buy ground from his firm. This loan was all the more welcome in the light of the Society's failure to secure a loan from the other leading local shipbuilders Messrs. Archibald MacMillan & Son Ltd. This company had been approached as it was the Building Society's opinion that "...the workmen in their(i.e. MacMillan's) employ would be benefitted by this addition to the house accommodation of the town."16 In 1884 MacMillan's did in fact advance £1,000 to the society for the period of one year at 4% interest with the promise that the loan could be then renewed or repaid at the Society's choice. However in 1885, a year described as one of "...deep depression in the chief industries of our town"17; MacMillans called in their loan. The intimate connection between the state of shipbuilding and the house market in Dumbarton is demonstrated not only by the Building Society's struggle to raise funds but by the development of a tenants' movement which pressed local landlords for rent reductions in view of the prevailing local poverty and unemployment. The vicissitudes of the shipbuilding industry locally seems to have been the critioal factor in demand for houses, in housebuilding and in the cost of accommodation.

The contribution made by Dennystown, the Newtown and Knoxland to the growth of Dumbarton was substantial, not only by virtue of providing some 1300 houses, or perhaps sufficient for around one half of the increase in the town's population in the period, but also because these three Denny estates pioneered new areas of mass housing in the town. All three areas were to a large degree undeveloped before the intervention of the Dennys and the westward and eastward expansion of Dumbarton owes much to the initiatives of William and Peter Denny.

These substantial projects were clearly expensive undertakings which must have competed for funds with the more direct needs of the Denny business enterprises. What was the reason for the firm's involvement in such activities and what benefits did the firm gain from investment in working-class housing and supporting home-ownership among their workers? Obviously there was a cash return from the properties but nothing in the record indicates that the affairs of any of the estates were conduoted solely with a view to the maximisation of profits or the narrow advantage of the shipyard. At Dennystown the stated intention was to provide accommodation at moderate cost and as the houses were not let exclusively to employees and as no attempt was made to house all the firm's employees on the estate one may discount the more obvious forms of social control as a motive. The evidence on attempts to control overcrowding suggest an enlightened attitude which was not shared by all mid-century employers who built homes for their workers. The development of the Newtown was again marked by evidence of social concern; the provision of credit facilities, the insistence on basic building standards in the feued area and indeed the willingness to deal with individuals rather than turn the whole area over to a commercial developer all testify to this concern. The same concern was to be found later at Knoxland, where wide streets, open spaces and strict conditions of feu all witness to enlightened planning and care for amenity rather than a purely commercial speculation.

Much of this social concern finds reflection in the philanthropic activities which the Denny and indeed the MacMillan families undertook in the burgh. However it seems reasonable to assume that the involvement of the companies owned by these families in the housing field betokens some advantage to the companies concerned rather than simple philanthropy.

At the most obvious level there was clear benefit in providing a healthy environment for a fit and effective workforce. However the particular form the Denny's later involvement in housing took euggeste a more complex motivation. The population of Dumbarton was remarkably fluid. In one area of Dennystown for example only 11 out of 160 heads of households recorded in the 1861 census were still resident there ten years later. Other evidence on the unsettled nature of the local population may be found, for example, in a prese report of 1865.18 Thie, reporting on a shipyard joiners strike, noted that by the end of the dispute most of the workers had left the area to seek jobs elsewhere. The sharply marked booms and slumps in shipbuilding often forced firms to lay off ekilled workers and there was clear advantage in a firm being quickly able to re-engage key tradesmen when conditions improved and work was available for them. In an increasingly complex industry the recruitment and training of key workers was an important element in the success of a business and it was an area where Dennys placed a great emphasis. The firm for example arranged competitive examinations for apprenticeships in the drawing office, engineering and commeroial departments. It seems reasonable to suppose that if they were prepared to take trouble over recruitment and training then investment in the retention of skilled workers would be equally worthwhile.

The fact that the company's efforts at the Newtown and at Knoxland went into housing for skilled workers as opposed to housing for the poorer-paid unskilled labourers tends to give oredence to this view. When one investigates the original mortgagees of the Newtown cottages and the founder members of the Dumbarton Building Society one finds them almost all to be skilled shipbuilding tradesmen. Ths officebearers of the Dumbarton Building Socisty around the period of the Knoxland developments were a foreman carpenter, a foreman painter, a foreman joiner and a shipyard clerk. An analysis made by a Denny's director in 1884 showed that of the house-owning members of the society carpenters constituted 22.3%, joiners 15.6%, platers 15.6% and rivetters 12.2%, with other shipbuilding trades contributing smaller percentages.19 At this time no labourers were to be found in this category of membership. The society was overwhelmingly composed of the skilled elite of the shipyard artisans.

There is evidence that this investment in housing may have paid dividends in retention of the workforce. The purchasers of the Newtown cottages and the pioneers of the Building Society were very much more settled as a group than were, say, the Dennystown tenants. Owner-occupation seems to have made for a markedly higher stability of population. A study of census and valuation returns for the Newtown area has shown that while only 32% of a sample of ocoupants of rented accommodation noted in 1881 were still present after seven years no less than 82% of owner-occupiers were still resident at the same address after the same time.

Whatever the motives for the shipbuilders' involvement in housing or the efficacy of this involvement in commercial terms the effect of it on Dumbarton was significant. In his evidence to the Royal Commission on Housing in 1913 the Rev. J.D.Robertson, Secretary of the Social Problems Committee of the United Free Church describing the Newtown said "the first Mr. Denny (i.e,Peter), the Senior Partner, acquired the ground, built houses upon it at different parts there, and then with a margin of 3% on the actual cost he handed these houses over to the occupiers and they paid them off in the form of rent, and then there were workers Building Societies started...and a flourishing town built up...The general result of it is that between 800 and 1,000 of the workmen there own their own houses, and this was fostered by the enterprise of the shipbuilders. It is a most interesting case".20

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11. D.H. 21.5.1857

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15. D.H. 2.3.1881

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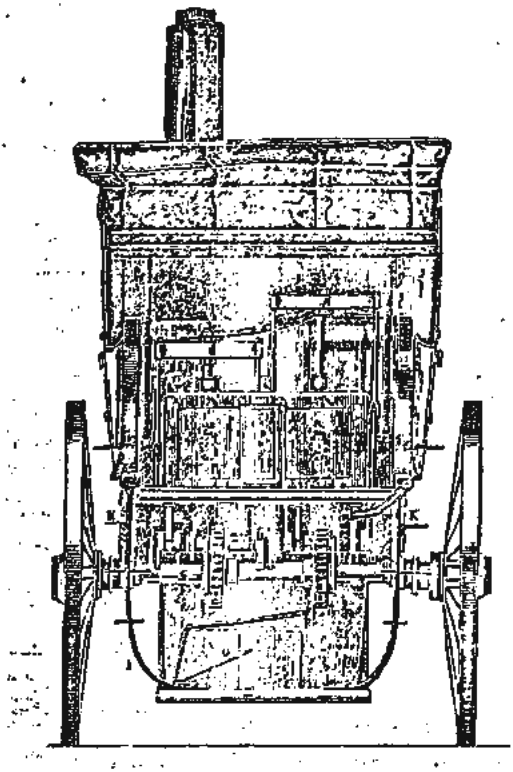
Mechanics' Magazine,
MUSEUM, REGISTER, JOURNAL, AND GAZETTE.

No. 663. SATURDAY, FEBRUARY 28, 1835. Price 6d.

RUSSELL'S STEAM-CARRIAGE ENGINE AND BOILER.

Fig. 1.



BRITAINS FIRST MOTOR COACH DISASTER - NEW LIGHT ON THE PAISLEY TRAGEDY OF 29 JULY 1834.

by

Colin C. Johnston.

The first accident involving a motor coach in Scotland occurred in the square of the Glasgow Cavalry Barracks on Wednesday 8 June 1831 when the boiler of one of Sir Goldsworthy Gurney's steam carriages was blown to pieces to the severe injury of two boys. The remains of this machine, found in the early years of this century in a shed by the Paisley road, are now preserved in the Glasgow Museum of Transport. It is probably the earliest surviving example in Britain of a mechanically propelled road vehicle. When it exploded it was not in motion (afterwards Gurney discovered that "several important parts" of the safety valve had been inadvertently removed) but the Paisley disaster was a different story. From 1 July - 28 July 1834 John Scott Russell's steam carriages were making six trips a day between George Square, Glasgow and the Tontine Inn, Paisley, covering the seven miles in an average time of 34 minutes with few breakdowns. Return journeys took about the same time for there were "spare tenders kept in readiness with a full supply of fuel and water, so that as one tender becomes exhausted, all that is necessary is to disconnect it, and attach another in its place".

Russell was only 24 when he succeeded Sir John Leslie to the chair of natural philosophy at Edinburgh University in 1832. Although the appointment was temporary, the models in his laboratory which included a "gas meter" a "railway" a "steam coach" and a "box containing canoe" bear witness to his obsession with the practical aspects of science. One can only speculate that the canoe was used in his important researches on the nature of waves and was the germ of the Great Eastern, but of the significance of the coach there can be little doubt. On 2 August 1833 he took out "Scotch" letters patent for an improved manner of applying steam engines to locomotive purposes. Included in the specification lodged on 2 December was an ingenious grasshopper suspension system whereby any irregularities in the road in no way interfered with the proper working of the spur gearing. The boiler took the form of a thin copper cube, the object being to reduce weight and facilitate pressure calculations. High working pressures and safety were achieved by braoing its interior with no less than 1,300 wire rods! An explosion was believed impossible since "the moment that the pressure begins to exceed the calculated maximum, the weakest of the rods will give way --- take off the pressure of the steam, extinguish the fire". As can be seen from the illustration taken from the Mechanics Magazine of 23 February 1835, the piston rods were connected by cross heads and side rods to two separate crank axles. The cylinders were 12" diameter x 12" stroke and were made of gun metal to reduce weight and minimise corrosion. Of 28 H.P., this engine could propel 30 passengers plus a steersman, an engineer, and a fireman and tender on a good turnpike road at an average speed of 12 M.P.H.

Little is known about William Dauney (d 1843) advocate in Edinburgh and later Solicitor General to British Guiana, except that he was virtually Russell's next door neighbour in a formerly very select part of Edinburgh's west end. Although his knowledge of engineering was nil, in June 1833 he secretly entered into partnership with Russell sinking £1,500 of his savings into a Steam Carriage Company of Scotland which promptly took a lease of Grove House Engine Works (believed to be in Leith) and a workshop near the Forth and Clyde Canal Basin in Glasgow. As works manager, Robert Pollock (later locomotive engineer to the London and Greenwich Railway) was entrusted with making the carriages "first for the business of the road between Edinburgh and Glasgow." This inter city bus service remained a pipe dream, but a station was actually built on the grounds of Sir James Gibson Craig near the Union Canal at (East) Hermiston and a copper water tank (later claimed by an irate landlord in lieu of unpaid rent) installed outside an inn at Mid Calder. Russell, "preparatory to running the carriages", surveyed the roads, made some experimental runs in Edinburgh, and secured cast-iron legal protection of his invention in both kingdoms. These incidental expenses came to £534, but the company sought to produce a quick return on capital by engaging in general engineering work long before its fleet of six carriages had fully taken shape.

At last on 1 July 1834 an experimental service was introduced between Glasgow and Paisley. Public demand was insatiable even though the fiery chariots had to plough through great quantities of road metal and boulders deposited by the trustees of the Glasgow and Paisley Road "in irregular masses and in the middle of the night". Undaunted, Pollock refitted the carriages with "wheels of great size and strength" but on 29 July the "off propelling wheel of No. 3 steam coach" gave way at Halfway House, three miles east of Paisley causing the whole weight of the vehicle to rest on the boiler which exploded killing five passengers. This was the first major disaster involving a "motor bus" on British, if not European, roads.

On legal advice, the company withdrew the carriages and determined to sue the Road Trustees for £30,000, the accident having "turned a prosperous undertaking into irretrievable loss". In November Dauney went to London to exhibit carriages 1 - 4 on the expectation that Mr. MacNeill, engineer to the Holyhead and Birmingham Steam Coach Company would purchase them and so increase the value of Russell's patent. For three weeks they operated very successfully between Hammersmith and Hyde Park Corner but remained unsold at an auction held in Covent Garden on 27 February 1835. Armed with advances of £800 from Charles Archibald of 3 York Terrace upon the security of the carriages, Dauney returned to Edinburgh to meet a mountain of unpaid bills from coppersmiths, iron founders and coach builders. Attempts to expand the general engineering work at Grove House failed and on 18 March 1835 the company and its partners were declared bankrupt. On 13 April it transpired that only £2622-4-4 was available to meet debts of £4,730-10-4. Proceedings dragged on until 12 September 1836, the greatest problem the liquidators faced being the disposal of the carriages. The relatives of the deceased passengers, it is strange to say, hardly figure at all in the legal and financial wrangles, though on 16 January 1836, a certain John Blakely, weaver in Charleston, Paisley, demanded £9-14-0 for "damages". Then on

17 August a lump sum of £700 was accepted from the Road Trustees as a satisfactory out of court settlement. By this time, Russell had sold all his furniture, but the real casualty was Dauney. With three children and a wife to support his finances went from bad to worse. He obtained little business as a practising advocate, but Russell's technical reputation had in no way been sullied indeed it increased. The Mechanics Magazine, generally a supporter of the railway, not the steam carriage interest, justly scorned the illiberal policy of the turnpike lobby everywhere against innovations in road transport, and the Union Canal willingly paid £250 after the disaster for the right to use Russell's patent for an "unlimited time" between Edinburgh and Falkirk only. Pollock faired better, being given a free licence to experiment with it in his spare time on the London and Greenwich. Since little is known of the fate of Russell's steam carriages, it seems appropriate to include the following additional information:

CARRIAGE NOS.

1 and 4. Shipped to London from Leith or Glasgow in December 1834, these were damaged during the voyage, and were repaired by James MacKenzie coachmaker, London and Braithwaite Milner & Coy. before being put into service between Hammersmith and Hyde Park Corner. Sold along with three tenders for £854 to James Johnston of Straiton at George Robins Covent Garden Auction Rooms on 30 May 1835.

2. On 10 April 1835 this was in store at Grove House Engine Works with three tenders "nearly completed" and was believed to be worth £615. However when auctioned at Carse's Coach Work in Leith Walk on 7 September 1836 along with a copper cistern to contain 180 gallons they realised only £121-13-10.

3. Badly damaged in the Paisley accident of 29 July 1834 its subsequent fate is unknown, but a list dated 10 April 1835 of miscellaneous items in the company workshop "at Glasgow Canal Basin" includes two coach door "with remainder of coach body".

5 and 6. Referred to briefly in Mechanics Magazine, but further particulars so far lacking.

7. Model steam coach in Russell's natural philosophy classroom at Infirmary Street, Edinburgh was valued at 12 shillings on 7 April 1835 and may have been sold after 2 June 1836.

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Acknowledgments

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JOHN TURNBULL AND THE HERCULES TURBINE

by
ALEX. RITCHIE

The following notes are the result of research stemming from the renovation of Nether Pollok Eastate sawmill by Glasgow District Council Parks and Museums departments. The sawmill is powered by a water turbine manufactured by J. and W. Jolly of Holyoke, Massachussets. It is dated April 17th, 1888. The maker's plate describes it as McCormick's Holyoke Turbine but it seems certain that it is of the type 'Hercules' and Holyoke was where they were developed. Thanks are due to Mr. John Clayson, Mr. David Lockwood, and Mr. Brian Hayton for their help.

Born in 1841 John Turnbull's early career is somewhat overshadowed by his military interests. One of the first to join the Volunteer movement in 1859, he was a member of the Queen's Guard of Honour when she opened the Loch Katrine water works that year, parading with the 1st Northern Company, 4th Lanark Rifle Volunteers.[1] As the movement flourished his name appears as a member of "P" company, 76th or Port Dundas corps of the 1st L.R.V.[2] When the Queen's Guard began to have annual reunions in 1879 Turnbull made a point of trying to be in Glasgow for the occasion, which fell on October 14th. One reunion he was unable to attend however, was that of 1899. Writing from New York, having been in Massachussetts, Turnbull expressed his regret but consoled himself with the thought that:

> "As a sort of compensation I was a witness of the great military spectacle here on Saturday last when 32,000 troops of all kinds paraded in honour of the arrival of Admiral Dewey from Manila, it was a great sight and took 5 hours to pass a given point".[3]

The lure of active service had taken young Turnbull to Italy where he served as a Redshirt in Garibaldi's English Legion. On his return he seems to have become a partner in a pattern-making business in London where he remained until in 1865 he came back to Glasgow and the Canal Basin Foundry of Turnbull, Grant and Jack, in which firm his father was senior partner. The younger Turnbull was admitted a member of the firm in 1870 and remained there until 1877, at which date he set himself up as a consulting engineer in offices at 184, Buchanan Street.[4] His special concerns were steam and water power, and it is in this latter connection that he is of most interest.

In 1879 he was approached by A. Pirie and Sons of Aberdeen with a view to replacing the vertical water-wheel and two Fourneyron-type turbines which powered their paper-mills. Before advising his clients Turnbull visited the turbine testing flume at Holyoke, Massachussets. According to James Emerson, formerly hydraulic engineer to the Holyoke Water Power Company, the 'Hercules'-type turbine had performed with the greatest efficiency of all types tested. It was this make of turbine that Turnbull recommended to Pirie's and it was to mark the beginning of a long-standing connection. Turnbull designed an installation using three 'Hercules' turbines enclosed in metal casings (one 54", one 48", one 42" on a 23' fall), generating 1200 H.P., arguably the largest water-power installation in Britain at that time.

The erection took place in the summer of 1882 and was executed by Messrs. Douglas and Grant of Kirkcaldy.[5] By this time Turnbull had already begun to supply 'Hercules' turbines elsewhere. His first was for A. Cowan and Sons of Penicuik (a 24" on a 14 foot fall, generating 44 H.P.). In all some 226 turbines were to be installed by him or his firm in the period 1881-1913.[6]

It should be made clear that there is no evidence that Turnbull was involved in anything other than the design of turbine installations. Most likely the construction work, as at Pirie's, was carried out by another firm. Moreover, although Turnbull appears in the Post Office Directories from 1886-7 as a turbine manufacturer, there is no works address. Consequently one must assume that he acted solely as an agent for imported American 'Hercules' turbines manufactured by the Holyoke Machine Company of Worcester, Massachussetts, and the brothers J. and W. Jolly of Holyoke.[7] This assumption is borne out further by Turnbull's catalogue which states "...prices include delivery on rail in Glasgow or Liverpool."[8]

Yet whilst Turnbull had secured sole control of 'Hercules'[9] turbines for Europe and the colonies he still had to contend with arguably inferior turbines. Exaggerated claims were part and parcel of turbine salesmanship, not always on account of the basest of motives. No one turbine performed best in all conditions and it was only natural to present one's product in its most favourable light. The 'Hercules' itself had the idiosyncrasy of operating relatively more efficiently at seven-eights gate than at full gate. Turnbull himself saw the 'Victor' as a serious rival and spilt a good deal of ink rebutting its claim. A more serious threat however, seems to have been posed by cheap register-gate turbines which undercut the 'Hercules' sufficiently to compensate for loss of efficiency. In order to plug this gap in the market Turnbull patented the 'British' register-gate turbines in 1890, presenting it as "the most efficient as well as the cheapest register-gate turbines yet produced".[10] It too seems to have been supplied by the Holyoke Machine Company, as they are named in the patent.

In addition to an already busy life Turnbull was Speaker of the Glasgow Parliamentary Debating Society for twenty-five years until his death.[11] He travelled widely on the Continent and North America, and was frequently called on by the courts as a technical arbiter. Turnbull collapsed and died in Central Station, Glasgow on January, 14th 1903.[12] His firm did not long outlive him, winding up in 1913. Behind him he left an impressive list of water-power installations, though none bigger than his early work at Aberdeen. His writings included : The Speaker's Handbook, A Short Treatise on the Compound Engine, Engineers' Guide Book, Arithmetical Questions and On Water Wheels and Turbines.

The following is a list of installations:

Messrs. Herdmans Ltd., Sion Mills, Co.Tyrone, Ireland (1100 H.P.).

Fison & Co.'s Mills, Burley on Wharfedale (800 H.P.)

T. Garnett & Sons Mills, Clitheroe (660 H.P.)

English Sewing Cotton Company's Mills, Belper (600 H.P.).[13]

Other 'Hercules' installations included:

J.H. Walter & Co., Bawburgh Mill, Near Norwich (one 33" on a 10' fall), 1887.

John Dickinson & Co.Ltd., Hemel Hempstead(three 18", two 21", four 24" on falls of 10ft. and 13 ft.)

William Tod & Son, Lasswade, Midlothian(one 30", on a 9ft. 6" fall), 1885.

James Cropper & Co.Ltd., Kendal (one 33" and one 27" on a 23ft. fall).

A. Cannon Sandford-on-Thames, Oxford (one 54" on a 6' fall), 1884.

John Fergus & Co., Leslie, Fife (one 48" on a 10' fall)

York Street Flax Spinning Co.Ltd., Muckomore (one 45" on an 8' fall), 1888.

Weensland Spinning Co.Ltd., Hawick (one 48" and one 36" on a 9'6" fall),1890.

Francis Dinsmore, Ballymena (one 27" on a 9'6" fall) 1887.

E. Bluche, Plainfaing, France (one 18" on a 24' fall) 1885.

W.S. Owens, Mildenhall, Suffolk (one 27" and one 24" on an 8' fall) 1887.

John Leacy, New Ross, Co. Wexford (one 18" on a 16'6"fall)

Wm. Walker, Shipley (one 48" on a 5'10" fall)

W.T. Hammond, Hollybush, Ayr (one 33" and one 27" on a 9' fall) 1888.

Alex Hadden & Sons, Aberdeen (one 51" on an 8' fall)1887.

Wm. Ackroyd & Co., Otley, Yorkshire (one 54" on a 7'fall) 1884.

Duncan Stewart & Co., London Road Ironworks,Glasgow (three 45" installed in France).

Andrew Norton, Charleston, Fife (one 12" on a 14' fall) 1884.

J. & W. Bennett, Ballygowan (one 15" on a 26' fall)1883.

Other firms using the 'Hercules' included:

H. Alexander & Son, Penwick

F.C. Arkwright, Cromford

Thomas Arthur, Greenock

Ashdown & Hobday, Dover

Baerlein & Co., Manchester

Wm. Baird, Dublin

J. Baldwin & Son, King's Norton

Ballysillan Spinning Co., Near Belfast

J.P. Barbour, Antrim

Beckitt & Robertson, Innerleithen

Henry Bennet and Co., Glasgow

John Berry & Sons, Ashburton

Bertrams Limited, Edinburgh

Biddulph Bros., Cromford

J.H. Blamey, Liskeard

E.S. Bowlby, Gilston Park, Harlow

Brown, Stewart & Co., Greenock

H. Bruce & Co., Currie

Sir E.H. Bunbury, Suffolk

C. Cail, Taplow, Bucks

D.G. Cameron, India

Carrongrove Paper Co., Denny

J. Carswell & Sons, Barbeattie

Victor Coates & Co., Belfast

J. Danks & Sons Ltd., Melbourne

Distillers Co., Ltd., Cameron Bridge

P. Dixon & Sons Sheffield

J. & W. Dixon, Markinch

Douglas & Grant, Kirkcaldy

A. & R. Dunbar, Craigellachie

D'Huart Bros., France

East London Water Works, London

Evans, Adlard and Co., Cheltenham

S. Evans & Co., Derby

Felber, Jucker & Co., Manchester

Filatura di Canapa, Italy

James Finlay & Co., Doune

Gillman & Co., Exeter

Glenfield Iron Co., Kilmarnock

Gordon's Mills Paper Co., Aberdeen

Mitchell Graham, Edinburgh

Sueton D. Grant & Co., London

George Green, Aberystwyth

Gryffe Tannery Co., Bridge of Weir
Lord Harrington, Elvaston Castle
Harrison & Son, Hanley
Hill, Craig & Co., Edinburgh
W. Hooker, Chartham
Henry Hughes, New Zealand
Hythe End Paper Co., Staines
P. Ibotson & Son, Colnbrook
Imperial University of Japan
Prof. Inokuty, Japan
Joley Freres, France
King & Co., Hull
Kinnaber Water Works, Montrose
Kirkpatrick Bros., Ballyclare
J. Kirkpatrick, Closeburn
Korndals Aktie Bolag, Sweden
Kanuma Flax Mills, Japan
Leithen Mills Co., Innerleithen
Geo. Lewis & Son, Market Drayton
Limerick Water Works, Limerick
Lincoln Water Works
Lumsden & Mackenzie, Perth
J. M'Dowall & Son, Johnstone
Wm. M'Murray, Rickmansworth
J. G. Marshall, Dunfermline
Mayebashi Silk Mills, Japan
Montrose Police Commissioners
J.A. Muirhead, Bridge of Weir
J. Murland, Castlewellan
New Zealand Mercantile Co., New Zealand
Henry Parr & Sons, Redditch
C.D. Phillips, Newport
Pont Remy Spinning Co., France
Lord Powerscourt, Dublin
Rendall & Coombs, Bridport
Robey & Co., Lincoln
Sir Charles L. Ross, Balnagown Castle
B. Singrun & Sons, France

The Earl of Scarborough

Smith, Anderson & Co., Leslie

S. Suzuki, Tochigi, Japan

Takata & Co., London

Tangyes, Limited, Birmingham

J.A. Taylor, Strabane

Henry Teague, Lincoln

Wm. Tod, Jun., & Co., Polton

J. Towle & Son, Derby

K. Touronitsy, Japan

Travancore Paper Co., India

R. Tullis & Co., Markinch

John Turnbull, Abbey St., Bathans

Ulster Woollen Co., Crumlin

John Ure & Son, Partick

J. & J. Vart, West Auckland

C. Venables & Co., Maidenhead

James Waddell, Heads Nook

A. Weilenmann, Gotenburg, Sweden

John White & Sons, Glasgow

T.H. White & Co., Tandragee

A.B. Wilson, Belfast

W.R. Wiggen, Durham

Jos. Wilkinson, Bishop Auckland

Wookey & Son, Leixlip

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Flintkiln

Verreville Pottery, Finnieston Street, Glasgow (NS.574653)

1. Background

The origins of Verreville Pottery begin with the purchase for £400 in 1776 of a feu situated on the East side of Finnieston Street extending to three acres and twenty one falls, then owned by James Young of Anderston. The purchasers were Patrick Colquhoun and Alexander Ritchie, both merchants in Glasgow. They along with Charles Williams, Isaac Cookson, and James Robinson of Newcastle; Evan Deer of North Shields and John Ritchie of Glasgow founded a co-partnery to manufacture white and flint glass and traded as Williams Ritchie & Co. The site was laid out to suit the process having a cone built of dressed ashlar standing over one hundred feet high, with cutting shop attached and warehouse facilities nearby.

> The event was marked by these lines published in 1777:
>
> There Verreville sheds a luster on the clyde,
> Which past its lofty cone does smoothly glide,
> There genius shines, producing by its power
> the cheerful glass, enlivening every hour;
> that makes mankind so happy, blyth and gay,
> and banishes dull care and strife away;
> Cementing friendship, animating love,
> procuring us a taste of bliss above.
> Hail to the curious inventive art!
> May it to unborn ages still impart
> The mirth-inspiring glass, the cup of joy,
> Diffusing pleasures that will never cloy!
> May future ages think, with grateful heart,
> On him who first at Verreville fix'd this
> curious art!

This first partnership did not last long and the premises were sold in 1786 to Gilbert Hamilton on behalf of himself and a new company styled Hamilton, Brown, Wallace & Co. The other partners were Archibald Wallace, Alexander Brown and Robert Dunmore all merchants in Glasgow. The new owners remained in business for twenty years before Hamilton and Wallace conveyed the property to the Dumbarton Glass Work Company in 1806. In the same year the works were again conveyed, this time to John Geddes "of the Verreville Glasgow works". The exact relationship of Geddes to the works is not clear, some suggest that he was manager, Andrew Brown in his "The History of Glasgow" 1795 Vol.III p.267 states that he was the proprietor. The last mentioned is clearly in error if Geddes's title dates from 1806, it seems more than likely that he was first appointed as manager on leaving the Glasgow Glass Work Co. but later became tenant of the works in the years immediately before his purchase.

John Geddes and his three brothers all became glass manufacturers albeit in different centres. In his case, the business grew and prospered and although at first dependent on 'foreigners' for the cutting and engraving of the glassware, he later founded a school to train local labour to undertake this process. His adaptation of a steam engine sometime before 1795 to power the grinding wheels used in the works, gives some idea of the degree of sophistication which he achieved at an early date when lustres, giranoles, epergines and dessert sets etc., were exhibited in the wareroom, Wilson's Street, New Town, Glasgow.

In the early 1820's the works were extended and the area of ground to the South used to erect new buildings and additional kilns in which the production of china was begun. Although the exact date of this expansion is unknown, the change is noted in these further lines penned by William Harriston in 1824:

> Here's Verreville, whose numerous oones arise,
> One far above the rest ascends the air,
> To vent its smoke aloft amid the skies -
> This is a place far-famed for pott'ry ware,
> Where skilful artists busily prepare,
> Tumblers, dram-glasses, servers, chandeliers,
> (for splendour not exceeded enywhere)
> of pure flint-glass, that wond'rous bright appears;
> Fine stuff, that if preserv'd unhurt, for ages wears.

By 1831 the entry in the local directory shows potters other than Geddes occupying the site. The reason for this is presently obscure but it may indicate that the partners had overstretched their resources and the change of name to Glasgow & Verreville Glass & Pottery Co. seems to reinforce this idea. By 1834 Geddes was in financial difficulties and his interest was sold to Alexander Kidston and Hugh Prioe of Lancefield Pottery for £9,000.

The firm now traded under the style of Robert Alexander Kidston & Co. until 1838 when Kidston became sole partner. Kidston then proceeded to upgrade the product by bringing to Verreville skilled potters from the Derby China Works as well as gilders, flower and landscape painters, from Coulport and the better known Staffordshire producers. His importation of skilled craftsmen extended to France and Flanders and in a short time, he was in a position to produce chinaware of the finest quality. His immediate market in Scotland was of a restricted nature and unequal in undertaking the purchase of such expensive wares. By 1841 Kidston was sequestrated and his frined William Johnstone was appointed trustee with the firm becoming Kidston & Co., and in 1845 the Union Bank provided further assistance when the works were conveyed to them. Robert Cochran became managing partner in 1846 and a further change of name to Kidston,Cochran & Co. is recorded. Just a year later Cochran took over the whole concern having arranged matters with the Union Bank and the firm became Robert Cochran & Co.

Apart from changes brought about by the purchase of part of the work by the Caledonian Railway when constructing the Central Underground, the outline of buildings on the site changed little from the mid 1840's until the whole area was cleared in 1918 prior to the conetruction of new workshops, stores and offices for Scottish Lion Ship Repairing & Engineering Co. Ltd. These newer buildings were, in turn, demolished during the winter 1975-76 and the site cleared for the second time. Following these events, several members of the Scottish Pottery Society, operating under the auspices of Glasgow Museums & Art Galleries, undertook an investigation of part of the site during the spring and early summer of 1976. The full report, where this relates to the product of the works, is in process of compilation and will appear in another publication in due course.

2. Position in 1976

When visiting the site during the final stages of clearing up following demolition of the buildings, it became obvious that there were a number of places which were beyond the capabilities of the traxcavator employed to lift the debries and level the surface. One such obstruction occupied an area bounded by the Western and Northern boundaries of the site and extended almost halfway along the latter. The heavy rainfall during the first few weeks of the year assisted in exposing the outer line of a structure constructed of hand cut clay brick of mid nineteenth century origin.

3. The Flint Kiln

a) Location

The kiln is identifiable on Ordnance maps of 1861 and 1891. It does not appear on McFarlane's map of 1840, but the position of the adjoining building on that map shows that the kiln was built close up against the South boundry of Verreville house garden. As the kiln was always operated from the North Side, as far as ascertainable from the extent of excavation, it is inferred meanwhile that it was not built until the garden was taken into use for the pottery works, sometime after 1840.

b) Materials

The construction includes hand cut clay brick and machine made composition brick from local suppliers, yellow refractory bricks both of standard size and special shapes, large sections of refractory kiln-lining material, and some sections of broken-up grinding pans of quartzite, parts of which are also found used as paving in other parts of the site (cf. Greenock pottery excavation); this stone appears particularly in Butt 1A. The way in which this variety of materials is haphazardly assembled creates a vivid impresaion of the ad hoc use of anything which happended to be lying about the yard, in order to keep the kiln in operation from week to week.

c) Construction

Setting Out

The North and South sides of the kiln, in its final shape, were made to agree with the building to the West of it; They converge slightly towards the West. The East and West sides are almost parallel. The geometric centre of the 3'6" square hearth, with its tunnel inlet narrowing from 7'0" to 2'6" appears to have been set out normal to the South boundary, making the charging opening off-centre of the North side; but the hearth-centre falls within 9" of the intersection of diagonals of the overall construction (ignoring later buttresses), giving a surprising degree of accuracy considering the perennial re-building of the lining and the settlement which has occurred. Taking account of the heat required to calcine flint (at least 900°C., Copeland, op.cit. 16) and its effect on the clay subsoil, it may be supposed that there was a tendency for the centre of the cone to sink during firing, and rise again as the cooling of the structure allowed some subsoil water to re-permeate the solum, and swell the clay. To some extent the structure was designed to allow for this, in that it consisted of a well-built internal cone lining, with a square-built enclosing box (of unknown height), separated by a kind of rudimentary expansion area in each of the four resulting spandrels, which were loosely filled with brick rubble and mortar waste (tested at trial pit 2). Not surprisingly in view of the nature of the foundations, however, this precaution did not serve to prevent serious trouble with expansion and settlement cracking, and a series of buttresses (again of unknown height) had to be added to save the cone from splitting open at the base. Butt 1A was built first on the West side, followed by 1B of the West, Butt 2 running the full length of the South side (these two may be contemporary). Butt 2 was founded straight on to a trench in the made-up clay which formed the walkway on the South side, and cannot have been of much value except for the inward thrust resulting from its slight batter.

d) Construction

Comparative Chronology

Inspection of the East and North faces as excavated showed that Wall A was already in position when the kiln was first built. As no other structure appears on the earliest map at this point, it is reasonable to equate wall A with the original garden boundary. Thus the natural slope of the ground would help to reduce the height of lift of materials into the top of the kiln, while at the same time keeping its mouthaway from the prevailing wind.

The foundations on the East side suggest an order of development starting with a 10'0" section from the North end and founded on a 4" mortar bed, then a 5'0" section with average 3" mortar foundation, and finally a 3'0" southward extension built on a layer of average 3" chunks of kiln-slag placed on the ground in a trench which was not even all excavated to the same depth.

A good deal of further dismantling would be necessary to prove the point, but it seems possible that the first 10'0" may be the earlier extent of the structure. If so, the T - shaped cast-iron plate forming part of the hearth covering (now removed) may be indicative of the original site and shape of the hearth.

At the back (South) of the kiln, two using levels, unpaved, are identifiable, H1 and H2. The latter agrees with the level of the cobbled roadway on the West side, which slopes gently up to the charging floor on the North, and seems contemporary with it. Wall C may tentatively be identified with the bund wall to the north of the kiln on OS map of 1861 and wall D with the 'Tank' wall on the OS map of 1891, both being built up against the kiln.

e) Historical and Technical Background

The method of operation of such a kiln is well summarised by R. Copeland in describing the Cheddleton Flint Mill, where the remains of two kilns may be seen; "Calcination (of flints) is in brick-lined kilns which are filled alternatively with flints and coal slack in the proportion of about one ton of slack to 20 tons of flints. These materials are ignited at the bottom of the kiln and allowed to burn naturally until cool enough to handle. The calcined flints are then removed from the bottom of the kiln and are usually crushed before being passed to the grinding pans of mills. (A Short History of Pottery Raw Materials and the Cheddleton Flint Mill, R.C.1972, 14).

f) Conclusion

The kiln was built between ca 1840 and 1861, probably being enlarged at least once before reaching its final size by 1861. It was a continual source of trouble due to the unstable ground conditions and rudimentary foundations. There is no indication of when it went out of use, but pottery continued in operation until 1918, and the kiln appears on photographs of the building of Anderston Dock between 1877-1880. A similar kiln appears in a photograph on page 42, Glasgow as it was Vol III c.1920.

(The contributor wishes to thank Rodger McAslan, Jim McCulloch and Willie Robertson for their assistance in excavating the kiln, Peter Denholm for his description and plan, and T.A. Walden CBE, Director, Glasgow Museum & Art Galleries for permission to use accompaning photographs).

SITE NEWS

As the recession deepens, an ever-increasing number of older concerns is closing. While to some extent this is inevitable, the paucity of native initiative in new industry is disturbing. What we seem to be witnessing is the de-industrialisation of the West of Scotland. Among the closures are:

The Singer Sewing Machine Works, Clydebank, NS 494707

One of the most dramatic deaths is that of Singer (UK) Ltd's., Kilbowie Factory, once the largest sewing machine factory in the world. Though domestic machines had been altered radically during the past 30 years, some of the industrial models were recognisably like the traditional products of the concern, and were produced on machinery which had in some instances come from the earlier Bridgeton Factory, opened in 1867. Though much of the early Kilbowie Factory has been demolished, the original oil store and a few other minor buildings still exist, as do two of the late nineteenth century brick blocks, which have reinforced concrete framing. The Scottish Development Agency apparently intends to take over the site, and will presumably demolish the older structures.

Hallside Steel Works, Lanarkshire, NS 665603

Another historic works, Hallside is to close in the near future. This was the first purpose-built steelworks in Scotland when it was constructed by the Steel Company of Scotland in 1872. Latterly it produced alloy steels using an electric arc furnace. Its closure is another nail in the coffin of the integrated Scottish steel industry produced by the rationalisation measures of the 1930's and their post-war extension.

Lanarkshire Steel Works, Flemington, Motherwell, NS 767564

The Lanarkshire Works, founded in 1899, has for some time been operating at a low level of output, and its closure therefore is not surprising. Latterly it was producing steel sections for colliery roof supports. It is to be hoped that the unique three-motor steam crane, built by the local crane-makers, Marshall, Fleming and Jack for the opening of the works,will be preserved.

Calder Tubeworks, Coatbridge, NS 742643

The tube industry has been relatively immune from trade fluctuations in recent years, and the severity of the recession is indicated by the closure of Calder Works. This was the first place in Scotland where seamless steel tubes were made by the rotary forging or Pilger process.

General Terminus Ore Terminal, Glasgow, NS 576647

The closure of General Terminus(SIH 2.2 & 3)has been foreshadowed for several years by the construction of the deep water port at Hunterston. The delay in opening the latter, a consequence of a dispute between the steel unions and the dock workers, kept General Terminus open until December.

Pennystown Forge, Dumbarton, NS 392758

This old-established heavy forge closed late last year and is being dismantled. It was founded in 1854, and had a close connection with the shipbuilding industry in Dumbarton and elsewhere.

Gartlea Foundry, Airdrie, NS 763652

This foundry was the last part of the once-famous engineering works of Gibb and Hogg, who made winding engines, locomotives and other colliery equipment until closure in the early years of this century. The foundry, which retained a solid-bottom cupola, had close links with the now defunct firm of Fullerton, Hodgart and Barclay (see SIH 2.1) and specialised in engineering castings, such as machine frames.

Vulcan Works, Paisley, NS 486644

The main part of Fullerton, Hodgart and Barclay's works, on the east side of Renfrew Road, has been demolished to make way for an industrial estate.

Pennyvenie 2/7 Colliery, Dalmellington, NS 488068

With the closure of this colliery, first sunk in 1881 and extended in 1946, the mining of coal has ceased in the Doon Valley. The railway to the coal-washery at Waterside has been closed, but not dismantled, and the sidings at Waterside are now being used for transferring coal from open-cast workings near Bench to railway wagons. The washery is not currently in use but is not being demolished.

Broomhill Brickworks, Bonnybridge, NS 839796

This tiny works closed last year and the kiln has been demolished. Latterly it was the last 'one-man' fireclay works in the country.

Corrections

Two of my reports in earlier issues of SIH have proved inaccurate. In both instances they were based on press reports and photographs. The building at Cambuslang with Greek key-pattern ornament illustrated in SSIA/SSPHM Newsletter 7.3 & 8.1 is still fortunately with us, though somewhat obscured by recent factory extensions. The transit shed at Steamboat Quay, Greenock, (NS283763), was not destroyed, though the end remote from the 2-storey office was damaged by the fire in May 1979.

John R. Hume

News from other groups

Glasgow Museums

The new Subway Gallery was opened on 14th December by the Lord Provost of Glasgow. It consists of a shortened re-construction of part of Merkland Street Station, with an electric car as withdrawn, repainted in the last Glasgow Corporation livery, and a trailer car reconstructed as a four-wheeler and restored to Glasgow District Subway colours. An overhead train indicator, a colour-light signal, and the switch cabin at the end of the platform, together with a 'Q here' sign give something of the atmosphere of the old subway.

Dundee Museums

To commemorate the centenary of the Tay Bridge disaster, Dundee Museums have mounted an exhibition in the Central Museum and Art Gallery, Albert Square. This tells the story of the bridge from its conception, through its design and construction, to its collapse and the aftermath. The exhibition is open from Monday to Saturday, 10.00 a.m. to 5.30 p.m., until 28th March, 1980.

Forth and Clyde Exhibition

An exhibition of photographs and copies of old posters, engravings and paintings of the Forth and Clyde Canal has been mounted by the Collins Exhibition Hall, University of Strathclyde, with financial support from the Council for Museums and Galleries in Scotland. After a successful run in the Collins Hall the exhibition is on tour, and will visit the Lillie Art Gallery, Milngavie (13th March-6th April); the Auld Kirk Museum, Kirkintilloch (June); the Wilton Lodge Museum, Hawick (July) and the Magnum Leisure Centre, Irvine (1st-20th September).

Glengarnock Project

With the sponsorship of the British Steel Corporation and the support of the Scottish Development Agency, the Manpower Services Commission is financing a unique project to record and conserve the history of iron and steelmaking in the Garnock Valley. Three parts of the scheme - the excavation of the site of the old blast furnace, the recording of the oral history of the area, and the collection and history of the works archive - are already under way. The fourth, the conservation of historic plant from the Scottish Division of BSC, is likely to start in the near future.

The Seagull Trust

On the basis of its success with the boat St. John Crusader on the Edinburgh-Ratho section of the Union Canal, the Seagull Trust is planning a boathouse and terminal block at the Edinburgh end of the canal. The Trust has also started negotiations for the development of a base for a boat on the Forth & Clyde Canal at Kirkintilloch, and hopes to have a specially designed barge built locally. The St.John Crusader has given a great deal of pleasure to disabled children and adults in its first season, and it is hoped to extend operations this summer with additional volunteers. The Trust is looking for money for its new developments, and would welcome donations, which should be sent to the Honorary Treasurer, Mr. Norman Simpson, at 10, East Camus Place, Edinburgh, EH10 6QZ.

Shell Awards

The Seagull Trust's contribution to bringing new life to the Union Canal was generously recognised by the judges of the Shell Inland Waterways Restoration Awards for 1978-9. They gave the Trust one of the two top awards of £1,500, for the provision of a jetty at 'Port Calder'. The other Scottish awards for canal projects were £150 to the Ratho Canal Society, for moorings on the Union Canal; £150 to SWIA (Glasgow Group) for barges on the Forth and Clyde Canal; £270 to the 1st West Lothian Sea Scouts for the restoration of the Woodcockdale Stables on the

Union Canal; and £250 for Greater Possil City Farm, for the development of Firhill Basin and Canal Banks.

Scottish Railway Preservation Society

Life is exciting in the SRPS these days, with railtour business booming, and less publically, work progressing on the Bo'ness and Kinneil Railway. The first sod was cut on 20th May,1979, and by October the main platform road had been laid and the first turnout completed. The ex - SSEB Ruston D88 diesel D7 has been repainted in B. & K. railway colours and named Pioneer.

At Falkirk, the never-ending work of restoration and maintenance continues. On the locomotive front the overhaul of Morayshire is now nearly complete, and work has started on the rebuilding of standard 2-6-4T 80105. The Glengarnock Crane Tank, on loan from the British Steel Corporation, has been stripped down. Less spectacularly, coaching stock repairs have continued to enable vintage railtours to carry on.

The SRPS is looking for voluntary help at both Bo'ness and Falkirk, and also money towards the completion of the B. & K. Details of membership may be had from Mrs. Irene Gollan, 16 West Relugas Road, Edinburgh, EH9 2PL. £10 shares in the Bo'ness and Kinneil Railway Company Limited may be purchased by Society Members.

Forth and Clyde Canal Campaign

The idea of forming a group of interested societies to focus attention on the development and restoration of the Forth and Clyde Canal was discussed at a meeting held in the University of Strathclyde on 5th December,1979. There was general agreement that a co-ordinated response to the local government subject plan on the canal was desirable, and a steering committee was set up, to report back to the societies represented in about six months. The secretary of the steering committee is Richard Davies, 275 West Princes Street, Glasgow, to whom enquiries should be addressed.

The draft local (subject) plan being prepared by a working party consisting of representatives of both local authorities and appropriate national government agencies is approaching the stage of public participation, and an extensive programme of exhibitions and public meetings is being planned.

Strathkelvin District Libraries and Museums.

The fourth of the excellent Auld Kirk Museum Publications, is The Story of Bishopbriggs, a posthumous publication by Dr. J.A. Russell. This is a pleasing portrait of an unspectacular community with a surprisingly rich history. It is obviously based on original research though unfortunately there is little indication of the sources. The illustrations are well chosen and crisply reproduced. The Story of Bishopbriggs costs and is available from Strathkelvin District Libraries and Museums, Bishopbriggs, Glasgow.

Inland Waterways Amenity Advisory Council

The Government has decided to abolish IWAAC as part of its programme of reducing the number of quangos. The decision has met widespread opposition from canal enthusiast bodies in Scotland, who have valued the lead the Council has taken in stimulating interest in the leisure potential of Central Scotland's Canals. Legislation will, however, be required to get rid of the Council, and it is likely to function for at least another year.

Scottish Industrial Archaeology Survey

The SIAS enters its third year of operation with the brick and tile works survey nearing completion, with measured drawings of Scottish windmills almost complete, and with a substantial number of other monuments recorded. Lists were presented in 1979 to the panel supervising the survey of iron and steel girder bridges, and of harbours, and programmes of listing, scheduling and recording agreed.

Council of Europe

The provisional edition of the Council's recommendation on Industrial Archaeology may be of interest. It is reproduced in full, as adopted on 28th June, 1979.

The Assembly

1. Having considered the report of its Committee on Culture and Education on Industrial Archaeology (Doc. 4357);

2. Noting the scientific, aesthetic and sociological interest in the subject;

3. Believing that modern society can, through the study of its industrial heritage, reach a deeper understanding of its immediate origins and many of its present social and industrial problems;

4. Stressing the need for the individual to see his role in an increasingly industrialised world as something more than a simple cog in a machine;

5. Welcoming the initiative taken recently, especially by the private and commercial sectors, in preserving evidence of Europe's industrial past, but regretting the absence in most countries of any co-ordinated or structural approach;

6. Believing that it is necessary for the state and local authorities to assist more actively in the recording of the industrial heritage, in the selection, preservation and maintenance of industrial monuments and objects, and in the proper documentation, analysis and presentation of the continuing industrial record.

7. Believing that it is the particular role of the Council of Europe to explore new fields of European co-operation, and that industrial archaeology, at present developing differently in member states, presents an ideal subject for constructive interdisciplinary co-operation,

8. Recommends that the Committee of Ministers:

i. Arrange for an interdisciplinary group of governmental experts drawn from the appropriate steering committees:

a. to establish a workable definition of the precise goals of industrial archaeology in member states:

b. to propose means for the inventory and classification of the industrial heritage:

c. to co-ordinate analysis of the industrial records in full co-operation with existing national and international research in this field:

ii. call on member governments:

a. to provide greater financial assistance for the preservation of industrial monuments, and, by direct or indirect means, to assist private and commercial initiatives:

b. to ensure that conservation legislation is, where necessary, extended to include significant monuments of the recent industrial past, and that a fairer weighting is given to industrial monuments:

c. to encourage the preparation of suitable educational material in this field for young people:

d. to encourage and facilitate, where appropriate, similar action by local authorities.

Personal

We must congratulate Alasdair Auld on his appointment as Director of Glasgow Art Galleries and Museums, and Tony Browning as his deputy. Alasdair and Tony take up office at a difficult time, with financial problems very much to the fore, and with the major commitment of the Burrell Collection building. We must hope that once that project is completed an early priority will be display space for engineering and other technological material on a scale comparable with that currently devoted to transport. Glasgow has in store one of the finest collections of model and full-size engineering exhibits in Britain, and it is tragic that at the time of writing no technological exhibits other than transport are on display.

Miscellaneous

Queen Mary II

The future of this famous Clyde pleasure steamer is in doubt. She was bought from Caledonian MacBrayne by Glasgow District Council for £30,000, who aimed to convert her into a floating maritime museum. The financial cuts imposed by the Government have led to the postponement of the project, and the ship may be sold for scrap. As the last of the line of Clyde turbine steamers descended from the pioneering King Edward of 1901, the Queen Mary would be a sad loss.

Film of Woollen Mill, Bridgend, Islay, NR 351632

The film unit of the Centre for Educational Practice of Strathclyde University has made a short film of *the piecing* machine in the woollen mill at Bridgend, Islay. This is the last machine of its type *in situ* in Britain, so far as is known. The commentary has yet to be added, but when complete the film will be available for hire from the Centre.

The Wadsworth Prize for Business History

The Business Archives Council has announced that the Wadsworth Prize for Business History, 1978, has been awarded to David K. Fieldhouse, Fellow of Nuffield College, Oxford, for his authorship of Unilever Overseas. The Anatomy of a Multinational, 1895-1965 (Croom Helm, 1978, £25.00). The first prize of £100 was presented to Mr. Fieldhouse by John Wadsworth, a former Deputy Chairman of this Council and one-time visiting Professor at the University of Georgia and The City University, London, at the Council's Conference and Annual General Meeting at Lloyd's Register of Shipping, London, on Wednesday, 4 July, 1979.

The presentation to Mr. Fieldhouse was the first award of the Wadsworth Prize, which was established as an annual competition to mark John Wadsworth's retirement from the Council in 1977 after over 40 years of continuous and close association with the Council's activities. In making the award, the Council's panel of judges was asked to nominate the book or article published in 1978 which in its opinion was the outstanding contribution to the study of British business history. The panel of judges, after reviewing an entry of 19 publications, was unanimous in its nomination of Unilever Overseas.

The Business Archives Council is grateful to the panel of judges, and to Barclays Bank, Lloyds Bank, Midland Bank, National Westminster Bank, Pearson Longman, Publications for Companies, and Williams and Glyn's Bank for their generous support for the Wadsworth Prize Fund.

Third International Congress of Accounting Historians

No less than 50 authors from 14 countries in five continents have offered papers for the Third International Congress of Accounting Historians, which will be held at the London Business School from Saturday, 16 to Monday, 18 August, 1980.

The programme has been compiled by Professor R.H. Parker (University of Exeter), a member of the Working Party of The Accounting History Society, which is organising the Congress in association with The Academy of Accounting Historians.

The opening paper - "On not writing a general history of accounting" - will be given by Professor Basil Yamey of the London School of Economics. Other speakers will include Tito Antoni (Italy), Ernest Stevelinck (Belgium) and Williard E. Stone (USA). The programme also includes a Haskins Seminar sponsored by Deloitte, Haskins and Sells, London.

The president of The Institute of Chartered Accountants in England and Wales will hold a reception at Chartered Accountants' Hall where participants will also have the opportunity of viewing the Institute's Centenary Exhibition drawn from its collection of rare books.

Application forms with details of the programme and accommodation are available from Dr. G.A. Lee, Department of Industrial Economics, University Park, NOTTINGHAM NG7 2RD, England.

SUMMARY LISTS OF RECENT ARCHIVES, SURVEYS AND DEPOSITS

1) NATIONAL REGISTER OF ARCHIVES (SCOTLAND)

Surveys completed by the Registrar since the publication of Scottish Industrial History Vol.2, Nos. 2 and 3. Full details are available in the Survey List whose NRA(S) number is indicated. All communications regarding these should be addressed to:-

The Secretary,
National Register of Archives
(Scotland),
P.O. Box. 36,
H.M. General Register House,
EDINBURGH, EH1 3YY.

AGRICULTURE, ESTATES, LAND AND PROPERTY.

1734 Glasgow University Archives. Plans of Corehouse Estate, 1841-1907.

1739 Dundee City District Archives and Records Centre. J. & J. Hunter, solicitors, Dundee. Titles to property in Dundee, Broughty Ferry, Arbroath and Kinross, 1655-1896. Titles, accounts and other papers relating to Grange estate, Monifieth, 1652-1799.

1761 Leo G.D. Barclay, Esq., Muir of Fowlis. Game books covering Inchmarlo estate, 1887-1921. Dalhaikie estate, 1887-1903. Kashmir and elsewhere in India, 1902-16. Inchmarlo fishing books, 1900-22. Indian hunting diary of Duncan Hamlyn Davidson, 1904.

1766 Captain Iain Tennant, Elgin. Papers relating to Innes estate, near Elgin, 1858-1929, valuation of contents of Innes House, 1905. Domestic and estate correspondence of F.J. Tennant of Rymdford House, North Berwick, n.d.

1781 J. & W. Buchan, solicitors, Peebles, Cartularies relating to lands in Peeblesshire, 1781-1965.

1794 Colonel W.J.C. Adamson, Careston Castle. Volume of papers in bankruptcy action against 4th Earl Fife, 1833, including rentals and description and plan of Careston estate.

1817 Glasgow University Archives. Dowanhill Estate Company Ltd. Minutes, 1888-1941; accounting records, 1880-1972; share registers, 1889-1949; deed book, 1888-1904; correspondence, 1886-1904, 1943-64. Legal and financial papers relating to company and its properties, 1874-1967, including papers relating to West End Properties, 1890-1904; various trusts, 1921-46; James Templeton and Co., 1938-45; Colville Constructional Company Ltd.,1945-50. Plans of properties in West End of Glasgow belonging to company 1874-99. R. Wylie Hill & Co.Ltd., registers of share transfers, 1925-57.

1822 Glasgow University Archives. Miscellaneous deposits. Titles to lands in Lanarkshire and Ayrshire, 1619-1787. Account Book, James White & Co., 1880-90.

1838 Patrick Gifford and Co., solicitors, Castle Douglas. Papers relating to estate of Foulton, Ayrshire, 1656-1909.

1840 Princes Terrace Proprietors Association, Glasgow, Minutes, 1957-78; accounts, 1902-68; correspondence.

1845 Colonel J.S. Inglefield-Watson,Hamilton. Robertson-Aikman of the Ross muniments. Titles and estate papers relating to lands in Lanarkshire, 1621-1962. Plans and photographs mainly of lands of the Ross, 1765-1962.

1855 Walker, Sharpe, solicitors, Dumfries. Title deeds and financial papers relating to Roman Catholic diocese of Galloway, c.1900-current, and Speddoch estate, Dumfriesshire and Kirkcudbrightshire, c.1850-1960.

1858 Orkney Library. Baikie of Tankerness MSS. Titles to lands in Orkney, 1447-1878, including lands and barony of Tankerness, 1482-1920, St. Andrews, 1447-1878, and others. Valuations of Orkney, 1653, Deerness and St. Andrews, 1768, and earldom of Orkney and lordship of Shetland, 1783; extract process concerning kelp-cutting rights, 1737; copy petition to have fiars' prices struck, 1785.

55 (addit) Marchioness of Aberdeen, Haddo House, Estate, household and personal papers of Aberdeen family, 1668-1946.

234 (addit) Duke of Atholl, Blair Castle. Estate papers; rentals, 1827-1958, Ministry of Supply hutting at P.O.W. Camp, Struan, 1942-3.

396 (addit) Strathclyde Regional Archives. Plans of properties in Glasgow 1803-59, and in counties of Ayr, Clackmannan, Lanark, Perth and Stirling, c. 1776-1886; feuing plans, Glasgow, 1620-96. Blythswood estate papers; cartularies, 1800-47; legal papers, 1787-1934, including executry papers of 1st Lord Blythswood, 1908-34; accounts, 1804-1947; rentals, 1807-1904; papers relating to minerals, 1846-75, including journals and diagrams of bores, 1846-70; accounts for building St. Conan's Church, Loch Awe, 1907-11, with plan of church and adjacent lands, n.d.; estate plans, 1802-c. 1930, including Blythswood House and parks, 1862-1897, town of Blythswood, 1820, field drainage systems, 1861-79.

Plans of lands and estate of Kelvinside and Gartnaval, 1867.

796 (addit) Earl of Dunmore, Edinburgh. Titles and other legal papers, Stirlingshire and Harris, 1654-1900. Inventory of furnishing of Dunmore Park, 19 cent.

885 (addit) Earl of Strathmore, Glamis. Titles to lands in Aberdeenshire, Angus, Fife and Perthshire, 1462-1720. Cartularies and inventories of writs with references from 12 cent. Miscellaneous writs and related legal papers, 1566-c. 1900, including correspondence relating to settlement of Bowes estate, 1868-9. Papers relating to Scottish estates, mainly in Angus and Perthshire.

888 (addit) Marquess of Linlithgow, Hopetoun House. Estate papers relating to East Lothian, 1768-1855, including rentals, 1839-45; papers relating to Ormiston, including tacks, 1769-19 cent., parish roads and statute labour, 1824-55, Ormiston Hall, 1833-49, coal-mining, 1842-5; papers relating to Peaston Mill, 1793-1829, lime quarry, 1811-17, and new windmill, 1835; plans and papers relating to farm buildings, 1818-41, n.d.; note on crop rotation 1807. Personal and household accounts, 1687-18 cent., including accounts for wedding of Marquess of Annandale's daughter, 1699; inventories of clothes, furniture and household goods, 17-18 cent.

1246 (addit) Orkney Library. Sutherland-Graeme of Graemeshall muniments.

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1246 (addit) Estate and personal account, 1762-1906; correspondence on Crofters' Commission, harbours and other estate matters, 1884-1906, n.d. Miscellaneous legal papers, 1605-1905, shipping matters, 1785-91; taxation of Kirkwall, 1786; cattle market in St. Andrews parish, c. 1800; and poaching in Lambholm, 1905. Papers relating to pier at St. Margaret's Hope and roads in and around Kirkwall, 1897, 1904.

1454 (addit) K. Adam of Blair Adam, Esq., Blair Adam estate papers. Estate and legal papers and correspondence, 1630-20 cent. Factor's correspondence, covering also education, roads, railways, water supplies and all aspects of local and public affairs in Fife and Kinross, 1871-1917. Rentals, reports and valuations, 1731-20 cent., including survey of progress of estate, 1733-1833, and letters from John Clerk of Eldin about John Burrell's survey and valuation of estate and minerals, 1771-3. Papers concerning improvements, 1798-1859, including letters from James Loch, 1798-1807, and proposed sales of estate, 1762, 1772, 1787-9. Correspondence, accounts and valuations concerning woods, gardens and nurseries, 1748-20 cent., including letters from Professor John Hope about trees, 1769, 1782, and description and photographs of garden, c.1855.

1560 (addit) The National Trust for Scotland. Irvine of Drum MSS. Estate papers, 1564-1901, including rentals, 1607-1862; accounts and vouchers, 1729-1869; leases and tacks, 1751-1858; estate correspondence, 1699-1811.

FISHING

1729 Dundee City District Archives and Record Centre. J. & J. Hunter, solicitor, Dundee. Memorial on salmon fishing in barony of Barry, 1742.

1828 Joseph Johnston and Sons Ltd., salmon fishers and mussel merchants, Montrose. Minutes, 1885-1978; accounting records, 1843-1970; wages records, 1837-1964; contract book, 1914-55; sales records, 1899-1955; cartularies, 1924-75; catch statistics, 1861-1977; fishing station log books, c. 1900-1977; salmon and mussel analyses, 1927-48; accident reports, 1910-54; inventories and valuations of stock, 1904-60. Miscellaneous papers relating to fishing, 1824-1951, including printed material on salmon fishing industry, 1824-68; papers on Montrose harbour, 1836-1927; Journal of Carpie salmon fishings, 1877; reports and accounts of Berwick Salmon Fisheries Co. Ltd., 1897-1951; records of flow of River Dee, 1934. Papers relating to mussels, 1834-1966, including miscellaneous correspondence, reports and press cuttings, 1834-1946; leases of Dun mussel scalps, 1859-1912; printed materiel relating to mussel fishing in Scotland, 1888-9; report on possibility of canning mussels commercially, 1946. Plans, c.1750-1978, including fishings and fishermen's cottages; bag and fly nets in Fife, n.d.; Bervie Bay, Water, and river mouth, 1833-1926; Gourdon village, 1926; Montrose shore and harbour, 1803-1911; property in Montrose, 1884-1970; Rivers North Esk, 1839-1978, South Esk, 1850-1909, and Tay, 1809; lands of St. Cyrus, c.1750. Photographs, c.1870-c.1970, depicting fishings, fishing boats, premises processes, etc.

Above One of the older blocks at Singer's Kilbowie factory, with the oil store on the right.

Below A special milling machine in the industrial sewing machine section, built in 1867 for Singer's Bridgeton factory.

Left TSS *Queen Mary II* in happier days, approaching Campbeltown Pier in 1970. Right The solid-bottom cupola at Gartlea Foundry, Airdrie, in 1971.

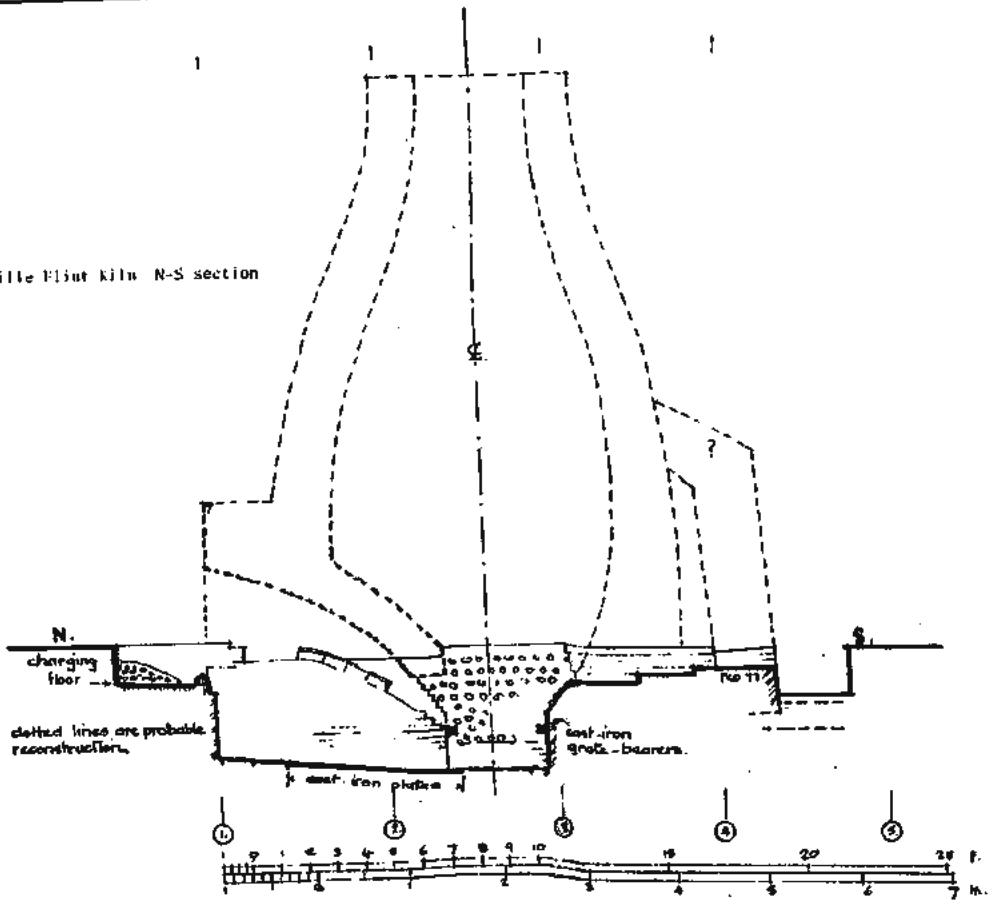
Above The headgear at Pennyvenie 2/7 Colliery, Dalmellington in November 1979

Below The Dalmellington Iron Works blowing engine house (1847) flanked by two continuous brick kilns.

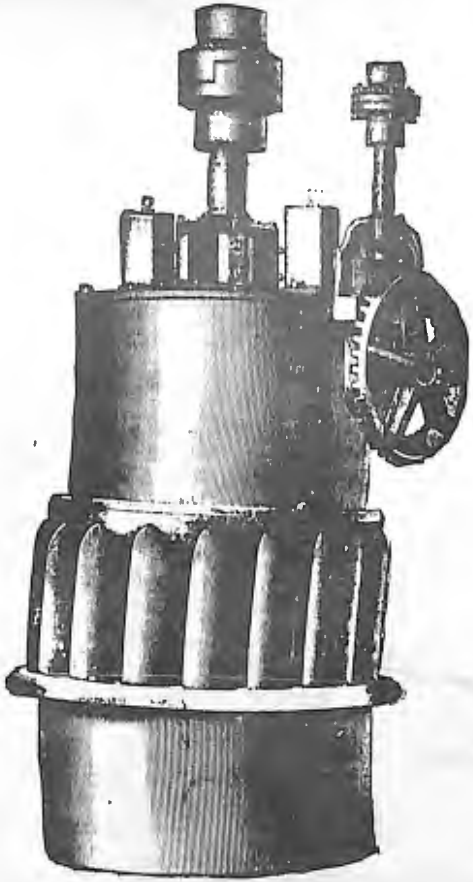
Above Applying blacking to a machine-tool bed-plate mould in Gartlea Foundry, Airdrie, in 1971.

Below NCB West Ayr Area No.24 shunting at Waterside Washery in 1970.

Verreville Flint Kiln N-S section



THE "HERCULES" TURBINE



AS DELIVERED

THE "HERCULES" TURBINE.

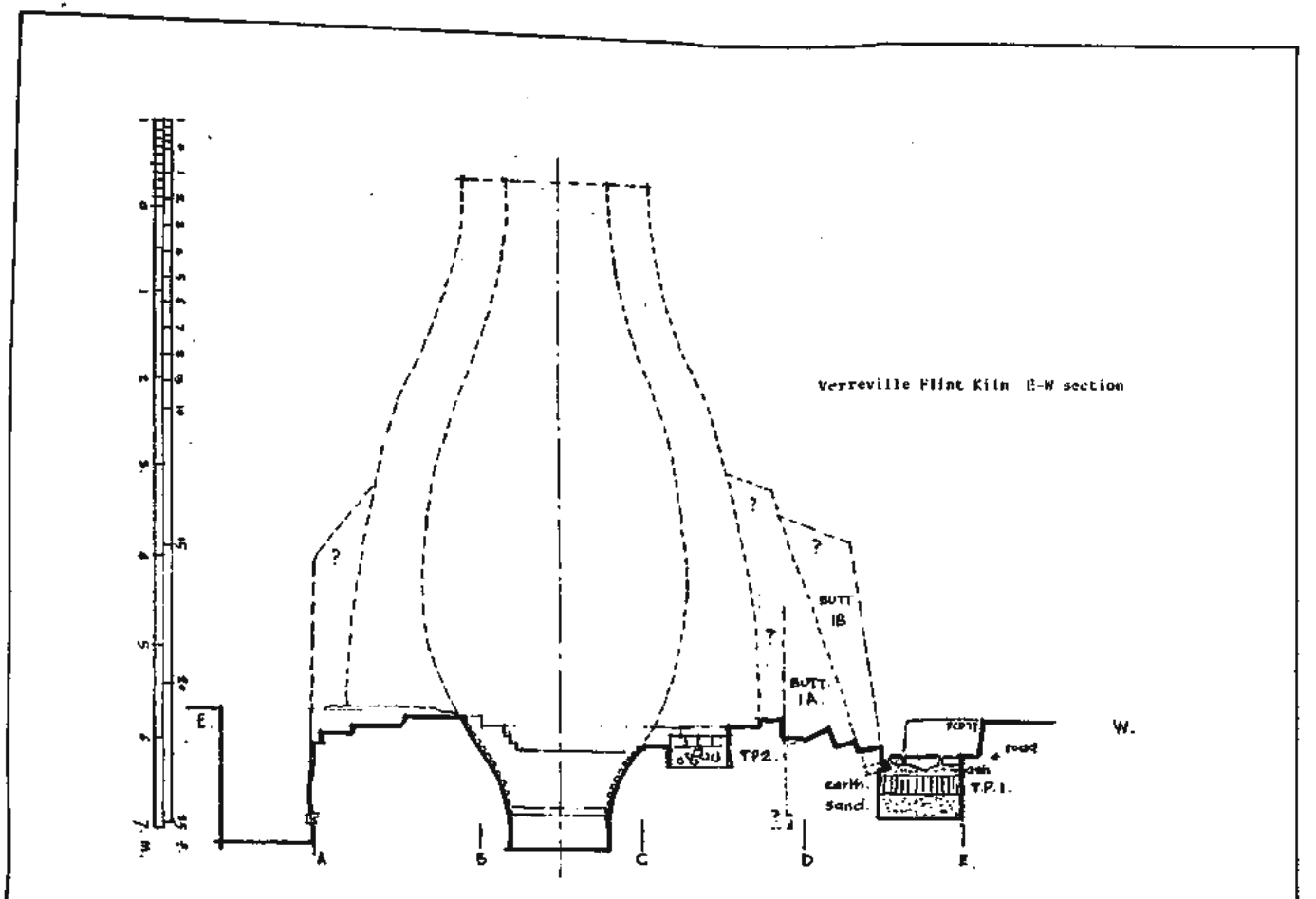
TURBINES v. WATER-WHEELS.

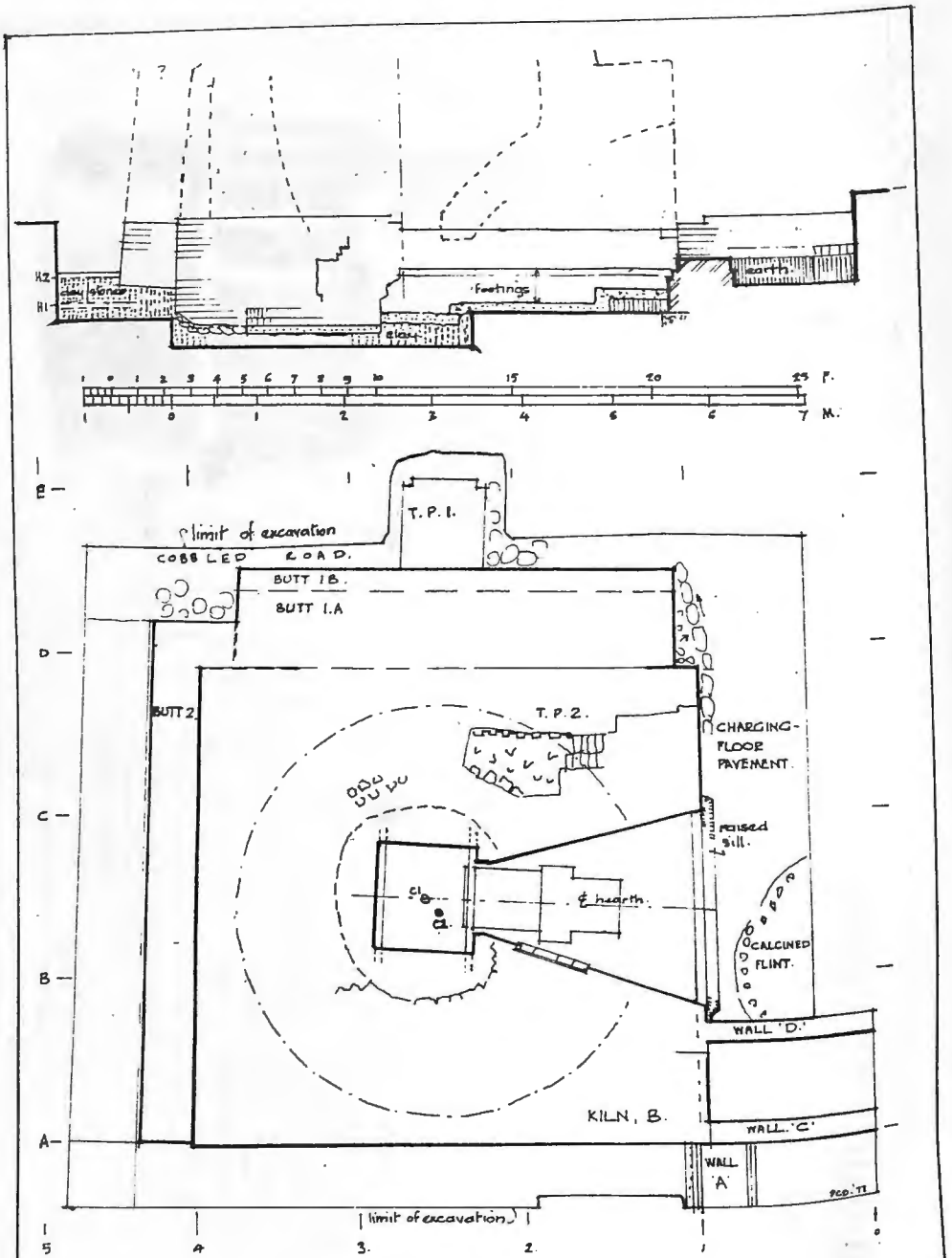
THE motive power of a mill is its very heart, and if this goes wrong or gives trouble, everything in the mill is affected, as well as the output diminished. It is therefore essential that manufacturers should see that their motive power is the best possible.

It is generally a difficult point for the owner of a water-power to decide how to make the most of a stream or river under all its varying conditions; but *this* may be taken for granted, that to bring about the end in view, the best Turbine is better than the best water-wheel; and, indeed, in one or two points even an inferior Turbine has advantages over the old form of wheel—such as its being able to work drowned or covered by the rise in the river, the small space required for it to work in, and the quick initial velocity of its shaft.

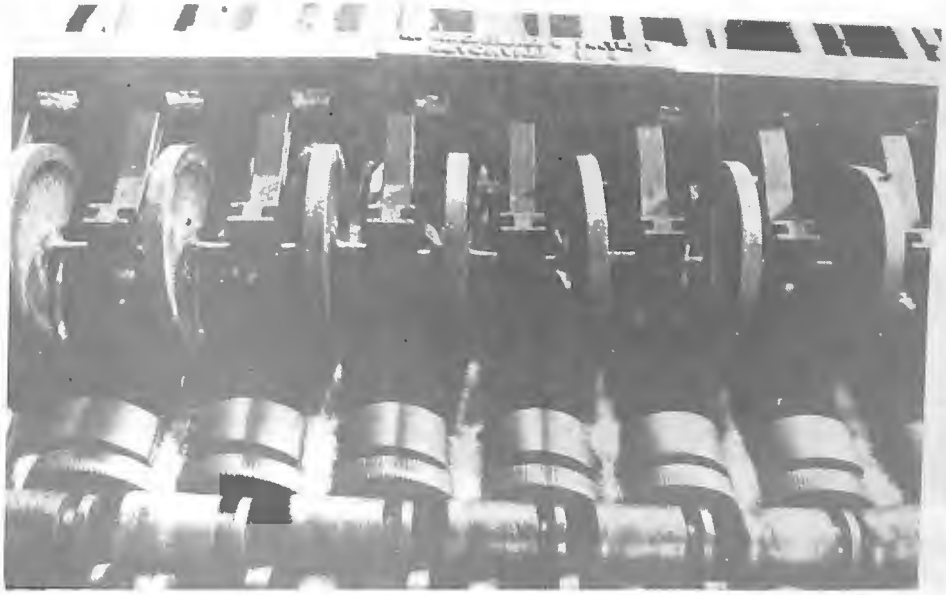
As a motor for mills, the Turbine is much superior from a mechanical point of view to the old wheel or the steam engine, as, owing to the water being equally distributed all round its periphery, it rotates with a uniform and smooth motion. 50 to 100 per cent. more power can be got from a "HERCULES" Turbine than from an old wheel with the same amount of water. A rising of the tail water only affects it if the height of the fall has been affected. The most improved types work best when partially immersed in the tail water, and thus permit of full advantage being taken of the whole fall.

The actual power in 1000 cubic feet of water falling one foot is 1·9 H.-P. By using an undershot wheel ⅛ H.-P. can be obtained; a breast wheel, 1 H. P.; an overshot wheel, 1¼ H.-P.; and a "HERCULES" or "BRITISH" Register-gate Turbine, 1⅝ H.-P.


Verreville Flint Kiln E-W section
E.
W.
A
B
C
D
E.
BUTT 1B
BUTT 1A.
TP2.
T.P.1.
earth.
sand.
road
ash
?



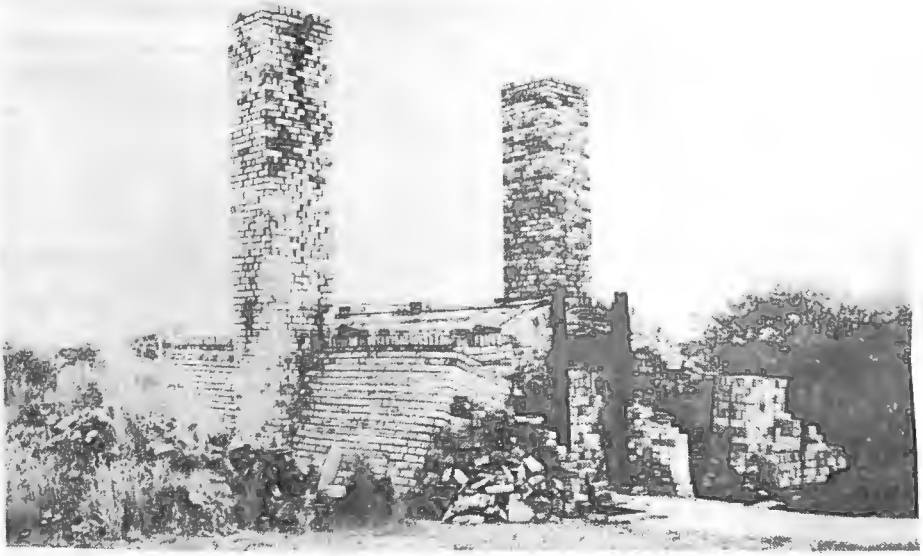
Verreville Flint Kiln, plan, E elevation of E side

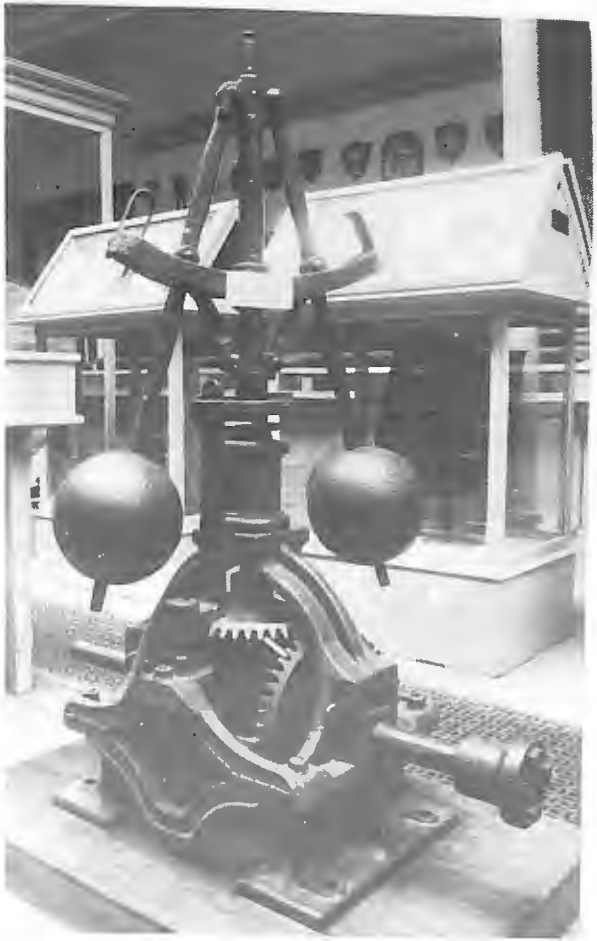


Above and Below — Piecing Machine made to Robert Archibald's Patent, Devonvale, at Bridgend Woollen Mill, Islay. The large rollers fed strips of sliver to the short rollers, which 'pieced' the strips to the ends of the previous ones.

Above The moulding shed at Broomhill Brickworks, High Bonnybridge in 1977.

Below The tiny downdraught kiln at Broomhill, formerly visible from the Edinburgh/Glasgow railway.





Left The governor from the great 70 foot wheel at the Greenock Cotton Mill and Right A small vertical engine from the James Watt Dock, both in the McLean Museum, Greenock

Above TSS *Queen Mary II* and MV *Arran* laid up in the East India Harbour, Greenock.

Below Renewing the bottom gates of the sea lock at Bowling, on the Forth and Clyde Canal.

1220 (addit) Dundee University Archives. Plans relating to Tay Navigation and salmon fishing, 1802-25.

EXTRACTIVE INDUSTRIES (including coal mining, quarrying and and the oil industry).

1743 Glasgow University Archives. Plans of Wilsontown and Blackfaulds coal workings, 1933 and n.d.

1747 Glasgow University Archives. The Tharsis Copper Company. Letter books, 1857-1930, including policy letter books, 1892-1912; reports of general meetings, 1872-4; resolutions of board meetings, 1882-95; reports to auditors, 1893-1906; credit receipts book, 1930-9; weekly lists of absentees, 1907-17.

1814 Glasgow University Archives. British Dynamite Company. Prospectuses and reports of British and foreign metal extraction companies, 1883-92. Printed and typescript material including history of factories at Ardeer, 1873-1923, and Westquarter, 1876-1951. Miscellaneous photographs, 1860-c.1904, including interior of Ardeer factory, c. 1880-c. 1890; groups of workers, c. 1890, n.d.; mines and miners at New Lanark, c. 1904.

1834 Central Library, Dunfermline. Records of Fife Coal Company 1860-1926, and Donnybristle Colliery Company, 1860-1908.

1837 Cormack and Byers, solicitors, Lockerbie. Map of Dumfriesshire showing Susanna Lead Vein and proposed Newcastle-Maryport canal, c. 1800. Grange Quarrying Company Ltd., accounting and sales records, 1939-60.

234 (addit) Duke of Atholl, Blair Castle. Report on minerals in Clunie forest, 1871.

396 (addit) Strathclyde Regional Archives. Miscellaneous plans of minerals in West of Scotland, 1871-1919, n.d., including Rosehall mineral field, n.d.

885 (addit) Earl of Strathmore, Glamis. Report on lead mines at Glamis, 1862. Papers relating to affairs of John Bowes and Partners, colliery owners, 1886-1901, 1940.

1454 (addit) K. Adam of Blair Adam, Esq., Correspondence, papers and accounts, concerning minerals on estate of Kelty, Blair Adam and Woodend Collieries, 1751-20 cent., including obligation to re-deliver collier, 1751, and list of employees at Kelty, 1837-9.

CONSTRUCTION AND ARCHITECTURE

1741 Professor D.C. Simpson, Edinburgh. Letters to Robert Adam from John Paterson, his clerk of works in Scotland, 1789-91, covering many aspects of work in connection with public and private buildings in Scotland and including references to mausoleums at Westkirk and Alva, inn and house for Lord Lauderdale at Dunbar, Gosford House, Newliston House, Ninewells House, Seton Castle, Airthrey Castle, Thirlestane Castle, Edinburgh University, Calton Jail, Parliament House, George Street and Charlotte Square, Glasgow Trades Hall.

1757 National Library of Scotland. St. Mary's Episcopal Cathedral, Edinburgh. Plans, including working drawings, of various features of the cathedral, n.d.

1758 Mrs. E. Murray Usher, Gatehouse of Fleet. Plans of proposed additions to Cally House, Kirkcudbrightshire (not executed), c. 1857. Photocopies deposited in National Monuments Records of Scotland.

1759 Royal Commission on the Ancient and Historical Monuments of Scotland. Dundee Dean of Guild plans, 1867-86. various public and industrial buildings.

1763 The Arch, Henderson, James Williamson Partnership, harbour engineers, Aberdeen. Tenders for contracts in Britain, France and South Africa, 1921-38. Photographs of harbours, including construction and improvements at Macduff, 1870-1950, Stonehaven 1910-60, Hull, Lerwick and Scalloway, c.1910-34, Findochty, 1927-8, Peterhead, 1931, Banff, 1932.

1769 Glasgow University Archives. The Glasgow Workmen's Dwelling Company Ltd. Articles of association, 1890. Report of Scottish departmental committee on housing, 1933.

1788 Glasgow University Archives. Unknown firm of builders. Estimates for miscellaneous building work in and around Glasgow, 1870-7.

1800 P.J. Knowling, Esq., Houston. Photographs of Old Smithy, Houston, c. 1885.

1839 Frank Carruthers and Sons Ltd., Builders, Lockerbie. Accounting records, 1872-1924; wages book, 1914-19; diaries of Francis Carruthers, founder of firm, containing comments on work undertaken and local news, 1874-1912.

1845 Colonel J.S. Inglefield-Watson, Hamilton Robertson-Aikman of the Ross muniments. Letters concerning construction of Ross Bridge, 1873; papers relating to paintings in and re-decoration of Ross House, 1874-9.

1454 (addit) K. Adam of Blair Adam, Esq. Papers of brothers John, Robert, James and William Adam. Correspondence and papers concerning business ventures in England and Scotland, mutual financial relationships and liability for their debts 1746-1832.

MANUFACTURING : BRICK AND TILE WORKS/...

1734 Glasgow University Archives Plans of Bo'ness pottery, 1899.

1854 Ochiltree Tileworks Ltd. Correspondence, 1929-48; quotations, 1936-8; orders, 1930-46. Advertising material and press-cuttings, 1931-41. Reports on other brick and tile manufacturers, 1939-42. Plans of machinery, 1942-67.

MANUFACTURING: DISTILLING AND BREWING

1795 Dundee City District Archives and Records Centre. Maltmen Incorporation of Dundee. Sederunt book, 1786-1820; lists of maltmen, 1727-50, 1829-30; register of apprentices, 1653-1847; lists of pensioners, 1692-1827; petitions to incorporation, mainly for financial support, c. 1812-44. Acts of Dundee maltmen, town council and dean of guild court concerning apprentices, masters, brewing and selling of ale and pensions for poor, 1621-1727. Papers relating to multures, 1678-1827, including contract for grinding malt at town's mills, 1678. Papers relating to malt and beer duties, 1707-1837, including minutes of meetings of maltmen concerning malt tax, 1725, and beer duties, 1826-9. Legal papers, 1649-1852, including papers relating to actions involving incorporation, 1775-1852. Financial papers, 1663-1871, including boxmasters' accounts, 1671-1848; contracts between town council and maltmen concerning town's debts, 1690-1705; accounts for management of incorporation's parliamentary business, 1700-6; register of master brewers' payments of malt duties, 1796-1839. Letters from incorporation's parliamentary agents, 1703-6; and other correspondence, 1813-62.

1850 MacLay and Company Ltd., Brewers, Alloa. Accounting records, 1888-current; directors' reports, 1899-1904; register of shareholders and share ledger, 1896-current; record of brewing, 1909-12; inventory and valuation of plant, 1896. Plans of brewery as reconstructed after fire, c. 1905, and plan and papers relating to bottling plant, London, 1901-20. Photograph of bottling plant staff, c. 1905.

MANUFACTURING : FOODSTUFFS

1743 James Keiller and Son Ltd., manufacturing confectioners, Dundee Private letter books, 1862-74; accounts and costings with related correspondence, 1889-1920; analyst's book, 1897-1902. Miscellaneous papers, including press-cuttings and photographs, 1895-1955, about recipes, confections and First World War.

1801 James Marshall (Glasgow) Ltd., foodstuffs manufacturers, Cumbernauld Minutes, 1901-76; output records, 1921-55; wages and salaries records, 1879-1962; letter books, 1912-71; price lists, c. 1890-1978 advertising material, 1886-1950, including pamphlet What is Semolina?, 1886; chemical analyses of firm's products, 1885-1955; notes on production and storage of semolina, 1939; papers relating to the firm's trademarks, 1887-1903, 1943-4; press-cuttings, recipes, wrappings, 1882-1978; drawings and specifications of firm's machinery, 1882-1978; photographs, 1938-75, including working model of macaroni machine, 1938, spaghetti production line, 1975. Farola Fare Ltd., minutes, 1963-74; reports and balance sheets, 1968-73.

1816 Glasgow University Archives. Finlay Clark and Co: minutes, 1862-81; private ledger, 1866-6. Finlay Muir and Co; manager's minutes, Calcutta, 1895-1900; standing instructions for tea estates' departments, Calcutta, n.d.; notes on history of firm. n.d. Accounting records and general papers of other related and subsidiary companies, including Amalgamated Tea Estates Co.Ltd., 1896-1971; Anglo-American Direct Tea Trade Co., 1899-1960; P.R. Buchanan and Co., 1891-1957; Chubwa Tea Co.Ltd., 1881-1972; Consolidated Tea and Lands Co., 1897-1965; Hopewell Tea Co.Ltd., 1899-1919; Thomas McMeekin and Co., 1880-6; George Payne and Co.Ltd., 1902-15; Rogivue and Co.Ltd., 1897-1921; Webster Steel and Co., 1882-1928.

396 (addit) Strathclyde Regional Archives Bishop Mills, Partick: legal papers, 1900-47; stock book, 1940-7.

1138 (addit) Hemlyn Angus Milling Company Ltd. Titles, legal papers and correspondence relating to mills at Ardtannes, Buckie, Cupar, Easterton, Inverurie, Kirriemuir and Rothney, 1702-1976; North of Scotland Milling Co., 1895-1975; Glencoul Distillery, Angus, 1901-65; properties in Aberdeenshire, Angus, Perthshire and elsewhere, 1786-1976. Letters, estimates and invoices relating to milling machinery, 1926-47. Plans of Port Elphinstone Mills, Inverurie, Meikle Mills, Kirriemuir, and plans and photographs of Rothney and Ardtannes Mills, Aberdeenshire, n.d.

MANUFACTURING : ENGINEERING

1731 Parsons Peebles Motors and Generators Ltd., Edinburgh: Machine number books and files, c. 1903-current; contract correspondence, 1963-current; specifications, technical data and manufacturing instructions, 1905-current; test particulars, 1898-current; design office calculations, 1940-current; operating instruction manuals, 1945-current; drawing office register, 1898-current; drawings, c. 1906-current. Publicity Department catalogues and photographs, c. 1900-current, deposited in S.R.O.

1736 Glasgow University Archives. Duncan Stewart and Co., sugar refinery requipment manufacturers, Glasgow. Cost book, 1881-1901.

1752 Glasgow University Archives. Messrs. Mirrlees, Watson and Company, sugar refinery equipment manufacturers, Glasgow. Letter books, 1903-49, including sugar department 1903, 1933-5, engine department, 1919, and Indian business, 1926-36; quotations books, 1919-21; order book, 1916. Printed volume of statistics on sugar production in St. Croix, 1862-89.

1779 J. Morrison, Esq., Dalmuir. Photographs: Clydebank factory of Singer Sewing Machine Company and its employees, 1890-1958, including rebuilding of factory after Clydebank blitz,1942; cottages at Dalmuir, c. 1870; Glasgow Road, Clydebank,1901.

1785 Clydebank Public Library. Photographic collection:German aerial photograph of Clydebank, c. 1940; blitz damage to local areas and buildings, 1941; rebuilding in Dalmuir, c. 1950; Singer Sewing Machine Company factory and workforce, 1883-c. 1970, including photographs of various departments, c. 1900.

1808 Glasgow University Archives. Oil heating and engineering: collection of catalogues. Printed catalogues relating to oil heating and related technology, 1910-60.

1823 James Rosie and Company, accountants, Galashiels. Accounting records of John Rutherford and sons Ltd., agricultural engineers, Coldstream, 1921-current.

1834 Central Library, Dunfermline. Michael Tod and Son Ltd., bleachfield engineers, miscellaneous records, 1914-73.Papers relating to local hammermen, 17-19 cents.

1851 William Harrison and Sons (Falkirk) Ltd., screw and bolt merchants and manufacturers. Accounting records, 1910-59 wages records, 1923-59; sales records, 1880-1904. Typescript article on firm's history, c. 1965. Correspondence relating to new buildings at Camelon Works, 1918. Plans, 1894-1964, including tenement bedside Camelon Works,1894. Photograph of capstan lathe, c. 1965.

1853 Falkirk Brass and Sanitary Engineering Company Ltd.,Minutes and accounting records, 1916-current; minute of co-partnership, 1900. Quotations book, Sharp and Sons Ltd., 1960-8.

1453 (addit) Dundee City District Archives and Record Centre Blacksmith apprenticeship indenture, Broughty Ferry, 1846.

396 (addit) Strathclyde Regional Archives Alexander Finlay and Co., structural engineers, Motherwell: c. 1950; catalogues of firm's products c. 1920-c. 1960. Marshall and Anderson Ltd., boilermakers, Motherwell: photographs of firm's products, n.d. : plans of boilers, 1952, n.d.

MANUFACTURING : IRON AND STEEL/...

MANUFACTURING : IRON AND STEEL

1733 Glasgow University Archives. Scottish Iron and Coal Masters' Association. Scottish Pig Iron Trade Wages Regulation Board: minutes, agreements and miscellaneous papers, 1899-1938; letter books, 1910-57. Scottish Steelfounders' Wages Association: letter books, 1915-34. Scottish Manufacturing Iron Trade Conciliation and Arbitration Board: minutes, 1898-1964; letter books, 1916-52; wages regulations, 1940. Scottish Iron and Steel Trades: minutes, 1922-41; correspondence, 1922-44; reports and miscellaneous papers, 1922-35. Ironmasters' papers, 1922-40. Coal Owners of Scotland: accounts, 1922-5; correspondence, 1945-9; miscellaneous legal and other papers on subjects including transport, particularly railway rates, dock charges and demurrage, 1876-1942, conditions of employment, 1920s, New Cumnock Collieries, 1928-36, electricity supplies, 1929-41 Scottish District Coal Mines' Scheme, 1930-9, Miners' Welfare Society, 1932-46, Lesmahagow Rescue Station, 1938-46. Plean Colliery agreement books, 1901-46.

1734 Glasgow University Archives. Plans of Govan Iron Works, 1909. Calder Iron Works, 1916.

1756 Glasgow University Archives. M.S. notebook concerning production of shells and bullets, n.d.

1813 Glasgow University Archives. Inventory of mining engineer's office, Calder Iron Works, 1907.

396 (addit) Strathclyde Regional Archives. Accounting records and other papers of Clyde Iron Works, involving actions for debt, 1809. Calder Iron Works; letter book, 1821-4. Licence permitting Rowan and Co., Glasgow, to use Bessemer process, 1861. Photographs of visit by George V. to Dalzell Steel and Iron Works, Motherwell, 1917.

1454 (addit) K. Adam of Blair Adam Esq., Papers concerning Carron Co., 1761-91, including correspondence and accounts following bankruptcy of Adam and Thomas Fairholme, bankers, 1761-71; liability for company's debts and possible charter, 1773; development of John Liardet's mortar, 1779, and litigation with him, 1787; relations with Ordnance Office, 1781-7; adoption of carronades by Royal Navy, n.d.; sale of guns to Holland, 1786-7, and to Russia, 1787-9; criticism of Charles Gascoigne, company's manager, 1788; operation of blast furnaces and supplies of coal, charcoal and ironstone, 1789-90; manufacturing techniques and costs of guns and mountings, 1790.

MANUFACTURING : LOCOMOTIVES AND GENERAL RAILWAY ENGINEERS

1800 P.J. Knowling, Esq., Houston. Photographs of railway locomotives c.1850-c.1910, including some built by N.B.L. Co.

MANUFACTURING : SHIPBUILDING

1770 Glasgow University Archives. A. & J. Inglis, shipbuilders, Glasgow, Minutes of agreement and co-partnery, 1868-1883.

1798 Glasgow University Archives. The Blythswood Shipbuilding Company Ltd. Finished particulars, ship Nos. 1-141, 1922-64; launching particulars, ship Nos. 60-141, 1940-64; wages costs, ship Nos. 32-140, 1930-63. Lecture on history of company, 1957. Plans, specifications and photographs of various ships, 1944-63, and of caravans and mobile homes constructed by company, c. 1960. Plans and photographs of Scotstoun yard, 1939, n.d.

396 (addit) Strathclyde Regional Archives. A. & J. Inglis, shipbuilders, shipbuilding plans and photocopies, 1929-59, n.d., including P.S. Lincoln Castle, 1938, S.S. Empire Maiden, c. 1941, S.S. Ballylumford, 1952-3. Glen, Mackinnon and Mowat, solicitors, Greenock; sederunt book of William Simons, shipbuilder in Renfrew, 1848-1932. Record of vessels docked with Ardrossan Dry Dock and Shipbuilding Co.Ltd., 1922-69, and Ardrossan Dockyard Ltd., 1940-69. Specifications of ships built by Greenock and Grangemouth Dockyard Co., 1907-20. Plans of Clydebank yard of J. & G. Thompson, 1873; various ships, 1874-1968, including yacht Livadia, 1880.

MANUFACTURING : TEXTILES (INCLUDING TEXTILE MERCHANTS)

1734 Glasgow University Archives. Plans of New Lanark Works and village, 1851.

1738 Glasgow University Archives. Douglas Britain and Co., sailcover and hatch tent makers, Glasgow. Journal, 1908-41.

1771 Glasgow University Archives. Dumbarton Ropework Company Ltd. Contracts of co-partnery, Peter Denny and John McAusland, 1862, and Hamilton and Co., rope and sail manufacturers, 1877.

1775 The Woolly Mill Company Ltd., woollen manufacturers, Langholm Minutes, 1933-5, 1954-77; accounting records, 1933-77; wages and salaries records, 1933-74; order books, 1933-current; costing records, 1934-77. Correspondence concerning Wool Control Board, 1943-50; purchase of Ford Mill, Langholm, 1950-3; Scottish Woollen Trade Employers' association, 1952-72. Cloth plan books, c. 1940-current; yarn sample books, Bury Ring Mill Co.Ltd., c.1965-c.1973. Plan of Woolly Mill, Blackburn, Lancs., c.1935.

1776 Arthur Bell (Scotch Tweeds) Ltd., woollen manufacturers, Langholm. Accounting records, 1912-72; wages records, 1911-17; order books, 1919-24; costing records, 1920-2; price list, 1921-2. Plan books for various clothe, 1889-1912. Correspondence concerning war-time cloth contracts, 1917-19, and purchase of machinery, 1920. Plans of Buccleuch Mill, Langholm, 1903-20. John Bell, draper and grocer, Langholm; account book, 1842-57; sales ledger, 1846-52.

1777 Glasgow University Archives. Moore, Taggart and Company Ltd., uniform manufacturers, Glasgow. Abstract book, 1871-8.

1778 Wilsons(Dunblane) Ltd., worsted spinners. Minutes, 1945-72; accounting records, 1853-1972; wages records, 1955-70; costings book, 1955-68; order books, c. 1868-1972; wool sales book, 1871. Correspondence, 1863-1972, including letters relating to machinery and Board of Control of Wool Textile Production. Inventory and valuation of buildings and machinery, 1891-4. Papers relating to wool prices, 1902-68, and performance of other textile firms, 1902-68. Plans of Cromlix estate, Dunblane, 1812; Springbank Mills, Dunblane, 1872; textile machinery, 1907-68. Photographs of Springbank Mills and workforce, c. 1900; textile machinery, c. 1920-57.

1786 Strathclyde Regional Archives. Fleming Reid and Company Ltd., yarn spinners, Greenock: minutes, 1899-1955; accounting records, 1861-1970, including shop accounts, 1899-1956, and property department records, 1910-59; sales records, 1922-65; wages books, 1953-8; records of shares, 1899-1960, and dividends, 1889-1960; mill and knitting factory plant books, 1910-55; notes on Bridgend Mills, Dalry, c.1900-57; press-cuttings relating to firm and woollen industry, 1917-68; photographs of buildings, plant and processes; c.1890-c.1970; plan of the Worsted Mills, 1868. Peter Sutherland and Co.,Ltd.,accounting records, 1945-61.

1790 Glasgow University Archives. Charles Todd and Higginbotham, calico printers, Glasgow. Memorandum of association,1790, minute of agreement of the partners, n.d.; liquidator's report on the firm, 1899.

1811 Glasgow University Archives. Miller and Muter, Milton Printworks, Dunbartonshire. Accounting records, 1828-64.

1815 Glasgow University Archives. Templeton's Carpets Ltd. Sales analysis book, London and Glasgow, 1879-1910.

1816 Glasgow University Archives.James Finlay and Company Ltd., textile manufacturers and merchants, Glasgow. Minutes 1845-83; accounting records, 1789-1962, including foreign accounts, 1867-1955. Correspondence, 1835-1940, including letters to India from Kirkman Finlay, 1835-48, and correspondence concerning Glasgow Water Co., 1846-53. Legal papers, 1870-1942,including titles to property in Ballindalloch, 19 cent., and Deaneston and Blair Drummond, c.1907. Agreement books, 1880-1931; Rangoon order books, 1906-15; overseas consignment book,1818-54; sales books, 1941-52. Memoranda concerning firm's business in India and Far East, 1893, n.d. Catrine Bleaching Works accounting records, 1929-45, and reconstruction ledger,1945-66. Weather reports for Catrine area, 1898-1939. Deanston Works accounting records, 1792-3,1829-36,1908-59;letter books 1840-44.

Champdany Jute Co.: minutes, 1873-1921;printed reports,1898-1940

correspondence 1890-1915; details of equipment ordered for Wellington and Champdany mills, 1890-1925, and inventories of mills, 1918, including town of Catrine, 1802; Deanston Factory, 1939, and mill machinery, 1949; Wellington and Champdany jute mills and machinery, 1880s-90s; jute-growing districts of north-east India and Pakistan, n.d.; Namroopte factory, 1938; properties of Steel Murray and Co. in Durban 1901.

Trust and executry records, 1846-1956, relating to estates of James Finlay, 1846-1923. Kirkman Finlay, 1846-67, Sir John Muir, 1903-56, and others. Miscellaneous papers, including burgess tickets, 1821; personal cash books, 1829-48, and other papers of James Finlay; Confederate States of America loan bonds, 1863; Iowa Pacific Railroad Share Certificates, 1874; notebook containing miscellaneous information on jute production, 1875; papers relating to Glasgow Corporation Water Works' proposed discharge pipes at Loch Voil, 1913.

1818 Glasgow University Archives. David Ligat and Son Ltd., muslin manufacturers, Newmilns, pattern books containing samples, n.d.; printed pattern sheets, n.d.

1827 Victoria Spinning Company, Dundee Minute book, 1894-1920, including correspondence and legal papers relating to voluntary liquidation and formation of new company, 1918-20; wages records, 1893-1977; spinning book, c. 1945-8; yarn stock book, 1959-62.

1834 Central Library, Dunfermline. Records of local weavers, 1596-1863.

1836 John Barry Ltd., textile waste merchants, Leith Accounting records, 1915-69, including those of branch firm H. Watson & Sons Ltd., Aberdeen, 1935-58; order book, 1956-64; stocktaking books, bags department, 1950-64, rags department, 1954-65. Correspondence, 1862-1954, including letters to continental firms about purchases of rabbit and hare skins, 1862-72, some containing comments on Franco-Prussian War. Outline of proposed amalgamation with E. Chalmers and Co.Ltd., waste merchants, Edinburgh, c. 1955. Papers relating to John Barry Trust, 1921-60.

396 (addit) Strathclyde Regional Council. Plans of New Lanark Mills and Village, 1851-2; Dunn's Cotton Spinning Mills, Dalmuir, and surrounding area, 1836.

1454 (addit) K. Adam of Blair Adam, Esq., Correspondence concerning relief for Kinross-shire weavers, 1826-8 and cholera at Beath, 1832.

1717 (addit)/...

1717 (addit) Glasgow University Archives. Gourock Ropework Co. Titles to property in Plymouth, 1847-87. Legal papers, 1793-1928, some relating to sale of sailing ships, 1896-7; dispute with War Office over rope contract, 1923-4; company's opposition to Lanarkshire Hydro Electric Act, 1924. Financial papers, 1903-20, including statement of company's assets in Britain and abroad, 1903, valuations of company's property and machinery, 1903-13. Correspondence, 1903-24; subjects include purchase of Govan Ropework Co.Ltd., 1919, bankruptcy of Rose Bros. Ltd., Dundee, 1924. Plans, 1881-c.1930, including works and village of New Lanark, 1881; company's premises in Bay Street, Greenock, 1907; Clyde Valley Electrical Power Company's installations, c.1930.

MANUFACTURING : RUBBER

396 (addit) Strathclyde Regional Archives MacLellan family papers: correspondence concerning family firm of indiarubber manufacturers, 1879, mainly relating to George MacLellan's world sales tour; photographs, c. 1860-1932.

MANUFACTURING : CHEMICALS

1787 Glasgow University Archives. John McHaffie and Sons Ltd., bleachers, Glasgow. Trading account, 1900.

1792 Glasgow University Archives. Kames Gunpowder Works, Argyll. Plans of Works, 1862.

TRANSPORT : CANALS AND RIVERS

1734 Glasgow University Archives. Plan of canal from Glasgow to Ardrossan, Harbour, 1805.

1800 P.J. Knowling Esq., Houston. Photographs of last passenger canal boat, Paisley Canal Basin, 1882.

1843 Strathclyde Regional Archives. Legal and financial papers relating to the Clyde Navigation Trust, 1894-1904.

234 (addit) Duke of Atholl, Blair Castle Plans relating to Benchil Canal 1800-64.

1454 (addit) K. Adam of Blair Adam, Esq., Proposals for canal from River Ore to Methil, 1772.

TRANSPORT : ROADS (INCLUDING TRAMWAYS)

1739 Dundee City Archives and Record Centre. J. & J. Hunter, solicitors, Dundee. Report on case for Tay Road Bridge, 1936.

1800 P.J. Knowling, Esq., Houston. Photograph of Houston Village Horse-bus, c. 1910.

1834 Central Library, Dunfermline. Papers relating to local turnpike roads and trusts, 1805-1879 and Dunfermline district tramways, 1905-1925.

1837 Cormack, Byers, solicitors, Lockerbie. Blue Band Bus Service expenditure and income book, 1933-5.

TRANSPORT : RAILWAYS

1734 Glasgow University Archives Plans of railways in Scotland, c.1840.

1813 Glasgow University Archives. Plan of property at Comley Green, Edinburgh, in relation to Edinburgh, Dunfermline and Perth Junction Railway, 1862.

1822 Glasgow University Archives Papers relating to flat rate conveyance of coal and coke by rail, 1923-4.

234 (addit) Duke of Atholl, Blair Castle. Plans relating to Highland and Inverness and Perth Junction Railway Companies, 19 cent.; Bankfoot Light Railway, 1900-1.

396 (addit) Strathclyde Regional Council Plans of railways and tramways in Glasgow area, 1851-1918.

TRANSPORT : SHIPPING (INCLUDING HARBOURS AND PORTS)

1732 Strathclyde Regional Archives. Langmuir collection. Plans, including some photocopies, of Clyde paddlesteamers, 1851-1936. Full list (32 pages) prepared by Strathclyde Regional Archives available in S.R.O.

1734 Glasgow University Archives. Plans of Port Glasgow, 1792, Liverpool and Birkenhead Docks, 1858.

1745 Glasgow University Archives. J.M. Campbell and Sons, shipowners, Glasgow. Records of ships' movements, 1870s-90s. Accounts of subsidiary companies set up for individual ships, 1893-1908. Plans, specifications and photographs of various company ships, 1900-58, n.d.

1746 Glasgow University Archives. Burntisland Pier and Ferry Company. Minutes, 1839.

1748 Glasgow University Archives. Lloyd's Register of Shipping: printed register of British and foreign shipping, 1834-1950, 1958-9, and of yachts, 1929. Annals of Lloyd's Register, 1884, 1934. Lloyd's Regulations, 1938-9.

1755 Glasgow University Archives. Log book of Capt. William Miller, master of bark Keilmaurs, on voyage between Glasgow, Madeira and San Fernando, 1845.

1768 Glasgow University Archives. The Netherlands India Dry Dock Company. Agreements with R. Behrend and Co. concerning dock construction at Batavia and Sourabaya, 1873-8.

1796 Weaver's Cottage, Kilbarchan. Executry papers of James Brown, seaman, 1816-17, with list of prize money from captured ships. Letter from James Brown to William Christie concerning destination of his ship H.M. sloop Crane, 1812. Insurance for cargo bound for Barbados, 1800.

1800 P.J. Knowling, Esq., Houston. Photographs of ships, c.1870-1937, including P.S. Iona, c. 1870 and S.S. Davaar, 1890.

1806 Royal Tay Yacht Club. Minutes, 1885-91,1938-75. Press-cuttings and records of races, 1885-91. Letter concerning royal permission for adoption of club's present name,1891. Photographs of yachts, 1909-66, and club regatta,1895. Advertisment for Forfarshire, Dundee and Hull Shipping Co., 1837.

1822 Glasgow University Archives. Article entitled Drift South of Scottish Shipping by 'G.J.I', 1943.

1845 Colonel J.S. Inglefield-Watson, Hamilton. Robertson-Aikman of the Ross muniments. Logbooks of vessels sailing to India, 1775-1805. Notes and charts concerning New Guinea and Far Eastern shipping routes, 1792 and n.d. List of East India Company Ships, 1827.

396 (addit) Strathclyde Regional Archives Donaldson Bros.:minutes, 1913-39, accounting records, 1868-1938, register of members,1915-35, ship service records, 1892-57, charter party books,1909-57; Anchor Donaldson Ltd.,:minutes, 1916-37, accounting records, 1916-54; Donaldson Atlantic Line Ltd.:minutes, 1951-5; Donaldson Bros. and Black Ltd.:minutes , 1938-66, accounting records, 1938-67; Donaldson Line Ltd.:minutes, 1913-31,minutes of joint board with Glasgow Steam Shipping Co.Ltd., 1938-67, accounting records, 1915-63; Donaldson South American Line Ltd., 1919-31; Glasgow Steam Shipping Co.Ltd.:minutes,1894-1941, register of members, 1899-1933; Joseph Black & Co.: register of members, 1919-38, individual ship accounts, 1896-1917; Kelvinbrae Steam Ship Co.Ltd.: accounting records, 1915-20; miscellaneous volumes and papers, 1885-1966, including particulars of staff, salaries and service, 1893-1962.

Greenock Chamber of Commerce:minutes, 1814-1971; parliamentary Acts relating to Greenock harbour, 1773-1862,and town 1866. Holder Bros.,shipowners and agents London; charter party books, 1931-52. Captain Andrew Smith, ship chandler:accounting records, 1866-9.

1138 (addit) Hamlyn Angus Milling Company Ltd. Minute of meeting concerning voluntary liquidation of Aberdeen, Newcastle and Hull Steam Co. Ltd., 1946.

1184 (addit) Stewartry Museum, Kirkcudbright. Miscellaneous legal and other papers, mainly concerning Kirkcudbright, 18-20 cent.,including charter party of brig Anna to trade to Bordeaux from Kirkcudbright 1777; papers of Kirkcudbright Shipping Company concerning high insurance premium demanded on vessel returning from North America, 1912.

1454 (addit) K. Adam of Blair Adam, Esq., Correspondence, minutes and papers concerning 1820, and competition with Granton-Burntisland ferry, 1846-7.

1500 (addit) The National Trust for Scotland Irvine of Drum M.B.S. Trade journal of ships Riddarhaus and Stockholm from Gothenburg to Canton, 1749-1; direction for sea passage to Ceylon, 1748.

TRADE : TIMBER

396 (addit) Strathclyde Regional Archives. Papers relating to families of Water McGibbon, timber merchant, Paisley, and his son-in-law, Andrew Ballingall, 1706-1952, including titles and rentals of Paisley properties, 1706-1939; accounts for building work, 1838-70; miscellaneous papers of Paisley Society of Wrights, 1737-1931.

TRADE : MERCHANTS

1782 George Boyd & Co.Ltd., architectural ironmongers and engineers' merchants, Glasgow. Accounting records, 1862-1958; wages records, 1902-36; sales records, 1861-1924; ironmongery price list 1918-22; press-cuttings and advertising material, 1948-76; partnership papers, 1876-1929; papers relating to leasing of premises, 1895-1910, and purchase of blacksmith's business, 1911. Photographs, 1918-c.1955, including interior manufacturing processes at Cathedral Works, Weaver St., 1919-40.

1813 Glasgow University Archives. Papers of Dr. Kellet. Correspondence and papers relating to the business affairs of William Pattison, merchant in Edinburgh, 1816-48; and estate of John Chisholm, ironmonger in Edinburgh, 1826-32.

1832 Cockburn and Company (Leith) Ltd., wine merchants, Edinburgh. Accounting records, 1801-1929; order books, 1911-36; sales book, 1801-21. Correspondence, 1801-68, including letters from Sir Walter Scott, 1825, Thomas Carlyle, 1832, and other famous customers. Scrapbook containing advertisements, price lists, including those for branch established in the Punjab, and specimens of labels, 1871-1950.

1841 Glasgow University Archives. A.B. Carruthers & Company, agricultural merchants, Auldgirth, Dumfriesshire. Fragment of ledger, 1931. Legal papers, 1910-40, including agreements relating to Auldgirth farm, 1925, and marketing rights to mineral mixture produced by Carruthers, 1928. Advertising material for agricultural machinery, animal feedstuffs and grain, c. 1940-60. Diagrams of cereal cutter and mixers, 1933-4.

1845 Colonel J.S. Inglefield-Watson,Hamilton. Robertson-Aikman of the Ross muniments. Business and commercial papers, 1674-1836, including accounts and vouchers relating to business dealings between Oswald and Aikman families, 1680-1719. Papers relating to John Aikman's trading venture in Leghorn, 1713-65. Papers concerning Indian interests of various members of Robertson family, 1726-1836. Papers relating to firm of Weir and Aikman trading with America, 1770-7. Accounts for trading voyages from London, 1803-5.

396 (addit) Strathclyde Regional Archives. Accounting records and other papers of James Laurie, merchants, Trongate, 1807-8; John MacConnell, hardware merchant, 1811-16, involving actions for debt. Glen, Mackinnon and Mowat, solicitors, Greenock: sederunt books of Simon Haglett Millar, wine and spirit merchant, Greenock, 1891-1928 and Lilias Smith, wine and spirit merchant, Greenock, 1898-1955.

TRADE : RETAIL

1729 City of Perth Co-operative Society Ltd. Minutes, 1875-1963, including education committee, 1892-1939, and Men's Guild, 1915-22, 1961-9; accounting records, 1875-current,including share and loan ledgers, c. 1915-64, sales books, 1954-77,and stocktaking books of various departments, branches and van stocks 1964-74; correspondence, 1919-69; employees' records, including wages, 1901-72, superannuation, c. 1935-66, and sickness, 1953-61; No.9 branch reports, 1901-20;miscellaneous printed material, including Society's monthly magazine Pioneer, 1877-1937, history of the firm by J. Willocks,1892, press-cuttings relating to co-operative societies and temperance, 1916-21, and diamond jubilee souvenir publication, 1931. City of Perth Co-operative Party: minutes, 1918-63; treasurer's statements, 1930-58. Wrights' Incorporation of Perth: cash book, 1937-54.

1803 A. Caird and Sons, retail stores, Dundee. Minutes, 1919-78; accounting records, 1904-69; sales records, 1920-5; wages and salaries records, 1921-38; correspondence and papers relating to finance and properties, 1894-1938; photographs of interior of Perth premises, c.1935. National Federation of Merchant Tailors, Dundee Branch: minutes, 1916-19. Dundee and District Drapers, Clothiers and Allied Trades Association:minutes, 1943-54.

1821 Glasgow University Archives. A.R. Henderson and Company Ltd. ironmongers, Glasgow. Minutes, 1903-41, accounting records, 1904-66; stock books, n.d. Miscellaneous printed sales catalogues of ironmongers, brassfounders and tool manufacturers, 1899-1968.

1825 Keith Holme, pharmaceutical chemists, Galashiels. Ledgers, 1880-1915; prescription books, 1880-1942; poison register, 1932-52. Physics lecture notes, c. 1930. Work record of pupil at Galashiels Academy, 1910-12.

1834 Central Library, Dunfermline. Minutes and accounting records of Dunfermline Co-operative Society, 1861-1967. Kingseat Co-operative Society minutes, 1950.

1453 (addit) Dundee City District Archives and Record Centre. Hector Stewart and Co., tailors and clothiers, Forfar: ledger, 1852-3.

TRADE : AUCTIONEERS.

1852 John Gibson & Son, auctioneers, Dumfries. General notebook and cash book of Dickson and Gibson families, 1679-1837, including account of John Gibson's apprenticeship, c.1805, and cash book for his work as cabinet-maker, 1808-20; minutes of meeting of Dumfries cabinet-makers, 1813; recipes for dyes and furniture polish, c. 1810.

TRADE : ASSOCIATIONS

1781 J. & W. Buchan, solicitors, Peebles. Minutes of Scottish Woollen Trade Employers Association, Peebles and Tweed Branch, 1917-34.

1784 Electrical Contractors' Association of Scotland. Minutes of central board, 1912-60, and Edinburgh branch, 1904-49. Register of members, Glasgow branch, 1904-11; Edinburgh branch, 1912-34. Printed year books, 1947-68.

1805 Jute Importers' Association Ltd., Dundee. Minutes: 1923-53; Jute Importers' Mutual Protection Association Ltd., 1892-1923; meeting with London Jute Association and German Spinners' Association 1926; meeting of association and fiscal committee of Association of Jute Spinners and Manufacturers, 1932. Balance sheets, 1907-49; annual reports, 1903-77; arbitration appeals register, 1918-53. Miscellaneous legal papers, 1895-1973, mainly relating to actions involving cargoes of jute. Correspondence, 1915-57, subjects include Calcutta jute freight rates, 1919-28; constitution of East of Scotland Ports Group of Port Labour Employers, 1927; Indian export tax on raw jute, 1932; Bengal Jute Inquiry, 1933. Papers relating to shore dues, 1914-33, Royal Commission on Agriculture in India, 1926-7; excessive moisture in jute, 1929-45. Jute importer's warehouse account book, 1920-55. Report on Jute delegation visit to Pakistan, 1955.

1820 Glasgow University Archives. Glasgow Salvage Association: minutes, 1892-41. Underwriters' Protection Committee minutes, 1857-92. Underwriters' Admission Committee minutes, 1859-1914. British Marine Salvage Company Ltd. minutes, 1888-1923.

1823 James Rosie & Company, accountants, Galashiels. Records of Scottish Wool Spinners' Association, 1915-66, including minutes, 1947-64; accounts, 1915-57; correspondence, 1915-66; reports and statistics relating to spinning industry, 1915-57; cost schedule submitted by member firms, 1921-51.

1824 Glasgow Shipowners' and Shipbrokers' Benevolent Association. Minutes, 1899-1948; accounting records, 1899-1962; printed annual reports and regulations, 1899-1968.

1828 Joseph Johnston and Sons Ltd., salmon fishers and mussel merchants, Montrose. Sederunt book of Fishermens Society of Ferryden and Usan, 1853-74. Printed reports of Salmon Net Fishing association, 1911-12. Titles, legal papers and correspondence relating to Ferryden and Usan Fishermen's Mussel Society, 1877-1901.

1833 Dunfermline Guildry. Court book, 1433-1597; minute books, 1684-current; accounting records, 1833-1968; letter books, 1894-1928; guildry cartulary, 1828-1935.

1836 Patrick Gifford & Company, solicitors, Castle Douglas. Stewartry of Kirkcudbright Dairy Association: minutes, 1887-1959, including South West of Scotland Registered Milk Producers' Association, 1937-40, Stewartry of Kirkcudbright Registered Milk Producers' Association, 1934-51; accounting records, 1887-1959, including cash book of Stewartry of Kirkcudbright Milk Records Committee, 1909-17; lists of members, 1897-1955; reports on experimental cheese making, 1893-1922; correspondence with English Cheshire and Cheddar Societies and similar bodies, 1931-6.

1843 Strathclyde Regional Archives. Merchants' House of Glasgow. Minutes, 1676-1930; accounting records, 1677-1943; correspondence, 1824-1936; lists of members and matriculation books, 1738-1963. Titles to property in Glasgow 16-20 cent. Charitable and educational papers including list of subscriptions towards the upkeep of Merchants' Hospital, 1659-1789; minutes and other papers of Clyde Marine Society, 1696-1813; papers relating to Merchants' House bursaries, 1699-1905; accounting records, applications and other papers of various trusts and mortifications, 1724-1923, including indentures of apprenticeship under Robert Saunders of Auldhouse's mortification, 1826-79; Merchants' House pension lists, 1826-7. Paintings displayed in Merchants' House Building, 1871-1911, trading relations with colonies and other foreign countries, c.1900. Plans, 1847-1929, n.d. including Barony of Glasgow, 1847; Chamber of Commerce, 1929; Merchants' House Building, 1909, n.d.; Necropalis, n.d.

UNDERTAKERS

396 (addit) Strathclyde Regional Archives. William Wallace Ltd., undertakers, Hamilton : ledgers, 1928-52.

SERVICE INDUSTRY : PUBLIC SERVICES

1734 Glasgow University Archives. Plan of Glasgow Sewers, 1868.

1773 Glasgow University Archives. Lennoxtoun Gas Light Company. Accounting records, 1925-39; register of shareholder, c. 1895-1904.

1454 (addit) K. Adam of Blair Adam Esq. Report on sanitary state of Cowdenbeath, 1879.

396 (addit) Strathclyde Regional Archives. Minutes of public meeting to promote water supply to Glasgow, 1797 and copy of surveyors report, 1798.

SERVICE INDUSTRY : BOARDING AND LODGING HOUSES

1740 Dundee City Archives and Records Centre. Morrison's Academy, Crieff. Memorandum and articles of association, 1933;minutes including Boarding Houses Association, 1931-71, and Crieff Girls' Boarding House Association, 1955-63; cash books, 1931-73; boarders' account books, 1932-45, 1956-8; letter books, 1934-70.

SERVICE INDUSTRY : ENTERTAINMENTS

1780 Lanark Race Course Ltd. Minutes, 1883-current, reports and accounts, 1908-77. Plan of racecourse, 1908. Photographs of course and its construction, c.1955-77 n.d. Lanark Race Club: minutes, 1970-8; accounts, 1946-78; club register, 1946-78.

1842 Glasgow University Archives. Lanark Race Course Company Ltd. Minute of directors' meeting, 1921; accounting records, 1908-77; directors' report, 1944; registers of members, 1908-41. Legal papers 1891-1956, including copy lease of racecourse, 1891, and agreement with Racecourse Betting Control Board,1935. Race cards, 1908-45. Press-cuttings relating to racecourse,1969. Plans of racecourse and buildings, 1945-70.

ACCOUNTANCY, BANKING, STOCKBROKING AND INVESTMENT CO'S.

1735 Glasgow University Archives. Thomson McLintock & Co., accountants Glasgow. Private ledger, 1880-90; private journal, 1877-88; documents and notes concerning firm's history, n.d.

1749 Glasgow University Archives. National Security Savings Bank. Letter book concerning foundation of bank, 1836-45.

1760 Aberdeen Trustees Savings Bank. Aberdeen Savings Bank,1844-1948; deposit records, 1822-8, 1892-1937; regulations,(1819);accounts and correspondence, 1815-1920; salaries book, 1845-83; scrapbook, 1932-50. Aberdeen Savings Investment Trust Ltd., minutes,1901-13. Minutes and miscellaneous records of local savings banks in North East Scotland, 1815-1942. Papers relating to local penny savings banks, including foundation records, 1849-95; constitutions,1880-95; correspondence, 1860-1, 1902-10. Miscellaneous printed and typescript material, 1852-1926, including bibliography of local savings bank histories, 1896; confidential memorandum on development of trustee savings bank system, 1926.

1765 Institute of Chartered Accountants of Scotland,Aberdeen Area. Committee minutes, 1951-78. Society of Accountants in Aberdeen: examiners' minutes, 1891-1921; reports on allocation of funds, 1867-1937; registers of members, 1867-1937. Aberdeen Chartered Accountants' Widows' Fund minutes, 1902-76; annual general meeting report, 1976.

1781 J. & W. Buchan, solicitors, Peebles. Minutes of Peeblesshire Savings Investment Society, 1870-1929.

1807 Glasgow University Archives. Provident Property Investment Company, Edinburgh, rules, 1850.

1809 Glasgow University Archives. Western Bank of Scotland. Contract of co-partnery and related papers, 1832-57. Papers relating to liquidation of the company, 1858-63. Plans and sketches of branch offices, 1845-58.

1810 Glasgow University Archives. Dundee Union Bank:deed of accession to contract of co-partnery, 1832.

1837 Cormack and Byers, solicitors, Lockerbie. Papers relating to the liquidation of the Western Bank of Scotland, Glasgow, 1851-61. Lockerbie Savings Bank: minutes, 1845-current; accounting records, 1816-1910.

INSURANCE

1772 Glasgow University Archives. Glasgow Fire Insurance Society. Constitution and articles of association; 1803. Miscellaneous legal papers, 1803-11. Plan of Govan and Gorbals showing coal areas, 1851.

1793 Glasgow University Archives. Bennett and Browne, Insurance Brokers, Glasgow. Correspondence, 1809-31, including letters to James Browne about personal money matters. Essay on Glasgow Association of Underwriters, 1938.

1813 Glasgow University Archives. Papers of Dr. Kellet. Papers relating to business affairs of William Braidwood, manager of the Sea Insurance Company, Edinburgh, 1816-32.

396 (addit) Strathclyde Regional Archives. Commercial Union Assurance Co.; minutes and accounting records of North British and Mercantile Insurance Co.Ltd., 1809-1961; Aberdeen Fire and Life Assurance Co., 1840-73; Fine Arts and General Insurance Co., 1890-1960; Glasgow Rate and Salvage Association, 1913; Railway Passenger Assurance Co., 1857-1960; Railway Passenger Fine Arts Insurance Co., 1951-62; Royal Scottish Insurance Co., 1907-60; Scottish Provincial Assurance Co., 1852-90; Universal Life Assurance Society 1834-7; Western Fire Insurance Co., 1840-59.

1453 (addit) Dundee City District Archives and Record Centre. Letter from Secretary of Shipwrights' Provident Union Society, Dundee, with list of members, 1826.

FRIENDLY AND BENEVOLENT SOCIETIES ETC.,

1762 Aberdeen and North-East Society for the Deaf, formerly Aberdeen Deaf and Dumb Benevolent Society, Minutes, 1896-1965;annual reports, 1902-current;constitution, c.1960.

1764 British Women's Temperance Association, Aberdeen District Union. Minutes, 1952-7. Printed and typescript works on temperance, 1891-c.1960, including history of local temperance organisation, 1901. B.W.T.A. Scottish Christian Union: annual reports,1938, 1958-60.

1799 Glasgow University Archives. Glasgow Dumfriesshire Society: minutes, 1895-1938; account, 1876-82; report, 1881-1937; correspondence, 1904-6, 1918-23, including applications for bursaries and relief payment; lists of members, 1867-1937, and office bearers, 1867-1904; press-cuttings relating to society, 1902-22. Glasgow Nithsdale Society minutes, 1866-95, cash book, 1867-1901; Glasgow Annandale Society minutes, 1883-5. Miscellaneous printed papers, 1881-1911, including rule books of South Australian Caledonian Society, 1882, and Glasgow, Sanquhar and Kirkconnel Friendly and Benevolent Association, 1902; reports of London Dumfriesshire Association, 1889-90, and Edinburgh Dumfriesshire Society, 1899.

1834 Central Library, Dunfermline. Minutes and letter book of Lochgelly Trades and Labour Council, 1925-7.

1855 Walker and Sharpe, Solicitors, Dumfries. Maxwelltown Soup Kitchen and Coal Fund Management Committee Minutes, 1887-1959.

PRINTING AND PUBLISHING

1751 Glasgow University Archives. Blackie and Son, publishers, Glasgow. Minutes, 1890-1912; accounting records, 1835-1911; Statements of sales, Khull Blackie & Co., 1815-30; Indian business papers, 1904- 13, including report on Bombay branch, 1907; papers relating to First World War price adjustments, 1916-20; letter book, 1902-12; binding shop wages books, 1846-58; catalogues, 1817-77; partnership papers, 1794-1900. Papers concerning George Brookman & Co., 1815-39, and Gresham Publishing Co. 1873-1921. Accounts and letters. Church Building Society of Glasgow, 1844-51. Illustrated booklet on firm n.d. Plan of Blackie & Son's premises,1933; copy plan of University Printing Office, Villafield,Glasgow, 1826. Photographs of personnel and premises, 1839-1956. Family papers, 1806-1939, including papers relating to trusts of John Blackie senior, 1822-47; correspondence concerning Partick Division candidature, 1887-9, including letters from Sir Henry Campbell-Bannerman; family tree, n.d.Miscellaneous papers, 1814-1964, including calendars of St. Mungo's College, Glasgow, 1889-94; notes concerning printers to Glasgow University, n.d.

1761 J. & W. Buchan, solicitors, Peebles. Neidpath Press Ltd : minutes, 1937-44; register of members, 1937.

1783 Guthrie's Newspapers Ltd., Ardrossan. Bound copies of Ardrossan and Saltcoats Herald, 1856-1976; Western Supplement and Advertiser, 1867-86; Beith Supplement,1919-32;Large and Millport Weekly News,1963-75; Irvine and Fullarton Times, 1963-75.

1453 (Addit) Dundee City District Archives and Record Centre. David Winter and Son Ltd., booksellers, stationers and printers, Dundee : accounting records, 1858-1951; day book recording supplies to Dundee schools, and colleges, 1944-5.

SOLICITORS

1737 Glasgow University Archives. Moncrieff, Warren, Paterson & Company, solicitors, Glasgow. Inventory of process in submission Scott & Co. and Valery, Frere & Fils.

1837 Cormack and Byers, solicitors, Lockerbie. Day Books, 1873-1955; accounting records, 1876-1900; trust and executry records, 1833-1955.

1855 Walker and Sharpe, solicitors, Dumfries. Minutes of partnership, 1873-1969, accounting records, 1897-1972; letter books,1960-4; memorials and opinions book, 1886-1931. Executry and curatory records, c.1865-1978, including diary and cash book of William Bannerman, partner in firm, 1865-78. Typescript notes on history of the firm, 1962.

396 (addit) Strathclyde Regional Archives. Kerr, Anderson, Miller, Stevenson & Co., stockbrokers, Glasgow: accounting records, 1846-67; correspondence, 1878-90; abstract statements of affairs of various companies, 1891-1903; printed prospectuses of public companies, 1912-74. Robert Armstrong Mitchell, solicitor, Glasgow: letter books, 1836-43; ledger,1837-8; day book, 1840-3.

2. Strathclyde Regional Archives

The following business, industrial and commercial records have been received since the appearance of the last number.

Applications for access should be made to the:

Principal Archivist,
Strathclyde Regional Archives,
P.O. Box 27, City Chambers,
Glasgow, G2 1DU or, if calling, at,

30 John Street, (Basement).

Manufacturing: Brewing

Patent, papers, letterbook of J. & R.Tennent & Co.,Wellpark Brewery, 1844-1900 from Tennent's Caledonian Breweries Ltd.

Manufacturing: Textiles

Inventory, standing instructions, agreements, photograph, 1911-1952, of Messrs. J. & J. McCallum Ltd.,dyers,Paisley.

Manufacturing: Clothing

Accounts of Messrs. John Glen & Co., footwear manufacturers and warehousemen, 1890-1904.

Manufacturing: Engineering

Messrs. Brownlie & Murray, structural engineers, records (uncatalogued).

Trade: Painters and Decorators

Cash and sales books, 1914-1969; wages books, 1945-1972; measurement books, 1942-1969, of Messrs. George W. Sellars & Sons, Ltd., Glasgow.

Trade: Carriers

Glasgow Hiring Co., carriers. Financial records (uncatalogued).

Transport: Shipowners

Burns & Laird Lines Ltd., & associated companies. (Ayr Steamship Co., Burns Steamship Co., G. & J. Burns Ltd., Laird Line Ltd., William Sloan & Co.). Minutes of these companies, 1900-1974, per Messrs. P. & O. Ltd., (Additional to main records deposited in 1971).

Andrew Weir & Co., Glasgow (The Bank Line): logbook of barque Elmbank, 1893-4 per Scottish Record Office.

Messrs. R. & J. Craig, shipowners, Glasgow: Ship movement books, 1880-93; shipmaster's journals, 1893-8; ship plans, 1876-91.

Solicitors:

Messrs. Monerieff, Warren & Patersons solicitors, Glasgow: directors' minutes of Thornliebank Company Ltd., 1886-1900, calico printers; letterbook of Peter Moir as factor of the Rouken & Davieland estates of the Crum family, 1897-1907.

Messrs. A.J. & A. Graham, solicitors, Glasgow: letterbooks, 19th cent., per Glasgow University Archives.

Service Industry:

Blantyre Lodging House Ltd., articles of association and minutes, 1907-1975.

BOOK REVIEWS

BRUCE LENMAN, AN ECONOMIC HISTORY OF MODERN SCOTLAND 1660-1976.

(B.T.BATSFORD LTD.,1977 £3.35 Paper.)

It is arguable that the writing of a textbook for undergraduates is one of the most daunting tasks an academic historian can undertake. The labour of amassing a range of material on a wide variety of themes can, of course, be taken for granted. But in addition, a number of particular difficulties confront the ambitious writer of a general study. He has to distil and generalise in a way which deters the majority of timid scholars who much prefer the safer genres of learned article and specialised monograph. A 'balanced account' of matters of massive complexity and controversy is expected but at the same time the discussion should seek to avoid the bland and the predictable conclusion. Perhaps above all accurate information should be purveyed in language understandable to the non-specialist but at the same time not so simple as to irritate the author's professional peers. Writing an historical textbook is akin to negotiating a minefield with reputation rather than life at risk.

Given these insuperable difficulties, Mr. Lenman's new examination of Scottish economic development from 1660 to the present can be judged a partial success. Few new interpretations or insights emerge and the book as a whole is emphatically traditional in structure. Yet this in itself is no bad thing and the author does provide a clear outline of the period and manages to incorporate much of the research which has appeared recently in this vigorous and expanding field. A major strength of the study is that it is attractively written and for that reason alone is likely to appeal to undergraduates. An additional selling point is the fact that the paperback edition is very reasonably priced at £3.35. It can, therefore, be anticipated that An Economic History of Modern Scotland will in time become a popular textbook in Scottish universities.

The weaknesses of the study only become apparent on closer scrutiny. On occasion, the author confuses description with explanation as in the view that 'growth derived from the exploitation of low-cost, low-overhead trades which were favourably placed to compete in the discipline of the market'(p.99). Moreover, narrow economic interpretation of development is sometimes favoured where a broader analysis, encompassing social and cultural elements, would carry much more intellectual conviction. In some sections there is a lack of sensible balance. Thus the agrarian changes in the lowlands between 1780 and 1840 attract a mere five pages and the treatment is so compressed as to be almost useless. On the other hand, the author spends no less than seven pages assessing the role of government intervention in the eighteenth century economy via communications developments and the activities of the Commission for the Forefeited Annexed Estates only to arrive at the predictable conclusion that its impact was marginal in the extreme. Indeed, a veritable scholarly industry has grown up around the records of the Forfeited Annexed Estates Commission, an effort which is totally out of proportion to that Body's real importance in eighteenth century historical developments. Finally, even 'old' economic history is essentially a

quantitative discipline and much more information could therefore have been made available in graphic and tabular form. It is strange indeed to read a work on economic history which does not contain one table. With these reservations, this book can be recommended to undergraduate students of Scottish history.

STRATHCLYDE UNIVERSITY T.M. DEVINE

A.E. MUSSON, THE GROWTH OF BRITISH INDUSTRY

BATSFORD, 1978, £14.50, 396 Pages)

The ambitious aim of this work by Professor Musson is to provide, not only an account of technological change in industry, but of such related economic factors as industrial structure, business organisation, entrepreneurial innovation, capital investment and markets. The magnitude of this task is eased by the exclusion of agriculture, trade and transport and by a terminal date set at 1939. Musson admits to some doubts over this date but argues that there has been a new scale and nature of industrial change, including greater government intervention, since the Second World War and that this period has already attracted much attention in academic writing. By concentrating on the period to 1939, he hopes to provide an historical dimension for the more modern studies.

The book has four main parts and an extensive bibliography compensates for the lack of footnotes. After a short section on the Pre-industrial Economy (1500-1700), the chronological divisions selected for thematic study are 1700-1850, 1850-1914 and 1914-39. Musson agrees with many recent writers in de-emphasising the role of steam power and 'modern' technology in industrial growth up to 1850 and instead places the Industrial Revolution, defined as the period of most impressive advance in the application of steam power between 1850 and 1914. During the inter-war period the second Industrial Revolution, based on oil and electricity, gained a momentum which intensified from 1940 onwards.

The method of treatment is a combination of more general chapters on economic growth and industrial structure with specific chapters on the principal industrial sectors such as Textiles, Coal, Engineering and Metals, Chemicals and other Consumer Industries. With an average of under 20 pages per chapter, many sections are inevitably compressed and readers in Scotland are likely to be irritated by the comparatively slight treatment of shipbuilding and only passing mention of the very successful Paisley thread and Scotch whisky industries. There is also a failure to mention the American origins of Babcock and Wilcox.

Though this volume will be a useful source of information, one cannot escape the feeling that, in trying to integrate the technology of industrial change in an economic context over 450 years, it has proved impossible to give both an adequate account of industrial technology and of its relationship to economic change. This is especially true of the period from 1850 where a growing complexity in the mechanics of industry coincides with a whole new debate on growth and retardation in the British economy. The main components in this debate are listed but so briefly, and with such qualification, that readers are bound to be confused. Musson does provide his own conclusions yet the argument leading to them is not well developed. His own preference is to stress the great social benefits of capitalist enterprise, to minimise the effective role of government and to highlight personal factors in entrepreneurship. He plays down the direct connection between market needs and innovation and regards the relative economic decline of Britain as inevitable though entirely compatible with impressive absolute growth.

While there is something to be said for such conclusions as a stimulus to critical assessment of alternative interpretations, the nature of the book does not give scope for the development of relevant argument. The problem of how to explain Britain's economic success in the inter-war period, given the prior exposition of the 'relative decline' thesis, is not resolved. It is not sufficient to explain this by a second Industrial Revolution since, given the 'decline' thesis, one would expect Britain to have been less able to take advantage of this than other countries. The abrupt ending at 1939 also obscures the fact that the British economy performed quite well between the 1920's and the 1950's. It is only in the more recent part that evidence of serious, relative decline has again appeared. There is scope here for a much fuller discussion of the problems of industrial relations within industry and of establishing an effective relationship between government, industry and the trade unions. Much is also left unsaid on how the nature of enterprise changed as business scale increased and research divisions multiplied. Though incoming American and German firms and individual entrepreneurs are mentioned, more could have been made of the implications of such changes for British industry and the economy.

However, while this work does fall between the stools of technological and economic history, it serves as a convenient reference to the main benchmarks in industrial development and should encourage further writing on the nature of relationships between technology, the economy and society in the still controversial post-1850 period.

UNIVERSITY OF GLASGOW

T. HART

G.N. VON TUNZELMANN. STEAM POWER AND BRITISH INDUSTRIALISATION TO 1860. (OXFORD: CLARENDON PRESS: OXFORD UNIVERSITY PRESS 1978. Pp. xii + 344. £12.50).

This study is concerned to evaluate the impact of the stationary steam engine on early British industrialisation. It falls into two main parts which are concerned with the backward and forward linkages of the steam engine. In the first of these, the author brings together a vast array of data on the number of engines, their price, fixed costs, variable costs, horse power, and fuel consumption which was obviously culled from a wide variety of sources. This data, once assembled, enabled the author to estimate the backward linkages of the steam engine, in the year 1800, in terms of its demand for cast and wrought iron, copper and brass, used in the construction of steam engines. His estimates indicate that a very small share of the output of these metal industries was consumed in steam engine manufacture, less than 0.25 per cent in the case of iron. These proportions remained low, although increasing throughout the first half of the 19th century, and the backward linkage thus remained weak. On the other hand the backward linkage to the coal industry was significant, ranging from one tenth to one fifth of total output according to the assumptions made in calculations. Von Tunzelmann used the same data to calculate the social saving of the steam engine in 1800, which he found to be 0.11 per cent of national income for Watt engines and 0.2 per cent for all steam engines. In other words "the level of national income on 1 January 1801 would not have been attained much before 1 February 1801 without James Watt".

The second major part of the book investigates the forward linkages of the steam engine in its impact upon textile manufactures and cornish mining. The greatest part of this study is devoted to the cotton industry, and generates the conclusion that productivity increases were facilitated by steam engine power via increased machine speeds.

The main impression given by this book is of the great effort in data collection which must have been necessary to provide a basis for the statistical exercises. The weakness of this data, stressed by the author with refreshing candour and explicitness, means that the results of the calculations must be treated with some caution. The social saving result is plausibly small and fits in with recent studies by more traditional means in providing a counter to some of the more extravagantly revolutionary claims made on behalf of the steam engine as an agent of economic change. The calculated linkages are also plausible although perhaps they should be taken as first approximations rather than as a complete and final statement of linkage effects notwithstanding the data errors. In a concluding section the author states his aim to "amalgamate the strengths of the British antiquarian approach to economic history with the strengths of the American statistical-cum-theoretical approach". There is certainly much of interest for exponents of either approach. Traditionalists will certainly approve both of the rigorous scanning of sources and the sensitive use of historical information, while those with a numerate orientation will be interested in the ingenious statistical manipulations.

One is left with the impression, however, that a fully successful amalgamation of all these virtues really required a wider canvas and a more general orientation. The focus here is firmly upon a single artifact in the economic universe and its links to the rest of that universe traced by partial equilibrium investigation. Nevertheless this work remains an important contribution to the study of both British industrialisation and the history of technology, and will be useful to economic historians for a long time to come.

UNIVERSITY OF ABERDEEN C.H. LEE

W.A. THOMAS, THE FINANCE OF BRITISH INDUSTRY 1918-1976
(METHUEN. 1978 Pp X + 351 £17.95)

Dr. Thomas has produced an extremely useful work of reference of use to all those interested in British economic history in the twentieth century. He covers all aspects of industrial finance in what is part of a larger survey of the subject going back to the industrial revolution. It is gratifying to see a study such as this coming right up to date. The historian may complain of some lack of perspective but there is compensation in the considerable amount of information available for recent years; the book rests exclusively on published sources so no imbalance is introduced between the recent and more distant past by this means.

The work has been divided into two parts, the first dealing with the inter-war years and the second with the post World War II period. No space is given to the Second World War years though of course many post-war practices had their origins there and these are picked up in the appropriate later chapters. The balance of the book is weighted to the second period in the ratio 5:2 (though there are five chapters in the first part and six in the second) and this is fair given both the length of the periods covered and availability of material. The reason given for the division is that World War II provides a natural break. While it is often the case that the War marks a discontinuity in British economic history it seems to this reviewer that the field of finance is far from being the clearest example of this. The book itself has some implicit support for this view for the last chapter of Pt.1. entitled "The Macmillan and Other Gaps", points to the well-known gap in the provision of finance for small companies that became a problem in the years after the First World War. But after mentioning the few initiatives taken in the 1930s to plug the gap, the chapter slides quickly into the more important measures which began in 1944. The topics covered in both sections are very similar. In Pt.1 chapters 2,3 and 4 deal with the new issue market, the role of clearing banks and the use of internal funds. In Pt. 2 chapters 6,7 and 8 deal with the capital market, the role of banks and internal finance. This may seem like

quibbling but perhaps these would all have been more easily handled as topics running through the whole period, and the reader could have seen the development and the interruptions to that development more readily. The extra topics in the post World War II period are Trade Credit and the financing of Public Corporations and these, like all aspects of finance, are greatly influenced by government policy. The final chapter is a drawing-together of the chief trends in sources and uses of funds over the years 1952-1976. A useful select bibliography is appended.

The available material for the earlier part is scant but Dr.Thomas points out what the gaps and the deficiencies are and indicates what use can be made of it. In some instances he has re-worked some of the figures to produce fresh series and there is one such useful series in the index of profit for 1919-38. For Pt 2 the material is relatively abundant and the task has been to bring it under control, something that has been remarkably well done. The subject matter is generally organised in an implicit demand/supply framework and then treated chronologically and in explicit relationship to the business cycle. That is to say the movement in most variables is 'explained' by reference to the fluctuations in aggregate economic activity. Some of these relationships may well prove contentious for some readers. There are useful reminders of the difference between the South of England and North and between London and Provincial practices. There is an occasional minor lapse in economic history, such as the suggestion that sterling depreciating after 1934 improved company profitability - sterling was appreciating after 1934; or that gross national product fell by 13 per cent between 1929-32 when the fall was less than half that.

These are minor points. It is a pleasure to use such a well produced book and one that is provided with helpful tables and graphs. It should be extensively used by modern economic historians and applied economists.

CITY UNIVERSITY, LONDON FORREST CAPIE

YARROW AND COMPANY LIMITED, 1865-1977 - pp.158, ILLUSTRATED,APPENDICES, (MACLEHOSE AND COMPANY, 1977).

Company histories fall broadly into one of two main categories, the Boardroom overview and the definitive full scale account of the development of the organisation. These are 'generic' categories, and are not meant to imply either automatic disapproval of the former or unthinking support for the latter. Both approaches have their merits and their flaws. Yarrow falls within the first of these types and raises the questions, why are such histories written and what purpose do they serve? Basically such accounts are meant to provide a record of achievement. They are produced by successful companies, are mainly self-congratulatory and contain a mixture of family and company anecdotes, personal plaudit, and a sprinkling of hard fact to underwrite important events. Such accounts are entirely appropriate for internal consumption and may also serve a modest promotional function. But beyond that they have little utility, either to the company itself,or to those interested in the firm, the industry, or in business development in general.

Within its limits Yarrows is a good history. The main building blocks in the firm's development are clearly set out. First, small beginnings on the Thames and the almost accidental entry to steam-ship building, in which a specialisation in small craft provided a basis for work in the early torpedo launches and subsequently the special commitment to Admiralty work in Destroyers. Second, the Yarrow expertise in high pressure water tube boilers, a critical link in Yarrows ascendancy in naval construction. Third the diversification of interests beginning in the inter-war depression into land boilers at home and overseas, especially in Africa, and, fourth, the significant commitment to research and development, first for the Admiralty and later for more general purposes through the Yarrow-Admiralty Research Department after the Second World War.

What is missing is the meat of the definitive history. This account neither asks nor answers the important questions concerning the development of the company as an organisation or the place of the company in the industry. In this account we have little idea of the objectives of the company. We do not know why decisions were made nor what alternatives were considered. We have no measure of the performance of the company over time by which to assess it. The company has grown and diversified, but could it have done more, was it a conscious development, or was it defensive action in response to other changes?

Business historians like to believe that company histories not only satisfy the proper sense of pride of successful companies, but should enable the company and businessmen generally to learn from experience. In this context this reviewers' sense of disappointment with Yarrows in keen. In a region of declining industry, and in an industry marked by stagnation and failure, Yarrow is an exception - not unique, but an exception nevertheless. Why has Yarrow succeeded where so many others have failed? This account provides hinte not answers. If Yarrows had asked as much of their history as they clearly do of the present, the business history of shipbuilding and Clydeside would have been immeasurably enhanced. Yarrows appear to have missed few opportunities in the past; it is to be hoped they pick this one up again in the near future.

UNIVERSITY OF GLASGOW

A. SLAVEN

JOHN ORBELL WITH E.GREEN AND M.MOSS
FROM CAPE TO CAPE:A HISTORY OF LYLE
SHIPPING COMPANY,(PAUL HARRIS PUBLISHING
EDINBURGH,1978. PpXIII and 239 : Ill n.p.)

Over the past century there have been many substantial changes in shipping. New trading areas and commodities brought to prominence by the expansion of the industrial countries have encouraged the development of new ships which are themselves often the product of new technology. The successful shipowner was the one who adjusted his fleet to the shifting demands of the market while keeping a weather eye on the storms of the trade cycle. The Lyle Shipping Company was such an owner, and this well-written and comprehensive history shows how on many occasions it triumphed over impending disaster by speedy yet far-sighted entrepreneurial decisions.

Lyle Shipping Company grew out of the shipping interests of Abram Lyle of Greenock, a cooper turned sugar refiner who built a fleet to transport his sugar. When, in the 1880's, the cooperage closed and the refinery was moved to London, those Lyles remaining in Greenock continued in shipping, though increasingly their ships forsook the Clyde and tramped the world. After a period of neglect, when the family's efforts were directly chiefly to sugar, Lyle Shipping Company was formed in 1890 to run a fleet of wind-jammers, and when these became uneconomic it turned to steamers. A war-induced prosperity led to expansion in the 1920's as cheap second-hand ships were bought up, and the crisis of the 1930's was easily weathered, partly because the Company had judiciously built up a large portfolio of diverse investments as a hedge against hard times. A slightly less profitable Second World War led to further expansion in second-hand-ships, but faced with world over-capacity in tramp shipping, the Company escaped from a potentially dangerous situation by selling their old vessels and moving into the more secure area of ore carriage on long-term charter. A continuing policy of ship replacement maintained a most efficient fleet, but it was obvious that the Company was too small to enter the container-ship and large bulk-carrier business which made most of the Lyle fleet redundant. A major gamble therefore took the Company into small-to-medium bulk-carriers which could trade in ports where the monster ships could not go. But in company with most shipowners, Lyle Shipping found that constant fluctuations in a market demanding massive capital investment could lead to ruin, and in the last decade the policy of portfolio investment gave way to direct investment via subsidiaries using the parent company's expertise in, for example, Lyle Offshore Group Ltd., and Seaforth Maritime Ltd., which are actively engaged in servicing North Sea Oil.

John Orbell and his associates have produced the wealth of detail one would expect from archivists, but they have not neglected the generalisation. Indeed, there is sufficient contextual material for this to serve as a history of tramp shipping until such a general history is written. The difficulties as well as the rewards of shipowning are examined; the importance of technical change is emphasised; and there are of course,endless details of ships for those who like such things.

For those who think it indelicate to expose what companies actually do, this is also an illuminating business history. Decision making is analysed; and the transitions from private company to public company to Group, and the evolution of professional management, is followed with care; and financial affairs receive their due weight. There are many financial tables, some seventy photographs, and a very full shipping list.

There are a number of places where one would have liked a fuller treatment of important issues. It is never really made clear what economic advantages were gained from the ship replacement policy, or why Lyle did so much better than their rivals between the Wars. The management function is, perhaps, the weakest part of the book - as it is of most shipping histories: clerks run a poor second to captains when it comes to the romance of shipping! Considering the amount of personal detail in the early part of the book, there is disappointingly little on the decision makers - or the decision-making process - in the post-war period when the Company's major expansion got under way. It might also have been illuminating to consider the role of government in causing the decline of British shipping in the post-war period. And the inevitability of competition ruining the best laid plans of any shipowner might have been studied more deeply in the Lyle context. But these comments are not intended to detract from a book which is, over-all, an excellent contribution to both shipping and business history.

UNIVERSITY OF STRATHCLYDE GORDON JACKSON

ALISTER McCRAE AND ALAN PRENTICE. IRRAWADDY FLOTILLA (JAMES PATON LTD., PAISLEY, 1978. Ill Pp.195 £4.50).

James Todd, one of a number of East India merchants from the West of Scotland, made a rather speculative investment in Rangoon in 1864, when he purchased four ageing river steamers, previously used by the Bengal Marine to effect the annexation of Lower Burma in 1852, and obtained a five-year contract to carry government mails and stores on the lower reaches of the Irrawaddy River. In this transaction was born the Irrawaddy Flotilla Company, a firm which is part of the history of the Clyde as well as the tropical river on which its steamships plied. The dominant interests in the business, at least from 1876 onwards, were Patrick Henderson and Co., the shipping concern which operated services between Glasgow and Burma, and the shipbuilders, Denny's of Dumbarton. The former provided the management of the Flotilla Company, while the latter constructed its steamers. From modest beginnings, this overseas extension of Clyde shipping and shipbuilding enterprise grew into the largest single river transport business in the world. The Flotilla Company, enjoying a virtual monopoly of steamer services on the Irrawaddy and Chindwin, had a central role in the economic development of British-ruled Burma. Carrying rice from the expanding frontier of peasant settlement in the Delta, crude oil from the fields in the central districts, and teak from the forests of Upper Burma, it assisted the great expansion of commodity exporting which transformed Burma between the 1860's and the 1920's. The failure of the colonial economy in the 1930's, however, stimulated a Burmese nationalism hostile to the foreign ownership and management of this strategic transport facility, and one of the first acts of the independent government of Burma in 1948 was to nationalise the Flotilla Company.

The history of the Company is presented here for the first time by two former, distinguished employees. Since they illuminate a small corner of a field seriously neglected by professional historians, namely the contribution of Scottish firms and businessmen to Britain's 'imperial economy', their endeavour is very welcome. The book, however, was obviously written with the general public, rather than an academic or specialist readership, in mind. The authors provide what is a relatively brief narrative outline, the early part of the story being embedded in descriptions of British diplomatic missions to and travels in Burma which do not seem particularly relevant, while little or no attention is given to issues and themes likely to interest the serious student of Scottish business history or Third World Economic History. The Company's finances, for example, are nowhere analysed. Nor is there any attempt to explore the importance of the operations on the Irrawaddy for the parent companies. A host of questions arise over the character of the Company's commercial activities, its relations with government, and its impact on the various sectors of the Burmese economy. This volume, in short, cannot be regarded as the definitive study of the firm - and the authors make no such claim. It is, rather, a 'good yarn', which is reasonably clearly and interestingly told, rather in the tradition of 'The romance of the East', and which is at its liveliest in accounts of 'The Flotilla At War' during the conquest of Upper Burma in 1885 and the retreat from the Japanese in 1942.

UNIVERSITY OF GLASGOW J. FORBES MUNRO

FREDERIK PHILIPS 45 YEARS WITH PHILIPS (POOLE, DORSET: BLANDFORD PRESS. 1978. Pp. viii + 280 £7.25).

This is a book of memoirs, originally published in Dutch in 1976, by the only son of Anton Philips, the joint founder with his brother of the great Dutch electrical company. Frederik Philips joined the company in 1930 at the age of 25, and he was its President from 1961 to 1971.

Philips and Co. was founded in 1891, and was originally concerned with the manufacture of carbon filament electric lamps. The years before the First World War saw increasing product process distinctiveness, and particularly the development of the metal-filament lamp. By 1913 Philips was the largest incandescent lamp producer in Europe. After 1919 the company began to diversify from light bulbs to radio valves. Philips also began to establish affiliates abroad. A marketing subsidiary was founded in Belgium in 1919, and the 1930's saw the international spread of Philips manufacturing activities. After 1945 the company's rapid expansion played a significant part in the fast economic growth achieved by the Netherlands in the 1950's and 1960's. Philips also continued to expand abroad, acquiring Pye in Britain, and becoming the largest wholly-Dutch owned multinational. A whole range of electrical consumer goods, such as the electric dry-shaver and the cassette recorder, emerged from Philips factories during these years.

The history of Philips, therefore, is of considerable interest to the economic and business historian. It is consequently regretable that this book adds little to our knowledge about this enterprise which cannot be found in the semi-popular study by P.J. Bouman, Growth of an Enterprise: The Life of Anton Philips (London, 1970). In fairness, Philips' book does not claim to be a business history. It offers a 'personal impression of events', not even claiming to be a 'strictly factual account'. (p.viii). The 'personal' nature of the book is highlighted by the fact that a third of it is concerned with the Second World War, which clearly made a deep impression on the author.

The book, is, indeed, probably of most use to historians and economists in providing an insight into the character and views of an important executive of one of Europe's largest multinational enterprises. The more romantic business historians are often taken aback by the mundane characters of most of the creators and managers of large business enterprises. Frederik Philips is no exception. He emerges from this book as neither a Schumpeterian hero nor a Marxist exploiter, but a happily-married, well-intentioned, thoroughly normal Dutch businessman. His only strikingly distinctive feature is the obvious strength of his Christian commitment, and his constant resort to prayer to assist decision-making in both his personal and business life.

Some very general information in important issues of concern to historians can be gleaned from the book. Philips' provides an interesting account of the relations between his company and the German occupation authorities during the War. The view that the spread of intra-European manufacturing investment in the Inter War years was a response to protectionism receives some support from the Philips experience (p.54). The company's extensive research commitment - in common with other large Dutch companies such as AKZO, Philips has regularly devoted 7% of its annual turnover to R and D - is discussed, though only briefly (p.38).It is particularly disappointing, however, that the book is almost silent about the management structure of Philips. By the 1960's Philips had developed one of the most complicated internal management structures of any European multinational, with a complex arrangement of overlapping national, product and functional responsibilities. The growth of this system, its working and defects, receive no mention here. We are given only a cosy account of the annual get-together of Philips managers from all over the world in a hotel on Lake Geneva. No-one reading this book would gather that by the late 1960's the defects of the Philips management structure, with its lack of centralised authority and world-wide product perspective, had resulted in sharply falling profit margins, and would be largely responsible for Philips' dramatic losses in integrated circuits in 1971 and 1972. We are only blandly informed that Philips' turnover increased fourfold between 1961 and 1971 (p.215).

There has been a regretable tendency recently for business biographies to be written with an explicitly propagandistic aim - to convince people, especially 'young people', of the moral worth of business. Philips follows this tradition by expressing the hope that his book will encourage'young people' to use their talents in some business-perhaps, even, a'multinational one'(p.vii). It is unlikely, however, that 'young people' not already attracted by such a career will be converted by this book, and it might, indeed, confirm some people's fears about the rather narrow outlook of many multinational executives. Philips' view of the

world is essentially one would expect a top Dutch businessman to hold. Thus he believes that the free enterprise system 'is the best available'. (p.vii); that multinationals bring 'prosperity to countries outside Europe'(p.253); that Germany and Japan have become rich nations 'through the capacity and will of those peoples to work hard'.(p.227); and that World Council of Churches is wrong to discourage Western investment in South Africa (p.205).

In conclusion, the book is a pleasant business autobiography, and it has some value as a contemporary Christian devotional work, but it is not very informative about the Philips company.

BUSINESS HISTORY UNIT
LONDON SCHOOL OF ECONOMICS

G.G. JONES

HAROLD NOCKOLDS, LUCAS: THE FIRST HUNDRED YEARS, VOL. II: THE SUCCESSORS, (DAVID & CHARLES, NEWTON ABBOTT, 1978, III. Pp. 422. £11.50)

The second volume of Nockold's history of Lucas, the electrical equipment manufacturers, covers the period from the outbreak of World War II to 1975, the centenary year of the firm's foundation, and is sub-divided into three sub-periods; the war years, the 1950's, and 'Modern Times'of 1960 to 1975. In addition to Lucas' dominant interest in the manufacture of electric lamps, batteries and motor components, attention is devoted, in considerable detail to brake production, fuel injection systems, explosive devices and fuses, gas turbine and diesel engine development, a multitude of aircraft parts for lighting, fuel and control meters, medical equipment such as heart pacemakers, blood pressure monitors and kidney machines and an extensive range of hydraulic machinery including a number of defence requirements such as turret rotation devices for tanks. The activities both of subsidiaries - Girling, Rotax, Parsons and a host of Lucas' overseas interests - and of competitors such as Bosch and Bendix are covered, while the names of most major motor and aerospace producers figure at some stage in their business relations with Lucas.

Despite these wide ranging business interests and contacts the main diet ofthebook is a highly detailed account of product development. In a work which could be much shorter the reader is frequently treated to highly specific areas of technical development, as for example on pp. 178-81, when the advantage of the aluminised steel reflector over the silver-plated brass reflector in headlamp assemblies are presented, closely followed by a discussion of block cross patterns on the front glass and the consequent benefits to motorists' headlamp beam control. Sealed-beam, recessed beam and four lamp systems are successively discussed and this is typical of the treatment of other products and technical issues which, for those uninitiated in electrical engineering, represents an indigestible level of detail from which the author consistently declines to draw the wider implications. Detailed and chronological accounts of the combustion problems of gas turbines serve little useful purpose lacking the implications for the costs of product development or if no reference is made to capital and managerial requirements. Paragraphs which commence with technical jargon ("Ball-screw threads figured prominently in actuator layouts...", p.319, or 'A solid propellant, cordite, was used in the first turbo-starter which was tested in 1950', p. 156) do little to enhance either the readability of the book or the significance of the developments.

An enormous volume of factual material, none of which is footnoted, is presented, but to the business, industrial and economic historian, and to the general reader, the trees obscure the wood. Thus the death of Oliver Lucas, grandson of the founder and deputy chairman, is recorded in a few lines with no overall assessment of his contribution, nor is the resulting break in the important managerial partnership with his chairman, Sir Peter Bennett, the subject of analysis. Similarly the creation of the Lucas Institute of Production Engineering at Birmingham University is mentioned, as is the policy of graduate recruitment, but the effectiveness and achievements of neither is examined. Why was it that in 1948 this leading world producer of electrical equipment was'still inexperienced in licensing agreements' (p.105) and was the 'amateurish' approach reversed, and if so, how? Furthermore, the relegation of the financial performance of Lucas to a few figures at the end of two chapters and limited to less than a page in each underlines the view that this is a history of production engineering in the electrical field and not a company history in the normal sense of the term.

The dust jacket claimes this to be the 'story' of the Lucas group of companies. It is not; it is a chronological and narrative account of product development. The 'story' is not easy to read, could be considerably shortened, and would benefit from retelling, particularly if a more thematic and analytical treatment was adopted. Thus to those readers interested in the dynamics of business organisation, the evolution of market strategies, the role of entrepreneurship, pricing policies and the sources of capital, this volume is a most disappointing contribution.

UNIVERSITY OF LEICESTER R.G. RODGER

RICHARD PERREN, THE MEAT TRADE IN BRITAIN 1840-1914 (LONDON: ROUTLEDGE AND KEGAN PAUL, 1978. Pp.x + 258 £7.50).

Dr. Perren's book presents three major themes of the nineteenth century meat trade: the traditional traffic in livestock to the slaughterhouse, the growing trade in carcasses associated with advances in the technology of transporting and preserving meat, and the impact of the public health movement upon the regulation of markets and standards of hygiene. These themes, which cover the movement of beasts from farmer to wholesale market have been competently researched and are well presented by Dr. Perren. His book lucidly demonstrates the changes in the nineteenth century which transformed meat supplies to the major British markets- the rapidly growing industrial towns and, above all, London, which was the principal destination of so much agricultural produce. The significance of railway transport in expanding the trade previously limited to animals on the hoof is clearly shown, including the railways' capture of traffic developed by the coastal shipping link from Aberdeen to London. In turn, improved transport brought in imported animals once the prohibitions on the trade were relaxed in the 1840's, and this supplement to home production grew rapidly from the 1850's. As a result of the increase in supply, many traditional markets came under pressure, particularly as the

trade switched from live to carcase meat, and Dr. Perren illustrates both this process and the strongly entrenched opposition to change by market owners and salesmen that public health reformers encountered. His chronological division of the nineteenth century at 1865 and 1890 fits this aspect of his book well because the 1860's saw a whirlwind inquiry into cattle plague which led to the beginnings of a system of government control in the livestock trade. However, the break in narrative in the mid - sixties does not allow Dr. Perren to do justice to some other topics and his account of the enormous changes at the London end of the trade involved in the conversion of Smithfield from livestock to carcass market is fragmented by this division.

Public health concern over meat related not just to the unhygienic conditions of slaughtering and dressing carcasses but also to the trade in diseased meat. This is a fascinating and problematic area, the evidence for which is fraught with the emotive charges and obstructive disclaimers which characterize Victorian reform movement debates. Dr. Perren makes a valiant effort to assess the extent of the diseased-meat trade quantitatively but his sources are necessarily propagandist estimates by writers like the Gamgee family, for, as he shows, food inspection covered only the limited proportion of the trade carried on in major markets. Again, the chronological division of the book restricts this topic largely to the period before 1865 but, of course, the slink-meat trade did not die out until much later in English dairying counties such as Cheshire, and Dr. Perren's account leaves me no wiser about the extent to which braxy mutton was consumed in Scotland.

In the later sections of the book which deal fully with the growth of long distance imports, there is a useful outline of the development of chilling and freezing techniques and the growth of refrigerated-storage capacity in Britain. Here, a fuller picture of contemporary practices might have emerged if Critchell and Raymond's History of the Frozen Meat Trade had been used in conjunction with G.R. Leighton and L.M. Douglas, The Meat Industry and Meat Inspection 5 vols(1910). As there are so many branches of the meat trade, it is not suprising that Dr. Perren largely confines his study to butcher-meat, leaving the trade in poultry, game and cured meats aside. A more significant weakness is the almost complete exclusion of the retail trade. This is hard to accept, as J.B. Jeffreys' Retail Trading in Britain, 1850-1950, (1954) is no substitute for the more detailed study of an individual trade which Dr. Perren might have undertaken. The decline in private slaughtering and the rapid growth of the supply of frozen meat produced the new multiple-shop retailers like Bells, Eastmans, Fletchers and, above all, Nelsons, a firm which had over 1500 shops by the early twentieth century. In this type of company, new retailing techniques were developed to deal with bone taint and "drip". Even in the home trade and among the strongholds of fresh meat like Glasgow, the flesher was becoming little more than a meat retailer and, after 1905, was seriously affected by competition from frozen meat shops and even provision merchants who handled meat. In addition, there are dimensions to meat retailing like the "swap" trade which arranged cuts and joints by social area within each town still to be chronicled.

Some scientific assessment of nineteenth century evidence would also have been welcome in this book. There are one or two comments on nutrition but they do not bear examination - butter is not a source of animal protein (p.80) nor is there any serious justification for assuming that chilled or frozen meat was nutritionally better than salted (p.106). Given the strength of outcry by the public health lobby, it would have been useful to have assessed the value of their claims. Hygiene was important if it reduced the possibility of infecting the meat after the animal was killed. However, food poisoning (from Salmonella, Staphylococcus, Clostridium) occurred mainly from infected meat products or cooked meat, not carcases. Animal disease was transmissable to man mainly through milk (bovine tuberculosis), through hides (anthrax), or undercooked meat (worm infections). Man could probably eat safely most of the animals condemned by nineteenth century food inspectors; aversion, like that against eating horseflesh, was the main deterrent to marketing meat from a diseased carcase. These points apart, Dr. Perren has produced a welcome study of developments in the wholesale meat trade. Information on prices, meat consumption, and financial operations of markets, including the growth of a forward trade in meat late in the nineteenth century, are tantalizingly brief. As an overview of the market structure in the meat trade Dr. Perren's book will be a useful reference work, and one might hope for it to be supplemented in the future by detailed studies of individual firms or markets.

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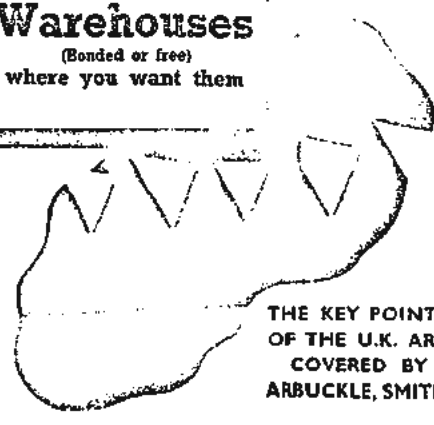

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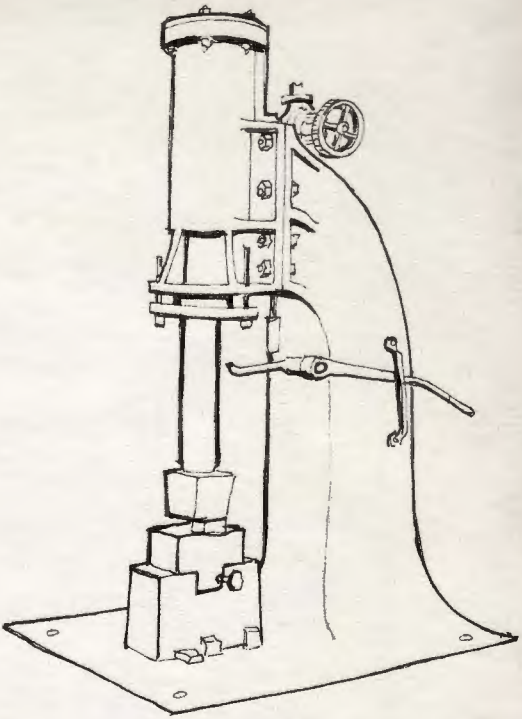

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