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The front cover illustration is of Port Dundas Power Station, Glasgow, and the back cover illustration is of John Street Power Station, Glasgow. (Reproduction by courtesy of RACHMS, Scottish Power Collection)

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SCOTTISH INDUSTRIAL HISTORY
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REVIEWS

Power Stations in Glasgow 1879-1939

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Glasgow's earliest electricity generating concerns, established in the late 1870s and early 1880s, were private companies supplying power for the first widespread application of electricity, the provision of lighting. In addition to the cost of the new technology, the cumbersome operating procedure and intense white light of carbon arc lamps made early electric lighting viable only for the illumination of large public buildings and streets. Not surprisingly the main customers of electricity companies were municipal authorities in the larger towns, railway companies and large public venues, such as theatres.

Unsure of the new technology many early customers had the installation and operation of arc lamps carried out by owners/operators who sited generating plant at the customers' premises and ran it for them. In many cases the operators were also manufacturers of the equipment.

In keeping with these trends the earliest electricity supply operations in Glasgow were instigated by the railway companies, who employed manufacturer/owner/operator companies to bring arc lighting to platforms. The Glasgow & South Western Railway's St Enoch Station saw six arc lamps installed in 1879 by the British Electric Co while R E Crompton and Co provided six steam engine-driven Gramme dynamos to power them. Crompton set up arc lights in Queen Street Station for the North British Railway the following year.[1] In both cases the initial arrangement was to lease the plant from the owner/operator, but the equipment was soon purchased at both sites and operated by the respective companies.

Following the lead of the railway companies, the General Post Office hired Glasgow company, Muir & Mavor, to install and operate lighting in its George Square building in 1880. Plant was initially sited on the lot subsequently used by the Municipal Buildings, but soon moved to the basement of the Post Office until a small generating station at 70 Miller Street was opened in 1884.[2]

With the construction of the Miller Street generating station Muir & Mavor took the opportunity to move into the general public supply business. As the demand for electricity grew, it became apparent to the supply companies that distinct advantages could be gained by offering new clients power transmitted from a centralised generating station owned by the supplier of the lamps. This removed the need for generating plant at the clients' premises and reduced the cost of installing lighting. These improvements attracted new customers,

especially on the domestic side, and for the supply companies opened up a whole new slice of the market.

It was in this climate that Muir & Mavor commissioned the Miller Street station, equipped with two 50hp steam engines driving three Crompton-Burgin dynamos, and producing a 100 volt DC supply transmitted by an overhead system. Despite the small scale and primitive nature of the operation, Muir & Mavor enjoyed considerable success, supplying not only the Post Office but also nearby businesses, and were soon ready to expand fully into the realm of public supply.[3]

When the firm was incorporated as a limited company in June 1888 as Muir, Mavor & Coulson Ltd, it set up a second generating station at 81 John Street, this time producing a full 2,400 volt AC supply, distributed through an overhead system that required substantial transformers at the customers' premises to bring it to the usual 100 volts DC. The John Street station (see end cover) was a simple single storey building, containing all the generating plant and was equipped with a locomotive-style boiler supplying a Mirrlees & Watson compound non-condensing tandem horizontal steam engine of 200hp. The compound engine, with a back-up 50hp auxiliary engine, drove a Ferranti alternator capable of supplying 3,000 eight-candle power lamps.[4]

The change to alternating current (that is 'AC', the flow of which alternates in direction) for transmission purposes at the new site reflects the uncertainty in the early electrical industry concerning the choice between AC and DC (direct, or 'continuous' current, which does not undergo the regular changes in direction of flow). While AC could be transmitted at higher voltages with considerably less loss of power, DC, which was used by lighting, transport and appliances during the early stages of the electrical industry, could be stored in large batteries both at generating stations and sub-stations. This was essential to help under-powered generating stations meet peak-time demand. Despite the rapidly rising demand for power, few early investors were inclined to purchase plant capable of generating AC at an economic scale, or of constructing expensively insulated transmission systems to supply the higher voltages. Indeed, several pioneer stations were forced to close when poor demand drove production costs to unprofitable levels - Edison's station at London's Holborn Viaduct among them.

However, the advent of such stations was foreseen by engineers like Ferranti, who borrowed ideas about station siting from the town gas industry for his celebrated power station at Deptford (London) in 1889. This anticipated large generating stations, planned on a grand scale, designed with effective fuel

supply a priority and placed at the centre of a high voltage (10,000 volts in this case) transmission system for AC. In fact the Deptford station also fell victim to poor demand, timid investment, competition over supply areas and technical problems, but the lesson was not lost.

In the case of Muir, Mavor & Coulson Ltd the company clearly did not feel a full change to AC generation at both generating sites, or a significant increase in supply pressure, were warranted at that stage. Interestingly, the introduction of the 2,400 volt AC supply at John Street can be traced to the emergence of Glasgow Corporation as a major customer. The 1,100 newly installed sixteen-candle power electric lamps in the Corporation's Municipal Buildings required supply at 2,400 volts to transformers in the building, and this must have prompted the change to AC in order to provide the increased pressure. This illustrates the growing influence the municipality had on privately owned electricity generation companies in the period before the Corporation took over Glasgow's electricity supply.

By May 1891, Muir, Mavor & Coulson Ltd's generating plant totalled 450hp, producing 330kw for 8,904 eight-candle power lamps, and had supplied its thirty-seven customers 422,588 units in the year 1890-91.[5] It was this sort of success that encouraged the Kelvinside Electricity Co to enter the fray and construct its Hughenden Lane generating station in 1892. The new power station, built by the engineering firm of Anderson & Munro, was a more mechanised operation than Glasgow's other facilities, with an elevated track bringing coal trucks into discharge positions over the boiler hoppers, but was of modest size, designed purely to cope with domestic lighting in the Kelvinside area.

Shortly before the establishing of the Kelvinside Electricity Co, Muir, Mavor & Coulson Ltd, possibly as a response to the prospect of competition, applied to the Board of Trade for a Provisional Order to supply the whole of Glasgow, but was challenged by a similar request from Glasgow Corporation which was enacting powers given it under the 1882 Electricity Act. Corporation ownership had been pioneered in Bradford in 1889 and Glasgow was among the first to follow that lead when responsibility for the city's public electricity was given to the Corporation by Act of Parliament in 1890 and placed under the control of the Corporation Gas Department (until an autonomous Electricity Department was created in 1896). Muir, Mavor & Coulson Ltd's generating plant was purchased and operation begun under Corporation control in March 1892. In August 1899 the Kelvinside Co's plant and supply network was also purchased and added to the city's system. The

Hughenden Lane station was subsequently expanded by the addition of a second, larger, set of boilers and engine-generator sets.

The take-over of private suppliers by the City Corporation marked a turning point in the provision of electricity in Glasgow. The supplied area now stretched from Glasgow Cross eastward to Park Circus and north into Kelvinside and from the start the Corporation sought to impose a unified system over the ever growing network.

In addition to the variety of transmission voltages early municipal operators also had to contend with a chaotic mix of overground, underground and overhead transmission cable systems installed by private suppliers who had themselves been influenced by capital resources, the location of the customers relative to the generating plant, the supply voltage pressure they chose and the attitude of the local authority. It soon became apparent that for the high-voltage supplies, essential to the economic viability of a major urban utility, underground cables were preferable and it was often the role of local government to undertake the required work.

In Glasgow the transmission of power by the overhead lines run from the John Street station was discontinued in August 1893. However, the underground supply network that replaced it was, in one sense, something of a half measure as it only carried a DC supply of 200 volts (to remove the necessity of changing customers' lamps and to enable temporary accumulator battery substations to be used to aid the generating stations at peak load). The Corporation proved loath to take on AC transmission and when the new integrated network was completed, all the supply area in the city, it was designed for 500 volts DC, delivering 250 volts to the customers premises. When the Corporation purchased the Kelvinside Co's Hughenden Lane station it too was brought into line with the Corporation supply voltage.

With the removal of the overhead system John Street power station was replaced by a larger, more modern facility, though it later re-opened for a few years to supply part of the street lighting scheme, inaugurated in 1893, while extension work at the new station took place.

The new phase of Corporation generating-station building started on a modest scale with the construction of a station on Waterloo Street in 1892. Waterloo Street station, a three storey building set on a prominent corner site, was designed to obscure its true function with the ashlar and classical detailing of a distinguished office building. In fact the lower floor extended below street level to house the generating equipment, with the upper storeys holding storage

batteries and office space, and a four-storey range behind the main street frontage serving as the boiler house.

The first operational plant at Waterloo Street was commissioned in February 1893 and consisted of five hand-stoked marine boilers supplying seven Willans compound steam engines (totalling 560hp) each driving a Siemens dynamo. Additional plant for street lighting consisted of two Easton & Anderson compound engines driving a pair of dynamos each. From the time Waterloo Street was opened the station was in a continuous process of expansion until 1897 when, at full capacity, it housed thirteen steam engine and dynamo sets (totalling 3,300hp) and nine boilers. Annual output stood at 1.25 million units with the maximum load handled 1,776kw.[6]

Despite this increased output the need for additional generating capacity was pressing. Temporary accumulator substations were constructed which could be charged up during the late night/early morning to be used as back-up to the generating stations during peak time. These sub-stations were sited so they could supply the immediate areas around them, enabling the stations to generate and transmit over a much shorter distance with less loss of power. Even during the construction of the new stations Waterloo Street and its associated accumulator substations suffered from overloading due to the growth in demand.

The next pair of power stations built by the Corporation proved to be the heart of the new system. Moving away from the small city centre sites the Electricity Department attempted not only to construct modern, efficient generating facilities but to accommodate the inevitable growth in demand. To this end the locations selected were outside the city centre (one to the north and one to the south), better supplied with fuel and given room for expansion, both in building design and in the size of site.

Two designs were forthcoming from architect Andrew Myles. For the first, (the northern site), the Corporation purchased land at Port Dundas adjoining the Forth & Clyde Canal to establish what may be considered its first full-scale power station, and one that expressed its function rather than be disguised as offices (see front cover). An ornate tower rose above the entrance hall set in the single storey battery rooms with the engine house and boiler house rising behind it in tiers and three chimneys spaced equally along the station's length. The coal store, by the canal wharf, was screened behind the main building.

Construction started in 1898 and by the following year the first generating plant was already in place. This consisted of a 750hp Ball & Wood engine driving a pair of 250 volt Walker dynamos; a 900hp triple expansion engine by

Matthew Paul of Dumbarton coupled to a 250 volt Shuckert dynamo and a pair of Mirrlees, Watson & Yaryan engines, of 200 and 400hp, driving Crompton dynamos.[7]

By 1900 additional pieces of equipment had been installed, namely a pair of Belliss engines, one 1100 and one 1500hp, coupled to Thomson-Houston dynamos and a Willans engine driving a Crompton dynamo. The boiler house at this time included ten boilers, with four more added shortly after. Increased efficiency was achieved by fitting induced draft fans and automatic ash removal systems to all the boilers.[8]

In the handling of fuel Port Dundas exhibited a good deal more mechanisation than its predecessors. A Temperly transporter (a type of travelling crane) took coal from barges on the canal at the rear of the station and passed it to hoppers above the boilers via hopper-bottom rail cars running above the boiler house roofs. Coal stock-piled in storage bunkers below could be raised to the cars by a bucket elevator. (See Figure 1)

Glasgow Corporation's second design by Andrew Myles was constructed south of the Clyde at St Andrew's Cross on Pollockshaws Road in 1900. The building consisted of a single storey facade, fifteen bays long, immediately facing the street and punctuated by recessed arches containing small windows. Offices were placed at each end in two-storey pavilions at right angles to the main building. A few ornamental details enlivened the frontage which screened all component parts of the station except the two chimneys and the tops of the three cooling towers built on the boiler house roof. In this way St Andrew's Cross was distinctly different from Port Dundas, which, through the use of tiered roof lines did much more to distinguish itself as a power station. By 1906 only 5800hp of St Andrew's Cross station's designed plant capacity of 15,000hp had been installed.

St Andrew's Cross was another highly mechanised station, this time wholly designed to receive fuel by rail. (See Figure 2) Coal was delivered by rail cars brought up to track running above the coal bunkers on an electrically driven screw elevator. Once on the elevated track the trucks deposited fuel directly into the bunkers before being lowered by a second elevator. Chain grate automatic stokers fed ten Babcock & Wilcox boilers and ash was handled by conveyor. The six generating units installed were powered by two 400hp, one 700hp and three 1,100hp steam engines, all fed with circulating water passed through three cooling towers sited on the roof of the boiler house. Two of the 1,100hp engines had in fact previously been part of a temporary power station

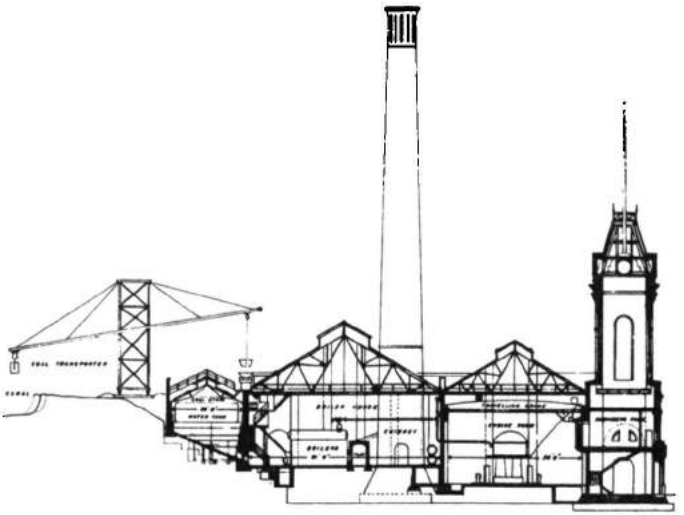

Figure 1 Cross section of Port Dundas Electricity Station.
(Reproduction courtesy of RACHMS, Scottish Power Collection)

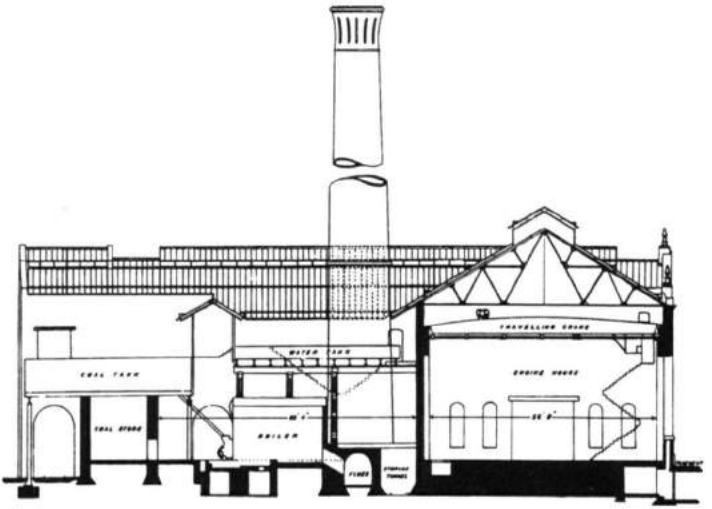

Figure 2 Cross section of Pollokshaws Road Station (St Andrew's Cross).
(Reproduction courtesy of RACHMS, Scottish Power Collection.)

set up in the machinery hall of the Glasgow International Exhibition during 1901 which supplied power to the exhibitors in Kelvinside Park.

By 1900 the application of electricity in the industrial workplace and to urban transport had increased dramatically. In Glasgow, the Corporation took over the operation of the tramways in 1894 and set up an experimental generating station in Springburn. Once the decision to fully electrify the tramway system had been taken a site was purchased at Pinkston and construction of a generating station began in 1899.

Pinkston power station's main building consisted of three ranges, containing boilers, generating plant and auxiliary plant respectively. The gable ends were ornamented with Dutch stylings and punctuated by tall arched windows, with the auxiliary plant room lower and narrower than the other two ranges. The facade was divided into eight bays by brick pilasters topped by a regularly undulating parapet. Two chimneys, flared at the top, were situated behind the boiler house range. Coal delivery was by rail, with an elevated track entering the boiler house approximately two thirds of the way up the gable end wall.

The original plant included 16 boilers, four 4,000hp and two 800hp vertical compound steam engines driving four 2,500kw alternators and two 600kw generators respectively. Output was at 6,600 volts AC.[9] Pinkston began operation in 1901 but was unable to supply demand by 1907 when additional power from Port Dundas was fed to the city's tram network. Following this a steady succession of additional plant was installed at Pinkston between 1907 and 1914, including six new boilers and three turbo-alternator sets. This was achieved, however, without expansion of the original building.

As both demand and supply area increased in Glasgow so the need for more efficient generating plant and an AC transmission system became pressing. The Electricity Department began to superimpose a 6,500 volt AC supply over the existing DC network from 1904 and the first generation of steam turbine plant was installed soon after.

The steam engine, restricted by the mechanics of its reciprocating action, could drive a directly connected electrical generator at little more than 500rpm. The turbine applied steam to a series of blades set on a rotating shaft and converted a greater amount of the steam's energy to mechanical motion, generating more electricity while using less fuel. The first turbine was placed in a commercial power station in Newcastle upon Tyne in 1888 and by 1912 more than a third of all electrical generators in the UK were powered by steam turbines.

The use of turbines that produced more electricity per generating set than steam engines enabled existing power stations to increase output without additional building. This was swiftly adopted in Glasgow, where the Corporation's power stations had been designed without the installation of turbines in mind and were set to reach full plant capacity but fall short of supplying demand.

The first major installation took place at Port Dundas, where continuing development of the station was part of a planned expansion. The original design had allowed for three phases of commissioning: each of the three chimneys marked the position of an independent boiler/engine room arrangement. By 1906 the first two sections had been opened, but with the application of turbines 20,000hp of plant was in place allowing room for an estimated 3,500hp beyond the designed capacity. At this stage the engine room housed eleven generating units, nine of which were powered by steam engines (totalling only 54 per cent of the station's full power capacity). The two turbo-alternator sets, by Willans Dick Kerr, were of 4,500hp each and generated 6,500 volts.[10]

Soon after the installation at Port Dundas, the St Andrew's Cross station received a 2,400hp Willans-Siemens turbo-alternator shortly followed by two more units of 4,500hp each. At Pinkston station the Transport Department added a 3,000kw turbo-alternator set by Richardson, Westgarth & Co in 1907 and two more of 500kw each in 1911 and 1914.[11]

The new generation of larger, more efficient Corporation power stations set higher standards of efficiency which earlier plants found hard to meet. In a bid to keep pace the Hughenden Lane station underwent additional expansion and by 1902 featured three boilers supplying three Willans-Bruce Peebles steam engine-dynamo sets of 350hp each. The Waterloo Street site, on the other hand, was closed down completely and used as a transformer sub-station from 1906.[12]

Two small power stations operated by the local authorities at Partick and Govan did not compare favourably with the new generation of stations either. The burghs had been authorised to supply public electricity in 1893 but had both proved slow in taking up this option, probably merely blocking the path of private companies until demand picked up and the future of their town gas operations became more clear.

When the burghs did construct electricity generating stations they were both incorporated within larger industrial complexes. Govan power station (built 1899-1911) was an addition to the Moorepark Boiler Works complex of

engineers Lindsay Burnett & Co and Partick power station, opened in 1905, was part of a municipal installation including a refuse destructor. Both facilities became part of Glasgow Corporation Electricity Department in 1912 under the Local Government Act and were immediately closed down and used as transformer sub-stations in part of the Corporation's large scale supply system centred on St Andrew's Cross and Port Dundas.[13]

Although the Electricity Department was pursuing a policy of centralising supply in large stations it was not actually self-sufficient within the Glasgow area. The Clyde Valley Electrical Power Co was a substantial private generating concern that, in 1901, had been authorised to supply the areas around the City of Glasgow including Coatbridge, Motherwell, Hamilton, Rutherglen, Clydebank and Dumbarton. The Company opened its first generation of power stations in 1905 (at Yoker and Motherwell) and in addition to supplying its own areas sold power to Glasgow Corporation for several of the City's residential areas including Cathcart, Newlands, Eastwood, Crookston, Cardonald, Scotstoun, Jordanhill, Knightswood, Lambhill, and Millerston.[14]

Some twenty years after the construction of the twin centre-pieces of Glasgow's electricity supply network, St Andrew's Cross and Port Dundas power stations, the Corporation Electricity Department once again addressed the need for a new station to meet the steadily increasing demand falling upon the previous generation. In fact these stations had reached their full capacities in terms of plant some ten years after opening and expansion on site was limited by the volume of water available for the steam condensers. This eventuality had been recognized and planned for as early as 1911 and thirteen acres of land between Dalmarnock Road and the River Clyde was purchased by Glasgow Corporation in 1913. Despite a surge in demand after 1913 construction was halted for the duration of the First World War and the station was not opened until 1920 although initial plans had foreseen plant of 100,000hp in operation by 1917.[15]

Dalmarnock power station (see Figure 3) was planned around two large units, each of two adjoining boiler houses, set behind adjoining turbine halls which were fronted by an independent building over-looking the Clyde containing two switch gear houses either side of a central control block serving the whole station.

At the rear (the north west side) of this complex were sidings of the London, Midland & Scottish Railway. Railway cars were positioned over a

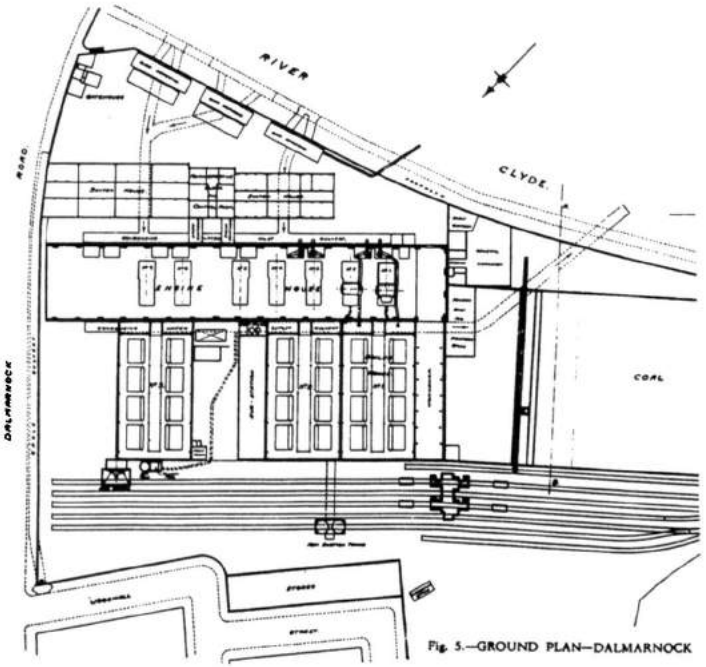

Figure 3 Ground plan of Dalmarnock power station, 1921.
(Reproduction courtesy of RACHMS, Scottish Power Collection.)

tipping platform and up-turned by an electrically operated ram, depositing coal into receiver hoppers beneath the track. The hoppers were positioned above coal breaking machines to reduce the fuel to a size suitable for the boiler grate if required. If coal was not taken directly to the bunkers in the boiler houses by bucket conveyors it could be diverted to a Temperley transporter which placed it in the station's 75,000 ton stock pile.

When opened in September 1920, half the station was completed, including the first pair of boiler houses, the corresponding half of the turbine hall range fronting it and one switch room. All building on the site was constructed with concrete frames and brick infill. Although an internal steel frame had been the original choice the war-time Ministry of Munitions demanded economies which necessitated the change.

While the boiler and turbine houses were fully clad in brick and looked much like their counterparts at Port Dundas and St Andrew's Cross, the switch

house/control building which fronted the complex had an externally visible concrete frame and a flat roof. This imparted an austere and more modern look to Dalmarnock which Glasgow's power stations since Waterloo Street had sought to avoid through the application of decorative detail.

Each boiler house had two tiers of windows at the northern (rail sidings) end. The flat roof was slightly raised at this end to accommodate the coal bunkers within and give them extra height from which to discharge fuel. A low clerestory emerged at this point and was screened by a modest curved gable at the north end. Beyond the coal bunkers the boiler house was divided internally by three floors. Ash handling equipment and forced draught fans (pushing air into the boiler furnaces) were placed on the ground floor with the eight boilers above and the chimney foundations and induced draught fans on the top (second) floor. The updraught of the chimney was artificially increased by the induced draught fans, enabling four short stacks to be placed on the roof of each boiler house rather than the usual single tall chimney.

The initial half of the turbine house was ten bays long and clad in plain brick with the concrete pillar frame expressed by raised brick on the exterior. Illumination was provided by a small eyebrow window in each bay, three tall arched windows in the gable ends and a clerestory. Four 15,000kw turbo-alternator sets were installed (one by Fraser & Chalmers and three by Metropolitan Vickers) along with a 500kw auxiliary set.

Following the Electricity (Supply) Act of 1926 the Central Electricity Board (CEB) established the National Grid to transmit power at 132,000 volts AC from a selection of the country's most modern and efficient power stations. Dalmarnock was included in the grid system and to cope with this new demand the third boiler house was added, in 1926, with a separate coal handling system for unloading rail cars and feeding the eight boilers. The turbine house also received additional plant, increasing the number of generating sets to seven. The second switch house was also constructed at this stage. It stood on the opposite side of the control building and was identical to the first but one bay longer and of slightly deeper plan. Dalmarnock power station was completed with the construction of the fourth boiler house in 1935 and the installation of two 50,000kw turbo-alternator sets in the turbine halls. When this addition was officially opened in 1937 the station contained total generating plant rated at 237,500kw.[16]

Dalmarnock was the last power station to be constructed in the City of Glasgow. During the final stages of the station's construction the City's electricity supply underwent the last major change before nationalisation when

the Corporation adopted the CEB's national standard frequency for electricity generation of 50 Hertz (the number of changes in direction of flow in AC current per second). In Glasgow, where 25 Hz had been standard, the Corporation had to covert ten of its power station's alternators, almost 400 transformers and many thousands of motors and meters.[17]

With the nationalisation of the electricity generating industry after the Second World War a period of massive investment in larger, more efficient facilities began. Part of this strategy was to construct generating stations away from the city centres in the midst of the coal fields, partly to reduce atmospheric pollution but also to ensure cheaper and swifter fuel supply. The new Central Electricity Generating Board (CEGB) stations were larger buildings, usually consisting of a pair of steel framed boxes clad in glass and steel with one or two concrete chimneys tall enough to disperse furnace gasses high above the adjacent land and featuring new developments in fuel handling and other technologies. As part of the CEGB strategy Glasgow Corporation's power stations, out-moded in generating ability and rendered comparatively inefficient by their plant and urban locations, were closed down.

In the sixty years before World War Two, Glasgow's public electricity generating stations had developed from small semi-permanent facilities set up largely at the behest of a single client, within proximity of that client, to large mechanised plants at the centre of a high-voltage AC transmission system supplying both the small domestic user and the largest industrial complex. The power stations changed from simple machine-covering sheds to more complex arrangements of connected units with modern generating equipment. At first, the large, purpose built stations were dignified by architectural detailing but later they embraced a more functional look that foreshadowed post-war designs.

NOTES

1. John Hume, *The Industrial Archaeology of Glasgow* (London, 1974) p.139.
2. Glasgow Corporation Electricity Department (GCED) *The Electricity Supply of Glasgow* (Glasgow, 1935) p.19.
3. W W Lackie, 'Electricity Supply In Glasgow, Its Progress & Possibilities', *Glasgow Herald*, 14 Dec 1909, p.4.
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9. Glasgow Corporation Transport Department (GCTD), *Visit of the Rt. Hon. Thomas Johnston to Pinkston Power Station* (Glasgow, 1954) p.10.
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11. GCTD, *op.cit.*, p.12.
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14. Anon., *The Clyde Valley Electrical Power Company: Quarter of a Century's Work* (The Electrical Age For Women, Apr 1931) p.137.
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The Clyde Screw Steam Packet Company: An 1850s Venture - Part I

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The 1840s experienced a 'railway mania'. Steam navigation produced a similar phenomenon in the 1850s as entrepreneurs sought to exploit the evolving technologies of steam and screw during a time of economic expansion. The Clyde Screw Steam Packet Co was one of many ventures that appeared in the 1850s only to be brought down by the post-war recession of 1857. Formed in 1853 to operate a service for passengers and freight between Glasgow and New York, the company quickly lost its two ships: the first on the coast of Algeria in 1855 and the second in the Gulf of St Lawrence in 1857, indicating that the firm strayed from its original intention.

The company would probably hold little interest for the industrial historian but for the survival of a small archive. In 1944, a collection of some 150 items was deposited with the Mitchell Library in Glasgow and these papers and plans, which appear to have been little disturbed in the intervening years, are the primary source for this article.[1] From this archive we can deduce that unlike several of the other deep-sea ventures of the time, the energetic promoters of the Clyde Screw Steam Packet Co deserved to succeed. Their commercial instincts were correct and they knew their trade. By the standards of the day, the venture was adequately capitalised. Unfortunately, the desire to get 'quickly to market' with their first ship caused the promoters to adopt an unproven and ultimately unsuccessful mode of propulsion - the angular geared engine.

The steamship connection between Glasgow and the New World was established in April 1850 when the Tod & McGregor ship *City of Glasgow* left Glasgow on the 16th for New York. The steamship was quickly purchased by a group of Liverpool traders who introduced steam to the Liverpool-Philadelphia route. David Tod and John McGregor had succeeded in their objective of demonstrating that there was a demand for the more predictable service offered by steam and that the demand could be satisfied even without a mail subsidy - the press referred to the 'brilliant success of the recent experiment'[2] - and the two entrepreneurial builders of ships and marine engines were joined by several other Glasgow merchants to form the Glasgow & New York Steamship Co (G&NYS). *Glasgow* was delivered to the G&NYS in the autumn of 1851 and her maiden voyage to New York left Lancefield Quay on

15 September, one month after her launch from the Tod & McGregor yard at Meadowside.[3]

In early July 1851, even before the launch of *Glasgow*, there were reports of the G&NYS directors planning a second ship, but it was to be 1854 before *New York* joined their fleet.[4] The delay provided an opening for another group of Glasgow businessmen to act and take advantage of the booming economy.

The promoter of the Clyde Screw Steam Packet Co was David Alexander Bruce Murray, a partner in Reid & Murray which from 1843 had operated a regular sailing packet service between Glasgow and New York. Murray knew the trade and surmised that the traffic could sustain a second steamship. An early collaborator with Murray was Captain David Henderson. Henderson had been master of several Reid & Murray barques on the Glasgow-New York run and so knew first hand the conditions to be encountered on the crossing. He handled negotiations with the shipbuilders.

The choice of shipyard to construct a screw steamship was limited. Tod & McGregor had built the pioneers on the New York route, *City of Glasgow* and *Glasgow*, and had a financial stake in the G&NYS and so were unlikely to be eager to built a vessel for a competitor. William Denny & Brothers of Dumbarton were another possibility but at that time were heavily engaged in building for G & J Burns either in that firm's own right as operators of coastal steamships or as building agents for the British & North American Royal Mail Steam Packet Co (Cunard). In the late summer of 1852, Denny had launched *Andes* and *Alps*, the first iron screw steamers in the Cunard fleet. Most of the Denny-built Cunarders were for the firm's Mediterranean trade but *Andes* and *Alps* were for a secondary (non-mail contract) North Atlantic run from Liverpool. So, presumably Denny would not think it prudent to offer to build a ship for one of Cunard's competitors.

At least three yards interested in building with iron were induced to make offers to build the steamship. The first came from Alexander Stephen & Sons who had just set up business at Glasgow in the Kelvinhaugh yard. The firm was now working with iron but had built no screw steamships at either their Dundee or Kelvinhaugh yards. Undaunted, on 25 November 1852, David Henderson invited and received an offer to build a 245 feet x 31 feet x 20 feet steamship with a pair of geared engines of 160 horse power for about £22,500. A revised offer incorporating alterations was received in December but allowed to lapse.[5]

The Greenock engineering firm of Scott, Sinclair & Co offered to build a steamship with a 160 horse power engine for about £24,600 and one with a 200

horse power engine for £26,000. A month later, early in January 1853, a revised proposal came for a hull of a 1,150 ton vessel at £15,000 and £15,700 for a 1,200 ton vessel. The cost of a pair of angular geared engines would be £5,600 for 160 horse power and £7,000 for 200 horse power.[6] A third firm, Smith and Rodger of Govan, offered in mid-January to build and engine a steamship for £25,000.[7]

In the event, a contract was signed with Scott Sinclair on 11 February 1853 with responsibility for the hull being subcontracted to the related firm, John Scott & Sons. £25,000 would produce a 1,200 ton vessel with a pair of engines giving 200 horse power. Delivery date for the ship to be named *Clyde* was to be seven months from the signing of the contract with a penalty of £15 per day for late delivery.[8] Murray wanted the vessel as quickly as possible and a major factor in favour of the Greenock firm was that a pair of angular geared engines was already partially constructed.[9]

With the Scott Sinclair offer in hand, Murray prepared a prospectus for circulation to possible investors. This 'Scheme for Building a Screw Steamer to Trade between Glasgow & New York' is reproduced as Appendix A. The scheme displays optimism: one ship was to be built *in the mean time* (emphasis in original); and a payback of capital was expected within two years. In addition, it was claimed that the relative shortness of the transatlantic journey and the adaptability of the vessel allowed for a rapid redeployment or abandonment should the trade prove to be less than expected.

The list of subscribers was opened on 7 February 1853 with the capital being divided into sixty-fourths. Within a few weeks, fifty-eight of the £400 shares were taken up, including three by John Scott, a principal of the shipbuilding firm.[10] While no correspondence survives on the matter, it was not unusual for shipbuilders to take up shares in return for the promoters sending the building contract to the yard. Certainly, John Scott indicated later that if the Packet Co was to build a consort, he would give serious consideration to taking up additional shares.[11] Five shareholders were appointed directors with William Ewing and J Bruce Murray as trustees and David Alexander Bruce Murray as manager and trustee of the Clyde Screw Steam Packet Co.[12]

Like the overhead beam engine fitted by Tod & McGregor in *Glasgow*, the engine designed by Scott Sinclair operated on the gear principle whereby the revolutions of the engine were increased to a level that permitted the employment of a propeller. But that is where the similarity ended. The double angular geared engine for the new ship, represented an attempt at a

technological step forward. Evidence of the engine being viewed as a break from tradition is seen in the prominent coverage given it in *The Practical Mechanic's Journal* and in Scotts' bicentennial history, though the ship is not identified in the latter - understandably, as we shall see.[13]

Marine engine builders in the 1850s had increased efficiency as a primary objective. This could be achieved by either reducing coal consumption and so reducing the amount of coal that had to be carried or by increasing the earning space of a ship by reducing the space occupied by machinery.[14] The compound engine was about to take the former approach while the steeple engine and trunk engine were attempts at the latter. Scott Sinclair's engine for the Glasgow-New York steamship aimed at a compact engine room. *The Practical Mechanic's Journal* commented:

> The engines ... are, perhaps, the most compact specimens of their class in existence, for the space occupied by them, fore and aft the ship, is but 12 feet 6 inches.[15]

While *Glasgow* and *Clyde* were of almost identical length - 250 feet and 249.1 feet according to their certificates of registry - the space occupied by the engines and boilers of *Clyde* was 53.75 feet compared with 78.2 feet for *Glasgow*.[16] While data is not available, the engines in Clyde, lacking the large castings involved in the fulcrum and the beam, must have been somewhat lighter than those in *Glasgow*.

The double geared engine consisted of two cylinders of 52 inch diameter and 45 inch stroke placed diagonally athwart the hull and at approximately 120 degrees to each other. Each inverted cylinder had two rods which operated through long return connecting rods onto two large spur wheels placed fore and aft of the cylinders. The spur wheels were 11 feet 5.5 inches in diameter and of 14 inches breadth and operated onto the propeller shaft through pinion wheels of 4 feet 6 inch diameter. The gearing produced was one turn of the engine to 2.5 turns of the propeller. The specifications for the engines are included as Appendix B, while the plans are shown in Figures 1 and 2.

In passing favourable judgement on the arrangement, *The Practical Mechanic's Journal* commented:

> In assessing the engines this high character, we do so, not because the makers have contrived to cram a complex mass of machinery into an unduly limited space, but because, whilst the grand features of compactness has been thus well

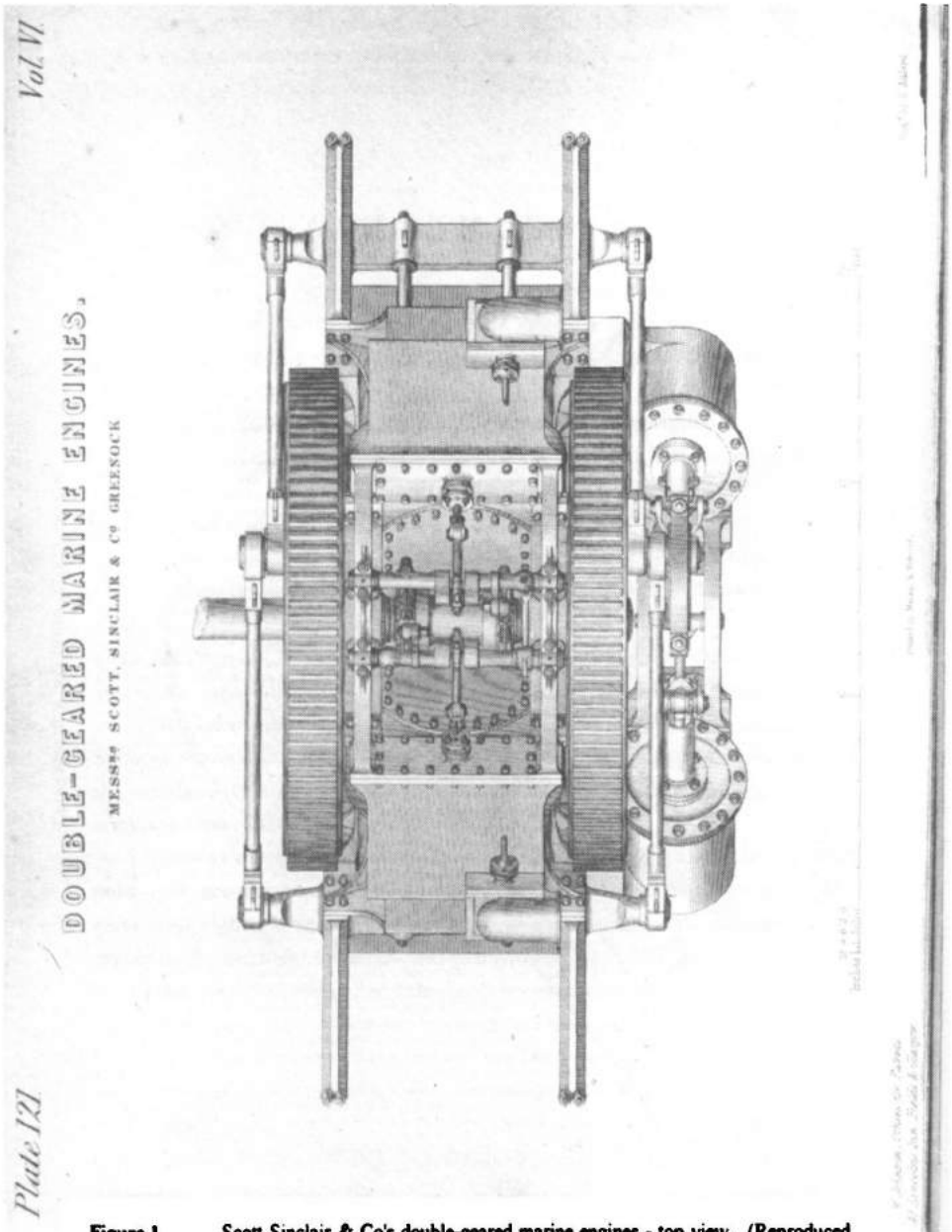


Figure 1 Scott Sinclair & Co's double-geared marine engines - top view. (Reproduced by courtesy of the Business Science and Industry Department, The Free Library of Philadelphia.)

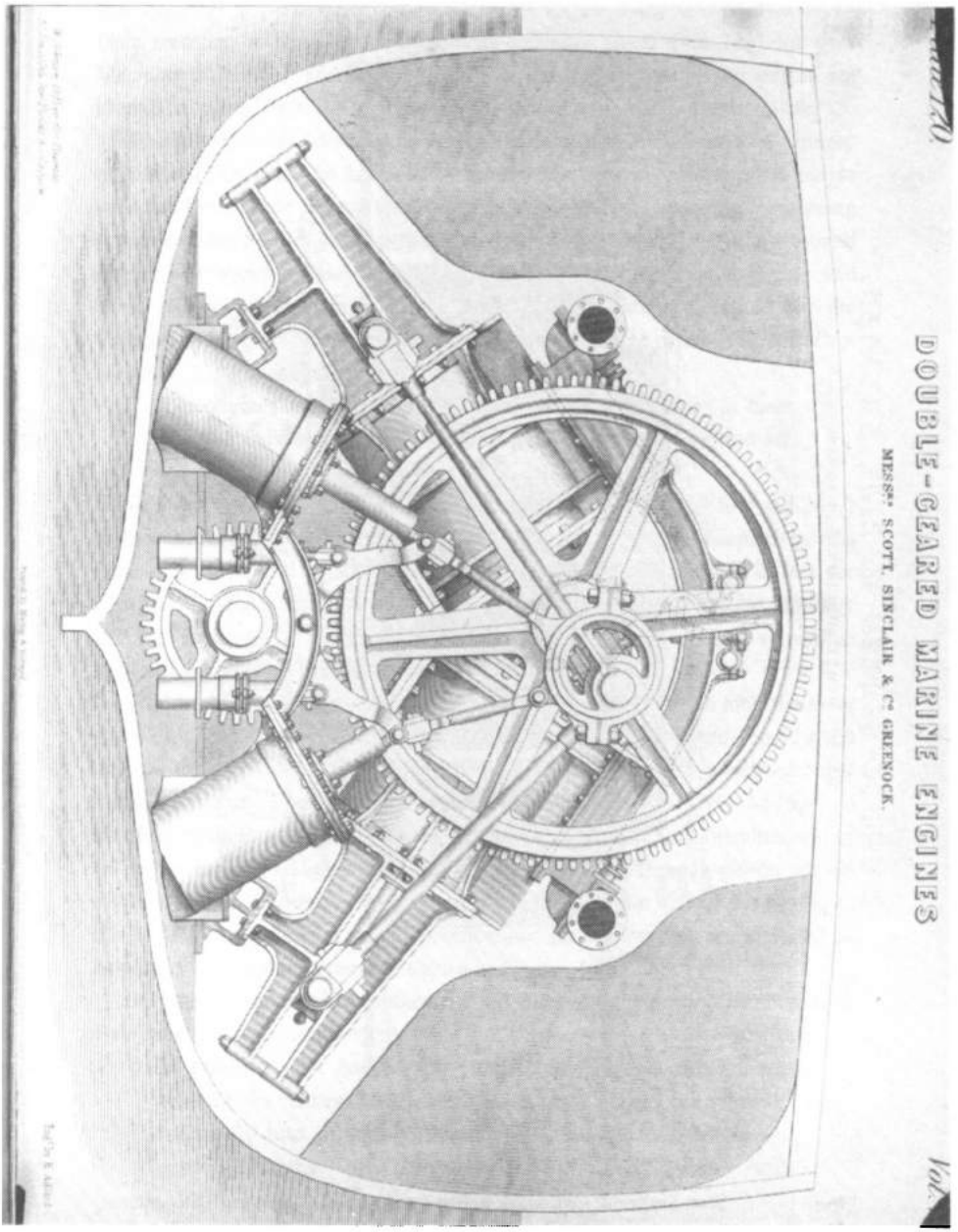


Figure 2 Scott Sinclair & Co's double-geared marine engines - side view. (Reproduced by courtesy of the Business Science and Industry Department, The Free Library of Philadelphia.)

> kept in view and secured, the whole details have been combined under a convenient, workmanlike, and symmetrical form.[17]

While the geared engines were to be the primary source of power, *Clyde* was also rigged in schooner fashion.

The building of *Clyde* progressed slowly. The funds for the instalments were raised by calling up portions of the shares with the six unappropriated shares being handled by six-month bills of exchange drawn on Murray. Also the amount due from John Scott on his three shares was handled by a 'book entry'.[18] Murray's letter of 1 October 1853 would contain no surprises for Scott Sinclair when he wrote, 'I beg to remind you that the term specified in the contract for her being completed expired on 11 September'.[19] Scott Sinclair's reply was unhelpful:

> We are quite aware the time has expired that was originally fixed by contract, but you must be sensible of the many difficulties we have had to contend with in bringing forward the work: the delivery of iron by the makers, and the irregular attendance and slow working of all classes of operatives. There are upwards of 100 men now employed about the Clyde and from the state of the weather during the last fortnight they have not made much show of progress ... We are doing all we can ... to push on the Clyde, but you will allow with such a class of disorderly irregular workmen we are suffering much loss.[20]

Subsequent requests for a completion date were met with more comments on the weather. 'We hardly know when to promise to have the vessel finished', admitted John Scott.[21]

Clyde was eventually launched on Saturday 18 March 1854. Her intended passenger accommodation was reported as approximately thirty-six in first class with eighty in second class. Steerage accommodation - the real money earner in the transatlantic trade - was planned for about 300 passengers.[22]

As the trial trip approached John Scott became apprehensive. He wrote,

> I am very sorry about her trim. It will do the vessel no credit - great harm I fear. I wish the trial could be put off for a few days, but I suppose it must go on - risk and all. We must hope for the best.[23]

The reference to 'trim' is taken to refer to the interior fittings of the ship since Murray in July had occasion to write to Scott Sinclair pointing out that several items in the saloon were still missing.

Trouble appeared on the trial trip of *Clyde*. About 200 guests joined her for the trip on 2 May 1854 but the vessel could not be fully tested because of 'bearings overheating'. The compact design of the engine allowed no room for imprecision of fittings and the overheating was almost inevitable. But the usual highlight of a trial trip - handing over the final instalment in exchange for the builders' certificate - was not observed. Murray refused to hand over the final instalment in case it prejudiced the claim by the Steam Packet Co against Scott Sinclair for breach of contract following the late delivery of the vessel. The representatives of Scott Sinclair then declined to hand over the builders' certificate which the Steam Packet Co required in order to register *Clyde* in the name of the company's trustees. Eventually lawyers arranged for the payment and delivery of the certificate on 12 May and the *Clyde* was registered at Glasgow on 19 May 1854 as owned by William Ewing, John Bruce Murray and David Alexander Bruce Murray as trustees of the Clyde Screw Steam Packet Co.

The register shows *Clyde* as three-masted and with dimensions of 249.1 feet 'from the inner part of the main steam to the fore part of the stem aloft', 30.2 feet breadth amidships and with a depth in hold of 21 feet. She is described as having a demi-woman figurehead.[24]

After *Clyde* had left on her maiden voyage to New York, Murray sent a late delivery claim to Scott Sinclair for £3,645, being 243 days at £15 per day. The shipbuilders ignored Murray's claim and later explained, 'We did not acknowledge, conceiving that in making the claim you were not really serious'. The matter soon found its way into the hands of lawyers and the legal proceedings would in fact outlive the vessel.[25]

The maiden voyage was announced for Monday 15 May, but 'for causes inseparable with a steamer of such dimensions [she was] detained until Saturday night [20 May]'. She sailed with twenty-six passengers in first class and 323 in intermediate and steerage.[26] David Henderson sailed as master with a crew of sixty-one. The composition of her crew and the pay rates are shown in Table 1.

Clyde reached New York on 8 June 1854, a crossing of nineteen days. On June 9th, Henderson penned a letter to Murray and sent it off by the Collins liner *Baltic*. A few extracts from the five-page letter give a flavour of life as master (or as fireman) on an early transatlantic steamship.

> *Sat 20 May.* 9.30 p.m. started from Greenock.
>
> *Mon 22 May.* Water has been accumulating in the engine room. I have been at the engineers several times about it.

Table 1

Pay Rates on First Voyage of *Clyde*

	Monthly rate			Monthly rate	
	£	s		£	s
Chief Mate	12	10	Chief Steward*		
2nd Mate	8	10	2nd Steward	5	0
3rd Mate	6	0	Chief Cook	6	6
4th Mate	5	10	Cook (4)	4	10
Carpenter	7	0	Cooks' Boy	2	10
Boatswain	5	0	Baker	5	0
Joiner	5	0	Butcher	3	10
Storekeeper	5	0	Steward (8)	2	10 to £4
A B Seaman (12)	4	10	Stewards' Boy	2	10
Ordinary Seaman (3)	4	0	Stewardess (2)	3	0
Lamp Trimmer	2	10	Boots	2	0
1st Engineer	14	0	Purser	110	
2nd Engineer	10	0	Surgeon*		
3rd Engineer	8	10			
4th Engineer	7	10			
Fireman (6)	4	5			
Coal Trimmer (3)	3	15			

Notes: The numbers in parentheses indicate the number in each position where it is more than one. All completed the round trip except the Boots who left in New York.

* Monthly rates are not given for the chief steward and surgeon, but the portage bill shows the latter receiving £17 10s (for 1 month 21 days) and the former £15 16s 10d (for 1 month 26 days).

Source: MS106/32, portage bill for *Clyde*.

The bilge pumps got choked with dirt from the engine. Four of the furnaces out from the quantity of water washing about in the firing spaces. Had to turn to the officers and sailors to get the water out and put things in order. Engine stopped six hours.

Tue 23 May. Strong gale NW by N. Heavy head sea, the ship behaving admirably, never ships a drop of water and very little rolling. I never saw a better seaboat. Carried away the fore

boom while giving her a press. 6 a.m. stopped engines to put the bilge pumps in order.

Wed 24 May. All the port, or lee, furnaces out from the quantity of water in the engine room. Had to take charge in the engine room. Engineers not worth their salt - *they think* it would be better to put back!!

Thu 25 May. Hot well cover bursted. Stopped the engine to secure it - after 4 hours set on again - eccentric heated, stopped 2 hours. A deputation from the passengers waited on me today to see if I would go back!! Two or three words put them all right.

Fri 26 May. Heating occasionally.

Sat 27 May. Engine stopped 5 hours to pack piston rods.

Sun 28 May. Something wrong with the air pump on the port side. Stopped to overhaul it, 3 hours. Still not right.

Mon 29 May. Hot well cover again started. Had to stop for 3 hours. Firemen up to the knees in water. Steam very low.

Wed 31 May. Passed an immense quantity of icebergs of a great size. Discovered that the discharge [indecipherable] cover was broken and a quantity of water coming into the ship at every stroke of the engine and from its appearance it must have been so for a considerable time. Secured it. Engine stopped 4 hours.

Thu 1 June. Engine working very ill and making a great noise. The port [air] pump rod broke. Tried to work the port engine high pressure but it went so stiff that we immediately stopped and disconnected the port engine, and set on with the starboard engine. Stopped 7 hours.

Mon 5 June. Engine stopped 3 hours to repack piston rods.

Wed 7 June. 10 p.m. anchored at quarantine.

Thu 8 June. 6 a.m. cleared and proceeded to New York where we arrived all right at 7 a.m.

I am well pleased with the ship. She is an excellent seaboat and easily managed under sail. I think if we had a much coarser pitched screw we would get a far better result. The engines always heat when we attempt to drive them as fast as Mr. Jeffery [of Scott, Sinclair & Co] calculated. The most we could get was 26 revolutions while he calculated on 36 or 40.[27]

I am well pleased with all our officers. They have had a great deal to do and they have done it cheerfully. With the steward and

> his department I am also well pleased. You will please let Mr. Scott know that I am very much dissatisfied with Mr. French the head engineer. He has not *one* redeeming quality. We must have another when we come back. Had I put him there I would have brock [sic] him before we were two days at sea.[28]

James French had left the G&NYS's *Glasgow* to join *Clyde* and one must wonder if the traditional and reliable overhead beam engines had prepared him for the cantankerous angular geared engine on *Clyde*.[29]

After extensive work on the engines, *Clyde* cleared from New York on Thursday 22 June and arrived at the Tail of the Bank on Saturday 8 July, reaching the Broomielaw about midnight. Murray passed on to Scott Sinclair the bill from Cunningham & Belknaps of New York for $2,244.98 and asked the firm to accept a sixty day bill of exchange payable to himself and drawn on Scott Sinclair for £472 16s 7d. Predictably Scott Sinclair denied any responsibility and returned the bill of exchange unsigned. But the firm did take the opportunity of sending Murray an invoice for £243 15s 2d covering 'extras' for *Clyde*. Murray then wrote to the firm complaining about the 'want of promptness' in finishing the repairs to *Clyde's* engines. In addition, he pointed out, there were several items still required in the engine room, for example, a 'breakwater to protect pipes and prevent the water from washing over the engines when the ship rolls over at sea'.[30]

Clyde performed two round trips before being withdrawn for major work on the engines. Her transatlantic sailings in 1854 are summarised in Table 2.

Table 2

1854 Sailings by *Clyde*

Glasgow		Greenock/ Tail of the Bank		New York	Duration (from/to Tail of the Bank)
		May 20	→	Jun 8	19 days
Jul 8	←	Jul 8	←	Jun 22	16 days
Jul 26	→	Jul 28	→	Aug 21	24 days
		Sep 22	←	Sep 2	20 days

The subsequent transatlantic sailings lacked the drama of the maiden crossing, inauspiciously when *Clyde* grounded for one tide at Whiteinch and repeated this act just below Dunglass. (The early transatlantic steamships from Glasgow

were testing the limits of the river. In 1854, *Glasgow* had spent four months in dry-dock after grounding on her way down river.) *Clyde* loaded the balance of her cargo at the Tail of the Bank off Greenock and her passengers joined her by tender from Glasgow. On Friday 11 August, coal was almost exhausted and Captain Henderson 'shaped a course for Halifax under canvas'. Early on the Monday she was alongside the Cunard wharf and loading coal. At ten o'clock when steam was raised it was found to be escaping from the bottom of the cylinders and it was 4.30 a.m. on Wednesday 16 August before *Clyde* sailed from Halifax to arrive in New York five days later. On the return trip a boy was lost overboard during heavy weather. An eccentric rod driving one of the air pumps snapped on the second day and much of the voyage appears to have been completed under canvas. At least the engineer was proving satisfactory. Captain Henderson wrote, 'Our present engineer is an attentive man working hard to get things right'.[31] The engineer, James Johnston, had previously served on the coastal paddle steamer, *Duke of Argyll*, engined by Scott Sinclair in 1852.

Some financial records for *Clyde*'s two voyages have survived. The portage (wages) bill for the first round trip shows a total expense, excluding the master's salary, of £520 12s. The crew signed on on 20 May 1854 and signed off on 10 July. An indication of the master's salary can be obtained from Captain Henderson's earlier estimate of revenues and expenses when he included £450 as the commander's annual salary. The freight lists for the 28 July departure from Glasgow show freight earnings of £1,963 15s.[32]

In the prospectus for the Clyde Screw Steam Packet Co, Murray indicated. 'I would propose to build one vessel (in the meantime)'. Even before *Clyde* sailed from the Clyde in May 1854, Murray had been looking around for a consort. In November 1853 the steamship *Petrel* was drawn to his attention. Built by Caird & Co of Greenock in 1852 for the Cunard-related Nova Scotia Newfoundland & Bermuda Royal Mail Steam Packet Co, *Petrel* had found insufficient traffic on her New York-Bermuda-St Thomas trade and, late in 1853, returned for lay up in Greenock's East India Harbour. A fire during the night of Wednesday 25 January 1854 caused the ship to be surrendered to the Lancashire Insurance Co.

In April 1854, *Petrel* passed from the Lancashire Insurance Co to the Clyde Screw Steam Packet Co in exchange for £13,500. Lawrie & Co undertook repairs which cost the Packet Co another £2,922. The financing of the purchase and the repairs was by a series of promissory notes drawn on the Edinburgh & Glasgow Bank. Unfortunately, it is not possible from the archive

to determine how the notes were financed as they came due. The company completed the refitting of the vessel and the final cost of *Petrel* was £20,696.[33]

The actual bill of sale was completed on 24 July 1854 and was recorded at the Glasgow Custom House on 31 August 1854 and a new register opened for *Petrel* which showed her to be brig rigged, two-masted and with dimensions of 198 feet by 26.2 feet and 20.2 feet. A shield figurehead is recorded. Despite her length being a fifth less than that of *Clyde* her engine room at 77.8 feet was 24 feet longer, again pointing to the compactness of the machinery arrangement on *Clyde*. *Petrel* was fitted with two beam engines with 50 inch cylinders and a 48 inch stroke with 10.5 knots expected. Steam was supplied from two boilers and the daily coal consumption estimated at 14 tons with bunkers for a twenty day supply.[34]

Two ships in the fleet allowed the Screw Steam Packet Co to arrange a monthly service from each end and the optimism of the company was reflected in the advertisements appearing on both sides of the Atlantic. The following appeared in a Philadelphia newspaper in September 1854 and indicates that the company expected to draw customers for its New York-Glasgow route from a wide geographic area:

From New York for Glasgow
Petrel on Saturday 7 October
Clyde on Saturday 4 November

First cabin $75. Limited number of third class at $30 at $30.
N.B. The attention of passengers is called to the improved system adopted by this company, and the only one, viz. Passengers will be abundantly supplied with best provisions properly cooked and served up; besides which, Beds, Bedding, all articles for eating, drinking, &c. &c. will be provided by the ship, Passengers having their personal luggage ONLY to provide and attend to.[35]

Petrel's first voyage from Glasgow commenced on Tuesday 5 September, 1854 when at 1.30 p.m. she left Lancefield Quay. Her commander was Robert Henry Church Tims. *Petrel* grounded briefly off Port Glasgow before proceeding across the Tail of the Bank to the Gareloch where she adjusted compasses. She dropped anchor at the Tail of the Bank off Greenock and at 1 a.m. on Thursday 7 September set off for New York. There were just over 100 passengers on board. The total passenger revenue was £1,121 while freight earned £505.[36]

Clyde's maiden voyage was a nightmare. That of *Petrel* came close to being a disaster. An extract from the log catches the turning point of the voyage.

> *Thu Sep 14.* 4.30 a.m. leaks gaining forward. Called passengers to lighten ship. Commenced throwing a quantity of pig iron overboard and shifted coal aft. Passengers baling out the forepeak. Two more passengers reported dead.
> 2 p.m. Master surveyed coal bunkers and considering state of ship and coal, determined to put back to Glasgow.
> Midnight, weather moderating a little.[37]

At ten o'clock on Monday 18 September, *Petrel* tied up again at Lancefield Quay. The death toll, from dysentery, was now five and her first (and last) attempt at crossing the Atlantic for the Clyde Screw Steam Packet Co was over. Four days later, *Clyde* completed her second round trip. Both ships were in need of major repairs and future looked grim for the Steam Packet Co.

When Murray reported to the shareholders on the half-year to January 31 1855 he had bad news. He referred to the costs incurred following the failure of the shipbuilders Lawrie & Co which had forced the Steam Packet Co to complete the refurbishing of *Petrel*. Murray also reported on the:

> unfortunate return of [*Petrel*] a miserable wreck ... the machinery of the Clyde broke down again and again on the voyage to & from New York, increasing expenses to a vast extent.

He concluded;

> I have no hesitation in ascribing the misfortunes of the company to the lengthened detention of the vessel beyond her contract time by the builders Messrs. Scott Sinclair & Co. and to the deficiency in construction of the machinery.[38]

His fellow shareholders would also be aware that a second steamship, *New York* had entered service for the G&NYS in November 1854.

But there was also good news. By delaying his report until mid-March 1855, Murray was able to report that the substantial losses incurred in the New York trade had been wiped out by a new trade. What caused this change in fortune? Answer: the Crimean War. Both of the vessels were patched up and found lucrative employment, though only one would survive the war.

[*The concluding part of the article will appear in the next issue of the journal and will document the employment of two steam vessels as transports during the Crimean War.*]

NOTES

1. Mitchell Library, Glasgow; papers relating mainly to the Clyde Screw Steam Packet Co, 1853-1858, MS.106 (hereafter MS.106). The assistance of Hazel Wright, Departmental Librarian, Rare Books and Manuscripts, Mitchell Library, is acknowledged with thanks.
2. *Scottish Guardian*, 4 Apr 1851.
3. A summary of the achievements of David Tod and John McGregor is given in P Gifford, 'Tod and M'Gregor: Atlantic Shipbuilders', *Scottish Industrial History*, 14-15 (1992) pp.39-47.
4. *Scottish Guardian*, 8 Jul 1851.
5. MS.106/53, copy correspondence between shipbuilders and Clyde Screw Steam Packet Co. Letters Alexander Stephen & Sons to D Henderson, 25 Nov 1852, 26 Nov 1852, 24 Dec 1852.
6. MS.106/53, letters Scott Sinclair & Co to D Henderson, 30 Nov 1852, 7 Jan 1853.
7. MS.106/53, letter Smith & Rodger to D Henderson, 15 Jan 1853.
8. MS.106/4, letter Scott Sinclair & Co to David Henderson 21 Jan 1853.
9. MS.106/53, letters Scott Sinclair & Co to Murray, 20 Jan 1853 (2), 21 Jan 1853.
10. MS.106/14, contract of co-partnery for the Clyde Screw Steam Packet Co.
11. MS.106/53, letter John Scott to Murray, 8 Dec 1853.
12. MS.106/14, contract of co-partnery for the Clyde Screw Steam Packet Co.
13. *The Practical Mechanic's Journal*, VI (1853-54) 61, pp.1f; *Two Centuries of Shipbuilding by the Scotts of Greenock*, Second and revised edition (Offices of *Engineering*, 1920) pp.31-33.
14. There were also attempts to leap-frog into a new technology. For example, John Ericsson's caloric engine which while it failed in 1853 has recently been noted as employing the same principle as one of the newest forms of heat-energy cycles being developed today. See Michael Lamm, 'The Big Engine That Couldn't', *Invention and Technology* 8, 4 (Winter 1993) pp.40-47; and letter, 'Caloric Comeback' (Summer 1993) p.2.
15. *The Practical Mechanic's Journal*, VI (1853-54) 61, p.1.
16. Strathclyde Regional Archives (SRA); *Glasgow*: Port of Glasgow, register number 71 of 1851, dated 3 September 1851; *Clyde*: Port of Glasgow, register number 72 of 1854, dated 19 May 1854, official number 25232.
17. *The Practical Mechanic's Journal*, VI (1853-54) 61, p.1. The article describes the cylinders as being at right angles to each other. The plans indicate this was not so.
18. For example, MS.106/53, letter Murray to John Scott 15 Jun 1853 on second instalment.
19. MS.106/53, letter Murray to Scott Sinclair & Co, 1 Oct 1853.
20. MS.106/53, letter Scott Sinclair & Co to Murray, 3 Oct 1853.
21. MS.106/53, letter Scott Sinclair & Co to Murray, 1 Nov 1853. Weather has always been a problem for shipyards. Two yards on the Clyde in the 1850s tried to reduce the difficulties involved in having their employees exposed to the elements by constructing high-roofed sheds over the slipways: Alexander Stephen & Sons at their Kelvinhaugh yard in 1851 and Tod & McGregor in 1853.
22. *Scottish Guardian*, 21 Mar 1854.
23. MS.106/53, letter John Scott to Murray, 29 Apr 1854.
24. SRA, *Clyde*: Port of Glasgow, register number 72 of 1854, dated 19 May 1854.
25. MS.106/53, letter Murray to Scott Sinclair & Co, 6 Jun 1854; letter Scott Sinclair & Co to Murray, 7 Jul 1854.
26. *Scottish Guardian*, 21 Mar 1854, 23 May 1854, 25 May 1854.

27. The name of the engineer manager at Scott Sinclair & Co appears in contemporary records as both Jeffroy and the spelling followed here.
28. MS.106/28, letter D Henderson to Murray, 9 Jun 1854.
29. Public Record Office, Kew, BT98 Box 3746. *Account of crew of foreign going ship* for *Clyde*. This box contains the 'agreements' for both the 20 May 1854 voyage and the next voyage, 24 Jul 1854.
30. MS.106/53, letters Murray to Scott Sinclair & Co, 7 Jul 1854, 5 Aug 1854; letter Scott Sinclair & Co to Murray, 4 Aug 1854, 10 Aug 1854; letter Murray to Scott Sinclair & Co, 19 Jul 1854.
31. MS.106/25, logbook of *Clyde* 22 May 1854 to 22 Sep 1854; *The Glasgow Herald*, 25 Sep 1854; MS.106/36, letter David Henderson to Murray, 23 Aug 1854.
32. MS.106/32, portage bill for *Clyde*, dated 10 Jul 1854; MS.106/19, estimated revenue and expenses for *Clyde*; MS.106/34, freight lists for *Clyde*.
33. MS.106/27, agreement to purchase *Petrel* between Lancashire Insurance Co and the Clyde Screw Steam Packet Co; MS.106/38, invoice Lawrie & Co, Sep 1854; MS.106/58, detailed cost of *Petrel*.
34. SRA, *Petrel*: Port of Glasgow, register number 116 of 1854, dated 31 Aug 1854; MS.106/17, specifications for *Petrel*.
35. *Cummings Evening Bulletin* (Philadelphia) 13 Sep 1854.
36. MS.106/39, steerage passenger list for *Petrel*; MS.106/41, freight list for *Petrel*.
37. MS.106/40, logbook of *Petrel* 5 to 18 Sep 1854.
38. MS.106/63, report for the half-year to 31 Jan 1855 given at the general meeting of shareholders held 13th March 1855.

APPENDIX A

Scheme for building a Screw Steamer to Trade Between Glasgow and New York

The present large and rapidly increasing traffic between this port and New York offers so evident an opening for the introduction of a line or lines of Screw Steamers that little need be said to point out its advantages. That extensive trade is now being carried on (the 'Glasgow' excepted) by means of sailing vessels and these of an inferior class; and the most of the fine goods manufactured here find their way to Liverpool to be thence shipped by steamers &c. to America.

I am quite confident from the opportunities I have had of obtaining information, that a line of Screw Steamers would, if built in a proper principle and fitted out expressly for the trade, successfully compete with Liverpool or any sailing vessels and prove a profitable investment for capital. It will however be of great importance that the scheme be immediately carried out because such a station cannot long remain unoccupied.

I would propose to build one vessel *in the meantime* of the following dimensions - of a fast sailing model - to be propelled by a Screw with geared engines of 160 horse power.

	Dimensions for old tonnage		**For Register tonnage**		
Length	245 ft.	tons	D. 81.8 x B. 198.6 x L. 232		tons
Breadth	31 ft	1157.27/94	3,500	=	1076.843
Depth in hold	20 ft		deduct engine & boiler space		200
					876 tons

Capable of carrying on 16 ft. draft of water 1136 tons weight with space for storage of cargo of 2224 tons meas[t].

Such a vessel would make the passage in 12 to 15 days carrying about 600 tons meas[t] tons with 486 passengers or about 1500 meas[t] with 186 pass. She could be built for £22,500 and sailed with about 50 of a crew and would consume about 450 tons of coal on the voyage out and home.

To ensure full cargoes I would propose to have rates similar to sailing vessels *if need be* and carry that class of goods and passengers which could be had in greatest quantity - and as there is no difficulty experienced in obtaining full cargoes for sailing vessels of steerage passengers and coarse goods I think it would be quite safe to calculate on full cargoes for a steamer while fine goods and higher rates might with confidence be anticipated.

It is almost impossible to give a correct estimate of the average voyages for a season and were I to take the rates and prospects of the present time it would appear too sanguine. A voyage to New York during the most part of the year might be estimated as under and on those voyages when passengers cannot be obtained in sufficient numbers to fill up - a greater quantity of goods could easily be got and carried with little less profit.

400 tons Pig Iron @ 20/-	£ 400		
400 tons other goods @ 25/-	500	£900	
300 steerage passrs @ £3.10/-	£1050		
150 intermediate @ £4.10/-	675		
36 cabin @ £15	540	2265	£3165

Home	say 1000 tons @ 25/-	£ 1250			
	say passengers	500			1750
					£ 4915
Expenses	Coal & engine stuff		£250		
	Wages for 2 months		400		
	Provisions for crew		150		
	Exps on passrs' provisions		500		
	Commissions & disbursements at home		300		
	do. do. abroad		300		
	Insurance		220		
	Tear & wear			150	£2270
[Profit before] int., depreciation &c. 2 months					£2645

The vessel would make 6 trips a year and suppose the average profit to be estimated at £2000 a voyage instead of £2645 as shown above, the amount realised would be £12000 - more than one half the original cost in one year. The safety of such a speculation is that such a steamer would be good property easily disposed of or removed to a more lucrative trade while the short voyages give an opportunity of immediately stopping a losing speculation before any serious loss could be sustained.

I have procured a model and plans by a scientific draftsman which I shall be happy to exhibit and explain at my countinghouse, 54 Hope Street.

D.A.B. Murray

Source: MS.106/5a

APPENDIX B

Specifications of Engines & Boilers for a Screw Steamer Building by Scott Sinclair & Co.

Engines to be Angular Geared
Diameter of Cylinders 52 inches
Length of Stroke 45 inches

Air Pumps Two in number to be wrought from an eccentric on end of crank pin. Chambers, buckets, valves and rods of gun metal.

Slide Valves To be 4 ported equilibrium valves with an opening of 2 inches for steam and 4 inches for exhaust.

Expansion Valves Gird iron expansion valves of gun metal.

Pumps 2 feed, 2 bilge, 1 double acting hand force pump to pump from sea and bilge on to the deck and into boiler and to be connected with the engines. The plungers, valves & seats of these pumps to be of gun metal.

Cross Heads All cross heads, connecting rods, piston rods, and shafts to be of the best hammered scrap iron.

Pipes All the pipes to be of copper except the bilge which is to be of lead, and to lead from all the compartments of the ship, also a bilge injection coil to be fitted on condenser.

Donkey Engine A donkey engine capable of feeding the boilers with their own steam.

Propeller To be 3 bladed with differential pitch, 12 feet 3 ins. diameter - cast iron.

Boilers To be tubular in 2 parts yet divided into 4 distinct Boilers and well stayed in every part, capable of sustaining a working pressure of 20 lb. per square inch and to be proved with water pressure of 30 lb. per square inch to be fitted with safety valves, stop valves. Pressure and water gauges, surface & bottom blow off cocks in short everything necessary to insure their safety and efficient working, to be covered with felt and wood battens firmly secured to boilers.

Plates to be from 7/16 to 3/8 thick, bottoms double riveted to 3 feet up the sides, furnaces of the best Staffordshire iron with Lowmoor iron on sides, tubes of malleable iron no. 8 wire gauge 3 1/2 inches diameter and 6 feet 9 ins. long each boiler to contain 135 tubes or 540 in all.

Finally To be supplied with all the necessary stores and tools for engine room, spanners, wrenches, hammers, chisels, a vice and bench, oil cans, tallow chest, fire irons, block & tackle, hose for deck, and all things suitable and usually provided for a vessel of her class and to be guaranteed for 6 months after delivery from all defects in material & workmanship.

The whole to be of the best material & workmanship and finished in the manner generally done in similar contracts.

Scott Sinclair & Co.

Greenock

11 February 1853.

Source: MS.106/7

An Early Dumbarton Helicopter

Niall MacNeill
Scottish Maritime Museum

The helicopter is widely regarded as a post World War Two invention, a reliable and practical aircraft which came into widespread use in the early 1950s. The name most commonly associated with it in this century is Igor Sikorsky (1889-1972) who perfected the design of machine in use today and ensured its first successful flight on 14 September 1939.

However, a far less auspicious attempt at manned helicopter flight took place in Dumbarton eighty-two years ago. The machine in question comprised six 'rotor blades' mounted on either side of a tubular aluminium framework. (See Figure 1). On 7 September 1912 it rose to a height of ten feet. This was the length of rope by which it was tethered to the ground.[1] Inspired by Edwin R Mumford (1858-1926), superintendent of William Denny & Bros ship model test tank for over forty years and one of the leading ship experimenters of his day, it looks fragile in the extreme and the shape of the 'rotor' appears to owe as much to marine propeller design as aeronautics.

Early work on the project was carried out from 1905 to 1907 with the utmost secrecy and the first machine was built in a large shed in the hills beyond Overton to the north east of Dumbarton.[2] Given the remote location of the site and the importance attached by William Denny & Bros to maintaining the secrecy of all experiment tank work, it is hardly suprising that there are no contemporary press reports of these tests. Subsequent interest in the development of Scottish aviation centred not on Dunbartonshire but on Lanarkshire and Renfrewshire, Scotland's first flying meeting being held on Lanark race course on 2 to 4 June 1910 . Described as the finest yet organised in Europe, as many as 50,000 people turned up to watch several of the twenty-two competitors set new speed and altitude records.[3] Two years earlier a group of young aviators, spurred on by the Wright brothers' achievement, chose Barrhead as the site for an airfield and later formed the Scottish Aviation Co on a basis of £10,000 of share capital.[4] Its directors included the eminent aircraft designer A V Roe and Walter G Duncan of the Scottish Aeronautical Society. Barrhead airfield was destroyed by fire but not before the company had designed and built prototypes for the Caledonia monoplane and biplane.

The Scottish Aeronautical Society's contribution to the International Exhibition held at Kelvingrove in 1911 served to arouse the interest of the

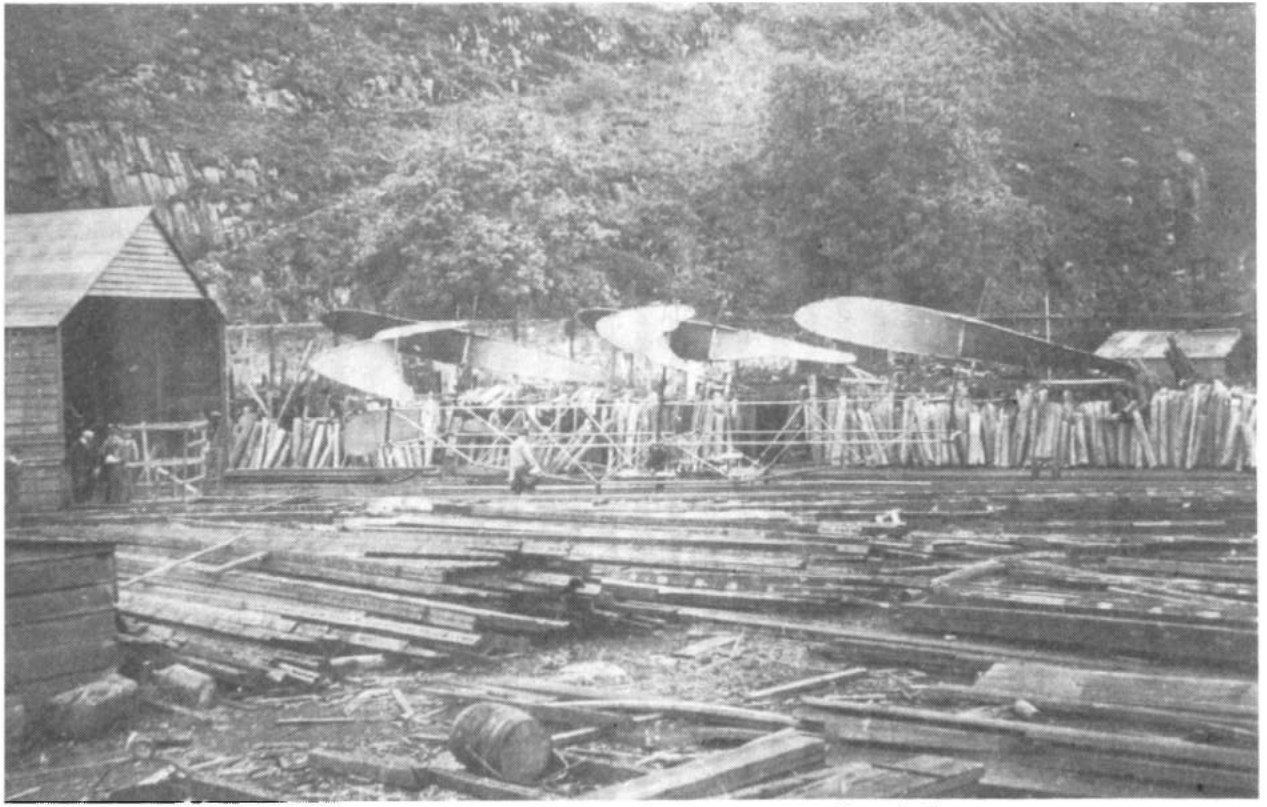


Figure 1 Side view of machine prior to tethered flight, January 1913. (Reproduction by courtesy of Royal Aeronautical Society.)

Scottish public in aviation. The society erected a huge display hangar near Park Circus in which no fewer than three new Scottish aeroplanes were displayed; the Caledonia monoplane, with a large wingspan, built by W & S Pollock of Robertson Street, Glasgow, and the Grampian monoplane built and engined by Frank Barnwell, one of the leading Scottish airmen of his time.[5]

Mumford's helicopter conceived in a Dumbarton shipyard, never enjoyed the glamour and panache of such flying meetings and exhibitions. The design was not influenced by any of the above mentioned machines and was well outside the mainstream of contemporary aviation development in Scotland and the rest of Europe. Indeed, about the only common feature shared by the Grampian monoplane and the Mumford helicopter was the occupation of their respective designers; both had qualified as naval architects though by different paths. Barnwell took his degree in naval architecture at Glasgow University, a career choice which was not too surprising for a son of the manager of Fairfield shipyard in Govan.[6] There are striking parallels between Barnwell's career and that of Scotland's pioneering aviator, Percy Pilcher. The latter also served an apprentice at the Govan shipyard before joining the staff of Glasgow University's Department of Naval Architecture in 1892. After developing an interest in the glider experiments of Otto Lilienthal, he made the first British 'heavier than air' flight in a glider of not dissimilar configuration to Barnwell's monoplane of sixteen years later. He took off from a hillside near Cardross less than five miles from the site of Mumford's first helicopter experiments in 1905.

Edwin R Mumford entered HM Dockyard at Devonport in 1872 as a thirteen year old shipwright and received practical and scholastic education there for five years.[7] At the end of 1878 the British Admiralty appointed him to assist William Froude (1811-79) with experiments on model ships and propellers at their recently opened Torquay test tank. Mumford continued his work there for five years. In 1882 William Denny & Bros made the decision to build the first privately owned test tank in the world. Mumford joined the staff of the Dumbarton tank in 1883 under the auspices of Frank Purvis who had been his fellow assistant at Torquay until 1880. In 1881 Purvis had been placed in charge of the Denny yard's newly opened scientific department with the brief of setting up the new experiment tank.[8]

If life in the town of Dumbarton was disconcerting for both men after Torquay, the new tank at least provided a reassuring work environment. Both William Denny III (1847-87) and his younger brother Archibald (1860-1935) were enthusiastic proponents of Froude's work on the testing of model hulls

and propellers and the former had accepted an invitation to visit the Torquay tank in 1873.[9]

From the opening of the Dumbarton tank on 21 February 1883, Mumford worked zealously on means of improving ship propulsion giving ever more attention to the design of the screw propeller as it began to replace the paddle wheel in ordinary vessels. By the end of the 1880s, propeller test equipment had been installed at the tank and was used extensively to measure propeller drag for individual models and comparative tests.[10] As the trend for the screw propeller to replace the paddle wheel continued in the 1890s, many an inventive brain sought to improve the efficiency of the former and Mumford was soon inundated with requests for tests and support for new and elaborate designs.[11] One such design, 'Colonel Smyth's propeller', worked sufficiently well to be tested on an eighty foot steam yacht but many of the designs did not even match the efficiency of the normal propeller, far from improving upon it.[12]

Mumford, however, was a man of broad scientific principles and although using the narrow criterion of improved efficiency the above experiments were failures, they doubtless gave his creative mind the impetus to investigate new applications for the propeller. In 1900, he collaborated with the Spaniard, Vergara, on the design of what appears to be a form of orinthocopter. A sketch of this survives in the Denny collection of the National Maritime Museum, Greenwich.[13] Although this collaboration was short lived, Mumford produced a memorandum in which he expounded his conviction that flight in air was possible without any supporting plane surfaces. To support this theory he conducted an exhaustive series of tests for the thrust and turning force of propellers in water and air. Records of those tests survive in the Denny Tank archive.[14] Mumford's notes record his concern to allow as much air space as possible above the propeller shaft!

The logical conclusion of the tests was to put theory into practice and thus the helicopter was built. Mumford applied for patents on 16 February 1905 for 'improvements in or connected aerodromes or flying machines'. (See Figures 2-4)

> My invention relates to aerodromes or flying machines of the kind which is heavier than air and in which screw propellers are used to raise the machine to, and maintain it to the desired height and to propel it in any desired direction, and has for its object to provide an improved, simple and effective apparatus of the type in which the same propellers are used for suspension and propulsion.[15]

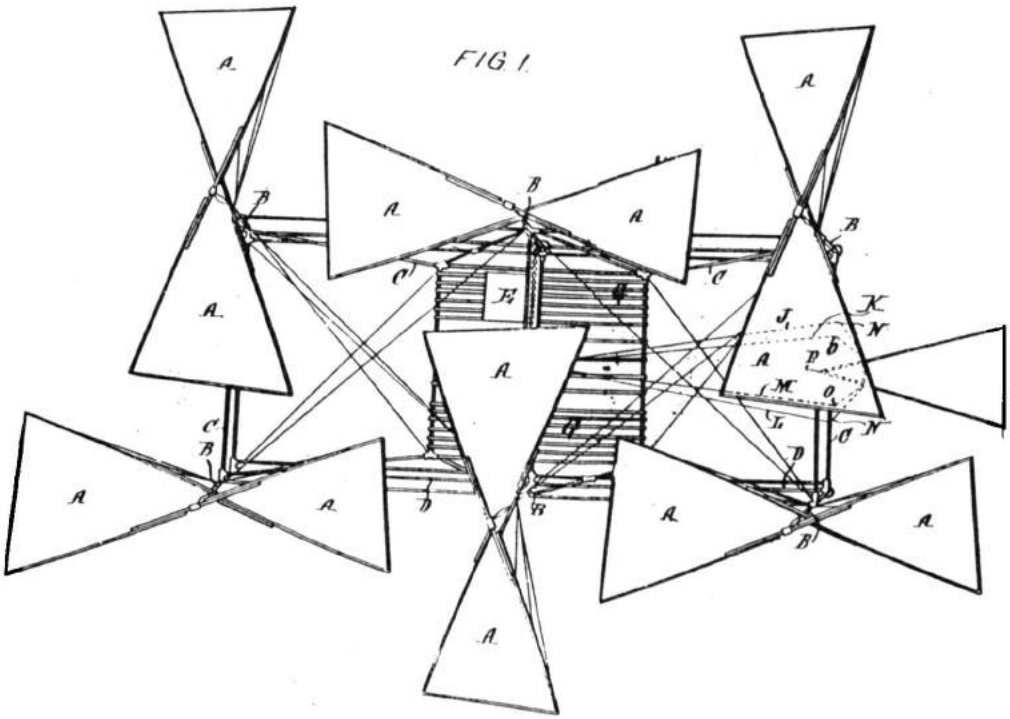


Figure 2 Plan of helicopter. Fig.1. Mumford's Specification, Aug 1905, No.15,698.

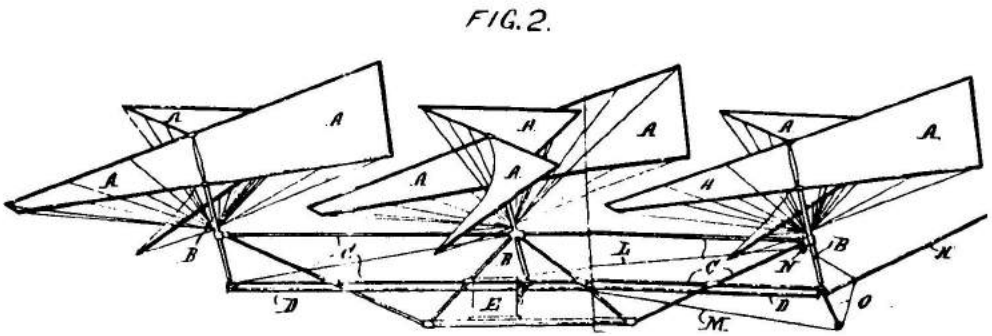


Figure 3 Side Elevation. Fig.2. Mumford's Specification No.15698 Aug 1905.

FIG. 3.

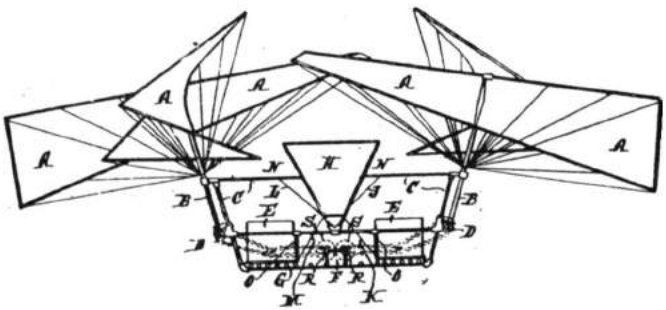


Figure 4 End Elevation. Fig.3. Mumford's Specification No.15,698 Aug 1905.

Despite Mumford's bizarre use of the term 'aerodrome' to describe his invention, this description can easily be related to the helicopter as it is known today. Other parts of the patent specification are more idiosyncratic:

> In order that sufficient stability be maintained, I use at least four and preferably more propellers as it has been found that sufficient area [for lift] cannot be attained with two. There are therefore four or any other convenient multiple of two.[16]

Mumford then embarks on a detailed description of of the complexities of the machine's controls and here he is grappling with a problem similar to that of describing by words alone how to tie a shoe lace to someone who has never seen a shoe! Fortunately Mumford submitted a series of explanatory drawings and they have an elegance and clarity denied to a verbal description. Figures show the drawings which accompanied patent 15,698, a slightly later patent for the same invention, showing clearly the six propellers.[17]

How well did the 'improved flying machine' of 1906 work in practice? There are no known photographs of this 1906 version, designated SO 60, and no contemporary documents other than Mumford's own 1906 notebook and a set of plans surviving in the Denny collection of the National Maritime Museum.[18] This reflects the secrecy of the tests, but forty years later, Sir Maurice Denny (1886-1955), the sponsor of the project, recalled during those tests how a large model was launched from the top of a high building at a variety of angles yet always reached the ground right way up irrespective of whether the propellers were fixed or free to rotate.[19] This was no doubt to the

assurance of J Pollock Brown, Mumford's chief assistant and 'pilot'. Yet for all that those model tests proved its inherent stability, it seems that his early attempts to fly the helicopter were a failure. The machine was designed round an eight cylinder Buchet engine which was said to give 25bhp but did not fulfil its promise. With chauvinism not untypical of the time, William Denny & Bros attributed this to the engine, 'a French production and quite unsatisfactory'.[20] However, a struggle to adapt this engine to the airframe and vice versa ended in failure.[21] Other design shortcomings and misfortunes were equally to blame, not least the bamboo framed propellers which in the damp atmosphere of the west of Scotland absorbed enough water to increase their weight by almost a fifth.[22] This problem was compounded shortly after the first test when a storm blew down the hangar, completely destroying the machine. Once rebuilt, the bamboo framework was found to have become so water logged that the machine was far too heavy for flight of any description, let alone manned flight. Apocryphal though they may be, stories still persist among older Dumbarton people of how the old bamboo framework was put to more productive use supporting tomato plants in Mumford's greenhouse! He was certainly a keen gardener, for many years in charge of the Garden Allotments Section of Dumbarton Social Union.[23]

In 1909, the helicopter was rebuilt yet again, this time with steel rotor rims and a new (British!) engine supplied by the aptly named New Engine Company of Acton. It was finally decided to fit the machine with this company's V4 engine which in a 1911 test developed 41bhp.[24] It was this version of the helicopter which made the celebrated tethered flight in September of the following year. According to Denny it took 'the combined strength of a whole squad of men to prevent the helicopter disappearing'[25] with the unfortunate Pollock Brown wrestling at the controls.

Undaunted by this ordeal, he went on to test the final version fitted with amphibious floats. (See Figure 5) This machine was taxied out on to the Clyde late in 1914 and made a successful 'hop' of about 100 yards at a height of 10 feet.[26] Its appearance resembled some oversized prehistoric dragonfly and with its six 25 feet diameter rotor blades threshing the air, it must surely have astounded those aboard more conventional river craft. That same night it was towed back to the shipyard and destroyed by a gale, never again to be rebuilt.

The outbreak of World War One made more pressing demands on Mumford's time and put a stop to further development of the machine. When Mumford died on 13 February 1926, his concept of the helicopter as a practical means of transport died also. Nevertheless, as late as 1939 William Denny &

Bros proposed to build and present to the Science Museum a replica of the helicopter but the outbreak of another World War put paid to that project.[27]

J Pollock Brown, the unsung hero of the 1912 to 1914 experiments, left Dumbarton to become a distinguished test pilot with a career spanning over forty years. A 1953 obituary in the *Journal of the Royal Aeronautical Society*[28] covers many aspects of his life and work but it is improbable he ever tested a more unusual aircraft than Mumford's helicopter, a pioneering attempt to produce a machine which has now become commonplace and versatile. Mumford's machine also stands as a tribute to the innovative zeal of the firm of William Denny & Bros, whose decision to built the world's first commercial ship tank allowed the creative genius of Mumford to flourish to its best advantage.

NOTES

1. P J Aldridge, 'The development of an early helicopter', *Journal of the Royal Aeronautical Society*, 58 (1954) p.558.
2. Maurice E Denny, Contribution to discussion of paper 1074, C A Oakley, 'Aircraft construction in Scotland, *Transactions of the Institution of Engineers and Shipbuilders in Scotland*, 90 (1947) p. 94.
3. Oakley, p. 76.
4. *Ibid.*
5. *Ibid.*
6. A M Robb, Contribution to discussion of Oakley, p. 76.
7. Mumford obituary notice, *The Rock*, 8 Apr, 1926.
8. See David John Lyon, *The Denny List Part 4* (National Maitime Museum, 1975) Appendix VIII.
9. See Alexander Balmain Bruce, *The Life of William Denny* (Hodder and Stoughton, 2nd ed. 1889) pp. 140-41.
10. Maurice E Denny, 'The Denny Experiment Tank', *Transactions of the Institution of Naval Architects*, 97 (1955) p. 24.
11. *Ibid.*
12. *Ibid.*
13. Lyon, Appendix VIII.
14. Scottish Maritime Museum, Denny Tank Archive, model test record book no. 36.
15. UK Patent no. 3214, accepted 2 Nov 1905.
16. *Ibid.*
17. UK Patent no. 15,698.
18. Lyon, Appendix VIII.
19. Maurice E Denny, contribution to discussion of Oakley, p. 52.
20. William Denny & Bros, *Souvenir Book* (1932) p. 69
21. Aldridge, p. 557.
22. *Ibid.*
23. Obituary notice, *The Rock*, 8, Apr 1926.

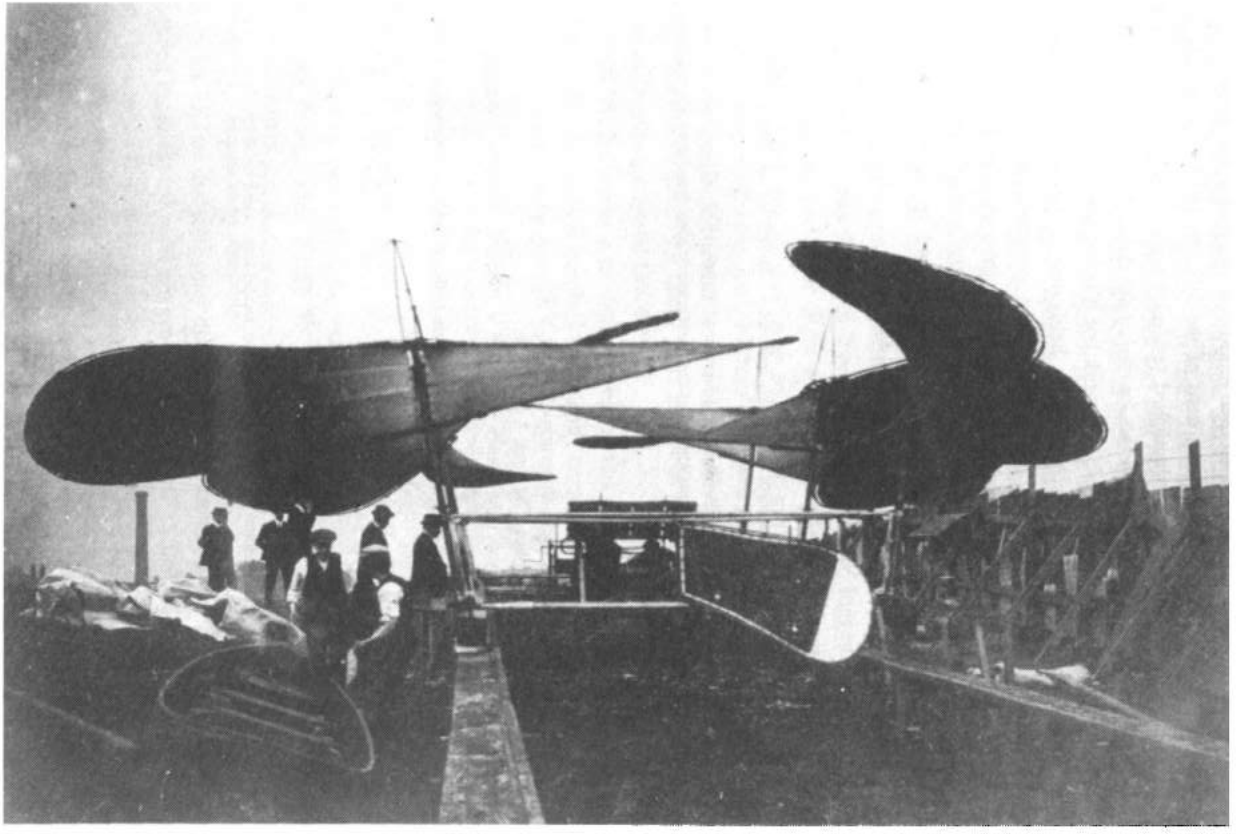


Figure 5 Final 1914 version showing floats. (Reproduction by courtesy of Royal Aeronautical Society)

24. Aldridge, p. 558.
25. William Denny & Bros, *Souvenir Book* (1932) p. 69.
26. Aldridge, p. 559.
27. Lyon, Appendix VIII.
28. Obituary, *Journal of the Royal Aeronautical Society*, 58 (Mar 1953).

The Relocation of South Ayrshire Mining Communities after 1946: A Consequence of Coal Nationalisation?

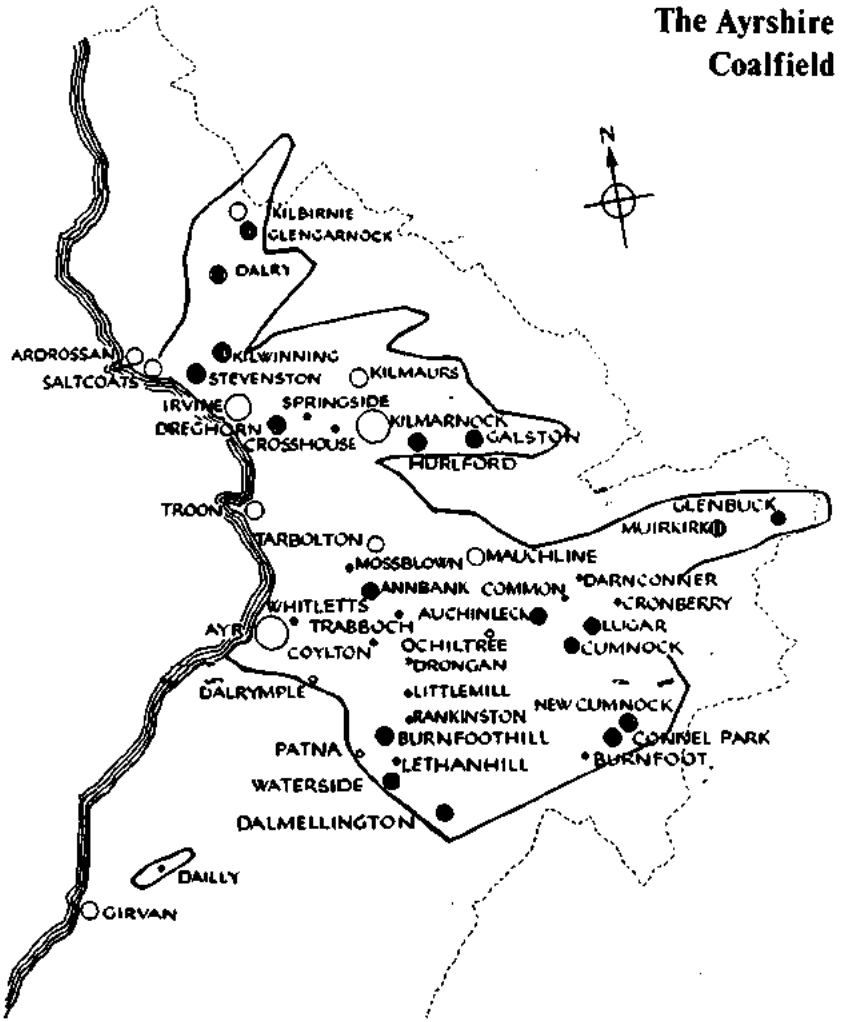
Neil Earnshaw
Johnstone

The first day of January 1946 was an important date in the history of coal mining. That was the vesting date of the Coal Industry Nationalisation Act 1946. The National Coal Board (NCB) not only took over collieries and ancillary stock but also became the responsible owner of colliery housing, much of which had depreciated beyond a habitable condition. Whilst this situation prevailed throughout the United Kingdom, this article will examine the impact of nationalisation on colliery communities in south Ayrshire.

The background to industrial development in south Ayrshire owed much to the county's geological foundation of coal, limestone and ironstone - the essential elements of the industrial revolution - together with an abundant water supply which led to specialisation in lace and carpet manufacture as well as various branches of the textile industry. Most of this textile activity was carried out in central and northern Ayrshire where an extensive colliery industry was virtually exhausted before 1939. Great iron works in both north and south Ayrshire relied heavily on local coal until English iron competition ended Scottish domination in the 1920s.

At the outset labour had to be attracted from outwith the county and housing provided for the work force. Colliery villages, sometimes no more than just a few houses, sprang up in the vicinity of a pit or mine. More often than not these were located in remote areas on a hillside far from existing townships and devoid of water and sanitation. In south Ayrshire two major localities developed, one around Cumnock and the other further south near New Cumnock and Dalmellington. Many small villages would in time be eradicated from the map altogether. These included Benwhat,[1] Burnfoothill, Cairntable, Commondyke, Corby Craigs, Darnconner, Drumsmudden, Glenbuck, Kerse, Lethanhill, Taiglum, Waterside and Woodside. Some were the victims of the clearances of the 1930s when planners, in general, tried to re-house slum clearance tenants in new housing in their own village but did not always succeed especially where pits were 'worked out' and there would be no foreseeable work. Thus the relocation of a colliery workforce might be dependent on a number of factors not the least of which would be economic

The Ayrshire Coalfield



AYRSHIRE IN 1913. SHOWING--

- COASTLINE
- COUNTY BOUNDARY
- AREA OF COALFIELD
- MINING COMMUNITIES
- MAINLY MINING
- OTHER MAIN TOWNS AND VILLAGES

SPECIALLY DRAWN TO ILLUSTRATE FACSIMILE EDITION. J.S.I.M.

SOURCE: Ayrshire Miners Rows,(1913) centre pages, published Ayrshire Archaeoligical and Natural History Society 1979

regeneration. Such relocation begs the question - did new industrial activity necessitate the transference of men and their families from within south Ayrshire or did they come into the county from elsewhere? To what extent did those moved locally acquiesce in the movement?

At nationalisation several large private colliery companies operated in south Ayrshire, most notably New Cumnock Collieries Co Ltd, South Ayrshire Collieries Ltd and Baird & Dalmellington Co Ltd. Of these, the records of Baird & Dalmellington[2] give a deep insight into the transition of colliery workers' housing from private to public control after nationalisation. Yet, in themselves, these records can give no direct indication of the effect on the labour force. Nonetheless, they are worthy of detailed examination. After vesting date nine separate lists were drawn up for all Ayrshire detailing the transference of colliery houses to NCB and giving rise to much discussion regarding the best method of assessing their value to the mutual agreement of NCB, as buyer, and the colliery owners, as sellers.

Methods of assessing the value of transferred colliery housing were discussed on a national basis together with a compensation factor, most notably with H Brian Eve, valuation adviser of Jermyn Street, London, and Sir Geoffrey Cox, solicitor to the Mining Association of Great Britain. The general text of differences between the two was whether it would be more advantageous to dispose of the ancillary plant, including housing, individually, or as one lot with the colliery, and whether valuing houses on a rental basis would give a low value, on a structural basis then high.

Another suggested method was contained in a 'Memorandum on Classification of Houses for Valuation Purposes' dated 25 September 1952. This grouped all houses into two main categories: Modern Houses (with electric light, inside water closet, hot and cold water, etc.) readily saleable on the open market if vacant possession available; and Older Houses (lacking the former's facilities, not satisfying modern sanitary requirements) not so readily marketable. The modern houses were divided into three further categories and the older ones two. All were then sub-divided into a further five categories relative to all groups briefly stipulating specific suggestions appertaining to colliery houses occupied, at vesting date, by officials or workmen under service agreements (when let to colliery workers at their pit) or not, rent free or otherwise, or subject to Rent Restriction Acts or let to a third party. It also took into consideration the location of the housing and the colliery, whether in an isolated district or in an industrial neighbourhood.

Before any specific method was adopted it had been mutually agreed that the Coal Owners' Association would select a major company from each of its four (Scottish) districts and inspections of the housing of these companies by representatives of the individual company, the NCB and the valuers would help formulate a standard (Scottish) policy. Baird & Dalmellington Co Ltd were chosen for the Ayr Division. That this was decided upon was due to the success of settlements of valuations of lands and farms through tripartite meetings of claimants, NCB and District Valuation Board. It was anticipated that the same procedures would be adopted for housing. However, before agreeing to this, representatives acting on behalf of the companies within the four districts, held a private meeting to discuss the matter, the memorandum detailed in the previous paragraph being high on the agenda. The Coal Owners' secretary, Robert Baird, was present with two legal representatives. Such was the importance with which that organisation viewed the transference of company-owned housing. Baird & Dalmellington Co Ltd had three company representatives there together with a valuer and a legal adviser. The other companies were also well represented. Each district submitted examples of the method of assessment adopted on houses erected in the 1920s, Fife and Ayrshire adopting a similar method which resulted in a valuation considerably less than the high market values pertaining at vesting date. Because of the remoteness of collieries in these two counties, most miners' houses could only be let to pit workers at their pit and would have little or no value if the colliery were worked out, regardless of the structural condition of the housing. Hence the low valuation uniformly assessed. Elsewhere, whilst some miners' rows fell into this category many did not and the houses could be re-let to private individuals not connected with mining - thus resulting in a higher valuation being placed upon them. Further meetings followed.

By 1 May 1953 the Coal Owners' Association had produced a fifteen page document entitled 'Valuation in Association', the crucial aspect of the circular being that colliery housing should be valued along with the colliery that owned it together with ancillary stock such as outbuildings, plant, equipment and land. A counter argument was that housing should be a separate entity. There were valid arguments for both views. Finally it was agreed that five separate scales of assessment were to be considered.

A detailed case study of the action taken on former Baird & Dalmellington housing may serve to illustrate the point. At nationalisation that company owned a total of 2,385 houses, of which almost one third had been built prior to 1880 although their value was only five per cent of the total. Of these 2,835

houses, 1,022 were in the Lugar area, 746 of which were two-apartment located as follows:- Lugar 159; Cronberry 18; Commondyke 4; Skares 105; Auchinleck 208; Glenbuck 27; Muirkirk 225. There were also fifty-one single apartment houses: Lugar 13; Commondyke 36; Glenbuck 1; Muirkirk 1, and several large managers' houses of five-apartment and above. There were some four-apartment and eighty-one three-apartment: Lugar 16; Auchinleck 14; Cronberry 51.

The NCB lists also showed considerable Baird & Dalmellington housing outwith the Lugar area. For example, the First Schedule instanced 863 miners' houses and twenty-seven single properties in the Dalmellington district of which 227 were at Lethanhill, 169 at Waterside and 106 at Bequhat. The remainder were located at Craigmark, Dalmellington, Pennyvenie, Littlemill, Patna and Coylton. The single properties included 'Ardoon' mansion at Waterside, the Miners' Institutes at Lethanhill and Benquhat, the village hall at Craigmark, as well as provision stores and provision houses in each of the three villages, Lethanhill, Benquhat and Craigmark. Another list includes 272 houses in the vicinity of Annbank and 211 at Prestwick. The Annbank houses comprised 36 at Drumley, 179 at Mossblown and 57 in Annbank, whilst those at Prestwick detailed 184 at Newdykes and twenty-seven in Glenburn Road.

The foregoing Annbank and Prestwick houses were together valued at £2370 15s at November 1945. Included in the list under company offices were Glenburn House, Prestwick; Ayr Harbour Office; and Eglinton Iron Works Office, Kilwinning. There were also licensed premises at Kilwinning and a bakery and stores there too. All the property was at least thirty years old, most probably much older. The date of purchase by Baird & Dalmellington Co Ltd was not necessarily the date of erection as property might have been transferred to the company when existing collieries were bought. The earlier custom of houses being demolished on change of ownership or the transference of a colliery lease was not always rigorously followed.

Between 1950 and 1953 inspections were carried out on Baird & Dalmellington property to assist in the standardisation of valuations. These inspections served also to highlight the number of sub-standard miners' rows still inhabited, as well as indicating the improvements made. All meetings and inspections comprised representatives of Baird & Dalmellington Co Ltd, NCB and the valuers. Generally, only one house of each apartment size was measured in each row or site. This included an internal examination, the extent of feu and special features such as garden, fencing or trees. Cursory as this

may at first appear, it was not as bad as similar inspections in England which purported to having been made 'from a moving car'.[3]

Of the improvements made since vesting date it was noted that many of the three-apartment houses and large officials' houses had had old ranges replaced with 'Rayburn' cookers, some at the tenant's own expense. Likewise some of the houses had had water closets fitted in a box room or former maid's room at the tenant's expense. In Highhouse Rows, Auchinleck, where most of the eighty-eight two-and three-apartment houses were without an inside water supply, the four apartment houses had bathrooms. A number of houses had had electricity installed since vesting date. These included 114 at New Dykes, Glenburn; 28 at Cronberry; 19 at Sanquhar; and 62 at Kirkconnell. Many, but not all, tenants carried this out. Moreover, extensive improvements were being carried out at the community wash-house and public baths at Glenburn at the time of the inspections.

An example of the value of demolished properties was given in a letter from NCB to Baird & Dalmellington dated 16 August 1952. Between August 1950 and May 1952, 220 houses were demolished at Benquhat, thirty-five at Lethanhill and a further eighteen at Drumsmudden, Corby Craigs, Sinclairston and Coylton. Not all the houses had been owned by Baird & Dalmellington but all were part of a composite demolition contract. The total assessed value of these houses was just under £826 apportioned on an annual basis and rising considerably in 1952 due to an increasing shortage of building materials. Further demolitions were carried out at Muirkirk and at Cronberry. Houses demolished at Commondyke were considered to have no value at all.

At the same time as the NCB was carrying out its valuation policy on miners' housing, Ayr County Council was also turning its attention to the adverse sanitary conditions still prevailing in many houses throughout the county. In a special report issued in February 1953, entitled 'The Ayrshire Coalfield and Housing',[4] the county planning officer A M Rosie stated:

> ... a settlement pattern has emerged which is generally incapable of reaching maturity. Pungent examples of this are Polnessan, Burnfoothill, Lethanhill, Benquhat, Dalleagles, Burnfoot Row and etc. Largely recognised by the County Council of Ayr in that their housing programme proposals virtually eliminate many of these obsolete and remote settlements ...

To the above ought to be added Waterside, Corby Craigs, Clawfin, Cronberry, Skares, Cairntable and Woodside. But many miners' rows in more accessible places were gradually scheduled for demolition. In some instances this was a

continuing process of a pre-war policy revitalised after 1945, in others a later programme of clearance on housing in relatively better condition pre 1939 but having deteriorated considerably twenty years on.[5]

Local authorities' concern and contribution developed from new government legislation much of it attributable to town and country planning and subsequent related development plans at county level. This resulted in Ayr County Council drawing up proposed plans which would have to be submitted to various bodies for approval before being implemented. These plans demonstrated the concern shown by the Council at the deterioration into which much of the older housing had fallen. Of the existing housing stock in 1953, two classifications were formed: third class housing - structurally unsound, inadequate sanitation and beyond economic repair; and second class housing - structurally sound, adequate sanitation, economically repairable but falling short of modern internal layout and site planning.[6] *The Housing (Scotland) Act 1950* authorised grants subsidising local authority repair bills on second class housing preventing it falling into the third class category, thereby releasing local authority finance for new house building. It was, generally, recognised that a high proportion of the County's sub-standard housing was located in the industrial or working-class settlements, the small burghs and the landward area, although industrial coastal towns such as Ardrossan and Stevenston, in north Ayrshire, had high proportions as well.

Landward area statistics relevant to south Ayrshire settlements show that Muirkirk had by far the greatest proportion of its houses classified as third class: 587 of its 1,002 houses, 58.5% fell into this category. Auchinleck had 39.1% of its 1,265 houses so classified and New Cumnock 31.8% out of 1,603. By contrast in north Ayrshire, Beith had 49.1% of its 1,384 houses in the third class category, Dalry had 45% of 1,515 and Kilbirnie/Glengarnock 36.2% of 2,579.[7] This high incidence of third class housing in north Ayrshire may have been because these towns had not previously been cleared significantly as much of their housing was erected post 1900 and deteriorating, whereas mining communities were cleared, *in toto*, of nineteenth century housing and replaced with phased housing schemes, pre 1939, resulting in their having a higher percentage of new housing. In south Ayrshire, Drongan had only three (or 0.07%) of its 394 houses categorised third class - an indication that the old mining village had been cleared. Although the new township of Drongan never reached the incredible number of houses originally mooted by the planners it did assume an appearance far removed in size from the small mining community of Taiglum of former years.

The immediate post-war period was one of concentration on new housing as a necessity. The shortage of traditional house building materials forced the authorities into utilising new constructional materials and methods. Between 1945 and 1951, 1,715 such houses were erected throughout Ayrshire although over 5,000 permanent local authority houses were built in that time, the inference being that the prefabricated homes were erected in the immediate aftermath of the war and the normal standard scheme housing followed. Moreover, the statistical evidence indicates the number of houses built by the Scottish Special Housing Association (SSHA), a non-profit making government-funded body set up in 1937 to build houses in the designated Special Areas. Its contribution was of particular significance to the colliery communities of south Ayrshire as between 1945 and 1953 it erected the following number of houses in the landward area there:- Auchinleck 20; Crosshouse 2; Cumnock 568; Dalmellington 212; Drongan 108; Lugar 142; New Cumnock 280; New Dailly 22; Patna 226; Rankinston 8.[8]

The location of much of this post-war housing was influenced by the changing face of the Ayrshire coalfield. Of thirty-three Ayrshire pits closed between 1945 and 1965 only five were privately owned, the others having been nationalised at vesting date. Significant closures in south Ayrshire were Shieldmains (1955), Polquhairn (1958), Hindsward Nos. 3 and 4 (1958) Chalmerston (1960) and Bank (1962).[9] Douglas Colliery in south Lanarkshire but in the East Ayr area, closed in 1959 with a loss of 348 jobs.[10] Some of these men were absorbed into the new Killoch Colliery at Ochiltree which had 3,500 vacancies when it opened in 1958,[11] thus explaining the large population movement into that area. There were further plans for the transfer of men from Kilwinning, Hurlford and Annbank areas, in the north and central districts, to Killoch.[12]

Thus housing planners recognised the need to integrate the policies of the NCB with their own. 'Spheres of residence' were drawn up indicating the existing location of mine workers to a given group of pits and it was then assessed which existing or new locations would be most suitable for centralising colliery populations moving to new coalmines at the end of the estimated life of existing pits.[13] Such policies created by planners hastened the demise of the old colliery villages. For instance it was reckoned that a new town at Drongan would have to be developed as a central location for Killoch Colliery. It was anticipated that 1,390 houses would be required there for a total population of 4,865 (3.5 of a family per miner). Allowance was made in the total for an estimated 400 miners and their families transferred into the

county from outwith Ayrshire. Similar assessments indicated a movement of 130 miners to Mauchline and Catrine, 105 to Patna and 250 to Dalmellington together with their families. In NCB's east area it was anticipated, in 1953, that 1,100 men would change their place of work by 1972. Consequently 1,660 new houses were planned (for 5,810 people) nearly all of which would be in Cumnock which would expand considerably to take in population from a wide area as well as miners transferred in. The Cumnock development would embrace spheres of residence such as Skares, Lugar, Cronberry, Gasswater and Commondyke resulting in the demise of these villages as no new houses would built to replace the demolished rows. Because of the extremely limited suitability of house building sites at New Cumnock, due to possible subsidence, any new houses would only be allocated to people already living there. Miners and their families who moved to New Cumnock pits from other parts of Ayrshire or transferred in from elsewhere would be housed at Cumnock. It was also planned that miners similarly transferred to Muirkirk would be housed at Cumnock.

Most of the house building went ahead as planned. Statistical evidence showed the major contribution made by SSHA in new housing for colliery workers and their families. Mere statistics, however, often draw a veil over multifarious difficulties not readily resolved. SSHA houses had higher rents than these erected by the local authority and were also recognised as inferior. Consequently on occasion they were difficult to let.[14] The new Bellsbank housing scheme on the outskirts of Dalmellington was one such estate where, in 1958, houses were not in demand. Similarly, in Muirkirk, 3-storey flats lay empty because of the miners' aversion to heights. By the mid 1960s the drift of workers from coalmining areas due to pit closures resulted in many houses lying empty in Patna, Dalmellington, New Cumnock, Muirkirk and waiting lists were practically non-existent at Auchinleck and Ayr.[15] By this time the traditional small colliery communities had nearly all been cleared and their inhabitants moved to conglomerate housing centres often located on the periphery of town boundaries and officially recognised as being devoid of the social amenities so necessary for community living and which existed in the old villages before clearance and still did in towns. In that respect Patna, which had been but a village in the early 1930s but had grown to a population of 2,000 twenty years later, had greater amenities than Dalmellington five miles up the Doon valley.[16] This may have been influenced, to some extent, by the influx of inhabitants from the thriving hillside communities of Waterside, Burnfoothill and Lethanhill where many social activities were indulged in by

the community. Pennyvenie and, in particular, Benquhat also had communities with social interests but not having such large populations as the Waterside group their impact on Dalmellington may not have been so great. Whilst the demand for housing in the Muirkirk and Doon Valley areas had fallen in the 1960s, this was not so in other parts of the county, particularly where industrial upturn was in evidence. Before 1939 local authority policies predetermined criterion that tenants had to have the ability to pay rents before housing was granted. After 1945 movement was almost compulsory but some housing was refused and there was no guarantee that tenants accepting a new house in a re-located area, would stay especially after the pits closed.

Whilst the vast majority of people living in miners' rows and similar old housing welcomed the opportunity to live in better houses, it would be a mistake to think that everyone did. Most of the reasons were linked with nostalgic memory of neighbours, friends and loved ones but others included, the reluctance to quit a healthy hillside area; trepidation of new locations bereft of tradition; or just a natural aversion to compulsion. There were others most notably involving whole communities such as at Glenbuck and Waterside. So intense was the feeling among the inhabitants of these two villages that their indignation drove them to lodge official protests at what they considered to be unjustified treatment in decisions totally against the wishes of the populace.

Protest was made in several ways, the favoured method being by formal communication to the district clerk requesting that a deputation be received by the committee convened for housing matters. Sometimes the executive of the district committee received the representatives. On other occasions, such as in the case of Glenbuck, the protest proceeded beyond the local authority. All deputations carried written mandates from various bodies and communities authorising their action and endorsed with supportive signatures which often included parish councillors, churchmen and even parliamentary members. For the most part they met with little success.

The protests concerning Waterside and Glenbuck were extremely important not only to the villagers but to the very concept of the continuation of community life in large compact working class village settlements. The success of the protests would ensure the continued existence of these villages, even townships, although there would never again be foreseeable work in the vicinity. Their failure would mean that the people's tenuous hold on a fragile existence was destined to break down quickly. The communities would be scattered indiscriminately throughout their valleys.

The villagers' protests together with the support of Ayr County Council having failed to convince the Scottish Board of Health (the government body responsible for housing in Scotland) of the desirability of the continuation of a village at Waterside, the Earl of Glasgow (Lord Kelburne) who had unsuccessfully championed the cause of Fergushill and Barkip residents on the north Ayrshire Council of which he was a member for Largs, took the cases of Glenbuck and Waterside to the House of Lords in a last ditch effort for reprieve. His main point was that the inhabitants of neither village wished to go elsewhere and he fully rejected the view of the government that it was uneconomical to continue to provide such services as water and drainage to these districts. Glenbuck residents would be moved to Muirkirk four miles westwards, where most of the men worked. However, some worked at Douglas several miles to the east. Moves to Muirkirk would take them further away from their work. Many of the men living at Waterside were employed there in engine repair sheds. Removal to Patna and Dalmellington would mean early morning starts for them to get to work on time. The main stumbling block to the earl's appeal was the government minister, Lord Morrison, who totally rejected any suggestion that miners' villages could, in any way, be classed as rural. Government policy of the day was to integrate as many industrial craftsmen in one place for the combined use of their services. Rural agriculture was not part of this plan. The Earl of Glasgow bitterly opposed Lord Morrison's view, feeling that the workpeople had been betrayed. He cited the strong support of Ayr County Council for the people of Waterside, in particular, in private conversation and action, but publicly declaring their support of the government line with reluctance.

Similar attempts by the earl to forestall plans to build a 40,000 population new town at Drongan, in favour of resisting the further clearance of small mining communities and isolated rows again failed to get an agreeable response, in spite of the views of many miners that houses in the new township would be considerably further distant from their workplace than were their present homes. There was the added outcome to the Scottish Board of Health's action in erecting this new town that much good dairy land would be used up. Ayr County Council's plans for a smaller development were overruled at that time, although the final outcome would greatly reduce the numbers envisaged in the government's proposals.[17]

Historians concerned with the political and socio-economic analysis of government may have an acceptable explanation for these actions. In the long term government may, arguably, have been proved correct. But the inhabitants

of Waterside and Glenbuck did not think so at the time. Neither did those at Lethanhill, close by Waterside, whose inhabitants were moved out to the Bellsbank housing complex at Dalmellington and the Carskeoch scheme at Patna in the 1950s.[18] Most were reluctant to move for they knew they would miss the kindred companionship of their hillside neighbours. Even though many of them would move together the new style housing would eliminate their doorstep conversations.

It was an unusual situation. Working class inhabitants desirous of remaining in long established village locations were thwarted in their efforts to do so by a working class government adamant that the people should be re-housed in entirely new locations. It would appear that these new post-war housing locales were established to break up any form of a balanced population outlook of differing political, moral and ethical viewpoints that might develop in village life from a mixture of farmers, miners, textile workers and teachers living therein. Lord Morrison and Lord Kelburne, at different ends of the political spectrum, recognised this viewpoint, the former advocating the need for new schemes to draw together a higher percentage of the colliery workforce than previously, the latter persisting with the ideals of village life. Bellsbank was an example of the type of community that the government wanted and to which Lord Kelburne was opposed. In spite of the government view the people of the Doon valley did not wish to move there. However, the inhabitants of Waterside and of Glenbuck were forced to move out of their villages much against their will.

It is more than apparent, from all the foregoing, that the NCB played a pivotal role in the relocation of the industrial workforce at their collieries. After nationalisation, NCB became the sole owner of much existing colliery housing which, formerly, had been company-owned. Together with Ayr County Council, the NCB formulated a joint 'spheres of residence' policy to locate new housing near areas of future coal production.

That new housing was required was not in doubt. Rehousing had been an ongoing policy since 1919[19] when extensive repairs were feasible and were carried out by company and private owners often under legislation which granted local or government funding. Such policies were suspended during the six year interval of the 1939 to 1945 war when much deterioration and decay in the housing fabric resulted. Thereafter re-location centred not on traditional colliery sites but in new locations. The fact that there was by this time only one owner of all the collieries facilitated this transition. Co-operation with the County Council enabled a 'spheres of residence' policy to be drawn up

concomitant with the changing face of the coalfield. Old company-owned housing was demolished and not replaced resulting in the demise of many village mining communities.

However, in south Ayrshire after 1946 re-location was as much influenced by government policy in bringing miners together from these scattered communities into conglomerate housing schemes as it was by joint NCB and local authority policies in rehousing colliery workers near to new and remaining pits. Any division of argument is so narrow as to make it impossible to arrive at a definite conclusion as to whether re-location was a consequence of nationalisation. Suffice it to state that the County Council in locating its conglomerate housing schemes in new centralised localities away from traditional village sites, after nationalisation, reflected the ideological policies of the government at that time.

NOTES

1. Hereafter Benquhat. Both versions appear in official documents.
2. University of Glasgow, Business Records Centre, UGD164/3/4/2/17.
3. A Ravetz, *The Government of Space* (1986) p.75.
4. Strathclyde Regional Archives (SRA), Ayr, CO 3/17/4/1/4.
5. *Ayr County Council Development Plan 1953*, Vol.1, Chapter 13, pp.20-1.
6. *Ibid.*, p.(iii).
7. *Ibid.*, p.21, Table 125.
8. *Ibid.*, pp.5-7.
9. Craigie College Library, Ayr, *Ayrshire Sound Archive Pack*.
10. *Hansard*, Vol.605, May 1959, col.144 (Emrys Hughes MP).
11. *Ayrshire Post*, 6 Jun 1958, p.17 (1).
12. *Ayr County Council Development Plan 1953*, Vol.1.
13. SRA, Ayr, CO 3/17/4/1/4.
14. SRA, Ayr, CO 3/18/1/19 (Annual Report of Chief Sanitary Officer) 1959, p.48.
15. *Ibid.*, 1964, p.18; 1966, p.16.
16. *Ayr County Council Development Plan 1953*, Vol.1, Chapter 12, p.17, para (iv), group No.11.
17. *Parliamentary Papers: House of Lords Vol. 145, 1946-47*, col.403-21 (Housing Schemes) and SRA, Ayr, CO 3/8/2/42 (*Ayr County Council: Housing*) 1 Apr 1947, p.3.
18. SRA, Ayr, CO 3/8/1/1-18 (*Annual Report of Chief Sanitary Officer*) 1947, p.44 and *Ayrshire Sound Archives No 235*, testimony of Mr and Mrs Whalen of Bellsbank who lived at Lethanhill 1943-50.
19. Parliamentary Papers: CMND 8731 (1917) *Report of the Royal Commission on the Housing of the Industrial Population of Scotland, Rural and Urban*.

The Beginning of the Pottery Industry in Greenock

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The earliest history of the pottery industry in Greenock involves three families: the Stevensons, the Muirs and the Kers. The Stevensons' part in this history is taken by three people: James Stevenson and his two sons, James, Junior, and Robert. A claim has been made for a Staffordshire origin for James Stevenson[1] but this is contradicted by the 1841 Census which gives him an origin in Scotland, though not in Renfrewshire. The most likely candidate would seem to be the James Stevenson born on 29 January 1772 in Prestonpans to James Stevenson, 'gardner', and Janet Dalglish. He had a younger brother, Robert, which was the name given to James' second son; he also had an elder sister, Margaret, who was of the right age to have married Andrew Crawford, salter, who, in 1795, had a son, Thomas Crawford, who will figure several times in the history of pottery in Greenock and Glasgow. The relationship of uncle and nephew would explain Thomas Crawford's presence in Greenock and his lending James Stevenson large sums of money. Whatever is the truth, James seems to have been a trained potter though, in 1809, which is the earliest known date for his appearance in Greenock, he was carrying on a business in William Street as a china merchant in partnership with James and Andrew Muir.[2] He was living at 73 Crawfordsdyke, just outside Greenock.[3]

James and Andrew Muir were two brothers with a multiplicity of interests. Another china retail outlet, this time in Paisley, was run by a third partner, John McIntyre, but the brothers were also ship owners and merchants with businesses in St Thomas's and St Domingo for the sugar trade and in Miramichi for timber. They were manufacturers of cordage and sail-cloth and straw hat makers as well as haberdashers and silk mercers also run from William Street. They were also partners in the New Clyde Shipping Co, a Glasgow company.[4] Both brothers were married: James with a family of two sons, James and Andrew, and five daughters; Andrew with no children at that time. The two families lived together in a house called Rosebank in Forsyth Street, Greenock.

Alan Ker was also a prosperous merchant with a wide range of interests, including a partnership along with the Muirs in the business in Miramichi and a partnership in the Clyde Flint Glass Co.[5] He lived in Blackhall Street, Greenock, and he and his young son, Alan, Junior, who was bed-ridden throughout his life, played an important, if passive, part in the history of

pottery-making in Greenock. David Ker, presumably a member of the same family, was also involved for a brief period in the manufacture of pottery in Greenock.

A series of letters from James Stevenson to Josiah Wedgwood dated 1809 and 1815,[6] show that the shop in William Street was selling the best quality of wares, especially creamware. In 1814, 20 per cent of Minton's trade with Scotland went to James Stevenson in Greenock.[7] Undoubtedly some of these luxury goods would be sold to the increasingly prosperous merchants of Greenock and the local gentry, but most of them would go for export in the Greenock ships which went out to the Americas and elsewhere in such great numbers.

This traffic gave enterprising merchants an opportunity to get into the trade as manufacturers, not perhaps starting at as high a quality as Wedgwood or Minton, but a little way downmarket. In 1815 James Stevenson, James Muir (without Andrew), and Alan Ker (on behalf of his son Alan, Junior, who was still a minor) formed a partnership as the Clyde Pottery Co and bought land from Sir Michael Shaw Stewart of Blackhall and Greenock.[8] The land was on the main road from Greenock to Port Glasgow, stretching north to the River Clyde, and on it they built a pottery for the manufacture of whiteware, for both the home and export markets.

James Stevenson was the managing partner in the Pottery and as the other two had no knowledge of pottery manufacture, their involvement was probably mainly financial. The extent of James Stevenson's financial involvement in the business is not known since no partnership contracts are known to have survived but in view of his subsequent involvement it must have been fairly large. James Muir's involvement was probably only financial, as the Pottery would have been quite a small item in the totality of his business interests. Why his brother, Andrew, took no part in this venture is a mystery since in all their other businesses they worked together.

On 11 October 1816 the following advertisement appeared in the *Greenock Advertiser* and other local newspapers:

> THE CLYDE POTTERY COMPANY
>
> INTIMATE to Shippers and Dealers, that their WORK is now in full operation. They are manufacturing Cream-coloured, Fancy-coloured, Edged, Painted, and Printed EARTHENWARE, of a Quality which they can with confidence recommend.

Orders addressed to the Company, Greenock, shall be gratefully received and punctually executed.

Clyde Pottery, 11th October, 1816.[9]

The Pottery that the three partners had built was considerable with four working kilns and housing for the workers.[10] The latter must have been imported into Greenock, either from England or from other parts of central Scotland. The Census shows that as late as 1851 just under 23 per cent of the pottery workers in Greenock and Port Glasgow came from England, with an equal number from Ireland and other parts of Scotland; just over 31 per cent were native to Greenock and Port Glasgow. One at least, Thomas Crawford, James Stevenson's nephew, we know from later evidence came from Prestonpans.[11]

Very little is known of the wares of this period apart from the description in the advertisement quoted above. Most creamware of this period was not marked by the makers since it was hoped that it would be mistaken for the products of the Leeds Pottery or Josiah Wedgwood. One marked piece from the Clyde Pottery, however, does exist in the collection of the National Museums of Scotland. It is a pearlware wall plaque, moulded with four nude or semi-nude mythological figures in a landscape. It is decorated in underglaze colours in yellow, brown, green and blue and inscribed on the front 'D. & M. McNAB' in black. It has two holes for hanging. On the back is inscribed 'Greenock Pottery 1818'. (See Figures 1 and 2) The quality of this piece, the only marked piece of Scottish prattware known, shows that if it could not equal the quality of Minton, the Clyde Pottery was at least producing wares that could vie with those of any other Scottish pottery of the period.

In about 1819, though the exact year is not known, James Stevenson, Junior, and David Ker formed another partnership and founded the Ladyburn Pottery.[12] Again James Stevenson, Senior, was engaged as manager but this time he was not a partner. In every respect this Pottery contrasted with the Clyde Pottery, which is useful since both are, at various times, referred to as 'the Greenock Pottery'. It was also located on the main road between Greenock and Port Glasgow, west of the Clyde Pottery, but its area was much smaller. There were only one large and one small kiln and the products were to be utilitarian brownware, teapots, dairy ware and similar goods.

The Regulations of the Potters' Society Ladyburn have been preserved and give an insight into several aspects of the Pottery's life.[13] The benefits were very much the same as other friendly societies. Members who were sick were

Figure 1 Clyde Pottery pearlware wall plaque: front showing mythological figures. (Reproduced with permission of National Museums of Scotland.)

to receive 5s a week if bedridden and 4s if able to walk. This reduced to half after six months. Funeral expenses paid were 10s for a child under twelve, 20s for a wife and £2 for a member to his widow or heir. The entrance fee was 5s and thereafter members paid 1s 6d per quarter. The list of potters who signed this document is given in Appendix I.

James Stevenson, Senior, after 1819 was in charge of three businesses: the retail outlet in William Street, the Clyde Pottery Co and the Ladyburn Pottery. In two of these he was a partner and he must have been deliberately increasing his capital. He almost certainly employed a manager for the retail outlet. The Muir Brothers kept the books, since James Stevenson seems to have been temperamentally incapable of book-keeping. The Muir Brothers, meantime, were withdrawing from the partnership in the retail outlet in Paisley and buying more property in William Street.[14]

In 1823 the three partners in Clyde Pottery Co feued more land from Sir Michael Shaw Stewart, this time on the hills high above the Pottery on the banks of a burn on Strone Farm. On this land they proceeded to build a water

mill for the grinding of flint which was used greatly in the body of their wares.[15]

For the first eight years of business all would seem to have been well with the Clyde Pottery Co but on 23 December 1824 the partners were forced to

Figure 2 Clyde Pottery pearlware wall plaque: back showing mark.
(Reproduced with permission of National Museums of Scotland.)

borrow £2,000 from the Renfrewshire Banking Co. Alan Ker, Senior, was surety for the repayment which was to be made on Whitsunday 1826 with £400 'in addition'. The repayment was not made and the debt remained for a further ten years with interest at 4 per cent per annum.[16]

These were, indeed, bad years for trade and in 1829 the Ladyburn Pottery was closed down and offered for sale in the following year;[17] there was no interest in the Pottery and it remained unused for some time. In 1831, however, James Stevenson, Senior, bought David Ker's half of the Ladyburn Pottery and in the following year his son's half, spending altogether £300.[18] He then proceeded to spend more than £900 in converting it into a pottery capable of making whiteware but did not put it into production. James Stevenson, Junior, had, meanwhile, moved to Belfast where he seems to have run another retail establishment. He died there on 15 July 1833.

Alan Ker, Junior, died on 16 October 1833[19] and the Clyde Pottery was advertised for sale in 1834[20] but no one was interested in a pottery with a debt of £2,000. In December of the same year James Muir died. An inventory was made of his estate and his stake in the Clyde Pottery was just £10, although his

initial outlay must have been many times this amount. The simplest explanation for this seems to be that James Stevenson, whose share at this time was given as £1,400, had been buying out the other partners in an attempt to control both Greenock potteries and run them in tandem.

James Muir's will[21] stipulated that all his business interests were to be sold off over a space of five years, so as not to lower their market price, and meantime his two sons were to be trained in business methods and practices. Andrew Muir, the deceased's brother, was a trustee on the committee of executors carrying out the provisions of the will, as was James Muir, Junior, the eldest son of the deceased.

The straw hat business was dissolved and merged with that of a similar Glasgow firm to become Muirs, Connal & Co which subsequently became a very large enterprise with premises in Glasgow, Greenock and Luton, Bedfordshire. James Muir, Junior, was made a partner in this business[22] and played no part in the subsequent history of the pottery trade in Greenock.

In February 1836 the Clyde Pottery Co was dissolved and reformed.[23] Andrew Muir, Senior, paid off the £2,000 debt, bought out James Stevenson and, presumably, Alan Ker. He and his nephew, Andrew Muir, assumed full control of the Clyde Pottery. In the rearrangement the Muirs also withdrew from James Stevenson & Co, the retail shop in William Street, and opened their own china shop there.

Andrew Muir, Senior, was best known in his family for his absent-mindedness which was of legendary proportions. Under pressure of losing so many, he took to using a red umbrella which was known by its colour all over Greenock and was returned to Rosebank wherever it was found. He once walked up the aisle in church on a Sunday with the umbrella over his head. He was known to walk backwards sometimes when he was lost in thought.

James Stevenson now activated the Ladyburn Pottery, which was therefore in direct competition with the Clyde Pottery, making the new improved white earthenware. No pieces have ever been found bearing a possible mark of the Ladyburn Pottery at this or any other period of its existence.

Some of the wares of Clyde Pottery of the period between 1836 and 1841 are well known, namely the printed earthenwares. The marks on the back of these vary with the pattern printed but always contain the initials 'AM' for Andrew Muir. Only two patterns have been identified with any certainty. One, 'Caledonian', is extremely rare but has been found in the USA as well as in Scotland. It shows the usual lacustrine landscape of the period with horsemen in the foreground and boats on the lake. There is a stylised border with leaves

and flowers. It is recorded only on dinner plates and soup plates. The other known pattern is quite common in this and some ensuing periods, though the pieces made in this period are superior to those made subsequently. It is called 'British Rivers' and is a changing pattern. This means that the border is invariable from piece to piece but that the central scene changes with the shape of the piece. Large ashets will have a different scene from small ashets or dinner plates. The border is floral with areas of stippled and plain background alternating. This is edged with short rods, each surrounded with eight rosettes, curiously reminiscent of a culture of bacteria seen in magnification. The central scenes vary enormously, though most show a river and a castle. The commonest, however, on dinner plates, shows a man, a woman and a young girl facing towards the viewer. The man carries a fishing rod. Behind are a tree and bushes on the bank of a river which has a wooden bridge across it and fantastic houses on the far bank. This pattern is known in both brown and blue and has been found on a wide variety of dinnerware pieces in surprising quantity for a pattern produced, as the marks indicate, for only five years. This quantity is capable of a different interpretation as will be discussed later. It is also known in a copy by Methven's of Kirkcaldy.

There is one other piece of information available on the wares of this period, though it is rather enigmatic. In a letter of 1840, Andrew Muir, Junior, wrote to his sister, Jane, mentioning his own latest project: a 'Neapolitan set' which he had ambitious plans to market in Edinburgh. From Jane's reply, warning him not to go 'too far out of the beaten track for personal safety', it is obvious that this was something new in design. Whatever it was, we have no knowledge of it at the moment.

On Saturday, 21 November 1835, after a period of extremely heavy rainfall, Beath's dam on the Crawfordsdyke Burn burst and an immense body of water came pouring down the hill, carrying trees and shrubs which it had torn out of its banks. It damaged the flint mill and killed a large number of people in Cartsdyke. The north-east side of the mill was the worst damaged, the casing of the water wheel having been torn away and the entire body of the wall threatened.[24]

In 1837 the Clyde Pottery won a premium of £30 from the Board of Trustees for the Fisheries, Manufactures and Improvements in Edinburgh.[25] In the same year £1,000 was borrowed from John Weir, a resident of Crosshill, using the flint mill as security.[26] These were poor years for the pottery trade and James Stevenson, in direct competition with Andrew Muir in both manufacture and retail, did not have the capital to survive. In February 1840 he

sold his retail business to James Marshall, a Glasgow china merchant, for £370. In the same month he had borrowed £300 from the feudal superiors of the Pottery site, four Glasgow businessmen, the trustees of Robert Paterson.[27]

Business was so bad that on 8 January 1841 James Stevenson and his son, Robert, successfully petitioned the Court of Session to have James' estates sequestrated. Robert was owed £520 11s by his father. James Innes Lang, a wood merchant in Greenock, was appointed interim factor and then trustee of the estates. The sederunt book of the sequestration contains an enormous amount of information, some of which is tantalising. The list of documents and books then in existence, but now presumably lost, is particularly disappointing.[28]

The works at Ladyburn were reckoned to be worth £500 but since there was a heritable bond for £300 on them, the value was thereby reduced. The goods were valued at £147, colours £120 8s 3d, tissue paper at £21 4s, clay at £61 and copper printing plates at £95 16s. The last item shows that transfer-printed wares were being produced at the Ladyburn Pottery, though none has ever been found. The commissioners appointed to the estates included Thomas Crawford, 'potter, Glasgow', a major creditor.

The list of potters, pottery companies and related businesses to whom James Stevenson owed money is very interesting:

	£	s	d
Robert Gray & Co, coal merchants, Glasgow	100	0	0
R A Kidston & Coy., potters (*i.e. Verreville & Anderston*)	80	0	0
John Thomson, potter, Glasgow (*i.e. Annfield pottery*)	40	0	0
Wm. Baillie & Co, glass manufacturers, Portobello	53	3	3
Glasgow Flint Glass Coy., Glasgow	14	0	0
Lake Blackett & Coy., lead manufacturers, Newcastle	36	12	6
Minton & Boyle, potters, Stoke	10	1	6
John Rodger & Son, potters, Longport	37	7	6
Hilditch & Hopwood, potters, Longton	20	13	6
I & H Pike, potters, Wareham	77	10	6
Charles Meigh, potter, Hanly (sic)	39	15	6
Zachary Boyle, potter, Stoke	4	0	0
Robertson Wood and Brandford, potter, Cobridge	12	15	6
Benjamin Taylor Hay (?), clay merchants, London	46	6	6
Thomas Crawford, potter, Glasgow	40	6	6
Alexander Pearce, potter, Ladyburn	43	9	6
William Horatio Parkhurst of Shelton potteries	31	15	0

His total debts, known at this time, amounted to £1650 9s 6d and he is owed about £335 but £189 of this is considered bad debts. Most of it is owed by Irish china dealers. Late arrivals among the list of creditors were:

Joseph Twigg of Burslem for cobalt blue refiner	25	15	0
John Boyle of Stoke due to Herbert Minton of Stoke	11	1	0
William Brownfield of John Wood & Wm Brownfield of Cobridge	17	0	0
Peter Ferguson, clay merchant, Glasgow	46	1	6

James Stevenson had never kept any books for any of his businesses, in spite of the fact that he claimed to have been cheated out of money by several people, including Andrew Muir, Senior, about whom he seemed to have some doubts. He was not sure whether he was ever paid the full amount for his share of the Clyde Pottery, since much of it came in goods. His excuse for never keeping books was that he was too occupied with business to have time. Nevertheless his creditors accepted his word on many subjects and were pleased to let him have his house furniture when he asked for it, which is a testimony of some strength to his reputation.

On Tuesday, 9 March 1841, a roup was held in Greenock of the printed and plain stone and earthen ware of all descriptions and these were sold to Duncan McDougall, a Greenock grocer, for £88. On 20 May a roup of the whole Pottery failed as did an attempt to sell the utensils. Another roup in Glasgow also failed and so on 17 March 1842 the trustee of the estates informed Lamont & Monteith, lawyers to the feudal superiors of the Pottery site, that he was abandoning the Pottery. The only dividend mentioned is of 1s 4d per pound paid on 1 January 1842. On 25 December 1843 James Stevenson died in Greenock at the age of 72.[29]

There had also been dramatic events at the Clyde Pottery. In 1841 the younger Andrew Muir ceded the Pottery to his uncle[30] and departed for the United States on a business visit. A year later he returned to Boston and then went to Montreal where he lived for several years. Meanwhile, in 1844, at the age of sixty-five, Andrew, the elder, had married a girl of twenty-five called Isabella Fox, daughter of E Fox of London.[31] When the younger Andrew returned to Britain in 1847, as a result of business troubles, it was to London where his sisters were now living. In 1849 he crossed the Atlantic again, this time to New York, and from there he went in 1852, not back to Britain but to Russia where the most spectacular part of his career took place.

The reason for his going to Russia was that his sister, Jane, had married, on 21 July 1844, as his third wife, Archibald Mirrielees, a merchant from

Aberdeen, whose business was in St Petersburg, Russia. Andrew went in 1852 and worked for his brother-in-law, whom he virtually succeeded in 1857. He became the founder of Muir & Mirrielees, the first and later the greatest of all the Russian department stores.

Before his marriage the elder Andrew Muir had decided to retire and in the process of doing so had disposed of the Clyde Pottery to two partners, Thomas Shirley and John Milligan, trading under the name of Thomas Shirley & Co. Andrew Muir died in Greenock on 20 April 1849.

The Shirley period is the least documented period in the Pottery's life. The partnership leased rather than feued the ground, so there is little information to be obtained from the Register of Sasines and the lease has never been located. Another factor is that Thomas Shirley at some date before his death, most probably around 1848, created a trust that owned the company and the relevent documents have not been discovered, though we know that his widow, Mary, and her son, William, were trustees.

The Census of 1841,[32] and *Post Office Directories* of the period inform us that Thomas Shirley, born in England, was fifty years old at that time and John Milligan was thirty. There is also a William Shirley who is described variously as 'potter' or 'engraver and printer' who is twenty years old and a son of Thomas Shirley. Another son, John, is not mentioned in the *Post Office Directory* or the Census but is known to have died on 13 September 1849.[33]

Two documents have come to light recently which give us information about the Clyde Pottery at this time. The first is an invoice dated 12 August and 3 September 1844 sent by the Pottery to Thomas Dalziel, a china merchant of 62 Queen Street, Glasgow.[34] It sets out an order from Dalziel in great detail and shows that knowledge of the Pottery's wares for this period is incomplete. The actual shapes that were made: breakfast cups, evening cups, teapots with sugars and creams, bedroom sets, water coolers and many more have never been recognized from this period of the Pottery's life. The jugs, bowls and ewers are often described as 'cov'd' (presumably covered) and these are also unknown. Knowledge of the methods of decoration is also deficient: some printed wares are mentioned which are known, but also 'pressed' (and presumably undecorated), 'flowing blue' and 'blue edged' are also described of which very little or nothing is known.

Two printed patterns are named in the invoice: 'British Rivers' and 'Continental Cathedrals', the latter in purple and blue, the former in blue only. Mention of 'British Rivers' is a surprise for specimens with this pattern are quite common with the pottery description 'AM' for Andrew Muir and with 'C.P.Co'

for Clyde Pottery Co but no specimen with 'T.S. & Co. (or Coy.)' for Thomas Shirley & Co have ever been reported. Since, as has already been stated, there are more specimens of 'British Rivers' marked 'AM' than would have been expected to have survived from a five year period, it may be that Shirley continued to produce this pattern using unaltered Andrew Muir plates and that some of the Muir period 'British Rivers' was actually made in the Shirley period.

Otherwise the wares that are known from this period are mostly the popular lacustrine landscapes that were fairly universal in the first half of the nineteenth century. A list of the known patterns (probably incomplete) is given below:

Aleppo	Known on jugs, the jugs being frequently of a shape which was also manufactured by the Bo'ness Pottery of J Jamieson & Co.
Athenian Sketches	Known on dinner ware.
British Rivers	Never marked with a Shirley mark - see above.
Cabul	This pattern is reported in Coysh & Henrywood's *Dictionary of Blue and White Printed Pottery 1780-1880*. It is also known from the period after 1857 (probably after 1875) as a grey pattern on punch bowls.
Continental Cathedrals	Known on dinner ware - a changing pattern.
Foughabellagh	Known only as sherds from an excavation by Peter Denholm, never fully published but one sherd of this pattern was illustrated in an article in *Scottish Archaeological Forum 8* (1977).[35] Other patterns, whose official names are not known but which are probably of this period, were also found. The sherds are preserved in the McLean Museum in Greenock.
Gondola	Found on punch bowls, jugs and mugs in blue and brown, this pattern also has a life after 1857.
Mansion	Known on dinner ware.
Oriental Scen ...	Found on dinner ware but the mark is reported as defective, so it is not known for certain whether the name has 'Scenery' or 'Scenes' as its second word. The mark is often seen as a hybrid of 'T.S. & Co.' and 'C.P.Co.' as if the plates had been reused after 1857 but had been imperfectly altered.
Pickwick	
Rio	Known on jugs and dinner ware, in blue and in purple.

Le Tombeau de Paul et Virginia (sic)	Known on dinner ware
Venetian Sketches	Known on dinner ware.
Washington	Known on dinner ware and continued into the period after 1857 in blue and in sepia.

Some of these patterns are quite common, such as 'Rio' and 'Continental Cathedrals', and some are extremely rare, like 'Venetian Sketches' and 'Le Tombeau de Paul et Virginia'. Several examples of 'Washington' have been found in North America and it seems likely, in view of its name and the eagle on its border, that the USA was its intended destination, though quite a number of specimens are known from this country.

The potters who worked for Thomas Shirley were employed on a yearly contract which ran from 11 November to 10 November. In November 1844, a group of the workers, all 'in one or two departments' refused to work under these conditions and went on strike for more pay. This was in spite of the fact that Shirley claimed to be paying the same as, or more than, other potteries. The men were said to be earning from 22 to 30 shillings a week. When their wives also worked in the Pottery, the family income was brought up to as much as 36 or 37 shillings per week. Shirley told the strikers that if they did not return to work within a fortnight he would replace them since they had brought the Pottery to a standstill.

The men did not go back to work so Shirley hired workers from Staffordshire, where he seems to have had no trouble in recruitment. The malcontents caused trouble and two boys and a man actually ended up in jail. They also distributed handbills in the Greenock area and issued a notice in the Staffordshire papers denigrating Shirley and warning off others from working for the Clyde Pottery. However, on 10 January 1845, an article appeared in the *Greenock Advertiser* covering the whole affair and the men working at the Pottery inserted a notice defending the Pottery management and claiming to be perfectly happy working there. The notice was signed by thirty-nine men who claimed to be the entire adult male workforce. Since it is known from other sources that the Pottery had about eighty workers, there must have been forty-one women, children and apprentices. The list of signatories is given in Appendix II.[36]

The second recently discovered document shedding light on the Shirley period of the Pottery's history is an indenture of 1846 for the apprenticeship of Joseph Wylie, aged seventeen, as a plate and saucer maker.[37] Joseph, whose father, John, was a slipmaker at the Pottery and had signed the 1845 notice in the *Greenock Advertiser*, had worked at the Pottery since February 1844, the

date which was taken as the commencement of his six year apprenticeship. Joseph was bound to secrecy about the methods of the Pottery and was not to 'frequent tippling or gaming houses nor associate with low companions' on pain of forfeiture of two days' wages. During his second year he was to receive 2s 6d per week, 3s in the third year, 3s 6d in the fourth, 4s for the fifth and 6s in the sixth year, though he may be put onto piece wages at any time the masters considered him good enough. The penalty for breaking the indenture was £10 sterling. By 1851 this same Joseph Wylie was to be found living with Thomas Crawford and family at 416 Dobbie's Loan, Glasgow, and, therefore, presumably working at the Bells' Pottery.[38]

The *New Statistical Account* mentions two potteries employing a total of 200 people, with men getting 10s to £1 a week, women 7s, boys 2s 6d, for a ten hour day, six days a week, though it was probable that the works closed early on Saturday.[39]

The Ladyburn Pottery opened again in 1846, when, in August of that year, at a cost of £250 Thomas Crawford, who had previously worked in Greenock and then in Glasgow, feued the land from the superiors at a public roup in Glasgow.[40] In the following year, Thomas Crawford was already having to borrow £250 from the feudal superiors.[41] The gaurantors for the loan were R A Kidston and George Hatfield, the former having been the owner of Verreville and Anderston Potteries until he went bankrupt in 1841. In 1847 the two men were partners in the flint grinding and whitening business which they carried on at North Woodside and Garrioch Mills on the banks of the River Kelvin in Glasgow. In the same year as they gave surety to Thomas Crawford they themselves went bankrupt, and, indeed, R A Kidston was briefly imprisoned for debt.[42] There was a connection between these mills and the Greenock potteries, since the next owner of the two mills was John Brinkley, Senior, who was also the second recorded owner of Larne Pottery which played an important part in the subsequent history of the Clyde Pottery.

On 6 July 1849, Clough, Geddes & Co took over officially the Ladyburn Pottery from Thomas Crawford, though William Clough, nephew of Robert Clough of the Glasgow Pottery and a trained potter, had bid for and obtained the Pottery at a roup in the Royal Exchange Rooms, Glasgow on 13 December and had, in fact, moved into the Pottery on his own in January 1849.[43] Thomas Crawford moved to Glasgow.

William Clough had hoped at first to take Thomas Roger Murray, presumably of the Caledonian Pottery family of Murrays, as a partner, but Murray's father 'could not bring forward the necessary sum for his stock' and

the proposed partnership was abandoned.[44] Hugh Montgomerie Geddes became Clough's partner in the middle of April 1849. In the intervening period Clough had been preparing the Pottery for production, but manufacture only began when Geddes became a partner and brought the necessary £320 capital. Hugh Montgomerie Geddes was the brother of John Geddes of the glass-making family. He had been 'bred to the Engineer business' and was obviously not really interested in pottery making. His function was to look after the books and cash while Clough took care of the manufacture. The Pottery had its own mill for grinding colours, glazing and flux at the Old Bottle Work. The Pottery always made its own flux. Many of the workmen seem to have been recruited from Glasgow and continued to maintain homes there, as one of the reasons given for slowness in manufacture was that some of the men got to work late on Mondays from living in Glasgow. Clough mentions 'expenses in Staffordshire' early in the life of the firm so perhaps he had also recruited from there. Much of the business seems to have been geared to providing hawkers with goods for sale on a cash basis but there was certainly trade as far afield as Ireland, since payments are mentioned from Dublin and Newry.

On the day after they formally took over Ladyburn Pottery, Clough, Geddes & Co borrowed £200 from a minister in the north of England[45] and like Thomas Crawford they took very little time to go bankrupt since their estates were sequestrated on 16 April 1850.[46] The two partners seem not to have got on well together. If William Clough bore any similarity in character to his uncle Robert then he probably was not easy to work with;[47] on the other hand Geddes seems to have been interested only in horses and the good life and to have been none too honest with the firm's money. On 18 October 1850 John Geddes offered to buy his brother's discharge for £150, an offer which was accepted. Eventually a dividend of 3s 4d in the pound was paid to creditors. No examples of the work of the Ladyburn Pottery of Clough, Geddes & Co has ever been identified. William Clough later became manager of the Wellington Pottery, a redware pottery in Glasgow's East End, and Hugh Montgomerie Geddes emigrated to Australia where he married in 1855 and died three years later.[48]

On 29 October 1850 William Shirley took over Ladyburn Pottery as trustee for Thomas Shirley & Co, thus uniting the two sites for the first time. In the instrument of sasine for this transaction,[49] Thomas Shirley is described as being so ill that he cannot be asked to sign and, in fact, he had died on 25 October 1850 at the Clyde Pottery.[50] It can be assumed that, if William Shirley was using the Ladyburn Pottery for the production of wares, then the two potteries would be making identical wares. Certainly no difference in marking has ever

been noted. This state of affairs obtained until 1856 when the Ladyburn site was sold to a firm of brassfounders and ceased to play any part in pottery production in Greenock.[51] Several members of the Shirley family in the years following are described as 'brassfounders'.

In the Census Returns for 1851, William Shirley is described as 'pottery Clerk', born in Staffordshire and aged thirty-five; he has a younger brother Thomas Shirley, aged twenty-two, a potter, born in Hanley. The manager of 'Greenock Pottery' since 1847 had been James Farie, aged thirty, who was born in Glasgow.[52] In 1855 Farie and William Shirley formed a partnership to lease the Larne Pottery in Northern Ireland from the estate of the late John Brinkley, Senior, who had died and his estate declared bankrupt in January 1855. It is at this point, in 1856, that William Shirley sold the Ladyburn site, presumably in order to finance this venture. However, in April 1856, Thomas Shirley & Co stopped payments and managed to reach a composition with its creditors of 5s in the pound only on condition that the notes were covered by the Larne Pottery.

Much money was spent in transforming the Larne Pottery into a whiteware works and Thomas Shirley spent much time there, probably intending to move there and leave his nephew, Thomas S Green, to manage the Clyde Pottery. In the event, the Larne Pottery went bankrupt in 1857, directly as a result of its coverage of the Greenock Pottery's notes. Meanwhile James Farie had become a partner in Thomas Shirley & Co. The Larne Pottery had never made money and had cost Thomas Shirley & Co £2,000 in the ensuing period. Mrs Mary Shirley, who with her son, William, was a trustee in the Shirley business in Greenock, was never included in the sequestration proceedings for the Larne Pottery. Thomas Shirley & Co stopped payment again in January 1857 and that is the last that is heard of the firm. The effect of this very complicated series of failures, legal cases and compositions is that in 1857 the Clyde Pottery passed to a totally new set of partners who formed the Clyde Pottery Co Ltd and the most productive period of the Clyde Pottery began.[53] No products of the Larne Pottery have ever been identified. Mrs Shirley and her son, William, moved out of the house in the Pottery, where they had lived since 1841, and moved to 12 Regent Street, Greenock, where Mrs Shirley died on 24 June 1865, aged seventy-eight,[54] and William on 17 July 1872.[55]

In 1861 the final transfer of Pottery land took place when the Clyde Pottery Co Ltd bought the 'blubber yard', which lay to the west of the Pottery proper, from the trustees for the creditors of William Shirley.[56] This piece of land had belonged in the eighteenth century to a whale fishing company which had

existed in Greenock but was forced out to the east so that the smells of its activities would not disturb the citizens of the town.[57] With its acquisition we may assume that the earliest period of pottery making in Greenock had ended.

Acknowledgements.
Every archivist that I have consulted has been more than helpful and I wish to thank the staffs at the Scottish Record Office, General Register House and West Register House; Strathclyde Regional Archive; the Glasgow room in the Mitchell Library and the University of Glasgow Busness Records Centre. But above all my thanks must go to Mrs Lesley Couper-white of the Watt Libray in Greenock who has gone out of her way to be helpful and has saved me hours of work by her excellent indexing system for local newspapers and Censuses. Among private individuals,of course, I have already expressed my gratitude to Harvey Pitcher of Cromer. Mr D Allan of Greenock has also been most helpful with my explorations of Greenock family history, especially with sorting out the many Alan Kers who were around at that period. The members of the Scottish Pottery Society have also been remarkably helpful, particularly with the wares of the Clyde Pottery. My thanks to them all.

NOTES

Any statements about the Muir family which have no reference are taken from Harvey Pitcher, *Muir & Mirrielees: the Scottish Partnership that became a Household Name in Russia*. My grateful thanks to Mr Pitcher for letting me read the relevant chapters prior to British publication - it has appeared in a Russian language edition - and for giving me permission to use the information contained therein.

1. Boa, Denholm, Quail, *The Clyde Pottery* (Inverclyde District Libraries, 1987). The claim is made on p.2 by G Quail.
2. Keele University Library, Wedgwood Collection A4960-4964-29: correspondence between James Stevenson and Josiah Wedgwood, 1809.
3. *Greenock Post Office Directory*, 1841.
4. For the businesses in which the Muirs were engaged, see Henry E Kelly, 'The Muir Brothers and the Clyde Pottery' in *Scottish Pottery Historical Review* 15 (1993) pp.19-23
5. *Edinburgh Gazette*, No.4000, 1831, p.258 and No.4104, 1832, p.274.
6. Keele University Library, Wedgwood Collection, A4960-4964-29: correspondence (8 letters) between James Stevenson and Josiah Wedgwood 1804-15.
7. Lorna Weatherill, 'Marketing English Pottery in Scotland 1750-1820. A study in the inland trade' in *Scottish Economic and Social History* ii (1982) pp.18-43. My thanks to Mrs Jill Turnbull for bringing this reference to my attention.
8. Scottish Record Office (SRO), Register of Sasines RS54/179/156.
9. *Greenock Advertiser*, 11 Oct 1816, p.1.
10. There is a description of the Pottery in the *Greenock Advertiser*, 6 Mar 1834, p.3 when it is being offered for sale.
11. Thomas Crawford's appearance in the Census of 1851, 622/576, No.30, p.25, Entry 93, gives his birthplace as Prestonpans. His birth took place on 19 May 1795 and is registered in the OPR for Prestonpans for that date. My thanks to Mrs Heather Jack for this last piece of information.

12. SRO, Register of Sasines RS54/1105/199.
13. SRO, Regulations of the Potter's (sic) Society Ladyburn, FS1/21/19.
14. *Edinburgh Gazette*, No.2850, 1820, p.301 for the dissolution of the Paisley partnership; for the buying of land in William Street, Greenock see *Abridgements of Sasines for Renfrew*, Series 1, No.8722, 25 Jan 1808, No.15,400, 9 Aug 1808, Series 2, No.1225, 30 Dec 1822, No.4339, 5 May 1827.
15. Strathclyde Regional Archive (SRA), T-ARD 1/6/107 which is a bundle of papers giving a complete history of the site over a considerable period.
16. SRO, Register of Sasines RS54/395/12 No.3, 3 Jan 1825.
17. *Greenock Advertiser*, 21 December 1830, p.3; and SRO, Register of Sasines RS54/1105/199.
18. SRO, Register of Sasines RS54/585/30 and RS54/601/286 and Sederunt book for the Sequestration of the Estate of James Stevenson, Senior, CS280/18/14, pp.26 ff.
19. His obituary is in the *Greenock Advertiser*, 17 Oct 1833, p.3.
20. *Greenock Advertiser*, 6 Mar 1834, p.3.
21. SRO, SC58/42/8.
22. *Edinburgh Gazette*, 1 Jan 1836, No. 4447, p.3.
23. *Ibid*., 16 Feb 1836, No. 4460, p.49.
24. George Williamson, *Old Cartburn* (Paisley & London 1894) pp.230-39.
25. *Greenock Advertiser*, 28 Dec 1837, p.2.
26. *Abridgement of Sasines for Renfrew*, Third Series 3975, Jun 16 1837. The full sasine is RS 54/759/134.
27. SRO, Sederunt book for the Sequestration of the late James Stevenson, senior, CS280/18/14, pp.11-23.
28. SRO, CS280/18/14.
29. *Greenock Advertiser*, Dec 1834.
30. *Edinburgh Gazette*, 1 Jun 1841, No. 5013, p.177.
31. *Greenock Advertiser*, Feb 1844. Previously I had assumed that the marriage between Andrew Muir and a 24 year old woman involved the younger Andrew Muir (see note 4) but Mr Pitcher's book corrected this mistake.
32. 1841 Census, 564, District 124, p.6.
33. *Greenock Advertiser*, 25 Oct 1850.
34. Invoice dated 12 Aug 1844, discovered by Mrs Heather Jack and in her possession. My thanks are due to her for allowing me to use the information contained in this document prior to publication in the *Scottish Pottery Historical Review*.
35. Peter Denholm, 'Pottery Excavations' in *Scottish Archaeological Forum* 8 (1977) pp.3-5.
36. *Greenock Advertiser*, 10 Jan 1845, pp.2-3.
37. SRO, RD 5/772.583-587.
38. 1851 Census, 622/576, No.30, p.25, entry 93.
39. *New Statistical Account of Scotland*, volume vii (1845) Greenock Parish, p.440.
40. SRO, RS54/1105/199.
41. SRO, RS54/1106/41.
42. *Edinburgh Gazette*, 3 Aug 1847, No. 5667, p.380 and SRO, CS 279/1239. These deal with the sequestration of Kidston & Hatfield. For their involvement with Thomas Crawford, see note 41 above.
43. SRO, RS54/1164/188.

44. All the details of Clough, Geddes & Co come from their sequestration papers, SRO, CS280/39/33. The break-up of Clough, Murray & Co comes from the *Edinburgh Gazette*, 11 May 1849, No. 5856, p.486.
45. SRO, GR 3/2458/182.
46. *Edinburgh Gazette* 19 Apr 1850, No. 5957, p.323.
47. For Robert Clough's character, see Henry E Kelly, 'The 1844 Explosion in the Glasgow Pottery' in *Scottish Pottery Historical Review* 14 (1992).
48. *Glasgow Herald*, 13 Aug 1855 for his marriage in Melbourne, Australia, on 23 Apr to Henrietta Fletcher of Rushden, Northamptonshire; *Glasgow Herald*, 12 May 1858 for his death at Melbourne in Mar 1858.
49. *Abridgements of Sasines for Renfrew*, 5th series, No. 3191, 29 Oct 1850; full sasine, SRO, RS 54/1192/258.
50. *Greenock Advertiser*, 25 Oct 1850.
51. *Abridgements of Sasines for Renfrew*, 7th series, No. 870, 2 Jan 1857.
52. Larne Pottery sequestration, SRO, CS318/10/196. This also gives much information unobtainable from elsewhere about the demise of Thomas Shirley & Co.
53. SRO, BT2/16.
54. *Greenock Advertiser*, 27 Jun 1865.
55. *Ibid.*, 18 Jul 1872 and *Greenock Telegraph*, 20 Jul 1872.
56. *Abridgements of Sasines for Renfrew*, 8th series, No. 843, 14 Oct 1861; full sasine, SRO, RS54/1629/84.
57. Archibald Brown *The Early Annals of Greenock* (Greenock, 1905), p.142.

APPENDIX I

Potters who signed the *Regulations of The Potter's (sic) Society Ladyburn*

John Melrose
John Sinclair
Jas. Stevenson Jr. [James Stevenson, Junior, died in July 1833]
Alexr. Pearce [shown in the 1841 Census, aged 50]
Jas. Alexander
Robert Gillies
Willm. Rhodes Secy. [there is a William Rhodes in the 1841 Census, aged 30 and an Elizabeth Rhodes, aged 50. Perhaps these are the Secretary's widow and son]

[Melrose, Sinclair, Alexander and Gillies do not appear in the 1841 Census at all]

APPENDIX II

The following is the list of potters who were working for Thomas Shirley & Co in January 1846. It should be noticed that it does not include women, children, or apprentices. It contains thirty-nine names, including two duplicates. The duplicate names could well be fathers and sons. Since we know that the muster at the Pottery was about 80 workers at this period, we can assume that the remaining 41 make up the missing categories, especially since the newspaper notice describes this list of 'the whole of the workmen employed in the various departments at the Clyde Pottery' in January 1846.

John Burnish	1851, E	William Carr	1851, E
Joseph Shenton	1841	Samuel Barlow	
Hugh McLachlin	1851, GK	Joseph Caton	
Peter McLachlin	1851, GK	Enoch Wood	
Absolam Burnish		Joseph Taylor	
William Turner		Daniel Harrison	
William Sear		William Ridgway	
James McWilliams		Thomas Elkin	
Archibald Davie		James Brown	1851
Thomas Green	1851, I	Walter Paris	1841 (son in 51)
Henry Bodson		Joseph Shenton	1841
John Wylie	1841	Edward Farns	
Richard Meir		Alex Robertson	1851, GK
Joseph Taylor		Joseph Meyer	
George Mitchell		Noah Heath	
John Barker	1851, E	William Clewlew	
Benjamin Blackburn		George Munro	1841
A. Walker	1841	George Sawyer	
James Millar		Alexander Marquis	
Thomas Hargreaves	1851, E		

Notes: Those names which occur in the Census of 1841 or 1851 are indicated. Those known to have been born in Greenock are marked 'GK' and those of known English origin, 'E'. Those of Irish origin are marked 'I'; the rest are of unknown origin. There is a distinctly English cast to the list of names, and, in fact, several of the surnames are well known in Staffordshire as belonging to pottery families. The John Wylie listed is, of course, the slipmaker who is father of the apprentice of 1846 mentioned in the article. The large number of names which appear in neither Census is an excellent illustration of the mobility of potters which must have been a headache to pottery proprietors throughout the nineteenth century. Though indicating a shortage of skilled labour, it may have helped to raise wages.

The Oldham Limited Company in Scotland - The Glasgow Cotton Spinning Co Ltd

Dong-Woon Kim
Glasgow

The history of the Glasgow Cotton Spinning Co Ltd is unique in two senses: the first is that the company appeared in the period of decline of the cotton industry in Scotland; and the second is that it was the first of its kind in Scotland modelled on the Oldham limited company. A contemporary observer described the company:

> The Glasgow Cotton Spinning Company is the only concern which meets the Lancashire establishments on their own ground, and, significantly enough, its experience proves that commercial success is possible with capital, experience and the right methods.[1]

The Glasgow Cotton Spinning Co Ltd was founded in 1883 and unlike many firms in the industry concerned, it was not a family business. No one family dominated either ownership or control: ownership was in the hands of several hundred local investors and control was in the hands of nine Scottish professional managers, although a few of them were family-tied. In 1920, however, the company was acquired by two Manchester business families and was wound up in 1928.

The leader of the Industrial Revolution in Scotland, the cotton industry enjoyed a hectic expansion between 1790 and 1830. This expansion, however, soon turned into general decline caused by fierce competition from Lancashire and Europe in the lucrative markets for coarse goods.[2]

The establishment of the Glasgow Cotton Spinning Co Ltd in 1883 was largely possible due to the state of good health in which one section of the textile finishing trade, namely Turkey-red dyeing, was during the second half of the nineteenth century. The main product of the Glasgow Cotton Spinning Co Ltd, a high class of yarn spun from high quality cotton, was suitable for Turkey-red dyeing.[3]

The limited company movement which had developed in the 1870s and 1880s in Oldham also encouraged the foundation of the Glasgow Cotton Spinning Co Ltd.[4] The typical Oldham limited company, on which the Glasgow company appears to be modelled, was a completely new business venture rather than the conversion of an established business into a limited liability company. It owned modern mills equipped with new machinery and

sufficient spindles to provide economies of scale. The creation of such new businesses was encouraged by several developments in the cotton industry. First of all, the cotton famine of the 1860s depressed profits and forced out many small mills. Secondly, the introduction of the self-acting mule made it possible to replace labour by capital. And thirdly, the increasing demand for cotton goods, particularly in the 1870s, stimulated the construction of new larger mills.[5] J B Jeffreys noted how readily, thanks to these circumstances, Oldham limited companies could be formed:

> A [new] mill could be built, equipped and started working within about two years, the cost, though increasing, was insignificant compared with a mine, transport, and steam-driven machinery had solved the location problem, land was still cheap around Oldham, and ... other improvements besides those of machinery could be introduced such as fire-proofing which could not be used in an old or converted mill.[6]

Although the average amount of fixed capital for a new mill nearly doubled between 1850 and 1885, it could be more easily supplied through the joint stock form, rather than through the partnership form, because small investors were readily available in the cotton production areas and neighbouring large urban centres.[7]

A large wave of such promotions occurred in the trade upswing of the early 1880s: twenty-three companies were projected in the Oldham area in 1880, twenty-five in 1881 and twenty-four in 1882-83. Promoted companies nearly doubled to forty-five by 1884, when seventy-one of 156 cotton spinning businesses in the Oldham area (forty-five per cent) were limited companies and their collective spindleage accounted for more than half the total in the area; in 1886 there were ninety limited companies in the Oldham district.[8]

A purpose-built mill for the Glasgow Cotton Spinning Co Ltd was erected in 1883 at Bridgeton, Glasgow, on the basis of the most recent and approved Lancashire plan. The mill was equipped with the best machinery which was imported from the south with fire-proofing equipment designed by Joseph Scott of Oldham; and it was operated by an expert from Lancashire.[9] A newspaper reported that the promoters of the company adopted the Lancashire standards because of their superiority:

> ... the main reason why cotton spinning in Scotland has not been profitable of late years is that, presuming on their cheaper labour, Scotch spinners have attempted to run machinery of such an age

> and construction as Lancashire spinners would not think of working at all.[10]

The Glasgow Cotton Spinning Co Ltd was larger and more efficient than its competitors. In Scotland, the company and its arch-rival, the Clyde Spinning Co Ltd, owned respectively the largest number of spindleage (75,000) in 1889, but the financial position of the former was more encouraging than that of the latter: the Glasgow Cotton Spinning Co Ltd raised £100,000, of which £96,340 was taken up, in its formation in 1883, while the Clyde Spinning Co Ltd retained the nominal capital of £80,000, of which £75,200 was taken up, for more than a decade after its conversion into a limited company in 1882.[11]

The position of the Glasgow Cotton Spinning Co Ltd was strong even in comparison with limited companies in the Oldham area. Above all, the spindleage of the Glasgow company in 1889 (75,000) was well above the typical 50,000 spindle-size of new Oldham mills in the 1870s.[12]

The Glasgow company was also competing in terms of capital. In 1886, for instance, ninety limited company mills in the Oldham district had an average taken-up capital of £38,874,[13] while the Glasgow company had a taken-up capital of £99,240.[14] Examined from a different angle, of the eighty-seven public limited spinning companies in the Oldham district in 1885, nine companies had larger nominal capitals than that of the Glasgow Cotton Spinning Co Ltd (£100,000), but none of the Oldham companies had larger issued-capitals than that of the Glasgow company (£93,540): the largest taken-up capital in Oldham was £75,000 (the Guide Bridge Mill of Ashton, of nominal capital £150,000; the West End Mill, of £150,000; and the Sun Mill, of £75,000).

In terms of spindleage however, twenty-nine of the eighty-seven companies in 1885 owned more spindles than that of the Glasgow company (75,000 in 1889): the largest spindleage (186,012) was owned by the Mid and Tonge Mill, and the lowest spindleage (9,252) by the Lower Moor Mill.[15]

The promoters of the Glasgow Cotton Spinning Co Ltd were five businessmen from the Glasgow area: Thomas Reid (1831-1900), partner of Alexander Reid & Sons, dyers in Burnbrae, Dunbartonshire; John Colville (1844-1924), partner of A & A Galbraith, cotton spinners in Glasgow; Robert Fraser, partner of Archibald Orr Ewing & Co, dyers in the Vale of Leven; Andrew Paterson (1819-1904), partner of James Paterson & Co, cotton manufacturers and East India merchants in Glasgow; and William James Walker (d.1894), partner of G L Walker & Co, manufacturers in Glasgow (Table 1).[16]

Table 1

The Span of Service of Directors, 1884-1928

Name	Beginning	End	No. of years
Thomas Reid	1884	1900	16
John Colville	1884	1920	36
Robert Fraser	1884	pre-1897	> 13
Andrew Paterson	1884	1900	16
William J Walker	1884	1894*	10
James Caldwell	1901	1907	6
Douglas M Hannay	1901	1920	19
Robert G Paterson	1901	1920	19
James Reid	1908	1920	12
Thomas Smith	1921	1928	7
Joshua Barber-Lomax	1921	1924	3
George Holden	1921	1928	7
Joshua A Barber-Lomax	1921	1928	7
James C Smith	1921	1928	7
Charles H Holgate	1924	1928	4
Ernest Hirst	1928	1928	1

Note: * The date of death.

Sources: Annual returns, 1884-1928, the Glasgow Cotton Spinning Co Ltd, Scottish Record Office (SRO), BT 2/1293; *Stock Exchange Official Intelligence* (SEOI)

The structure of the first board of directors was similar to that of many Oldham companies in that the members were recruited locally,[17] but it also shows two very different features. Firstly, the early boards of many Oldham companies consisted of 'promotional groups'[18] whose occupations supplied expertise for every aspect of a new mill from construction to management. For instance, the first board of the Moorfield Spinning Co in Shaw in 1875 consisted of a cotton spinner, an ironfounder, an architect, a carder, an engineer, and a joiner and builder.[19] This sort of board structure was also found in many other Oldham companies such as the Borough, Star, Dowry, Lion, Royton, Thornham and Shiloh Spinning Companies. By contrast, the occupations of the first directors of the Glasgow company were based mainly on the cotton trade.

Secondly, promoters of Oldham companies were frequently professional company promoters as Jeffreys has indicated:

> Entrepreneurs [in Oldham] could easily step in and build a mill in a time of high prices, realise a fortune, and then almost as quickly lose a good part of it again.[20]

John Bunting, for instance, transformed himself from a sharebroker into a company promoter in the boom of 1889-90: by 1916 he had become the largest individual millowner in Lancashire, controlling twenty of the finest and most profitable mills.[21] In the same manner, William Marcroft of the Sun Mill Co was involved in promotion of eight companies between 1850 and 1881.[22] In contrast, the founders of the Glasgow company were not professional promoters.

Thomas Reid, the first chairman of the Glasgow Cotton Spinning Co Ltd, undertook three years of training as an accountant in McEwan & Auld in Glasgow, before joining his family firm, Alexander Reid & Sons, dyers, in 1848 at the age of eighteen; he was admitted as a partner in 1864 and retained the position until his death in 1900.[23] While managing his family firm, Reid became a co-founder and chairman of the Glasgow Cotton Spinning Co Ltd in 1883. His interest in setting up the firm was to reduce the costs of purchasing high quality yarn from the Oldham area for the Scottish dyeing trade by producing it locally.[24] Reid was also involved in various businesses other than cotton spinning and dyeing: he held directorships in the Nobels Explosive Co Ltd (chairman from 1884); the Nobel-Dynamite Trust Co Ltd (chairman from 1886); the South African Explosives Co Ltd; the Birmingham Metal & Munitions Co Ltd; the London & Glasgow Engineering & Iron Shipbuilding Co Ltd (chairman in the 1880s); the Indo-China Steam Navigation Co Ltd; and the Steel Company of Scotland Ltd.[25]

The Glasgow Cotton Spinning Co Ltd increased its nominal capital from £100,000 in 1884 (of which £96,340 was taken up) to £175,000 in 1890 (fully taken up) in order to build a second mill. On the completion of this mill, the company came to have the largest production facilities in Scotland with 75,000 spindles.[26] In 1890 a sum of loan capital (£53,613) was also raised to finance the erection of the second mill; it increased to £90,006 by 1893, but decreased to £47,633 by 1900.[27] On the whole, loan capital of the company remained less than half of subscribed capital between 1883 and 1900. In this respect the Glasgow company was in contrast to many Oldham companies which heavily relied on loan capital with loan finance frequently being equal to equity subscription.[28] For the first four years after the formation in 1883, the

Glasgow Cotton Spinning Co Ltd distributed no dividends, but after 1888 the company continuously gave investors more dividend than the general average in the cotton industry, 5.9 per cent between 1894 and 1911 (Table 2).[29]

Table 2

Dividend, 1884-1925 (per cent per annum)

1884-88	0	1903-04	1.25
1888-89	7.5	1904-05	2.5
1889-90	10	1905-06	12.5
1890-91	10	1906-07	13.75
1891-92	7.5	1907-08	15
1892-93	6.25	1908-09	10
1893-94	6.25	1909-10	5
1894-95	3.75	1910-11	2.5
1895-96	6.25	1911-12	5
1896-97	6.25	1912-13	5
1897-98	7	1913-14	2.5
1898-99	8.75	1914-18	0
1899-1900	8	1918-19	15
1900-01	6	1919-20	10
1901-02	3.75	1920-21	5
1902-03	0	1921-25	0

Sources: 1884-98, *The Burdett's Official Intelligence*; 1899-1925, SEOI

When Thomas Reid died in 1900, John Colville became chairman, the other three founders having retired: Andrew Paterson in 1900; Robert Fraser before 1897; and William J Walker before 1894.[30] In their place three new directors were recruited in 1901: James Caldwell (d.1907), an employee and, from 1905, a partner of A & A Galbraith, cotton spinners in Glasgow, of which J Colville was also a partner; Douglas Mann Hannay (1848-1928), partner of Kelly & Co, cotton brokers in Glasgow; and Robert Gilchrist Paterson (d.1938), manufacturer in Helensburgh.[31] When Caldwell died in 1907, James Reid, Thomas Reid's son, became a director (Table 1).[32]

The second chairman, John Colville, joined the partnership of A & A Galbraith in 1874, a firm which had been established by his uncles, Archibald and Andrew Galbraith. In 1883 he withdrew from A & A Galbraith to join the Glasgow Cotton Spinning Co Ltd, but he rejoined the family firm in 1890,

becoming a partner in 1906, while remaining a director of the new company. He retained a directorship in the family business until it was voluntarily liquidated in 1915. Colville held the chairmanship of the Glasgow Cotton Spinning Co Ltd until 1917, remaining a director for a further three years. Like Thomas Reid, Colville joined the boards of several non-cotton spinning businesses, mainly financial, including the Scottish Life Insurance Co Ltd, Stobcross Estate Co Ltd and the Savings Investment Trust Ltd.[33]

During Colville's chairmanship, the number of spindles increased from 75,000 in 1889 to 138,000 (93,000 mule, 36,000 ring and 9,000 doubling) by 1910; by contrast, spindleage of the Clyde Spinning Co Ltd remained 75,000 during the same period.[34] However, while expanding its production capacities, the company gradually became dependent on overseas markets as the British dyeing industry declined due to competition from foreign countries.[35] Consequently, the earlier high dividends of the Glasgow company were not sustained (Table 2). Nevertheless, the chairman remained optimistic as he proclaimed in the annual report of 1905:

> [Shareholders] ought not to be unduly depressed with a year or two of bad trade, nor throw away their shares at a half or two-thirds their value. The cotton trade has been sick, but it has recovered and is not going to die just yet.[36]

The chairman's optimism did become a reality as dividends increased dramatically after 1905. However, these good years were soon followed by further bad years (Table 2). Subsequently, subscribed capital was reduced from £175,000 in 1890 to £105,000 by 1906, although loan capital was kept to a minimum, decreasing from £62,804 in 1898 to £19,367 in 1909 and then to £13,321 by 1918.[37]

In 1918 the chairmanship of the Glasgow Cotton Spinning Co Ltd was taken up by Douglas M Hannay who had long been associated with the cotton trade through his family firm, Kelly & Co, cotton brokers, and several other textile businesses including the Champ Danny Jute & Co. Hannay also held directorships of tea-related subsidiaries of James Finlay & Co Ltd, Tenom (Borneo) Rubber & Co and Sudan Plantation Syndicate Ltd. Hannay presided over a boom period with the quoted price for the company's shares increasing by one and a half times to fifty shillings per £1 share. It was in these buoyant circumstances that the Glasgow Cotton Spinning Co Ltd, together with the Clyde Spinning Co Ltd, was acquired by the Smith and Barber-Lomax families of Lancashire in 1920.[38] *The Glasgow Herald* later assessed this event:

> It was largely due to [Hannay's] exertion as chairman that the shareholders ... obtained such good terms when the business was sold.[39]

The acquisition occurred in a speculative mood, and 'unfulfilled hopes of quick profit'[40] led the Lancashire businessmen to run down not only the two Glasgow companies but also, consequently, Glasgow's cotton spinning industry itself.

The ownership structure of the Glasgow Cotton Spinning Co Ltd was also similar to that of many Oldham companies in the sense that capital was raised mainly locally by small investors. A study of four Oldham companies in 1874, 1876, 1881 and 1884 has revealed three general features concerning ownership. Firstly, in each company more than fifty per cent of shares were taken up by residents in Oldham; most of the remaining shares by those in the Manchester area, Southport or St Annes-on-Sea. Secondly, the average size of shareholding was less than 100 shares. And thirdly, shareholders were mainly manufacturers, merchants and local traders.[41]

This type of ownership structure also applied to the Glasgow Cotton Spinning Co Ltd: more than ninety per cent of both shareholders and subscription came from the Glasgow area before 1920, and more than eighty per cent of shareholders held less than one per cent of total shares each.[42]

The first subscription of 1884 illustrates the general character of ownership in the Glasgow company: shareholders numbered 150; nominal capital was £100,000, with the denomination of £10, of which £96,340 was taken up. Firstly, 111 shareholders (seventy-four per cent) were Glaswegians and their total subscription was £65,780 (sixty-eight per cent). The remaining shareholders and their subscriptions are as follows: twenty-three shareholders (fifteen per cent) with the subscription of £22,760 (twenty-four per cent) were residents in the adjacent counties such as Dunbartonshire, Lanarkshire, Renfrewshire and Stirlingshire; eleven shareholders (seven per cent) with £2,888 (four per cent) in the rest of Scotland; and only three shareholders (two per cent) with £1,700 (two per cent) in England.

Secondly, 117 shareholders (seventy-eight per cent) owned less than one per cent (ninety-seven shares) of the total shares each with the total subscription of £29,840 (thirty-one per cent). On the other hand, twenty-eight investors (nineteen per cent) subscribed between one per cent (ninety-seven shares) and five per cent (481 shares) of the total shares each with the total of £41,500 (forty-three per cent). The remaining five shareholders held 500 shares (five per cent) each with the combined total of £25,000 (twenty-six per cent): they were James Black of Duntoucher; Archibald Orr Ewing of Glasgow,

dyer; James Stevenson of Glasgow, merchant; Douglas M Hannay of Glasgow, cotton broker; and Thomas Reid of Milngavie, dyer.

Thirdly, the five directors of the company invested collectively £11,100 (eleven per cent): Thomas Reid, £5,000; John Colville, £2,500; Robert Fraser, £1,500; William J Walker, £1,000; and Andrew Paterson, £1,000.

Fourthly, occupations of shareholders were diverse. Large and small merchants (sixty shareholders, forty per cent) constituted the largest group with the total subscription of £30,010 (thirty-one per cent), and nineteen manufacturers (thirteen per cent) subscribed collectively £16,100 (seventeen per cent). Other occupations included cashier, clerk, stockbroker, engineer, banker and chartered accountant. Unlike the case of many Oldham companies, proxy shareholding, nominee shareholding or bank shareholding on behalf of private investors are not found in the case of the 1884 shareholding of the Glasgow Cotton Spinning Co Ltd.[43]

The new board of the Glasgow Cotton Spinning Co Ltd in 1920 consisted of five Lancashire businessmen with diverse business interests; no former directors continued to be involved in the new board. The new management was under the control of two families, namely Smiths and Barber-Lomaxes; Thomas Smith was the chairman and James C Smith the managing director. Thomas Smith, director of the Astley & Tyldesley Colliery Co Ltd, Tyldesley, near Manchester, the Alder Spinning Co Ltd, Leigh, and the Clyde Spinning Co Ltd, Glasgow; James C Smith, director of the Clyde Spinning Co Ltd; George Holden, director of the Alder Spinning Co Ltd and the Bedford & Mill Lane (1920) Spinning Co Ltd, Leigh; Joshua Barber-Lomax, director of Joshua Barber & Co Ltd, cotton waste merchants, and Cannon Brothers Ltd, cotton spinners, both of Bolton; and Joshua Arthur Barber-Lomax, director of Arthur Bromiley & Co Ltd, cotton manufacturers, Bolton.[44] In 1924 Joshua Barber-Lomax was replaced by Charles H Holgate, director of Cannon Brothers Ltd and the Clyde Spinning Co Ltd; three years later Ernest Hirst, director of Mons Hill (1919) Ltd, Todmorden, and the Manchester Raw Cotton Co Ltd, joined the board of the Glasgow Cotton Spinning Co Ltd (Table 1).[45]

The Lancashire directors saw a loss of £12,999 with no dividend in the first year of their management, and with the exception of a profit of £5,996 in 1925, there were again losses of £24,670 in 1926 and £20,787 in 1927; no dividends were distributed between 1921 and 1925 (Table 2). Consequently, while subscribed capital remained £105,000, loan capital rapidly increased from £13,321 in 1918 to £30,061 in 1921 and then to £85,879 by 1926. Liability,

which remained less than £200,000 before 1920, also increased from £148,154 in 1918 to £276,030 in 1921 and then to £304,770 by 1926 (Table 3).

Table 3

Liability, 1909-1927 (£)

1909	170,317	1919	179,284
1910	168,712	1920	289,294
1911	174,982	1921	276,030
1912	148,259	1922	290,166
1913	139,528	1923	290,171
1914	151,567	1924	284,535
1915	145,783	1925	282,432
1916	147,289	1926	304,770
1917	151,138	1927	323,555
1918	148,154		

Note: All the figures include £105,000, the share capital. Other items in liability are loan account, reserve fund, sundry creditors, bills payable, temporary loan, profit & loss account, unclaimed dividend, fund for renewal of plant, provision for postponed repairs, bankers, excess profits duty & corporation, etc.

Sources: Statement of accounts (balance sheet from 1920), the Glasgow Cotton Spinning Co Ltd, SRO, BT 2/1293

These poor results seem to have been partly due to the unfavourable trade environment, an important aspect of which was that Lancashire's main export markets in the Far East collapsed after the post-war boom of 1921.[46] By 1928 the Lancashire directors were forced to resolve on the winding-up of the Glasgow company and the Glasgow Cotton Spinning Co Ltd was legally dissolved on 29 November 1932.[47]

The Glasgow Cotton Spinning Co Ltd ended its forty-five-year life in 1928 by failing to overcome the changing circumstances of its trade. As the Oldham limited company in Scotland, the company was successfully managed until 1920 by the nine Scottish businessmen under the chairmanships of Thomas Reid, John Colville and Douglas M Hannay. The company rewarded investors with modest dividends for most of the years before 1920 with more than ten per cent for several years.

In the boom period following the end of the First World War, however, the Scottish businessmen detached themselves from the company, selling it to the Lancashire businessmen. The sale itself may not have been unusual during the

period of take-over bids after the War. If the Scottish businessmen had reasonably held a pessimistic view on the future of both the cotton industry and their company, they would have been wise enough to sell the company when its share values were high enough.

However, it is rather dubious that the sale of the company was the best and wisest decision. When the Lancashire businessmen acquired the Glasgow company for the purpose of speculation, they must have had their own prospect, presumably optimistic at least in the short run, about the future of the cotton trade. If this was the case, the sale of the company would appear to be prompted by the misjudgement of the Scottish businessmen. If the Scottish businessmen had maintained capital, experience and right methods which were the basis for the earlier success, they would have managed better than the Lancashire successors.

NOTES

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Abbreviations

BH *Business History*
DBB D J Jeremy & C Shaw (eds), *Dictionary of Business Biography*, 5 vols. (London, 1986-8)
DSBB A Slaven & S G Checkland (eds), *Dictionary of Scottish Business Biography*, 2 vols. (Aberdeen, 1986, 1990)
GH *Glasgow Herald*
SEOI *Stock Exchange Official Intelligence*
SRO Scottish Record Office

1. M Mclean (ed), *Local Industries of Glasgow and the West of Scotland* (Glasgow, 1901) p.145.
2. For the general trend of the cotton industry in Scotland, see A Slaven, *Development of the West of Scotland, 1750-1960* (London, 1975) pp.105-10; R H Campbell, *Scotland since 1707* (Edinburgh, 1985) pp.87-91, R H Campbell, *The Rise and Fall of Scottish Industry, 1707-1939* (Edinburgh, 1980) pp.57-9; A J Robertson, 'The Decline of the Scottish Cotton Industry, 1860-1914', BH, 12-2 (1970) pp.116-26; T J Byres, 'The Scottish

Economy during the Great Depression, 1876-96' (unpublished BLitt Thesis, Glasgow University, 1963) pp.36-57.

3. *Textile Manufacturer*, 15 Nov 1889, p.449; N J Morgan, 'John Colville' in DSBB, Vol.1, p.338. For the general trend of the Turkey-red dyeing industry, see Byres, thesis, pp.89-90; Campbell, *The Rise and Fall*, p.59; C G Doherty, 'The Growth and Decline of the Bleaching, Printing and Dyeing Industry in the Vale of Leven', *Scottish Industrial History*, 8-2 (1985).
4. The limited company movement had its origin in the co-operative production movement of the 1850s which believed that workers should hold shares of capital for profits. An important momentum for the co-operative movement was the Companies Act of 1856 which encouraged investment of the working class. A subsequent development was the establishment of the Oldham Building & Manufacturing Co Ltd (renamed the Sun Mill Co Ltd in 1867) in 1858, which became 'the inspiration and model for the various Oldham Limiteds formed during the 1870s and 1880s' (P L Cottrell, *Industrial Finance, 1830-1914* (London, 1983) p.107; R Smith, 'An Oldham Limited Liability Company, 1875-1896', BH, 4 (1961) pp.34-5; R E Tyson, 'William Marcroft' in DBB, Vol.2, pp.120-2.
5. J B Jeffreys, *Business Organisation in Great Britain, 1856-1914* (New York, 1977) pp.86-8; Cottrell, *Industrial Finance*, pp.108-9.
6. Jeffreys, *Business Organisation*, pp.89-90.
7. *Ibid.*, pp.91-3. 'The natural response of the entrepreneurs to the larger need for capital was not to search for a few men who could supply, say, £25,000 each, but to draw in the £100's of both of the merchants of the commercial cities and the shopkeepers and foremen of the industrial towns' (*ibid.*, p.93).
8. Jeffreys, *Business Organisation*, pp.90-1; Cottrell, *Industrial Finance*, p.111. Cf. Smith, 'An Oldham': there were sixty-two limited companies in 1880, eighty-eight in 1885, eighty-six in 1890, and eighty-four in 1896 (p.36, Table 1). Around sixty per cent of limited companies in Oldham in the 1880s were newly established, whereas turnover companies were few in number and neither successful nor popular (Cottrell, *Industrial Finance*, p.94).
9. Mclean, *Local Industries*, p.145; *Textile Manufacturer*, 15 Nov 1889, p.449; N J Morgan, 'Thomas Reid' in DSBB, vol.1, p.396.
10. *The Scotsman*, 17 Oct 1883, quoted from Robertson, 'The Decline', p.125.
11. Numbers of spindles - *Worrell's Directory*, 1898; capital - the Glasgow Cotton Spinning Co Ltd, annual returns, SRO BT 2/1293 and the Clyde Spinning Co Ltd, annual returns, SRO BT 2/1057. Other Scottish companies with more than 50,000 spindles in 1889 were: Robinson, Crum & Co (74,964 spindles), George Grand & Sons (69,000), James Clarkson & Co (61,000) and the Lanark Spinning Co (55,900) (*Worrell's Directory*, 1889). See also Morgan, 'Colville', p.338; J R Hume, *The Industrial Archaeology of Glasgow* (Glasgow, 1974) p.29.
12. D J Jeremy, 'Thomas Edmund Gartside' in DBB, vol.3, p.494.
13. Calculated from the collective capital of £3,498,667 in 1886. The average spindleage in that year was 65,342 with the collective spindleage of 5,880,820 (Cottrell, *Industrial Finance*, p.111).
14. The Glasgow Cotton Spinning Co Ltd, annual return, 1886.
15. Smith, 'An Oldham', Appendix, pp.52-3.
16. Morgan, 'Reid', p.396; SEOI, 1884; the Glasgow Cotton Spinning Co Ltd, the first annual return, 14 Mar 1884.
17. Smith, 'An Oldham', p.37.

18. Cottrell, *Industrial Finance*, p.111.
19. Smith, 'An Oldham', p.38. For the Royton Spinning Co, see A McIvor, 'John Brown Tattersall' in DBB, vol.5, pp.444-54 ; for the Shiloh Spinning Co, see Jeremy, 'Gartside', pp.494-8.
20. Jeffreys, *British Organization*, p.92.
21. D A Farnie, 'John Bunting' in DBB, vol.1, pp.506-7.
22. Tyson, 'Marcroft', p.122.
23. Morgan, 'Colville' and 'Reid', pp.338, 395-6.
24. *Textile Manufacturer*, 15 Nov 1889, p.449; Morgan, 'Reid', p.396; SEOI, 1900.
25. Morgan, 'Reid', p.397.
26. *Ibid.*, p.396; the Glasgow Cotton Spinning Co Ltd, annual returns, 1884, 1890; SEOI, 1884, 1890.
27. SEOI, 1884-1900.
28. Cottrell, *Industrial Finance*, p.110. See also Smith, 'An Oldham', pp.42-4 for the case of the Moorfield Spinning Co.
29. Farnie, 'Bunting', p.508.
30. N J Morgan, 'A E Ewing' and 'J Paterson' in DSBB, Vol.1, pp.353, 383-4; SEOI, 1894, 1897, 1900.
31. Morgan, 'Colville', pp.337-8; SEOI, 1901, 1904; the Glasgow Cotton Spinning Co Ltd, annual return, 1901; GH, 26 Nov 1928 & 27 Nov 1928.
32. Morgan, 'Colville', p.337; SEOI, 1908, 1920; the Glasgow Cotton Spinning Co Ltd, annual returns, 1908, 1920.
33. Morgan, 'Colville', pp.337-8; SEOI, 1901.
34. *Worrell's Directory*, 1889, 1910; Morgan, 'Colville', p.338.
35. Morgan, 'John Hyde Christie' and 'Colville' in DSBB, Vol.1, pp.322, 338.
36. The Glasgow Cotton Spinning Co Ltd, annual return, 1905, quoted from Morgan, 'Colville', p.338.
37. SEOI, 1890-1918; the Glasgow Cotton Spinning Co Ltd, annual returns, 1890-1918.
38. Morgan, 'Colville' and 'Paterson', pp.338, 385; GH, 26 Nov 1928.
39. Morgan, 'Paterson', p.385.
40. GH, 27 Nov 1928.
41. R Smith, 'A History of the Lancashire Cotton Industry between the Years 1873 and 1896' (Unpublished PhD Thesis, Birmingham University, 1954) pp.185-91 (quoted also in Cottrell, *Industrial Finance*, p.110). A similar pattern has been also observed with regard to the ownership structure of the Moorfield Spinning Co in Shaw in 1877 (Smith, 'An Oldham', pp.40-2).
42. The Glasgow Cotton Spinning Co Ltd, annual returns, 1884-1920.
43. Smith, 'An Oldham', p.41.
44. The Glasgow Cotton Spinning Co Ltd, copy of register of directors or managers, 8 Mar 1920, 20 Mar 1920, SRO BT 2/1293.
45. The Glasgow Cotton Spinning Co Ltd, annual returns, 1920, 1927.
46. M W Kirby, 'The Lancashire Cotton Industry in the Inter-War Years: A Study in Organizational Change', BH, 16-2 (1974) pp.146-7. See also J H Bamberg, 'The Rationalization of the British Cotton Industry in the Interwar Years', *Textile History*, 19-1 (1988); W Mass and W Lazonick, 'The British Cotton Industry and International Competitive Advantage: The State of the Debates', BH, 32-4 (1990); A J Robertson, 'Lancashire and the Rise of Japan, 1910-1937', BH, 32-4 (1990); G W Daniels and J

Jewkes, 'The Post-war Depression in the Lancashire Cotton Industry', *Journal of the Royal Statistical Society*, 42 (1928).

47. The Glasgow Cotton Spinning Co Ltd, certified copy of interlocutor, 29 Nov 1932, SRO BT 2/1293. See also The Glasgow Cotton Spinning Co Ltd, extraordinary resolution, 2 Sep 1928, SRO BT 2/1293.

Archive Report Number 10

National Monuments Record of Scotland

David C Eve

Royal Commission on the Ancient and Historical Monuments of Scotland

The National Monuments Record of Scotland originated, in part, as the Scottish National Buildings Record of Scotland, founded in 1941. Its aim was to undertake photographic and measured drawing surveys of buildings of historic or architectural importance, to gather or copy existing records of such monuments and make them available for public consultation. In 1966 the Record was renamed the National Monuments Record of Scotland (NMRS) and brought within the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS), which took over the survey role. This amalgamation widened the holdings of the NMRS to include material relating to archaeological as well as architectural monuments.

The recording of industrial sites and collecting of associated documentation is a major part of the RCAHMS activities and the NMRS holds an extensive range of material. Many industrial sites feature in the collections of photographs taken as part of the surveys regularly carried out by the Commission and collected by the Record. This also includes aerial photographs which provide much vital information about industrial landscapes and large sites, such as collieries.

One of the main collections relating to industrial sites is the archive of the Scottish Industrial Archaeology Survey (SIAS), a recording unit established at the University of Strathclyde in 1977, and transferred to the RCAHMS in 1985. The archive consists of drawings, photographs, field notes and printed ephemera relating to the full scope of industrial activity, with the brick and tile industries, watermills, windmills and agricultural prime movers particularly well represented. A comprehensive catalogue of this material has been produced by the SIAS.

A former member of the RCAHMS, Geoffrey Hay, recorded a broad range of individual monuments over many years (including material gathered to produce the Commission's publication *Monuments of Industry*, HMSO, 1986). The results of this work are deposited in the NMRS and constitute a valuable and wide ranging resource. Also covering the full spectrum of industrial monuments are the photographs taken by John Hume (formerly of the University of Strathclyde, now Chief Inspector with Historic Scotland) which

number several thousand and are gradually being accessioned into the NMRS collection.

The major collections concerning transportation in Scotland include the Rokeby Collection of photographs, postcards and printed plans relating to railway and stations throughout Scotland, collected and photographed by the Rev H D E Rokeby of Norfolk between 1920 and 1968. An inventory of stations featured in this collection, arranged by county, has been prepared. Photographic surveys of stations, bridges, signal boxes and other associated structures, carried out by the RCAHMS, also cover the whole country, with major surveys of Wemyss Bay, Kyle of Lochalsh, Elgin, Aberdeen, and Glasgow Central stations plus British Rail's St Rollox locomotive works at Springburn in Glasgow. The military roads of the Highlands and their bridges have been extensively studied by G Ronald Curtis and his research notes, surveys and index cards are held in the NMRS under his name. Other important material relating to bridges includes copies of photographs of the Tay Bridge, both during initial construction in 1876 and after the disaster three years later, with technical notes by Geoffrey Hay. Equally extensive photographic collections have been gathered from copied pictures and RCAHMS surveys relating to Kincardine Bridge, and the Forth Bridges. Engineering drawings for the airship shed at Inchinnan, constructed by Sir William Arrol & Co (1915-17) have been deposited in the NMRS by the company. The Northern Lighthouse Board has deposited a large collection of design drawings for 100 Scottish lighthouses, including those designed by the Stevenson family, plus an album of photographs and engravings of lighthouses and lightships. RCAHMS photographs also include several surveys of significant lighthouses and copies of a full set of design drawings for Bell Rock Light. They also extensively cover Scotland's canals, including thorough surveys of the Caledonian and Crinan Canals.

In the area of public utilities the Edinburgh Highways Board collection includes plans for the McDonald Road, Torphichen Street, Shrubhill and Portobello power stations, and a collection of drawings from the office of Leslie Grahame MacDougall's architectural practice includes designs commissioned by the North of Scotland Hydro-Electric Board in the 1950s. The recent presentation, by Scottish Power plc of the 'Scottish Power Collection', includes several hundred photographs of the post-nationalisation power station construction boom of the 1950s and 1960s, plus rare pictures of the construction of the Falls of Clyde hydro-electric scheme in the 1920s and a detailed record of Hunterston 'B' nuclear station's construction. In addition,

copious published and manuscript material from Glasgow Corporation Electricity Department, the South of Scotland Electricity Board and other bodies is included, dating from the 1880s to the 1970s. The gas industry is well represented by the substantial quantity of technical drawings held in the Scottish Gas Collection which covers the whole of Scotland from the mid-nineteenth century to 1965 and a large number of photographs, many recently arrived and awaiting accessioning into the NMRS. Copies of drawings of the oil gas apparatus at Abbotsford, the gas works at Balbirnie House, Kinfauns House, Carnwath and Elgin, and an album of photographs of Edinburgh's Granton gas works during construction (1899-1931) are also held, as are RCAHMS photographs of many gas works, such as Dalmarnock Road, Glasgow, where a major survey was undertaken. Two years ago an RCAHMS photographic survey of the Westfield Development Centre in Fife was completed in order to record buildings and equipment of the modern coal gasification research programme before closure.

The iron and steel industries are well represented by RCAHMS photographic surveys carried out over the years, including British Steel's Clyde Iron Works (Glasgow), Clydesdale Tubeworks, Ravenscraig Works and Gartcosh strip mill sites as well as Sir William Arrol & Co's Dalmarnock Iron Works and the Spring Garden Iron Works in Aberdeen. An extensive survey has also been carried out of the Kinlochleven Aluminium Works and the associated Blackwater Reservoir hydro-electric scheme.

A major collection of photographic and documentary material relating to many significant chapters in Scotland's engineering history has recently been provided by the presentation of the Sir William Arrol & Co collection to the NMRS by the company. The collection features much detailed material on the construction of some of Britain's major civil engineering feats (including the Forth, Erskine and Severn road bridges) and much of the company's overseas work. RCAHMS photographic surveys have also recorded the premises of other Glasgow engineering companies, including the North British Diesel Engine Works and Randolph and Elder's Engine Works. Despite the swift destruction of so much of Clydeside's shipbuilding facilities, RCAHMS surveys have recorded many important sites, including the Fairfield yard and Govan Graving Docks.

In addition to the valuable information yielded by aerial photographs of Scotland's mining districts, the MacKinnon and Harrison photographic collections, held in the NMRS, represent important records of the Ayrshire coalfield in the early nationalised period. Examples of other surveys in the

coalfields are those carried out at Bilston Glen and Monktonhall (Lothians field) and Rothes (Fife) before the sites were cleared.

The textile industries have created many significant monuments in Scotland and RCAHMS photographers have complemented the collection of contemporary illustrations and copies of drawings held in the NMRS to provide full records of sites such as Camperdown and Dens Jute Works in Dundee, Ferguslie Thread Works and Anchor Thread Works in Paisley, Grandholm Woollen Mills in Aberdeen and Houldsworth's Cotton Mill in Glasgow.

A distinctly Scottish industrial building type covered by NMRS photographic collections is the distillery, and several major sites have been surveyed, such as the Glenlivet distillery, as well as less well known locations like Bladnoch distillery, near Wigtown and Edradour distillery in Perthshire.

The above collections can be found through the architectural catalogue at the National Monuments Record, which lists the photographs, prints, drawings and manuscripts under the specific site location. In addition to this, the Scottish Industrial Archaeology Survey material has its own catalogue which includes indexes of site type and district while a catalogue also exists for the Scottish Power Collection which details the photographs and publications.

The National Monuments Record includes a great wealth of small collections of archive material, such as the recently donated Armitage Shanks collection, and more continues to be received. At a time when Scottish industry is undergoing dramatic change on several fronts, the work of the NMRS and the Royal Commission is playing an ever more vital role.

The National Monuments Record is located at RCAHMS, John Sinclair House, 16 Bernard Terrace, Edinburgh EH8 9NX (Tel: 031 662 1456) and is open to the public from 9.30am to 4.30pm, Monday-Friday (4pm Fridays). The NMRS welcomes contributions of material relating to the monuments of Scottish industry, and will be able to suggest other interested parties should such donations not be suitable for the collections.

Harbours, Whisky and Advertising: Report of the Business Archives Council of Scotland Surveying Officer, 1993-94

Kevin P Wilbraham
Business Archives Council of Scotland

Surveying activity this year has been extremely busy and far travelled, resulting in a great variation in the type of companies and records surveyed. These have ranged from harbour records in north west Scotland to life assurance records in the Borders. This constant flow of work has resulted from a positive response to enquiries sent to businesses, and requests for advice and assistance from companies and other archival institutions.

The main surveying operation carried out was on the records of the Standard Life Assurance Co which date back to the company's foundation in 1825. Over 350 linear feet of archives at Standard Life's record store in Peebles were listed and took over four months to complete. Like other life offices in Scotland, the Standard Life archives are very complete and include many different record types: sederunt books, ledgers and cash books, letter books, policy registers, as well as prospectuses in Cantonese! The collection provides a fascinating insight into the development of life assurance business at home and throughout the British Empire and highlights many areas of interest and significance, not only to the business historian, but also to historians of population and society: the strategic placing of local directors in major Scottish towns and cities to promote business; the acquisition of companies, in the form of the Edinburgh Friendly Insurance Society (est. 1720) and the Minerva Life Assurance Co (est. 1836) to accelerate growth in the home market; the establishment of the Colonial Life Assurance Co to accommodate British residents in the Colonies. Through the efforts of the Business Archives Council of Scotland (BACS), the records of the major life offices in Scotland are now accessible for research and it is hoped that this will stimulate some interest in these important, but largely unused, sources.

Another major surveying exercise was carried out on the initiative of the Highland Regional Archivist, Robert Steward, and centred on the north-west coast fishing industry. Given the rapidly changing nature of this historically important staple industry, it was decided to survey extant records to gain an overview of record survival and hopefully to encourage future preservation.

Some ten regional authority harbour trust and fish companies were surveyed, revealing useful source material, the most impressive of which were legal documents at Ullapool Harbour Trust, dating from 1788. These related to the British Fisheries Society and the subsequent development of the harbour. Other records, such as those at Kyle and Lochalsh Harbour and Mallaig Harbour Authority, highlighted the importance of the railway in the overall economic development of the north-west coast. Despite the importance of some of the records surveyed, it is evident that much of the written record is lost and that most of the information relating to the fishing industry now only survives in the oral tradition.

As well as these larger listing commitments many smaller surveys were also carried out. These included the publishers, Blackie & Sons Ltd, the Property Owners and Factors' Association of Glasgow Ltd and the Glasgow analytical chemists R R Tatlock & Thomson. Time was also spent in the world of finance surveying the records of the Committee of Scottish Clearing Bankers and the Airdrie Savings Bank, the last independent savings bank in Scotland, with records dating back to its foundation in 1835. Whisky once again featured on this year's agenda with two surveys carried out at Glen Grant and Longmorn distilleries in Speyside.

Perhaps the most interesting collection surveyed during the year, was that of the international advertising group, Rex Stewart Group Ltd. Started as a one man business in 1921, the company had its origins in early cinema advertising under Alex Howie, manager of the 'Waverley' Cinema near Shawlands Cross on Glasgow's south side. By advertising his cinema programmes in the form of posters, house film magazines, articles and newspaper advertising, Howie was able to draw large crowds to his cinema. Competitors were so impressed that they persuaded Howie to sell his Waverley Cinema and become their advertising agent. The new company was called the REX Publicity Service and occupied a two roomed office in Glasgow's Mitchell Street.

From these humble premises, the company prospered thanks largely to the spectacular boom in the new entertainment medium. By 1929, Associated British Cinemas was a major client and required massive advertising for the opening of its flagship, the Regal Cinema in Sauchiehall Street. The need to develop the ABC account led to the opening of a branch office in London in 1929. That year also saw the registration of the Rex Stewart Publicity Service as a limited company.

After the difficulties of the war years, when advertising space in newspapers was limited, the company continued to expand during the 1950s and 1960s.

This was largely due to the efforts of the Rutherglen born managing director, George Stewart, who later changed his name by deed poll to George Rex Stewart. During this period of rapid development, accounts were won with Howard & Wyndham to advertise their Glasgow and Edinburgh theatres: advertising was also handled for the Empress, Pavilion, Citizen's, King's and Alhambra Theatres in Glasgow and the King's and Lyceum Theatres in Edinburgh. Business also developed and diversified outside cinema and theatre, evident with the South of Scotland Electricity Board account and the Billy Graham Crusade account in 1955. In 1959 the company changed its name to Rex Publicity Ltd. This was followed in 1960 by the move of the Glasgow agency to prestigious new offices at 10 Clairmont Gardens in the city's west end, evidence of the company's growth.

The late 1950s witnessed many new developments in advertising, the main one being the advent of television advertising. After the establishment of Scotland's own commercial television network in the early 1960s, a television executive was appointed and an agency formed. Public relations also came to prominence at this time with campaigns carried out for Stakis, Red Hackle Whisky, Kahula and British Steel's Ravenscraig strip mill. However, the most important achievement at this time was the setting up by George Rex Stewart of an international network of advertising agencies known as the International Markets Advertising Agency. This allowed international companies and corporations to deal with one agency on a world wide basis.

During the late 1960s and throughout the next two decades the company enjoyed continued expansion through take-overs. These included the long established firm of H D Todd & Co who had on their books A G Barr's Irn Bru account. The London agency also acquired a 40% stake in Jeffries Harper & Partners who had been advertising managers for the Regent Oil Company and Shell Petrol. Through such take-overs and by the development of group agencies, Rex Stewart, by the late 1980s, was a major force in British advertising and the twelfth largest group in Europe. Despite all the success, it was decided that the future development of the group required a stronger London based advertising agency. As a result it was decided to merge with the London-based firm LOPEX Plc which controlled the Alliance international network of advertising agencies in Europe, North America and the Far East. The merger took place on 16 October 1989. The new company took the name of 'The Bridge/Alliance' and the Rex Stewart Group ceased to exist.

The archives of the Group summarised below and a fuller history of the company, by W D Scott and R B Ballantyne, are available for research at the

Business Records Centre, 13 Thurso Street, Glasgow, G11 6PE. Viewing is by appointment only and enquiries should be made through Vanna Skelley, Manager of the Centre (Tel. 041 330 5515).

The following summaries of companies surveyed during the year demonstrate the range and types of records located and listed. Any approaches to companies and institutions should be made through the National Register of Archives (Scotland), Scottish Record Office, HM General Register House, Edinburgh EH1 3YY.

Airdrie Savings Bank, Airdrie. Minutes 1835-1993; customer ledgers 1841-1953; customer address/signature books c.1860-1960; miscellaneous ledgers 1916-68; war loan cash books 1917-18; loan records 1922-73; investment records 1907-1961; premises records 1895-1970; plans 1919-83; miscellaneous records 1835-1937; records of Broomknoll Free Parish Church 1806-1914.

Ayrshire Dockyard Co Ltd, Scottish Maritime Museum. Specification books 1924-30; plans 1915-28; miscellaneous records 1912-68.

Biggart, Baillie & Gifford, solicitors, Glasgow. Trust sederunt books 1883-1972, trade association records 1891-1968; estate papers 1693-1968; company records 1789-1971.

Blackie & Sons Ltd, publishers, Bishopbriggs. Board papers 1890-1942; financial records 1827-60; letter books 1910-25; authors' agreements 1887-1920; photographic material 1899-1978; legal papers 1812-c.1917; administrative records 1890-1917.

Committee of Scottish Clearing Bankers, Edinburgh. Executive committee minutes 1945-66; Chief Accountants' committee minutes 1933-77; various sub-committee minutes 1957-80; general circulars 1945-63. **Federation of Scottish Banking Employees**. Executive committee minutes 1944-79; Joint Negotiating Council Minutes 1971-79; executive committee working papers 1971-80; Joint Negotiating Council Working Papers 1971-79; miscellaneous working papers 1959-76.

Gairloch Harbour. Accounting records 1973-76; landing records 1985-93; harbour sub-committee records 1981-89; miscellaneous records 1977-79.

Glen Grant Distillery, Rothes. Ledgers 1916-72; cash books 1953-71; invoice books 1882-1971; wage records 1965-1978; warehouse and stock records 1883-1975; delivery/order records 1938-41; letter books 1881-1966; production papers 1901-77; administration papers 1930-77; family papers 1773-1872; artefacts c.1750-1870.

Kinlochbervie Harbour. Accounting records 1977-87; vessel summary reports 1984-92; diaries 1971-92; miscellaneous records 1975-87.

Kyle & Lochalsh Harbour. Account book 1990-93; diaries 1990-93; berthage books 1990-93; photographic material c.1900-93.

Lochinver Fish Selling Co. Minute book 1938-50; profit and loss accounts 1949-56.

Lochinver Harbour. Diaries 1973-92; correspondence 1991-93; plan 1991.

Longmorn Distillery, Elgin. Board and legal papers c.1904-50; annual profit and loss accounts 1898-1983; ledgers 1932-60; cash books 1894-c.1960; invoice books 1894-c.1970; miscellaneous financial records 1899-1944; day books 1900-83; wage records c.1920-70; warehouse and stock records 1894-c.1960; letter books and

correspondence 1894-c.1970; administrative papers 1899-c.1970; miscellaneous records 1894-c.1970.

Mallaig Harbour Authority. Pre-harbour authority records 1950-69; minutes 1968-93; annual reports and accounts 1968-93; cash books 1968-80; wage books 1968-93; miscellaneous financial records 1978-83; diaries 1970-89; boat register 1968; fish dues 1977-83; administration files 1968-77; harbour development records 1972-84; property records 1971-81.

Portree Pier. Receipt book 1993; harbour diary sheets 1986-93; correspondence 1991-93; photographs c.1992; miscellaneous records 1991.

The Property Owners & Factors' Association Glasgow Ltd. Minutes 1875-1982; legal papers 1929-37.

Scottish Fisheries Protection Agency, Ullapool. Fishing boat registers 1869-1928; monthly landings books 1963-78; allotment book 1968-82; statistical tables books 1957-91.

Standard Life Assurance Company, Edinburgh. Sederunt books/minute books 1825-1984; letter books 1845-1937; reports and valuations 1839-1969; newspaper cuttings and advertisements 1866-1968; policy records 1825-1954; financial records 1825-1960; investment and investigation records 1835-1967; legal records 1832-1939; actuarial records 1880-1929; amalgamation records 1846-66; mutualisation papers 1924; Indian company 1870-79; miscellaneous records 1868-1951. **Bridgeton Land Co Ltd** records 1880-1988; **Colonial Life Assurance Co** records 1852-92; **East of Scotland Assurance Reversionary Interest & Annuity Co** records 1844-51; **Edinburgh Friendly Insurance Society** records 1846-50; **Experience Life Association Co** records 1843-92; **Heritable Securities Investment Association Ltd** records 1869-1909; **Heritable Securities & Mortgage Investment Association Ltd** records 1893-1970; **Legal & Commercial Life Assurance Society** records 1845-57; **Minerva Life Assurance Co** records 1836-1956; **Victoria Life Assurance Co** records 1838-65.

The Rex Stewart Group, advertising agency, Glasgow. Annual reports and accounts 1965-88; annual reports and accounts (subsidiary companies) 1971-83; executive directories 1974-83; administrative papers 1970-83; correspondence 1939-80; public relations material 1974-88; press cuttings 1962-88; publicity material 1946-80; Rex Stewart Associate News 1978-82; cinema advertising records c.1920-69; Rex Stewart histories 1922-88; International Markets Advertising Agency records 1960-86; photographs 1945-81; cinema advertising material 1920-64.

R R Tatlock & Thomson, analysts, Glasgow. Correspondence and working papers 1887-1960; experiment books 1893-1939; articles and publications 1888-1938; obituary notices 1907-c.93; miscellaneous records c.1890-c.1940.

Uig Harbour. Financial records 1986-91; diaries 1987-91; log sheets 1986-91; correspondence 1986-92; berthage/cargo files 1986-92; store order books 1987-92.

Ullapool Harbour Trust. Minute books 1912-83; yearly accounts 1960-69; legal records 1786-1951; miscellaneous records 1789-90.

William Spence (Huntly) Ltd, Aberdeenshire. Stock records 1970-78, pattern/order books 1938-41; cloth sample book 1927.

Business Archives News

1 Survey of Dean of Guild Court Records

The Scottish Survey of Architectural Practices, based in Glasgow University Archives is currently undertaking a survey of the records amassed by Dean of Guild Courts - the burgh planning authority unique to Scotland. This phase of the survey, funded by the Leverhulme, Carnegie, Manifold and Gordon Fraser Trusts, aims to locate Dean of Guild Court records and promote their use among historians.

Dean of Guild Courts originated as a means of settling mercantile disputes in medieval Scotland. The Dean of Guild also acquired legal jurisdiction over weights and measures, and boundary disputes; from the latter, the Edinburgh Dean of Guild Court developed general supervisory powers over buildings by the late sixteenth century. Glasgow copied this function in 1605. The Courts of other burghs did not develop this role; many declined or disappeared with the loss of duties to Town Councils.

Increasing concern over nineteenth-century urban conditions led to the revival of Dean of Guild Courts to supervise building activity in burghs. Some were established by local improvement acts after 1862, but the vast majority were constituted under the 1892 and 1903 Burgh Police (Scotland) Acts. By 1900, there were 106 Courts with powers over the erection, alteration and demolition of any building within burgh boundaries. A further eighty-four Courts were formed following the 1903 Act. Dean of Guild Courts continued to administer building control regulations in burghs until their abolition at local government re-organisation in 1975.

The early business of Scotland's Dean of Guild Courts is recorded only in minute books, with the exception of Edinburgh. Uniquely, petitions to the Edinburgh Dean of Guild Court exist from the seventeenth century; plans survive from the 1760s. For the rest of Scotland, petitions and plans submitted to Courts survive from the late nineteenth century, together with registers and minute books detailing the passage of petitions through the Court. These records can provide the Master of Works' reports on proposals; the objections of neighbouring proprietors and Court members; and plans, sections and elevations of all buildings erected or altered. As such, Dean of Guild Court records constitute an invaluable source for the study of architecture, building activity and local government in late nineteenth and twentieth century Scotland.

The survival and whereabouts of Dean of Guild Court records is haphazard. Local government re-organisation resulted in the dispersal of documents between a variety of departments at both district and regional level; in addition, the drawings for many burghs failed to survive the upheavals of 1975. Coverage across Scotland is patchy;

some districts are well-covered, others have few records. Happily, however, the drawings and registers for the larger burghs' Dean of Guild Courts tend to be more complete than the records of smaller Courts. The results of the Dean of Guild Court survey will be published in a comprehensive guide to Scottish architectural sources in 1996.

Rebecca Bailey (Surveying Officer) and Iain Gray (Archivist) of the Scottish Survey of Architectural Practices can be contacted at the Business Records Centre, 13 Thurso Street, Glasgow G11 6PE (Tel. 041 330 5515).

2 British Rail Records

The Railways Act 1993 came into effect at the beginning of April this year, and with it the break-up of the largely unified Scottish railway structure. This has put at risk large quantities of railway records which were in danger of being summarily cleared out of offices and storerooms as the deadline approached. In the three months from November to the end of January, Scottish Record Office (SRO) staff assessed some 4,000 feet of administrative records (mostly dating from the 1960s and later) in the Muniment Room at Scotrail House in Glasgow. 1,000 feet of records of potential historical value were transferred to the record store at Granton, Edinburgh, using up almost all the SRO's remaining spare storage space until the new building, Thomas Thomson House at Bankhead Drive, Edinburgh, becomes available towards the end of 1994. Twenty-nine sacks of plans, mainly relating to lines once part of the Glasgow & South Western Railway, some going back to the 1840s, have been collected from Scotrail's Shettleston store. In this case a selection was made by an experienced member of Scotrail's technical staff. A large collection of modern photographic negatives and slides of all aspects of Scotrail's operations was also tentatively offered to SRO, but in the end the new Scotrail train operating organisation decided to take them over as working records. All other records which were discovered through the SRO's enquiries, or which British Rail (and former British Rail) staff gave notice of, have been followed up and the records rescued in time, in one of the largest salvage operations ever conducted by the SRO.

Under the new Railway Act, the current British Rail Advisory Panel on Records will be replaced by a statutory Railway Heritage Committee. The legislative scheme under which this will operate is still being drafted under the aegis of the Department of Transport. It will have jurisdiction only over the records of the British Railways Board and any publicly owned companies. The SRO was not represented on the main committee as originally proposed, but they have now negotiated successfully for a seat. The main immediate risk is that records might be destroyed within the new structures

before the Heritage Committee can begin to function. It is hoped to reduce this by making contacts within the new organisations as soon as possible.

3 British Coal Records

The privatisation of the coal industry also began to take effect this year. Most of the Scottish records of British Coal are now centralised at their record centre at Lady Victoria Colliery, Newtongrange, where they are adequately stored and well organised. They include administrative records of the post-war mining industry from all over Scotland and a collection of some 40,000 mining plans. British Coal have agreed to keep the records there until the SRO's new record repository is available. There has been no change of heart by British Coal about the 10,000 'abandonment plans' of mines, which are required for current technical purposes. They have been centralised at Bretby in Derbyshire, although microfilm copies and a catalogue will be available at British Coal premises in Edinburgh. British Coal themselves were unable to say whether the new Coal Authority would maintain the plans centre at Bretby in the long term, and it may yet be that the Scottish plans will find their way back to Scotland.

4 Shipbuilders' Records

The SRO's catalogue of the main records of Scott Lithgows is now complete and available to the public in the Search Room at West Register House. The records themselves were transferred in February to Glasgow University's Business Records Centre at Thurso Street. There is, however, a substantial late addition to the collection, which is still to be sorted and catalogued but it will eventually join the rest of the records in Glasgow.

5 Local Government Reform

The main record clauses in the Local Government Bill have passed through the committee stage of the bill unamended. They will impose on the new authorities a statutory duty to consult the Keeper of the Records of Scotland about the arrangements they propose to make for the preservation and management of their records. The SRO has already been in informal consultation with various local authority archivists about the risks they foresee and the sort of arrangements they envisage as desirable and practicable. With the aim of getting planning under way at as early a stage as possible, the Keeper has written to existing local authority chief executives to offer the SRO's co-operation and assistance.

Summary Lists of Archive Surveys and Deposits, 1992-93

1 National Register of Archives (Scotland)

Full details of the surveys are available from the National Register of Archives (Scotland). All enquires and requests for access to material in private hands should be addressed to the Secretary, The National Register of Archives (Scotland), Scottish Record Office, HM General Register House, Edinburgh EH1 3YY.

ARCHITECTS

3362 **Dumfries Archive Centre.** Personal and business correspondence and architectural drawings and papers relating to Walter Newall (1780-1863) architect in Dumfries.

AGRICULTURE and ESTATE

832 **Lauderdale Muniments.** Lauderdale estate volumes, 1824-1961, including, letterbooks 1824-49, 1861-1919; labour books 1874-1961; estate ledgers and cash books 1865-1960.

2177 **Duke of Hamilton, Lennoxtown.** Valuations, offers, tacks and rentals of estate lands in Lanarkshire 1725-1834. Estate accounts and receipts 1757-98. Factorial accounts of Robert Brown of Dumbrexhill 1798-1838. Plan of estate of Orbiston 1804. Estate records (concerning Hamilton, Kinneil and Lennoxlove estates): rentals 1764-1945; auditor's reports on estate management 1846-62; factorial and other estate accounts 1759-1943; estate ledgers 1734-1950; cash books 1752-1961; repairs and improvements books 1831-1945; estate letterbooks 1788-1948. Lennoxlove estate records 1933-55. Register of mineral leases, quarterly returns and accounts 1832-1941. Volumes concerning specific pits, including Auchenheath, Avonbank, Kinneil, Parkhall, Redding and Shieldhall [1650]-1942. Financial records 1856-1951. Glasgow mineral depot 1838-40. Letterbooks, including correspondence with Edinburgh and Glasgow law agents 1838-1942. Journals of John Burrel, factor 1747-92. Volumes concerning Clanranald estate 1798-1811. Lanarkshire Commissioners of Supply minute book 1655-1702.

3258 **MacLean-Clephane of Torloisk and Carslogie.** Torloisk writs, family inheritance and other legal papers 1636-1835, some relating to: lands of Laggan Ulva 1729-1835; Jamaican affairs 1732-87; business debts of Daniel Maclean, merchant in Glasgow 1756-63. Correspondence 1675-1839, some relating to: Hector Maclean, merchant in Danzig 1764-65; steamboat service between Glasgow and Mull 1837; sale of British Fisheries Society land at Tobermory 1839. Torloisk estate papers and accounts 1733-1842, some relating to building works at Torloisk House 1780-1830s; kelp 1762-1821; linen manufacture 1821; local schools 1781-1839; road building 1809-36, including opposition to Argyllshire Roads Bill 1814-20; tacks 1750-1834. Accounts of Mull Meal Co 1754-57; rentals 1766-1826; list of the population of Torloisk estate 1837. Other estate papers: Auchinbreck 1759-64; Appletreeleaves 1725-64; Islay 1758-64; Kilsyth 1749-99, some relating to coal-mining, linen manufacture and postal services; Kinross 1799; Lochbuie 1730-64; Locheil 1762. Maxwell as Receiver of Collector General 1685-95.

Papers concerning county valuation, commissioners of supply and local administration 1685-1854. Kirkconnell estate papers 1635-1937, including: tacks 1665-1742; papers concerning timber and wood 1752-1891; estate accounts 1734-1845; papers concerning lead mining 1721-22 and 1863-73. Papers concerning Nith Navigation and fishings 1792-1939. Papers concerning insurance policies 1769-1906. Rentals 1808-27. Wages books 1822-27. Papers concerning Kirkconnell Grass Parks 1894-1920. Breoch papers: including correspondence 1674-1844, and estate papers 1676-1873.

FOOD and DRINK

3324 **Dundee City District Archives & Record Centre**. McKay Brothers of Carnoustie, jam and marmalade manufacturers. Accounting records 1938-72.

HARBOURS

3358 **Wick Harbour Trust**. Minutes 1880-1988; titles and other legal papers 1829-1960; accounting records 1880-1990; correspondence 1869-1990; registers of vessels 1860-1993; registers of tonnage, cargoes and dues 1851-1982; log books and diaries 1849-1940; registers of ratepayers and electors 1880-1965; weigh and fish landings books 1889-1974; nautical almanacks and tide tables 1887-1919.

INSURANCE

3317 **Scottish Amicable Life Assurance Society**. Board records 1824-1991, including, minute books 1836-1991; business books 1870-1947 and annual reports 1863-1990. Accounting records 1824-1988. Policy records 1826-1970, including, registers 1900-60, and list of policy-holders 1850-1910. Investment records 1824-1982, including ledgers 1882-1970 and Stock Exchange lists and registers 1908-84. Acturial records 1832-1977. Correspondence and letterbooks 1839-1946. Scrapbooks and newscutting books 1808-1961. Administrative records relating to Craigforth House 1946-83. Miscellaneous records 1837-1982, including, published tables 1837-1908; government annuity tables 1852-85; insurance magazines, printed returns and other publications 1821-1991; leaflets and pamphlets 1826-1975; directors' and other photographs, 1850s-1975. Australian branch records 1960-91, including accounting records 1960-87 and papers concerning sale of branch 1989. Records concerning West of Scotland Insurance Co, including minute books 1824-37. Records concerning West of Scotland Life Insurance Co, including minute books 1826-37.

POTTERY

3333 **Glasgow University Archives**. Armitage Shanks Bathrooms, Barrhead. Catalogues 1907-68; patents 1877-1951; production records 1943-46.

PROFESSIONAL ASSOCIATIONS

3319 **Glasgow University Archives**. Scottish Clerks Association: minutes 1886-1963; letterbook 1890-94. Glasgow Friendly Society: agent books 1941-45.

RETAILING

3318 **Shetland Archives**. T M Adie & Sons, general merchants and woollen manufacturers, Voe, Shetland. Accounting records 1880-1970; correspondence 1887-1969; articles of association 1903; plans of rural dwellings 1938.

3339 **R W Forsyth, St Boswells, Roxburgh-shire**. R W Forsyth Ltd, outfitters, Edinburgh and Glasgow. Ledgers 1872-1952; miscellaneous business documents 1886-1918; correspondence 1886-1981; publicity/advertising records 1900-80; newspaper cuttings 1889-1980; printed material 1891-1972; photographic material 1890-1972.

3349 **Orkney Archives**. Papers of Edwin Eunson. Nial Spence & Son, ship agent and chandlers, Kirkwall: accounting records 1867-1921; correspondence and specifications concerning sails 1926-60. Magnus Russell, general merchant, Shapinsay: accounting records 1880-1916.

SHIPPING

3320 **G & R Smith of Crowmallie, ship owners, Pitcaple, Aberdeenshire**. Letterbooks 1844-1923; diaries 1858-63; accounting records 1821-1928; family and estate papers 1880-1934; ship papers 1910-60; photograph albums 1880-1950.

TEXTILES

1453 **Dundee City District Archive & Record Centre**. Miscellaneous accessions. Report book for Dens works of Baxter Brothers, Dundee 1883-86; correspondence concerning jute business of Cox Brothers 1841-55; photographs of jute mills 1984.

3321 **Kilspindie Ltd, woollen manufacturers, Haddington** Administrative records 1974-84; accounting records 1927-76; yarn book 1963-66. *Records deposited in Edinburgh City Archives.*

3335 **Angus District Libraries**. Francis Webster & Sons Ltd, spinners and manufacturers, Arbroath. Accounting records 1892-1984; order and delivery records 1870-1990; letterbooks 1851-1934; production records 1873-1971; insurance records 1940-84; staff records 1871-1981; sales representative's notebook 1881.

3361 **Dumbarton Library**. Orr Ewing papers. Titles and papers relating to lands and buldings (including Levenbank Works) in the Balloch area 1786-1956; papers concerning the Forth & Clyde Railway Co 1853-1918; contract of co-partnery between Sir Archibald Orr Ewing and others 1886; plan of lands of Strathleven [c.1930].

TRANSPORT

1870 **Orkney Library**. Miscellaneous accessions. Aircraft movement log books 1972-84.

3338 **Highland Regional Archives**. Highland Scottish Omnibuses Ltd, Inverness. Minutes 1951-90; board papers 1966-91; accounting records 1952-89; marketing and planning records 1982-90; correspondence 1955-84.

3340 **Caledonian Canal Co (British Waterways), Inverness**. Annual reports 1803-1967; canal regulations 1860-66; ledgers 1890-1947; cash book 1877-

1907; wage records 1948-73; toll books 1950-67; property records 1950-82; miscellaneous documents 1802-1918; correspondence/business files 1904-67; diaries 1960-80; photographic material 1850-1981; miscellaneous records 1901-79.

MISCELLANEOUS

3328 **Alexander Morren Warrack**. Correspondence and related papers concerning Jamaican affairs of William and James Cruickshank, including papers relating to the slave trade 1791-1806; papers concerning Hugh Morren, merchant in Aberdeen 1816-32.

3344 **Falkirk District Museum**. Alloa Harbour and other papers 1874-1931. Bo'ness pottery papers 1788-1978. British Rail collection, including letters and accounts 1850s-1950s. Callander House and estate papers 1747-1933. Campbeltown shipbuilding papers 1890s-1939. Carron Co records 1839-1975, including plans 1860-67. Falkirk: building records 1862-1978, Burgh Merchants Association records 1894-1956. Forth and Clyde Canal records 1767-68. Grangemouth: Co-operative Society records 1904-64, Docks Co papers and plans 1823-1979. Ironfounders' catalogues and other records 1857-1979, including Avon Steel Works, Ballantine & Sons, Camelon Iron Works, Cruickshank & Co, Falkirk Iron Works, Lane & Girvan, Lion Foundry and Smith & Wellshot. Mining records 1907-60. Redding Pit Disaster papers 1923. Rollo Industries collection 1908-78. Stirling canal prospectus 1923; Thomas Wilson canal and dock log book 1842-46.

2 The Scottish Film Archive Acquisitions, 1993

Applications for access should be made to the Curator, Scottish Film Archive, 74 Victoria Crescent Road, Glasgow G12 9JN.

Golf Ball Factory (1961)
The Bishop's Mill (1978)
Scottish Record Office. SMT Lex Motors (uncatalogued)

3. Accessions to Repositories, 1993-94

The Royal Commission on Historical Manuscripts has supplied the following information on accessions to repositories relating to deposits of Scottish industrial, commercial and business collections. It should be noted that collections may not yet be available for research and all enquiries should be directed to the appropriate repository.

ACCOUNTANTS

David Strathie & Co, chartered accountants, Glasgow: ledgers 1904-34. *Glasgow University Archives Business Record Centre* (UGD338)

ADVERTISERS

Rex Stewart & Associates Ltd, advertising agents, Glasgow: annual reports and accounts, administrative and personal records, photographs 1939-92. *Glasgow University Archives Business Record Centre* (UGD336)

AGRICULTURE and ESTATE

Border Union Agricultural Society Ltd, Kelso: minute books, account and cash books, subscription books, letterbooks, subscription book 1813-1974. *Borders Region Archive & Local History Centre* (D/73)

Douglas family, Earls of Morton: estate papers 1535-1940. *Scottish Record Office* (GD150)

Dundas family of Ochtertyre: family and estate papers 1619-1897. *National Library of Scotland, Department of Manuscripts* (Acc 10719, transferred from the Scottish Record Office)

Forbes family, baronets of Newe: family and estate papers 17th-18th cents. *Aberdeen University Library* (MS 3402)

Robert Mack, tenant, Lauder: rent and commonplace book 1671-94. *Borders Regional Archive & Local History Centre* (SC/B/49)

Mackenzie family of Fawley Court: accounts relating to Scottish estates 14th-20 cents. *Buckinghamshire Record Office* (AR 1/93)

McLean family of Plantation: estate papers 19th-20th cents. *Strathclyde Regional Archives* (TD1282)

Stuart family of Annat: Rait estate papers 1806-95. *Perth & Kinross District Archive*

AUCTIONEERS

Thomas Corson & Co Ltd, auctioneers and livestock dealers, Oban: sale catalogues 1882-1975. *Argyll & Bute District Archives* (DR/17)

COMMUNICATIONS

Montrose Post Office: establishment books, absence records, register of recorded letters, salary records, minutes of Whitley Committee 1895-1968. *Montrose Library* (X/290)

CONSTRUCTION

Bearsden Building Services Ltd: corporate, financial, sales and technical records, wages books and correspondence 1920-90. *Glasgow University Archives Business Record Centre* (UGD340)

Robert Stevenson & Sons, civil engineers, Edinburgh: records c.1770-20th cent. *National Library of Scotland, Department of Manuscripts* (Acc 10706)

FINANCIAL

Dunedin Fund Managers Ltd: records of predecessor companies 1873-1985. *Dundee District Archive & Record Centre* (GD/DF)

FOOD and DRINK

Brechin Brothers Ltd, butchers, Glasgow: share records, annual reports and accounts 1904-90 *Glasgow University Archives Business Record Centre* (UGD337)

Glen Tarras Distillery, Langholm: records 1876-1906. *Dumfries Archive Centre* (GGD 204)

Lambert Bros (Edinburgh) Ltd, whisky merchants: customer and distribution records 1950-69. *Glasgow University Archives Business Record Centre* (UGD341)

Ramsay family of Kildalton: family and estate papers, including some relating to distilling 17th-20th cents. *Strathclyde Regional Archives* (TD1284)

MINING

A Kenneth & Sons Ltd, coalmasters and brick manufacturers, Dreghorn: records 18th-20th cents. *Strathclyde Regional Archives* (ATD1275)

PROFESSIONAL ASSOCIATIONS

Fowlis Wester & Monzie District Nursing Association: minutes and papers 1945-93. *Perth & Kinross District Archives*

Glasgow House & Property Owners & Factors Association, Glasgow: Minutes 1875-1982. *Glasgow University Archives Business Record Centre* (UGD342)

PUBLISHERS

Bell & Bradfute, booksellers and publishers, Edinburgh: correspondence and papers 1758-1850. *National Library of Scotland, Department of Manuscripts* (Acc 10662)

Blackie & Sons, publishers, Glasgow: corporate, financial and staff records, authors' correspondence and publicity material 1808-1964. *Glasgow University Archives Business Record Centre* (UGD61)

Canongate Publishing Ltd, Edinburgh: records 1972-93. *National Library of Scotland, Department of Manuscripts* (Acc 10892)

***Chapman*, literary magazine, Edinburgh**: papers 1981-86. *National Library of Scotland, Department of Manuscripts* (Acc 10684)

T & T Clark Ltd, publishers, Edinburgh: correspondence and papers 1977-87. *National Library of Scotland, Department of Manuscripts* (Acc 10689, 10785)

Lochar Publishing Ltd, Moffat: articles of association, papers, catalogues and photographs 1988-92. *Dumfries Archive Centre* (GGD 177)

RETAILING

Northern Co-operative Society Ltd: records c.1860-1980. *Aberdeen City Archives* (Acc 81)

TEXTILES

Dundee Brattice & Waterproofing Co Ltd, brattice cloth, tarpaulin and waterproof canvas manufacturers: records 1944-84. *Dundee University Library, Archives and Manuscripts Department* (MS 86/VII)

Hardie & Smith, jute spinners and manufacturers, Dundee: records 1971-83. *Dundee University Library, Archives & Manuscripts Department* (MS 86/VI)

A & S Henry & Co (Dundee) Ltd, jute merchants: records, including those of subsidiary and associated firms, Dundee and Calcutta 1858-1982. *Dundee University Library, Archives & Manuscripts Department* (MS 86)

James McCaig & Sons, wool merchants, Galashiels: letterbooks, financial and sales records, stock books and miscellaneous records 1890-1973. *Borders Region Archive & Local History Centre* (SC/S/67)

Sidlaw Industries Ltd, Dundee: records, including some of predecessor companies 1915-88. *Dundee University Library, Archives & Manuscripts Department*

TRADE UNIONS

Forfar Factory Workers' Union: minute books 1937-74. *Montrose Library* (X/293)

National & Local Government Association: Orkney branch: records 20th cent. *Orkney Archives* (D67)

National Union of Railwaymen: Perth No.1 branch: minutes 1968-73. *Perth & Kinross District Archive*

Post Office Engineering Union: Aberdeen branch: records 20th cent. *Aberdeen City Archives* (Acc 83)

Roman Catholic Diocese of Aberdeen: secretarial papers relating to friendly societies 1806-1992. *Scottish Catholic Archives* (GD64)

TRANSPORT

C J A Robertson, railway enthusiast: papers relating to the history of Scottish railways 20th cent. *St Andrews University Library* (MS 38288-95)

Montague Smith, railway enthusiast: technical records, photographs and printed material 1857-1974. *Scottish Record Office* (GD456)

MISCELLANEOUS

Montrose Business Women's Club: minute books and cash books 1938-93. *Montrose Library* (X/291)

Scottish Central Bureau for the Employment of Women: minutes and papers 1898-1922. *National Library of Scotland, Department of Manuscripts* (Acc 10710)

National Dock Labour Board: Strathclyde Local Boards: minutes 1942-81. *Strathclyde Regional Archives* (TD1273)

Kidstons & Co, solicitors, Glasgow: trust and charitable records 19th-20th cents. *Strathclyde Regional Archives* (TD1277)

Stewarts, Nicol, D J Hill, solicitors, Glasgow: clients' records 19th-20th cents. *Strathclyde Regional Archives* (TD1280)

Richard Holden, merchants, Bristol: letters to his family in Dundee, including some relating to slave trade 1747-61. *National Library of Scotland, Department of Manuscripts* (Acc 10765)

Scott-Elliot family of Arkleton: papers relating to business and military service 1842-1908. *National Library of Scotland, Department of Manuscripts* (Acc 10831)

Wilson family of Pollokshaws: family and business papers 1852-1986. *Dundee University Library, Archives & Manuscripts Department*

4. Scottish Record Office Accessions, 1992

For further details contact The Keeper of the Records, Scottish Record Office, General Register House, Princes Street, Edinburgh EH1 3YY

Customs and Excise

CE52	Perth outport records	1824-1925
CE53	Montrose outport records	1824-1914
CE55	Kirkwall outport records	1750-1972
CE58	Bo'ness outport records	1868-1984
CE62	Inverness outport records	1861-1898
CE63	Kirkcaldy outport records	19-20 cent.
CE67	Alloa outport records	1786-1955
CE68	Grangemouth outport records	1831-1984
CE70	Dundee outport records	1855-1988
CE80	Arbroath outport records	1844-1988
CE82	Campbeltown outport records	1855-1982
CE88	Methil outport records	1940-1972
CE96	Burntisland outport records	1830-1973
CE99	Windygates outport records	1938-1939
CE103	Anstruther outport records	1823-1870
CE105	Wemyss outport records	1823-1873

(Records prior to 1 January 1963 are open to public inspection)

Private papers

GD1/1137 Papers relating to **Magnus Prince**, brewer, Edinburgh, 1679-20th cent.

GD1/1162 Letterbook of **Thomas Chalmers**, paper manufacturer, 1858-68. Principally business correspondence of owner of mill at Loch Mill, Linlithgow.

GD378 **Baillie Gifford & Co**, investment managers, 1909-86. Investment trust records, including Scottish Mortgage & Trust Co Ltd 1909-86; Second Scottish Mortgage & Trust Co Ltd 1912-69; Scottish Capital Investment Co Ltd 1925-69.

GD448 **Martin Currie Investment Management Ltd** 1850-1976. Investment trust records, including Edinburgh Railway Station Access Co Ltd 1850-1937; Scottish American Mortgage Co Ltd 1874-1956; North British Canadian Investment Co Ltd 1876-1949; Canadian & Foreign Investment Trust Ltd 1909-76.

GD452 **National Farmers' Union of Scotland** 1864-1986. Minutes 1913-1986; correspondence files 1933-85; financial records

1920-58; membership lists 1955-66; *Farming Leader* 1948-65; Chamber of Agriculture minutes 1864-1938.

GD454 **BP Oil UK Ltd** 1688-1970. Records formerly held at BP Refinery, Grangemouth, particularly shale oil operations in West Lothian and papers of James Young and Young's Paraffin Light & Mineral Oil Co.

Reviews

IAN JOHNSTON, ***Beardmore Built: The Rise and Fall of a Clydeside Shipyard*** (Clydebank District Libraries and Museums Department, 1993, pp.192)

William Beardmore & Co's Naval Construction Works at Dalmuir, the largest shipyard on the River Clyde, opened in 1906, and was closed twenty-five years later. Ian Johnston's history of the yard tells a fascinating story of technical achievement and commercial failure.

The Naval Construction Works was the creation of the steel maker William Beardmore (1856-1936), created Lord Invernairn in 1921, whose company manufactured heavy forgings and armour plate at the vast Parkhead Forge in Glasgow's east end. His motive in diversifying into shipbuilding was primarily to obtain lucrative warship construction contracts, and the latest engineering plant and shipbuilding facilities were installed at Dalmuir to enable the firm to compete with established warship builders such as the neighbouring John Brown's in Clydebank. After several lean years, Beardmores were awarded the contract in 1910 to build the Dreadnought battleship HMS *Conquerer*. The yard made a major contribution to the British 1914-18 war effort when, in addition to warships such as the *Argos*, the world's first flush-deck aircraft carrier, Beardmores supplied aeroplanes, field artillery, shells and tank components at Dalmuir, and began to build airships across the river at Inchinnan.

During the depression in the shipbuilding industry of the 1920s, the Naval Construction Works made heavy losses. Invernairn, ever willing to build 'anything that was up-to-date and was likely to be useful', preserved with aircraft production and diversified into locomotive building and the manufacture of steel house sections at Dalmuir. With few profitable shipbuilding orders, however, and burdened by crippling debts, Beardmores sold the yard in 1930 to the National Shipbuilders Security Ltd (NSS). NSS was a government-backed co-operative venture by the industry's leading firms, to reduce overcapacity in Britain by acquiring and closing uneconomic shipyards: Beardmores was one of five yards closed by NSS in 1931.

Johnston ascribes the failure of the yard to high operating costs, together with Invernairn's inability to develop close ties with the Admiralty and, crucially during the 1920s, with the great shipping magnates who might have been able to place life-saving orders for commercial vessels. He does not dwell on the serious difficulties confronting other areas of Beardmores' core and subsidiary businesses, and the effect of reckless borrowing which had practically bankrupted the firm by 1927. Johnston concentrates on the story of the yard itself, in the knowledge that the history of the firm and the struggle to restore it to profitability during the 1920s has already been written by John Hume and Michael Moss, in *Beardmore: The History of a Scottish Industrial Giant* (Heinemann Educational Books, 1979).

Beardmore Built is a thoroughly researched and lucid account of a quarter of a century of shipbuilding at Dalmuir. It includes a detailed description of the yard and its facilities, and of the nature of the work done by the thousands of men who were employed there. The book is The book is lavishly illustrated, with photographs culled mostly from the Beardmore Collection in Glasgow University Archives' Business Records Centre. The excellent maps, drawings, tables and diagrams, as well as the crisp lay-out and attractive design, are the author's own work. Clydebank District Council, who commissioned the work, have good reason to be pleased with the result: anyone with an interest in Clydebank or in Scottish shipbuilding will be delighted to hear that the author has been commissioned to produce a companion volume on the history of John Brown's.

Iain Russell — Glasgow University Archives

T R GOURVISH and R G WILSON, ***The British Brewing Industry 1830-1980*** (Cambridge University Press, 1994, ISBN 0 521 45232 5, pp.xxv + 690, £50)

Business history has, by long tradition, been written in large volumes, but even in that context this study is impressively weighty. It is, not surprisingly, the work of two authors whose remit stops and starts respectively at the First World War. It is a companion volume to Mathias' study of brewing in the long eighteenth century prior to 1830 and, although thirty-five years have elapsed between the appearance of the two volumes, this book is close to that earlier study in style and approach. As a result, it contains most of the virtues of the genre as well as some of its characteristic limitations.

The brewing industry experienced substantial changes during the century and a half covered by this book. Demand for beer rose spectacularly in the Victorian era with growing urbanisation and affluence, and in the buoyant decades after the Second World War. The industry fared less well in the two world wars, in the depressed interwar years, and in the most recent past as fashion has turned from beer to other forms of drink. The industry has always been big business. Even in the 1830s, partners in major London breweries were often required to subscribe £100,000 or more, and major companies like Trueman carried a substantial investment portfolio, and lent to retailers partly as a means of securing their custom, in addition to the main activity of brewing. Towards the end of the nineteenth century the industry went spectacularly public, as Guinness floated £6 million worth of stock in 1886. For many brewers public share issues were an essential prelude to the acquisition of a network of tied houses to protect business, a development characteristic of the last two decades of the century which transformed them into major property owners.

Besides the large metropolitan brewers, Victorian Britain had a host of small local breweries. Some of these flourished spectacularly, none more so than the Burton-on-

Trent companies which exploited their natural advantage of a local water supply with high mineral content suitable for pale ales, and the distribution opportunities opened up by the railway and a network of selling agencies. Output from the town's breweries increased from 50,000 barrels in 1830 to 3.5 million by the turn of the century, enabling companies like Bass to become major producers at a national level. Other breweries flourished because of suitable local water supplies, as in Edinburgh and Alloa. But there was scope for new firms. John Smith's of Tadcaster near Leeds grew from a local coaching inn which brewed its own beer. Nor was access to London or an extensive agency network needed for success. Georges of Bristol sold most of its beer at the end of the century through tied houses in the immediate area.

Like other major industries, brewing experienced significant changes in demand and structural readjustment in the twentieth century. The effect of this was often manifest in merger and rationalisation of production, even though the industry already contained a number of very large firms. No less than sixteen brewers had a paid-up capital in excess of £2 million at the end of the First World War. In the 1920s mergers were a response to stagnant demand and productive overcapacity. In the 1960s and 1970s the process was part of a wider merger boom as well as a response to expanding market opportunities. Change extended to distribution in the shift from rail to road, the growth of supermarket sales, and diversification of products. By the early 1970s the industry was dominated by six major companies, but that decade brought a new wave of mergers which absorbed even the largest brewers into massive conglomerates as Courage merged with Imperial Tobacco, while Watney Mann was taken over by Grand Metropolitan Hotels.

In the 1980s lager consumption rose while sales of ale and draught beer fell, and cans replaced bottles. Conglomerate rationalisation continued, and control over production became more concentrated. The threat of government regulation hovered in the background, as indeed it had for the past 150 years, worrying about competition and economic efficiency on the one hand and the threat of drink to social order on the other.

This is a very substantial volume which contains a mass of interesting historical detail and examines a variety of important issues, especially evolving industrial organisation. Its virtues are those traditional to business history, a thorough exploration of sources, a weight of diverse evidence competently marshalled, and a full exposition of a large number of important themes. Its limitations are also characteristic of the genre. Detailed narrative is not a convenient vehicle for analysis. Many of the crucial issues here are canvassed and explored rather than analysed and resolved. In recent decades a great volume of analytical literature has been published dealing with, for example, the nature of the firm as an organisation. There is no reference to that here, even though the subject matter is rich in the historical experience of just such change. This is a very worthy book, which encompasses a great deal of work, and it marks a significant achievement which business historians will doubtless recognise.

But those with rather wider interests may also feel that some excellent opportunities have been allowed to slip way.

Clive H Lee University of Aberdeen

GRAHAM DOUGLAS and MILES OGLETHORPE, ***Brick, Tile and Fireclay Industries in Scotland*** (RCAHMS, 1993, pp.95, 34 figures, 5 maps, 39 plates, £5)

At a time when the timber-framed house clad in facing brick is proliferating in Scotland, making brick a fashionable material again, this book is a reminder of how greatly earlier housing and industry was dependent on heavy ceramics. This subject has long been ignored by professional industrial historians. Although K W Sanderson has traced the history of the refractory manufacturers, a general survey of the industries is long overdue; this work goes a long way towards filling the gap.

The authors have sensibly begun with an introduction to the four main divisions of the industry - brick, tile, refractories and sanitary ware - giving a succinct description of the processes and plant involved and including illustrations of products, machinery and kilns. Kilns are usually the largest and most important structure encountered at ceramics sites, but are also often difficult to interpret; the descriptions of the main types and variants, illustrated with over a hundred excellent drawings, would alone make this book indispensable to the fieldworker and researcher.

The second main section of the book consists of a gazetteer of sites visited and recorded by the Scottish Industrial Archaeology Survey, a helpful glossary, and a bibliography. The gazetteer lists 233 sites, most of which have since been cleared; the debt owed to the Survey for its pioneering fieldwork is evident. It is preceded by three distribution maps covering the central belt. There are seven appendices listing the major heavy ceramics firms and the dates of operation of their works.

The book concludes with some thirty-nine plates, which serve to 'flesh out' the drawings and descriptions; the small scale and relative crudity of some operations, and the size and complexity of, for example, G R Stein's Manuel Works, is well contrasted.

The lack of an index is perhaps surprising, given the amount of detail in the text, although the logical arrangement of sections does help to make searching easier.

This is a classic example of the way in which the results of industrial archaeological fieldwork can be presented in a readable and stimulating way, helpful to the specialist and generalist alike. It combines happily a short history of its subject with a sound basis for further research; the material presented here is but a selection from the Survey records which must form the starting point for any researcher into the heavy ceramics industries of Scotland. This modestly-priced book will find a place on many bookshelves both in Scotland and further afield.

Matthew J Hume Summerlee Heritage Trust

SHIELA MACKAY, ***The Forth Bridge: A Pictorial History*** (HMSO, Edinburgh, 1993, pp.112, £11.95)

This book first appeared in 1990, one of the several published to mark the centenary of the opening of the world's first major steel bridge. It is a pictorial history of the construction project, which seeks to revise and update ***The Forth Bridge***, published in 1890 by the project's 'biographer', the engineer, Wilhelm Westhofen, and it includes nearly eighty photographs by the official photographer, the assistant engineer, Evelyn Carey.

Sheila Mackay takes the reader through each stage of the project, 1882-90, providing biographical sketches of the principle characters involved in the undertaking, describing the immense difficulties they faced in building a mile-long railway bridge over the Forth, and giving clear descriptions of the technical innovations and revolutionary feats of engineering skill required to complete the work. Each section of the text provides background information and commentary on the accompanying illustration. Fifty-seven men died and 461 others were injured in excavating the foundations and erecting over 1,500 tons of steel plates and girders, and Mackay describes the skills, working conditions and organisation of the multinational workforce which was assembled on the banks of the Forth to build what was described as 'the eighth wonder of the modern world'.

Industrial historians often seem to write only for other specialists or enthusiasts, employing a dry, highly technical style which the general reader finds at best wearisome, and sometimes quite incomprehensible. Mackay shows that this need not be the case: that the story of an industrial enterprise can be informative, without being sunk in a morass or production figures and financial statistics, or technical jargon and arcane mechanical detail. Like Ian Johnston, whose book on the history of the Naval Construction Works is also reviewed here, Mackay writes in a style to appeal not only to those with an interest in the history of a great industrial achievement, but to anyone with a more general interest in the period and the setting of the story.

Iain Russell Glasgow University Archives

D L G HUNTER, ***Edinburgh's Transport: The Early Years*** (The Mercat Press, 1992, pp.208)

This new edition of the classic study of public transport systems in Edinburgh and Leith has given the author a chance to add a quantity of new material, extend the period of study (now covering 1830-1986) and divide it into two volumes, this first one ending at 1919.

D L G Hunter's exhaustively researched material is organised by transport type, the main chapters being concerned with horse-drawn omnibus networks, cable trams and motor buses. A new chapter illuminates the period 1830-70, showing the fledgling public transport system of the time as composed of stagecoaches and railways whose routes ran across the city together with a bewildering variety of small horse-drawn omnibus operators.

The main chapter on horse-drawn services is dominated by the story of Edinburgh Street Tramways, the company which operated the city's omnibus network from 1871 until Edinburgh Corporation exercised its right to purchase the system in 1893. Although this is fascinating in its own right the centre-piece of the book has to be the chapter on cable-drawn trams, that strange and unusual breed of technology native only to Edinburgh, San Francisco and a select few other cities.

In addition to a history of the operators and the services they ran the author supplies a wealth of detail about the construction and operation of the system and a selection of apocryphal tales associated with the trams, including one about a drunk who would find his way home by hooking his walking stick onto the cable!

Since Hunter has also published a more detailed work on motor buses (*From SMT to Eastern Scottish*, John Donald, 1987) the corresponding section in *Edinburgh's Transport* has been reduced. However, more than enough is retained to compliment the other chapters. A section detailing the early operators includes information on several little known local automobile manufacturers while the bulk of the chapter tells of the Scottish Motor Traction Co which came to dominate the city's bus system after running their first service in 1906.

Though the book is well served with photographs it is unfortunate that the maps supplied are less than helpful in illustrating the routes of buses, trams etc. Indeed the text itself could have benefited from more sub-division of the copious subject matter and the provision of a national context and chronology. However, this does not alter the fact that this is an impeccably researched work and an indispensable resource in local and transport history.

David C Eve RCAHMS

GEORGE OLIVER, ***Motor, Trials and Tribulations: A History of Scottish Motor Vehicle Manufacture*** (HMSO, Edinburgh, 1993, pp.vii+103, £9.95)

The late George Oliver identifies fifty-eight different car-making enterprises in Scotland between 1897 and 1984. His book is a survey of the diverse individuals and businesses producing cars in Scotland from 1897 to 1931 with most attention devoted to events pre 1918. The book is based around brief summaries of the activities of early individual tinkerers, enthusiasts and hopefuls of the early auto age plus more extended treatment of the three most substantial ventures. Arrol-Johnston, Albion, and Argyll.

The text is ornamented by good quality photographs: fifty-five pictures of cars, twelve of advertisements and nine pictures of factories plus two portraits, a drawing and a poem. There are no footnotes or references to other reading and the personal style, including some reminiscences, is that of the enthusiast immersed in his topic.

The pattern of many entrants and few long-term survivors is evident in all car manufacturing industries before 1939. Oliver's principal contribution is in assembling the shifting cast of characters who passed across the stage of the early motor industry in Scotland. Information on most firms is limited, but the use of a few tables would have been helpful to indicate available information on levels of output, employment, and capital in the industry. In general the emphasis is on the different models produced and their technical features, especially engine design. Oliver explains the decline of the Scottish industry in terms of a failure to develop new models and an entrepreneurial preference for individualism which inhibited any transition to mass production. These themes are not explored in detail and, given Oliver's interest in technology, it is unfortunate that the issue of the car-makers' relationship to local engineering community is not explored. The book is fine as a survey of its subject and excellent for its many photographs. It should sell well in museums and will be of interest to motoring enthusiasts. Alternative sources are stronger in particular areas, notably of business history. For instance, McKinstry's recent article in the *Scottish Economic and Social History* and Brian Lambie's *Albion Owners Newsletter* are more complete guides to the fortunes of the Albion Motor Co. The major businessmen, such as George Johnston, emerge more clearly from the entries in the *Dictionary of Scottish Business Biography*, volume 1 (1986).

Michael French University of Glasgow

IAIN SUTHERLAND, ***Dounreay: An Experimental Reactor Establishment*** (author, Thurso, 1990, pp.122, available from the author, 18 Smith Terrace, Wick KW1 5HB)

The decision taken earlier this year to start winding down operations at Dounreay lends a rather nostalgic air to this history of a unique industrial site. Iain Sutherland's narrative focuses on the early development (from 1955 onwards) of the Reactor Establishment and its affect on the nearby town of Thurso, which is placed in its immediate historical context. A brief description of the development of Britain's military and civil nuclear programmes in the 1950s is also provided to establish a context for the Reactor Establishment.

As a member of the post-Aldermaston generation this reviewer was surprised to learn of the enthusiasm shown by the local people for the creation of the Dounreay Establishment. From a mid 1990s standpoint it is curious to recall that there was a period when nuclear technology was not only at the high-profile leading edge of contemporary science but also enjoyed a good public image. In such a context it is

perhaps less surprising that the arrival of the UK Atomic Energy Authority in Caithness should have been a cause for celebration. However, one cannot help but find the fact that construction work on the Sabbath was more of an issue than radiation leaks quaint and the Thurso Labour Party's 'Atomic Queen' Beauty Contest quite bizarre!

This book is full of such fascinating insights into the community that grew up around Dounreay. As a local resident Sutherland is clearly sympathetic to the Reactor Establishment personnel and their fate in the world of politics: blown this way and that by changing winds of political and public opinion.

Dounreay was not simply a reactor feeding electricity to the National Grid but more in the realm of an atomic science park, playing host to a variety of research and development roles including the world's first Fast Breeder Reactor. It is in addressing the Establishment's significance beyond the local that the book is rather lacking, for it does not go into any great detail about the actual purpose and operation of many parts of the site nor how successful they proved to be. Though the book clearly does not set out to be a technical history, the ultimate fate of Dounreay cannot be understood unless the decline in breeder technology is commented upon. Though key events at the Establishment are noted, and there are some excellent photographs and line drawings (though without helpful references), they amount to a rather frustrating overview.

This is a handsomely produced book that is in many ways more like a collective documentary record than the author's history. As such it is liable to stand apart from others that may emerge as Dounreay passes into the nuclear history books.

David C Eve RCAHMS

HENRY E KELLY, ***Scottish Sponge Printed Pottery, traditional patterns, their manufacture and history*** (The Lomondshire Press, Glasgow, 1993, pp.31, 20 plates, £4.50)

The history of everyday things has been much neglected by historians despite the popular appeal of heritage centres that recreate the atmosphere of the life of ordinary people in the past. Anyone who has visited such an attraction will instantly recognise the sponge decorated earthenware once to be found in daily use in most households. As Henry Kelly explains, just because it was made for regular use, it has received little attention from historians of pottery or collectors. This is an ambitious publication, going far beyond the geographical limits of the title to embrace all countries where spongeware has been found. One of the reasons for this decision is to demonstrate that ware made in one place was decorated in another, often far away from the country of origin. It is very much a book for the collector wishing accurately to attribute a piece. The marks, not always to be found on pieces, are illustrated and described and different patterns and styles are discussed. Much the largest section of the book, as the

title implies, is devoted to Scottish patterns, principally Bo'ness and the fine Glasgow firms, including Bells and Victoria. Tantalisingly, the author tells us that photographs showing workers decorating spongeware at the Victoria Pottery have been deposited at the People's Palace Museum, but these are not reproduced. The twenty colour illustrations in the centre of the book are well chosen, showing clearly the delightful quality of most spongeware. For the business or industrial historian, it is to be hoped that Henry Kelly will take his investigations further. There are regular hints at a large export trade to North America and dominion countries and references to the fact that colonists often took spongeware, and presumably other household items, with them. Apart from coming across cargo manifests from the late eighteenth century listing remarkable assortments of household goods or references to pottery in bills of lading, we know little or nothing about the scale or importance of this trade in everyday things, and yet it must have been this trade which contributed more than anything else to Britain's industrial hegemony in the mid-nineteenth century.

Michael Moss — University of Glasgow

EDWARD J BOURKE, ***Shipwrecks of the Irish Coast 1105-1993*** (Printed Power Press, Dublin 1994, pp.240)

In the Business Records Centre, we are regularly asked about shipwrecks, their position and the circumstances surrounding their sinking. This volume is a guide to 2,000 of the known wrecks off the Irish coast.

The book is arranged by county, starting with Louth, and following the coast clockwise round to Donegal. Northern Ireland has already been covered in *Shipwrecks of the Ulster Coast*. The wrecks are listed by ship name with date given where known, and a paragraph outlining the details of the sinking, and numbers of crew and passengers lost. The amount of detail given varies, as one would expect, and this can be frustrating at times This will perhaps encourage readers to explore other avenues of research to find out more about the wrecks that particularly interest them. There cannot, however, be many avenues left unexplored by Mr Bourke; his bibliography runs to some 247 items. Wartime losses are listed separately, with only the briefest of details given, as these could fill a book in their own right if listed in any detail.

Where dates are not known, none is given, but a rough date would be useful, even if it only gave the century of the wreck. In almost 900 years there have been many ships of the same name. Occasionally there are discrepancies in dates, for example the warship *Drake*, which was lost on 20 December 1694, is reported as being launched on 26 September 1786.

There is an alphabetical index of ship names at the back, which makes it easy to find any individual shipwreck. However, it only includes ships with their own entry in the main list. For instance, there is an entry for the schooner Henry, lost in Skerries

Roads in 1908 in a great storm. The entry mentions that two other ships were also lost in this storm, the *Orior* of Newry and the *Wavelite* of Maryport. These two are not included in the index.

On the plus side, the book is packed with local colour and anecdotes like the ghost of the PS Blaney, wrecked in 1833, which is reported to have been seen before the loss of several other ships around Carlingford Bar. The author has gone to a lot of trouble to find good illustrations of the wrecks. About forty are included, and they are without exception, impressive, and really bring the text to life, especially as many of the users of this book will never have had the opportunity to dive on a wreck.

This book will, I am sure be a valuable tool for divers and to Irish local historians, but will, perhaps, be used less frequently by historians this side of the North Channel.

Vanna Skelley

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