

Mr Hamilton, Avonbridge born in 1908 at Avon Cottage and where he lived until manhood also says that he never saw the works in use. Another observation of Mr Hamilton's was that Wallace's Cave was a popular picnic area for children from Glasgow. They came by train from Glasgow to Westfield then completed their journey to the "Cave" on foot. Dwellers in the surrounding villages also found the "Cave" a pleasurable rural retreat.

On the Government Ordinance Map, 2nd. Edition, Quarter Sheet, Stirling, Muiravonside, 6" to 1 mile, parts XXXI and XXXVI, 1898, the Avon Steel Works are marked disused.

Mrs Vivers, the last occupant of the Avon Cottage (early 1930s) gave as her postal address 'Steel Forge', Nr. Avonbridge, Stirlingshire.

In the Sasines Register, in a specified monetary transaction, 13th February 1890, involving a bond for £500, Charles Walter Robinson (see excerpts from the Valuation Roll) describes himself as a steel manufacturer, Avon Steel Works, Linlithgow.

As a boy in the 1920s and as a young man far into the 1930s I remember a well trodden footpath along the north bank of the Avon stretching from the Westfield Viaduct to Torphichen bridge. A similar footpath existed from the Torphichen-Westfield road to the Cave. Alas, all is now a jungle.

The foot-plates on the metal bridge now spanning the Avon at the Cave are paper thin. As a matter of fact a six foot length of plate is missing entirely from the centre of the bridge. The decline of the Cave as a well loved area of sylvan beauty is in no small measure due to the pollution of the Avon by the discharge of effluent into the river by Westfield Paper Mill.

APPENDIX I

Extracts from 1841 Census of Scotland **County of Stirlingshire, Parish of Muiravonside**

Name of place, house etc.	Houses uninhabited buildings	inhabited	Name and surname Present 6 June 1841	Age M	Age F	Occupation	Where born
Hill Farm							
			Elizabeth Calder (widow)		60		Muiravonside
			John Calder	36		Farmer	do.
			Allan Calder	30		Farmer	do.
			William Calder	26		Farmer	do.
			Janet Calder		24	Farm Servant	do.
			Elizabeth Crighton		22	Farm Servant	do.
			Margret Dunsmuir		13	Farm Servant	do.
			Anne Davie		12	Farm Servant	do.
Hill Spaid Forge	1	1	Hugh Moore	23		Blacksmith	do.
			Joan Moore		22		do.
			Thomas Speritone	65			do.
			Mrs Thomas Speritone		55		do.
Hill, Spaid Forge		1	Andrew Moore	76		Blacksmith	do.
			Agnes Moore		58		do.
			Margret moore		24		do.
			John Moore	21		Blacksmith	do.
			John Gaurie.	10		Blacksmith	do.

please note discrepancies in ages of the Calder Hill Farm between the 1841 Census and the 1851 Census

Extracts from 1851 Census of Scotland, County of Stirlingshire, Parish of Muiravonside

Name of Place, Street, Road, House etc.	Name or surname of persons in house night 30 March 1851	Relation to head of family	Condition	Age M	Age F	Rank Profession Occupation	Where born
Compston	Robert Marshall			55		Agricultural Labourer	Muiravonside
	Janet Gillies				24	do.	Denny
Compston	William Hawksworth	Head	Married	27		Steel core maker and refiner	England
	Lousie Emma Hawksworth	Wife			29		do.
	Edward William Hawksworth	Son	u	1			Linlithgow Crawhill
Compston	Mrs Sharp	Head			46	Housewife	Linlithgow
	David Sharp	Son	u	20		Railway Labourer	do.
	Isabella Sharp	Daughter	u		24	Agricultural Labourer	do.
	Agnes Sharp	Daughter			22	do.	do.
	Elizabeth Sharp	Daughter			16	do.	do.
	Agnes Muir	Grandaughter			11 mnths		Muiravonside
Compston	James Nesbitt	Head	Married	58		Agricultural Labourer	Kirknewton
	Janet Nesbitt	Wife			44	Housewife	Kirkliston
	John Nesbitt	Son		29		Agricultural Labourer	Kirknewton
Avon Steel Works	George Kyne	Head		65		Carter	Muiravonside
	James Kyne	Son	u	20		General Labourer	do.
	David Kyne	Son	u	14		Scholar	do.
	Elizabeth Kyne	Daughter	u		22	Domestic Servant	do.
	Mary Kyne	Daughter	u		11	Scholar	do.

Avon Steel Works	James Stone	Head	Married	34	Steel Refiner	England
	Jane Stone	Wife		32		England
	Jane Stone	Daughter		6	At home	England
	William Stone	Son		4	At home	Muiravonside
Hill Farm	John Calder	Head	u	44	Farmer of 57 acres employing 1 labourer	Muiravonside
	Elizabeth Calder	Mother		74	Farmer's widow	do.
	Alex. Calder	Brother	u	42	Amateur mechanic	do.
	Janet Russell	Servant	u	19	House Servant	Torphichen
	Mary Kyne	Servant	u	15	House Servant	Bathgate
Compston	Agnes Carmichael	Servant	u	16	House Servant	Muiravonside

APPENDIX III

Extracts from Valuation Roll, Scotland County of Stirling Parish of Muiravonside

Year	Description of Subject	Proprietor	Tenant	Occupier	Rent
1855 to 1862	Lands of Hill	John Calder, Hill	Self	Self	£70 0 0
	Houses at Hill	do.	Wm Hawksworth, steel maker	Wm Hawksworth	£35 0 0
	do.	do.		Small rent	£ 7 15 0
1862 to 1863	Lands of Hill	do.		Self	£70 0 0
	Avon Steel Works, Hill	do.	Wm Hawksworth, steel maker	Wm Hawksworth, steel maker	£35 0 0
	Houses at Hill	do.		Small rent	£ 8 0 0
1866 to 1867	Avon Steel Works	do.		James Prentice & Co	£35 0 0
1867 to 18?	Avon Steel Works	do.		Stones & Robertson	£35 0 0
18? to 1890	Avon Steel Works	do.	Charles W. Robinson	Charles W. Robinson	£35 0 0
1890 to 1891	Avon Steel Works	Representatives of John Calder	Empty	Empty	

in subsequent Valuation Rolls no further mention is made of Avon Steel Works

1910 to 1916	Farm, Hill, Avonbridge	Wm Calder, farm	Self	Self	
	Houses at Hill	do.	8 houses with small rents ranging from £6 0 0 to £3 0 0		

from 1912 until 1916 Bo'ness Coal Co. paid rents £100; £100; £500; £260

no mention is made of Polmont Steel Work

Without the help of the undernoted persons and organisations this paper would not have been possible.

Institute Geological Sciences, Edinburgh; National Library and Map Room, Edinburgh; Central Library, Edinburgh; Falkirk Historical Society, Falkirk; Falkirk Library, Falkirk; Falkirk Museum, Falkirk; Bathgate Library and Bathgate Headquarters Library, Bathgate; Central Region Archives, Stirling; Strathclyde University, Strathclyde Region; Glasgow University (Archives and Industrial History), Glasgow; Register House, Edinburgh; West Register House, Edinburgh; Meadowbank House, Edinburgh; National Museum of Antiquities, Edinburgh; Royal Scottish Museum, Edinburgh; Dean Educational Centre, Edinburgh; Armadale Primary School, Armadale; West Lothian Historical Society, Secretary, Polmont; "West Lothian Courier", Bathgate; North British Steel Foundry, Bathgate; National Coal Board, Green End, Edinburgh; Mr D. McIndoe, Uphall; Mr Charles Brown, Avoncrook, Parish of Torphichen; Mr J. Fleming, Westfield; Mr J. Anthony, Armadale; Mrs Clarkson, Hill Farm, Nr. Avonbridge; Mr Peter Cameron, Bathgate; Linlithgow Primary School, Linlithgow; Mr Mechie, Coxhill Farm, Muiravonside; Mr Morton, Hill Row, Nr. Avonbridge; Mr Clarkson, Crawhill Farm, Parish of Torphichen; Mr Clelland, Linlithgow Bridge; Mr W. Hamilton, Avonbridge; Miss J. Litgerwood, Avonbridge; Mrs Allen, Avonbridge; Mr Alex. Hailstones, Bathgate; Carron Works, Falkirk.

SITE NEWS

by

John R. Hume

Ferguslie Mills, Paisley, Renfrew District, NS4663

This once great complex is ceasing production completely, and demolition of most of the remaining buildings is under way. No. 8 Mill, a doubling mill built in 1890 was the first of the larger structures to go. The fate of the magnificient No. 1 Spinning Mill, by Woodhouse & Morley of Bradford (1887) is uncertain, but demolition seems likely. Some of the smaller buildings are being retained as part of the development of the site for housing.

Clock Mill, Tillicoultry, Clackmannan District, NS914974

Conversion of this very attractive building (see back cover of **Scottish Industrial History** Vol. 4, 1981) into a tourist information centre and craft training centre has now been completed. Unfortunately it has proved necessary to box in the cast iron columns supporting the mill floors, and as a result most of the atmosphere has been lost. However it is good to see the constructive re-use of an historic industrial building.

Strude Mill, Alva, Clackmannan District, NS887975

The finest of the Hillfoots woollen mills, Strude Mill, is to be converted to flats. Provided the external appearance of this magnificently-sited building is maintained, this move to retain it must be welcomed. The Mill was built to accommodate hand looms and was probably the biggest of its type ever built.

Clackmannan Mill, Clackmannan District, NS913923

Lacking the obvious appeal of the vernacular-style Hillfoots Mills, the Clackmannan Mill of Paton & Baldwin was nevertheless a good example of a developed textile mill of the mid-Victorian period (1875-6). It was largely re-equipped about 1950, with spinning mules of two patterns, but some older machinery survived until its recent closure, including a carding engine of 1876, by Platt Brothers, and a hank-winding frame. Mule spinning is now becoming rare in the Scottish woollen industry.

New Abbey Mill, Nithsdale District, NX962663

The restored New Abbey Mill, in New Abbey Village, was opened to the public by Magnus Magnusson, Chairman of the

Ancient Monuments Board for Scotland on 9 May, 1983. The mill was gifted to the Secretary of State for Scotland in 1978 by local landowner Mr Charles Stewart. The waterwheel and provender stones can be demonstrated to visitors. Apart from the installation of descriptive panels and rope barriers to protect the public, the mill has been retained in original condition. A guidebook in the new, attractive Ancient Monuments Division style has been published by HMSO.

Millbank Mills, Berryden Road, City of Aberdeen District, NJ933072

This massive steam-driven mill, built in the late 19th century, is threatened with demolition. It was re-equipped during the last war, but with falling demand for oatmeal has been disused for some years, apart from a small area used for storage. Situated in the middle of a complex owned by the Northern Co-operative Society, the mill has proved unsuitable for re-use. Some items from it have been secured by the City of Aberdeen Museums.

Tangy Mill, Kintyre, Argyll and Bute District, NR662277

The subject of a detailed study by the Royal Commission on the Ancient and Historial Monuments of Scotland (see their Kintyre volume of the Argyll inventory), Tangy Mill, which was fast falling into decay, has been converted into a holiday cottage under the auspices of the Landmark Trust. Apart from the harling of the walls, and some alteration to the windows, the appearance of the building has to a large extent been preserved, and most of the machinery has been retained.

Murray & Paterson Ltd., Coatbridge, Monklands District, NS734643

This old-established general engineering firm closed down at the end of 1983, in the face of sustained losses. Founded in 1868, it had a long connection with the coal and metal industries of Lanarkshire, and more recently had carried out work on brick-making machinery. Ironically two of the most striking examples of the company's production, the steam winding engines at Cardowan Colliery, built in 1924, will be demolished in the aftermath of the closure of that pit. Murray and Paterson's works contained some fine examples of Scottish made machine tools, some of considerable size. The firm was one of the last in the West of Scotland to use self-acting boring bars. The closure of this well-run concern reflects the generally low level of demand for engineering services consequent on the decline of the traditional industries of the area.

Dalzell Steelworks, Motherwell District, NS7656

The bar mill and associated No. 4 open-hearth melting

shop at Dalzell Steel Works, closed since 1977, are being demolished by the British Steel Corporation to meet scrap requirements for Ravenscraig Steel Works. This follows the failure of a proposal by the District Council to develop an industrial heritage area incorporating all or part of the melting shop and mill. The complex was initially created to supply shell steel during the First World War, and one of the rolling mill stands installed at that time survived to the end. The melting shop was rebuilt between 1948 and 1952 with 90 and 100 ton furnaces.

Briquette Plant, Lugar Works, Cumnock & Doon Valley District, NS590213

The late 19th century briquette plant at Lugar was badly damaged by fire last autumn. It was built by the Eglinton Iron Company to make use of small coal produced by the pits operated in connection with the Lugar Ironworks. The process consisted of blending small coal and bitumen in steamheated containers, then moulding the semi-plastic mass in mechanical presses, similar to brick presses. At the time of writing the future of the plant, one of the first in Scotland, is in doubt.

SOCIETY AND MUSEUM NEWS

Scottish Maritime Museum, Irvine

This newly-established body made substantial progress during 1983. It achieved corporate status in June and appointed a Chairman and a Director in the autumn. The Chairman of the Trustees is Ross Belch, CBE, LLD, formerly of Scott Lithgow, and the Director is Campbell McMurray, BA, M.Sc (Econ) from the National Maritime Museum, Greenwich. Both are admirably qualified for the task of creating a Maritime Museum worthy of Scotland's outstanding history of shipbuilding, shipowning and seafaring. They come to a project developed by the West of Scotland Boat Museum Association and Irvine Development Corporation, with strong support from Cunninghame District Council. Steve Kay has been the man on the ground and has been responsible not only for supervising the collection and restoration of items for display, but also for developing the philosophy of the Museum. Under the auspices of the Development Corporation, a sixty foot wide quay, paved in brick, has been reclaimed from the Irvine Harbour foreshore; a slipway has been constructed; and workshop space is being created in part of the former Laird Forge, close to the harbour. Storage for the growing collection is also being provided. The tragic closure of older firms in the West of Scotland is providing a steady stream of appropriate equipment, and craft are being collected as opportunity offers. It is hoped to move the puffer Spartan from Bowling to Irvine later this year. A series of open days is being planned, details of which will

be available from the Museum Office, Harbour Street, Irvine, KA12 8PZ, telephone Irvine (0294) 73084.

SUMMARY LISTS OF ARCHIVE SURVEYS AND DEPOSITS

National Register of Archives (Scotland)

Full details of the surveys are available from the National Register of Archives (Scotland); all enquiries and requests for access should be addressed to The Secretary, The National Register of Archives (Scotland), H.M. General Register House, Edinburgh, EH1 3YY.

Agriculture Estates, Land & Property

2180 Shetland Archives. Papers of L.H. Mathewson, Lerwick. Miscellaneous legal papers mainly concerning property in Shetland, 1664-1946, including papers relating to division of scattalds or commonties including Fetlar, Nesting, and Delting, 1667-1880.

2185 Forfar Public Library and Museum. Miscellaneous financial papers, 1750-1942, including: accounts of Belmont Castle estate, Meigle, 1750-70; roup roll of farm plenishings, Meikle Milne of Kirriemuir, 1750; accounting records of Forfar businessmen includes John Guthrie, grain merchant, 1894, 1940-2; account book of harvesters wages, 1840-44, and payments to workers on Aberbothie Farm, Alyth, 1857-80.

2205 Major A. Stavert, Hawick. Titles, legal and financial papers, relating to Outersiderigg and Bondraw, barony of Wilton, Roxburghshire, and Hoscote, Selkirkshire, 1535-1926, including rental of Outersiderigg, 1578; Philogar,Cunsearton and Harkers, 1680-1861; Flomides and Dykeraw, Roxburghshire, 1809-67; Westderby and Walton, Lancashire, 1649-1807; Lumber Street, Liverpool, 1733-67. Paper relating to the enclosure of common lands in Lancashire, 1748-83.

2210 Dr P.M. Wood, Bristol. Legal and financial papers relating to lands of Mersington, Berwickshire, 1690-1769.

2212 A.M. Russel Ltd., horticultural engineers, Edinburgh. Minutes, 1947-68; accounting records, 1882-1938; legal papers, including leases and patent for 'multiplanter' 1894-1948.

2220 A.S. Maxwell, Aberdeen. Titles to lands in Aberdeenshire, 1506-1682, and fishings on the River Dee, 1509-1733.

2232 Captain D.W.S. Buchan of Auchmacoy. Titles of Auchmacoy estate and other properties in Abrdeenshire, 1486-1890.

2234 Major D. Chrichton-Maitland, Johnstone. Papers relating to Elderslie estates. Renfrewshire c. 1530-1972, includes titles and other legal papers, c. 1530-1864; financial records, 1763-1965; rentals, 1766-1928; estate workers' wage books, 1806-36; legal and estate correspondence and papers, 1789-1950.

2235 Institute of Chartered Accountants of Scotland. Yearly accounts of Craignook estate, 1732-1836. To be deposited SRO.

2237 J.T. Mackenzie, Esq., Motherwell. Titles, financial and legal papers of Mackenzies of Ballone, 1640-1876. Rentals, leases, estate accounts, and other papers relating to North Uist, 1763-1936, and tenancies in Skye, 1788-1802; correspondence concerning St. Kilda, 1877-1928.

Accountancy and Insurance

2101 Scottish Provident Institution. Minutes, 1837-1962; accounting records, 1905-74; register of policies, 1843-1972, annuities, 1869-1971, and assignations, 1838-1972. Miscellaneous printed papers, including prospecti, 1872-1940, and history of Scottish Provident Institution, 1837-1937. Photographs of staff and buildings, 1907-65.

2166 Mann, Judd, Gordon & Co. chartered accountants, Glasgow. Accounting records, 1829-47, 1893-1901; correspondence, 1826-1920; report books, 1897-1900; photographs of staff, c. 1900, c. 1950. Janet Morrison's Trust: minutes, 1829-current; rental books, 1850-95.

Associations and Societies Trade

2184 Arbroath Signal Tower. Arbroath Weavers Guild minutes, 1653-1939.

2185 Forfar Public Library and Museum. Records of Forfar trade incorporations, 1619-1848, includes: Tailor Incorporation acts, 1619-81, minutes, 1647-1848, legal papers and correspondence, 1668-1844; Weaver Incorporation acts and statutes, 1627-836; Shoemaker Incorporation minutes, 1662-1847, legal papers, 1640-1787, accounting records, 1806-46.

2186 Montrose Public Library and Museum. Records of local incorporations and organisations, 1725-current, includes: Incorporation of Smiths and Hammermen subscription register, 1725-62; Joiners' and Cabinetmakers' Friendly Society minutes, 1796-1882, accounts, 1804-31; St Crispin's Lodge (Shoemakers' Friendly Society) minutes, 1823-89.

2187 Coal Merchants' Association of Scotland Ltd., Glasgow. Minutes, 1909-79; accounting records, 1950-79; correspondence, 1954-79; papers concerning wage negotiations, 1949-57; survey of types of domestic fuel used in Glasgow and surrounding districts, c. 1966-c.1978.

2189 Templeton Carpets Ltd., carpet manufacturers, Glasgow. Association of Axminster Carpet Manufacturers, minutes 1879-92.

2211 Food Hold Ltd., wholesale food distributors, Kirkcaldy. Scottish Flour Trades Association, statistics of flour imports to Scotland, 1927-57.

2226 Glasgow Chamber of Commerce. Minutes, 1783-1974; annual reports, 1861-current; accounting records, 1884-1975; membership records, 1783-1918; general correspondence, 1782-1866; correspondence and papers of past presidents including Colonel Norman Kennedy, 1919-38; Lord Bilsland, 1925-55, Sir Cecil M. Weir, 1936-41; Harry Yates, 1947-61, and Sir Robert MacLean, 1954-60; press-cuttings, 1894-1913; photographs of Empire Exhibition held in Glasgow, 1938. Glasgow Junior Chamber of Commerce: minutes, 1937-60; annual reports, 1938-40; papers relating to meetings and special projects, 1950-67. Council of Scottish Chambers of Commerce, minutes, 1942-53. Association of British Chambers of Commerce, minutes, 1959-65; correspondence on matters affecting Scottish trade and business, 1960-7. Development Board of Glasgow and district: accounting records, 1932-4.

2231 National Cooperage Federation, Edinburgh Branch. Minutes, 1918-current; annual reports and accounts, 1922-current; apprenticeship registers, 1935-current. Glasgow and West of Scotland Cooperage Association: minutes, 1965-76. National Joint Industrial Council for Cooperage Industry: minutes, 1947-current.

2236 Scottish Flour Millers' Association, Glasgow. Minutes of Scottish Federated District Association of Flour Milling Employers, 1918-23; Glasgow Flour Millers' Association, 1930-current, Scottish Flour Milling Federation, 1943-7.

Builders and Architects

2131 Arthur Nicol & Son, building contractors, Letham. Job books and other accounting records, 1841-1964; miscellaneous plans of buildings in Angus, especially on the Dalhousie estates, with related papers, 1862-1915.

2203 Watson Salmond & Gray, architects, Glasgow. Plans and elevations of alterations and additions to Storn Castle, Ayrshire, 1857-63.

Engineering

2163 Clyde Structural Steel Company, steel fabricators, Glasgow. Minutes, 1934-75; membership register, 1898-1960; photographs of premises, c. 1925.

2184 Arbroath Signal Tower Museum. Alexander Shanks & Sons, Dens Iron Works, Arbroath, legal papers, mainly concerning costing, machinery and patents, 1835-1955; inventory of machinery and tools, 1893; printed catalogues, price-lists and technical instructions, 1842-1951; plans and photographs of premises and products, 19-20 cent.

2198 Smith & Wellstood Ltd., ironfounders, Bonnybridge. Minutes, 1888-1962; accounting records, 1863-1958, including wage books, 1863-73; correspondence 1873-1959; production records, 1863-96; stock books, 1860-84; legal papers, c. 1867-1930; shareholders' records, 1880-1950; business diaries of George A. Ure, 1917-47; printed matter, including press-cuttings, advertising material and catalogues, 1860-1975, and copies of Smith & Wellstood's magazine, c. 1920-50; minutes of Wellstood Club, 1945-63; photographs of premises and products, c. 1880-1952; feuing plans of company property, 1855-93. Sentry Boiler Company: minutes, 1926-53. Wood, Russell & Co Ltd.: ledger, 1929-47; share register, 1926. replaces Survey No 619. Company currently in receivership.

2212 A.M. Russel Ltd., horticultural engineers, Edinburgh. Minutes 1947-68; accounting records, 1882-1938; legal papers, including leases and patent for 'multiplanter', 1894-1948.

2215 Brown & Clegg Ltd., steel stockholders, Edinburgh. Minutes, 1902-current, annual reports, 1902-71; accounting records, 1898-1969; correspondence on contracts, 1904-8; order books, 1954-c.1972; stock records,1961-c.71; share records, 1902-58; catalogues

and price lists, 1912-69.

2216 Brian Webb Esq., Glasgow. Files of technical information, specifications, and diagrams of Armstrong Whitworth vehicles and locomotives, 20 Cent.

Food, Retail and Commodities

2211 Food Hold Ltd., wholesale food distributors, Kirkcaldy. Minutes, 1971-9; annual reports and accounts, 1972-9; register of members, 1967-79. Minutes, annual reports, accounting records and other papers of associated companies, including: Moorhead, Sons & Co Ltd., 1915-79; Robert Carson & Co Ltd., 1900-79; William Yule & Son Ltd., 1956-79; Buchan & Macaulay Ltd., 1948-70; George P. May Ltd., 1957-78; Young, MacMillan Ltd., 1960-74. Miscellaneous Carson family papers, 1921-53, and travelling sales and order book of Robert Carson, 1884.

2227 MacGregor & Company (Glass & China) Ltd., wholesale merchants, Edinburgh. Accounting records, 1914-54; photographs, c. 1870-c.1970.

2234 Major D. Chrichton-Maitland, Johnstone. Financial papers and correspondence of Alexander Spiers of Elderslie, Glasgow merchant, mainly relating to tobacco and sugar trades and business affairs in Virginia, 1760-89.

2242 Wm Milne Ltd., refrigerated food storers, Glasgow. Minutes, 1928-65; accounting records, 1918-61; register of members, 1928-current; photographs of premises and delivery wagons, c. 1910-42. North British Ice Company: minutes, 1898-1960.

Manufacturing Textiles

2172 J.&J.C. Dorward Ltd., clothing manufacturers, Galashiels. Minute books, 1920-79, accounting records, 1873-current, including accounts for building spinning mill, 1890; legal and financial papers and correspondence; inventories of furnishings and machinery, 1890, 1910-26; plans of premises, 1866-1933. Records transferred to SRO 1982.

2176 The Old Gala Club. Acts of Incorporation of Weavers (transcripts), 1666-1891. Paper relating to local woollen manufacture, including accounts of John and Richard Lees, 1788-1826, pattern book of P & R Sanderson, 1894-5; rules and other printed papers relating to Galashiels Textile Factory Workers Union,

1901-9.

2183 Arbroath Public Library. Tarry Mills Spinning Co. wage book, 1803-22. Papers relating to Renny family, especially William Renny, millowner, Arbroath, 1759-1879.

2189 Templeton Carpets Ltd., carpet manufacturers, Glasgow. Accounting records, c. 1874-1936, including wage books, 1887-1934; legal papers, 1907-10; notes and reports on labour conditions, 1890-1974; weekly employment figures, 1926, 1942-58; advertising material and sales catalogues, 1918-55; press cuttings, notes and printed matter concerning history of firm, 1889-1975; The Templetonian, 1931-66. Minutes of Templeton's Trust, 1885-1966; Benevolent Trust, 1894-1970, Superannuation Trust, 1935-58; Art Club, 1909-39 and of Association of Axminster Carpet Manufacturers, 1879-92. Plans, elevations and sections of Templeton's factory (Doge's Palace), 62 Templeton Street, Glasgow, 1888, and index of drawings of other Templeton carpet factories in Glasgow, n.d. (photocopies deposited in National Monuments Record of Scotland). Photographs of carpet designs, premises, machinery and employees 1889-1965.

2225 Dundee University Library. Sidlaw Industries, Dundee: minutes, 1922-47; list of workers, 1933-8; photographs of jute factories, 1892, 1929-57. Thomas Bell & Sons Ltd., jute spinners and manufacturers, Dundee: minutes, 1890-1933; accounting records, 1891-1930; correspondence, 1914-23. Boase Spinning Co. Ltd., flax, hemp and jute spinners and manufacturers, Dundee: minutes, 1886-1920; accounting records, 1876-99; production book, 1906-50; notes on importance of flax in wartime, 1913-1943, and on firm's history, n.d.; photographs of premises, workers, machinery and production processes, 1946-68. Cox Brothers Ltd., jute manufacturers, Dundee: minutes 1893-1927; accounting records, 1841-1933, including valuation of Caldrum works, 1892, and wages books, 1893-1913; correspondence, 1869-1923; legal papers, 1884-1924; census of labour employed in jute industry, 1917-18; notes on labour relations and disputes, 1886-1918, and on history of Cox family, n.d.; plans of Camperdown Works and Meadow Place Buildings, 1898-1913. Gilroy, Sons & Co. Ltd., jute spinners and manufacturers, Dundee: minutes, 1890-1921; accounting records, 1890-1929; legal papers, 1890-1924; history of firm, 1849-1920. J. & A. D. Grimmond Ltd., jute spinners and manufacturers, Dundee: minutes, 1892-1934; accounting records, 1892-1948, includes wages books, 1912-22; correspondence, 1893-1919; production statistics, 1905-19; list of workers, 1907-19; accident register, 1896-1935; legal papers, 1804-1924; inventories and valuations of machinery and buildings, 1892-1920, and

of A. D. Grimmond's paintings and furniture, 1903; history of Bowbridge Works, 1783-1894; photographs of works and workers, 1863-c.1906; plans of estates in Angus and Perthshire, 1879-1903. John N. Kyd & Co. Ltd., jute spinners, Dundee: minutes, 1920-33; accounting records, 1900-61; time books, 1897-1907; history of Walton Works, 1864-1931. John Lowson, jnr. & Co Ltd., jute manufacturers, Forfar: minutes, 1898-1950; accounting records, 1874-1955. F.S. Stewart, Sandeman & Sons Ltd., cotton and jute spinners, Dundee: correspondence, 1903-1920; history of Manhattan Works, 1858-1921. Harry Walker & Sons Ltd., jute spinners and manufacturers, Dundee: minutes, 1892-1933; accounting records, 1851-1931, including costing books, 1851-1910, and wage records, 1911-12; order books, 1847-51; correspondence, 1885-1926; including letter concerning dissatisfaction of female workers with pay rates, 1885; legal papers, 1856-1924; history of firm and of Walker family 1608-1935; photographs of Caldrum Works and workers, 1875-c.1920; plans of Caldrum Works, n.d. Papers of unidentified works, 1884-1950, including design books, 1895-1940, wages books, 1911-20, and notes by K Bell on jute trade, n.d.

Transport

2219 J. Ingram Esq., Dundee. Notebooks with information on shipping operating from ports in Fife, Perthshire and Angus, especially Dundee, n.d.

2234 Major D. Crichton-Maitland, Johnstone. Forth and Clyde Navigation papers and revenues, 1790-1827. Papers of Alexander Spiers, includes financial papers concerning Glasgow Tunnel and Railway Company, 1831-36. Papers on construction and maintainance of harbour wall at Renfrew, 1798-1833, and Glanderston Dam, 1832-54, building of Glasgow, Paisley, Kilmarnock and Ayr railway, 1839-41, widening of River Clyde, 1861-4, and miscellaneous railway plans, 1838-1918.

2237 J.T. Mackenzie Esq., Motherwell. Letters and accounts concerning Locheport pier, 1879-81; papers relating to tenancies and roads in Skye, 1788-1803.

2239 P. MacCallum & Sons Ltd., steel stock holders and shipping agents, Greenock. Lang & Fulton Ltd., shipowners, Greenock: minutes, 1909-24; correspondence, 1905-20; notes on tonnages of cargoes shipped in firm's vessels, c.1879-c.1923. Minutes of individual shipping companies established on purchase of new Lang & Fulton vessels, 1895-1922. Kindiesel Shipping Co. Ltd., Greenock: minutes and accounting records, 1936-62. Anderson, Orr & Co., Greenock: list of shareholders and creditors, 1870. Legal and financial papers of Lang

and MacCallum families, 1867-72 including correspondence with Canadian bankers about sale of ship Persia.

Currently on deposit with Glasgow University Archives. See also, J.R. Hume & M.S. Moss, A Bed of Nails. Lang & Fulton. Greenock, 1983.

BOOK REVIEWS

C.D. Harbury and D.M.W.N. Hitchens, Inheritance and Wealth Inequality in Britain. (London: Allen and Unwin. 1979. £10).

In recent years there has been a great interest in wealth and all its manifestations. This has ranged from the governmental activities of the Diamond Commission, the scholarly researches of Rubenstein, to the fascination of the television viewer in the every day story of rich folk, their houses, their cars, their clothes as portrayed in "Dallas" and "Dynasty". We are all fascinated by wealth whether from envy, a sense of social injustice, voyeurism or because it provides a vehicle for our own fantasies and aspirations.

Where all this leaves the social scientist is a matter for conjecture, nevertheless the study of wealth is now all the vogue just as working class housing once was. Joining the ranks of the wealth watchers are C.D. Harburg and D.M.W.N. Hitchens. Inheritance and Wealth Inequality in Britain examines the relative importance of inherited and self made wealth. Their work is based on many, and one must assume, tedious years of empirical study.

Harbury and Hitchens are to be admired for attempting to come to grips with a difficult subject. For the general reader, (and it has to be said this is more a handbook for socialist research workers than for taking to bed with the cocoa) the book lacks historical perspective and never really comes to terms with the definition of wealth [assuming this is possible]. The authors' concentration is heavily on the probate records. The use of these documents presents many problems and although these limitations are well explained by the writers there are inevitably gaps. Thus Harbury and Hitchens note that "probate valuations prior to 1894 were restricted to personality and did not extend to real estate". In Scotland, however, it has to be remembered that 'reality' did not figure until the 1960s.

The major points made in this study concern the role of inheritance in maintaining wealth inequalities in Britain. It is calculated that since the mid-1950s 60% of top wealth holders have been proceeded by rich fathers. This calls into question not only the nature of the system of taxation in Britain but institutions such as "the self made man". For many people the conclusions of the study will confirm their suspicions, for the rest it will confirm what we've always believed, that the rich have more money than us.

BEARSDEN CHRISTOPHER C LEE

Bruce Lenman, Integration, Enlightenment and Industrialisation. Scotland 1746 1832. Pp. vi, 186 and Christopher Harvie, No Gods and Precious Few Heroes. Scotland 1914-1980. Pp.ix, 182 (London: Edward Arnold. 1981. Paperback £4.95).

Of making many books there is no end, and such has been the volume of new work in Scottish history over the last fifteen years that a new multi-volume textbook history of Scotland is very welcome to assess where scholarship stands and in which directions it could or should proceed. With the publication of these two volumes, the New History of Scotland is well forward to completion. The format for all the contributions is standard. The Editor has imposed a word limit of c. 75,000 (little enough in all conscience) to which both these contributions have kept. There are no footnotes, but an annotated bibliography is some compensation, and the price for the paperback (£4.95) is not too outrageous. The one element of little apparent value is the Chronological Table tucked away at the rear - perhaps its function was to remind the authors of the ground they had to cover.

As one might expect, Lenman's is a very different book from Harvie's. Obviously the proximity factor is important in the latter case. It is desperately difficult to write recent history: so many of us have our own recollection of some of the events and issues he describes. Equally time confers immunity on Lenman: he need fear no-one answering him back from the grave or taking violent exception to the uncomplimentary descriptions he throws about with such abandon; 'impudent liar', 'a crashing bore', 'a whimsical unbalanced fellow'. Lenman can be generous, as in the case of Robert Haldane, but his kindness is carefully rationed. Harvie has to be far more circumspect.

Structurally, the two also differ. Lenman opts for a standard chronological approach, with each chapter following on its predecessor, using 1760, 1775, 1784, 1793 and 1815 as his markers. The section 1793-1815 is however divided into two; in the first he examines political attitudes during the wars and in its companion, the economic and social changes which were "ultimately to erode the bases" of the landed ascendancy. Harvie goes for a very different layout; much more thematic than chronological. He has an introductory chapter 'When the Lamps Went Out', 1911-22 and then tackles the period 1922-1964 by way of four chapters on the Economy, the Pillars of Society, Politics and Government, Media and Culture, before he draws the threads together in a single pessimistic chapter, Future Deferred? 1964-1980.

Apart from the difference in structure, it seems to me that there is a fundamental contrast in focus. The overriding concern of Lenman is to explain how Scotland was run, who controlled the levers of patronage and power, how the upper levels of society and the professional classes

played off each other. Other topics, even quite important and controversial issues like the Clearances or population growth are kept subordinate to the main lines of enquiry, the system of management, the role played by machine politicians like Islay and Dundee, the latter a man whose patronage was not just formidable within Scotland but stretched to India. Bruce Lenman's central thesis is that Scotland remained loyal and quiet (mostly) after the Jacobite Rebellions because the dissidents were purged, and the "monetary rewards for success in London-centred careers" kept most of the rest in line. Patronage was vital in so many areas of life, in the arts, literature and education; it took a brave man to dissent from the establishment's views, on the rightfulness of the American War or with the French.

Lenman's is, I think, a first-rate essay, organised and lively. There is little original in the economic sections, but the style and flair for language keeps the reader's interest up. Economic history must not be taught in a vacuum: this will be a valuable book to round out the undergraduate diet. It has to be said that the proof reading is a bit slack; 'larger' for 'laager' on p.80, for example, and it is supremely ironic that someone who has recently written well on the Jacobite Risings should manage to place Culloden on the wrong side of Inverness!

Christopher Harvie's task was probably more difficult than Lenman's. The need for a textbook on twentieth century Scotland has long been apparent but the information flood (especially in the last twenty years) makes it very hard to grasp the major issues amongst the mass of detail. Perhaps mistakenly, Harvie opts for a comprehensive approach (as opposed to Lenman's master theme) with the result that nearly everything is covered but very few topics receive study in depth. There is a tendency towards fragmentation in structure as well as text: one-word sentences (cf. "Disastrously", p.28) do not help the flow of analysis nor do the dozens of subheadings. In the third chapter, for example, "The Pillars of Society", a mere twenty-three pages are broken up into eleven sub-headings from Housing to Religion. What also makes this book less readable than Lenman's is not the illustrative material over which most readers will pause with nostalgia or surprise. In 1960 Edinburgh held the British records for library books borrowed per annum. I know: I was there, but even my reading has not enlightened me to what "thriving demotic literature is". Just occasionally, Harvie is a little too superior in his analysis, as in his implied criticism of the Scots failure to appreciate their own literati: "the ordinary people still read the Dundee Press and went to Burns Suppers".

Harvie's is a good book, much needed, particularly strong (as one might expect) on the rise and fall of the SNP, on political changes generally over the last fifty years. He keeps asking what keeps Scotland 'Scots': the economy has

been steadily assimilated, but in many other important areas of life - law, religion and education - the Scots remain different, Scottish rather than (in Lenman's final phrase,) "North Britons uneasily conscious of also being Scots".

UNIVERSITY OF ABERDEEN ALASTAIR J. DURIE

C.J.A. Robertson, The Origins of the Scottish Railway System, 1722-1844. (Edinburgh: John Donald. 1983. 421 Pp. £20).

In this study of Scottish waggonways and railways to the eve of the great mania of 1844-47, Robertson has produced the first comprehensive account of Scottish progress from isolated tramways towards full acceptance of the railway as the transport mode of the future. This is a well researched and readable account backed by clear maps (except for a minor lapse on p. 273) and tabular information which is relevant without being allowed to dominate the text. Most space is taken up with the important years from 1820 to 1844. Chapter 2 deals with the coal railways of the 1820s and this is followed by two chapters which examine the planning of the first 'town to town' lines and their subsequent construction and operation. Chapter 5 turns to the paper and verbal battles of the cross-border rail promoters in the early 1840s and chapter 6 presents a summary and conclusions.

Though the treatment is chronological, this has the advantage of showing the realities of rail evolution more vividly than econometric studies on the Hawke model. Yet economics is far from neglected. The changing technology of the railways as better rails and steampower became available is related to the problems and pressures affecting the forecasting of costs and traffic on particular routes. Contemporary sources are used to show that, though some lines (such as the Dundee and Newtyle) did experience severe financial difficulties, most achieved passable results even in the depressed years of the early 1840s. Issues such as the growing involvement of English capital in Scottish railways are given deserved attention and the contrast between the relatively high rates of English railways and much lower passenger rates in Scotland is emphasised in the context of the distinctively Scottish bias in the campaign for a restructure of the railway passenger duty so that it did not discourage lower fares.

Without detracting from a sound contribution to the study of what was Scotland's most rapidly expanding business sector in the 1840s, two points of criticism can be made. The first relates to the 'half-way' treatment of the mania

lines. The Anglo-Scottish lines are examined up to the stage of authorisation but their subsequent history, and that of the other mania lines whose construction had virtually completed the non-Highland Scottish trunk network by 1850, is left in the air. Robertson would have been better advised to concentrate his work on the evolution of the lines in operation by 1844 with a short postscript (anticipating a second volume?) on the intense surge of promotional and constructional activity between 1844 and 1850.

The second criticism is that a greater effort could have been made to fill in the economic background, including the regional dimensions within Scotland, which encouraged the gestation of rail proposals. The need to move coal and the need to use transport improvements to secure (or counteract) competitive advantages are mentioned but differences in regional economic strength could have been used to explain transport priorities which seem puzzling to modern eyes. A case in point is the marked interest in early, non-coal railways on Tayside. Robertson explains this by emphasising both the desire of Dundee to capture more of the trade of the region and the individual enterprise of the leading promoters of the Forfar-Arbroath and Arbroath-Dundee railways. These explanations, however, ignore the fact that Tayside, after Clydeside, was Scotland's most successful industrial region in the earlier part of the nineteenth century. Still on Tayside, Robertson also leaves himself open to attack in saying wihout supporting evidence, that the financially unsuccessful Dundee and Newtyle railway was 'a considerable success in opening up trade to and from Dundee'.

The criteria for economic assessment could have been sharper yet the author goes far beyond the descriptions and anecdotes of the rail enthusiast. There is here an impressive range of material on the conflicting proposals made for the main corridors of movement, on cost estimates and their revisions on traffic levels and rates and on how the rail system began to emerge.

UNIVERSITY OF GLASGOW TOM HART

Neil McKendrick, John Brewer and J.H. Plumb, The Birth of a Consumer Society : The Commercialization of Eighteenth Century England. (London: Europa Publications. 345 Pp. £18.50).

Conceived at a meeting of the Caius historical society, 'The Rise of a Consumer Society' reflects work which all three authors have been doing on the commercialization of English society. Almost two-thirds of the material comes from McKendrick. He deals, not only with his familiar work

on Wedgwood, but with the commercialization of fashion and a case study of George Packwood's ingenious, widespread and deliberate use of advertising to popularise his proprietary paste for razor strops. John Brewer shows how market expansion allowed a rise in the influence of men of moveable property seeking to lessen their dependence on older forms of clientage. This assisted the growth of a freer economic market bolstered by new webs of non-aristocratic credit and social standing. Politically, the Wilkes movement and the refining of concepts of public accountability and representation paralleled and complemented the appearance of a freer economic market. Plumb concentrates his evidence on the commercialization of leisure and on the growth of children as sales targets for entrepreneurs taking advantage of a growing parental interest in, and ability to pay for, improved education and a vastly extended range of children's books, toys and clothes.

Common to all the authors is a detailed use of printed material, including numerous advertisements and pamphlets, to indicate the scale of the 'consumer revolution' of the eighteenth century. By the 1770s, more materialistic and secular lifestyles extended well beyond a narrow elite. People had come to believe in modernity and, in Plumb's words, this was seen as a necessary condition for the existence and expansion of a consumer society.

By taking a consumer viewpoint, we are given a more realistic picture of what life was like in eighteenth century England than in studies confined to the production process. McKendrick, however, goes further in continuing to criticise most economic historians for 'supply side' preoccupations which fail to appreciate the dynamic effect of consumer attitudes on economic growth. He seeks to elevate the 'consumer revolution' of the eighteenth century into a signficiant cause of growth yet much of the evidence points to people changing their lifestyles because improving household incomes enabled them to do so. McKendrick admits that the desire to consume was already strong in pre-1700 England (and in much of Europe) and that the eighteenth century is characterised by a growing ability to consume rather than by the appearance of more materialistic desires. The implications of such an admission ought to have been more fully considered. Once it is conceded that social and cultural factors already favour economic growth, the ability to make supply side changes takes on a role which McKendrick is in danger of under-estimating. It was these changes which fed through to the reality of increased incomes and consumerism in eighteenth century England (and also in Scotland) at a time when other areas, such as Holland and Ireland, were facing increased difficulties in fulfulling expectations. Without adequate responses, one-time 'modern' societies can lose out in the economic pecking order.

At this level of analysis, McKendrick is in danger of

moving the pendulum too far towards the demand side as a powerful and independent force in the explanation of eighteenth century growth but, taken together, the authors have brought into one volume much hitherto neglected information relevant to changing taste and to the ways in which a host of entrepreneurs siezed and developed market opportunities in eighteenth century England.

UNIVERSITY OF GLASGOW TOM HART

T.M. Devine, D. Dickson (eds.) Ireland and Scotland, 1600-1850. (Edinburgh: John Donald. 1983. 283 Pp. £16).

In this sequel to Cullen and Smout's editing of the 1976 seminar on Irish and Scottish development, Devine and Dickson perform a similar task for the second seminar held in 1981. Twenty papers are presented, including a review by the editors of the discussion sessions. The principal theme is the problem of explaining why the two economies diverged from 1780 but this is considerably diluted by the use of sub-sections, several of which have a tenuous link with the overall theme. Attention is given to rural themes, migration, markets, religion and urban/financial comparisons as well as to treatment of the pre-1800 legacies and 'long views' of the pattern of change.

Some of the uneven balance of articles can be explained by what had already been covered at the 1976 seminar but both the range of topics and the short space available for each contribution (between 10 and 15 pages) make it difficult to do justice to the central theme. A fuller treatment of six or seven well-selected sub-topics would have been preferable.

Nevertheless, some interesting and perceptive new views are presented. Cullen brings these together in suggesting that Ireland was more commercial (in the sense of being more involved in external trade) and also poorer than Scotland. As a fractured, traditional society much influenced by immigration, land transfers and extensive markets in England (despite the ban on cattle exports), Ireland was well placed for economic growth in the late 17th and earlier 18th centuries but it was more difficult to move from this colonial stage of development to the sustained growth of a diversified internal economy and successive new sectors of external trade. Dickson does show how 18th century Dublin became more involved in trade with the rest of Ireland but, with few social pressures to restrain population growth, Ireland was becoming a low income, underemployed economy by

the early 19th century. Solar presents new evidence that Irish agricultural productivity was only a little below British standards yet, while 25% of the food produced could be exported on the eve of the famine, Ireland was failing to expand earnings in industry and was already conspicuous for long-distance emigration.

In contrast, the contributions of Mitchison, Devine, Campbell and Gray see Scotland as a society already more ordered and mature than Ireland in 1700. Though some transactions were still made in kind, internal trade was well developed. Effective incomes were relatively high and there was a capability for sustained indigenous growth, overspilling into external trade when favourable opportunities arose. At the margin, both religious and secular attitudes were more conducive to long-term economic expansion than in Ireland while, for reasons which still need clarification, Scotland in the 18th century combined a low level of population growth with a remarkable level of internal mobility. The net result was a cumulative increase in purchasing power reinforced by a cost-effective redistribution of population within Scotland.

These views go some way towards reviving the pre-1976 conventional wisdom that the Scottish economy was already more securely based than that of Ireland by the early 18th century yet the actual rate of growth in the Scottish economy during the first half of the 18th century does seem to have been lower than in Ireland. More work is still needed to explain why Ireland was unable to build on these advances and to establish a firmer link between Scotland's post 1780 expansion and the underlying conditions existing by 1700. Finally, the editors deserve congratulation on the speedy publication of seminar papers which were presented as recently as September, 1981.

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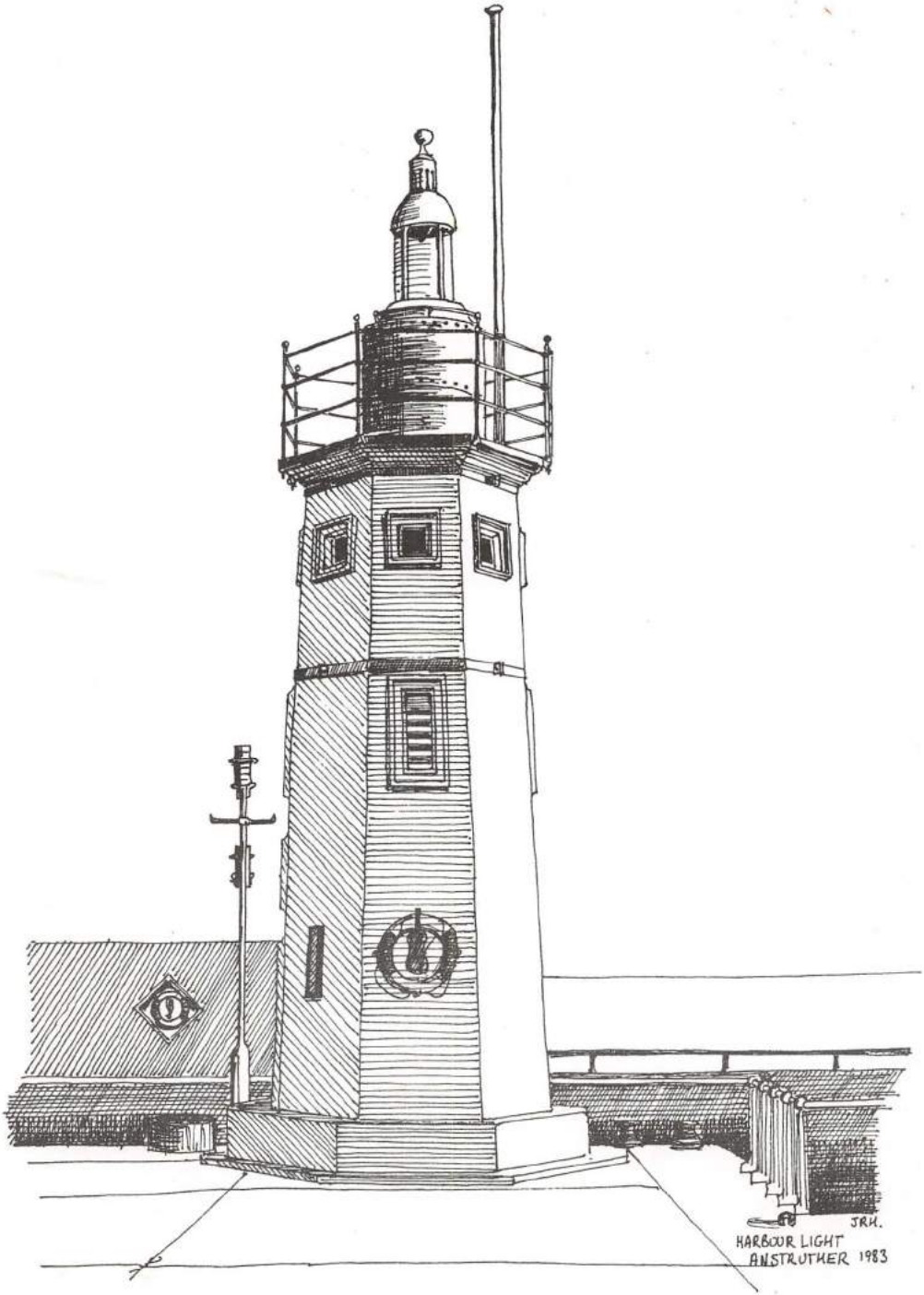
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