

THE GROWTH OF THE COTTON INDUSTRY AND SCOTTISH  
ECONOMIC DEVELOPMENT, 1780-1835

by

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ABSTRACT

This study is intended, first of all, to be an examination of the growth of the cotton industry in Scotland from 1780 to 1835. During this period, it became the largest and most important sector of the Scottish industrial economy, producing over 70% of the country's exports by value. There is, however, a subsidiary problem, that of placing the industry's growth within the general context of Scottish economic development in the eighteenth and nineteenth centuries.

The choice of terminal dates was to some extent dictated by the availability of material. The Old Statistical Account of Scotland, probably the most important single source of information on the establishment of the cotton industry, was compiled in the last two decades of the eighteenth century. The early 1830's saw the compilation of the New Statistical Account and the publication of the findings of the Factories Inquiry Commission and the Select Committee on Manufactures, Commerce and Shipping, all important sources for the industry's later development. Separate Scottish Customs records ceased to be kept in 1827, after which date no reliable guide to the importation of raw cotton into Scotland

is available. But the date 1780 does mark approximately the industry's foundation in Scotland, while 1835 marks the end of the main period of its expansion.

The problem of the industry's foundations and growth was dealt with by adopting a topical approach. The first topic to be discussed in this connection was that of the physical growth of the industry from 1780 to 1835, which involved an examination of the expansion of raw cotton consumption and of the number and size of the units of production. At the same time, the industry's location was considered. The next step was to consider the capitalization of the industry, the factors which stimulated the transference of capital and entrepreneurial ability from other sectors of the economy, and the response of the industry to consumer demand by specialization in certain types of product. These were considered to be the factors which made the industry's expansion possible. The most important problems involving labour in the new industry - labour recruitment, wages and conditions of work and the formation of labour organizations - were also considered.

In dealing with the subsidiary problem, a narrative approach was adopted. The first chapter, therefore, is simply a description of the developments within the Scottish economy which preceded the establishment of the cotton industry. Thus, the economic conditions out of which the industry grew and in which the capital, production skills and other requirements for its growth were acquired could be set out. The last

chapter is intended to show the effects of the cotton industry's development on other sectors of the Scottish economy.

The Scottish cotton industry developed out of the economic crisis which followed the loss of the American colonies in 1783. Its expansion after that date was rapid, though subject to considerable fluctuations due to uncertain market conditions and a rather narrow specialization in the type of fabrics produced. The industry's expansion was undertaken by means of the adoption of new production-techniques and new forms of organization, which marked a change-over from the system of manual production in small-scale units to mechanized production in large-scale factory units. These came to be centred in the south-west of Scotland, around Glasgow, because of the advantages which that area enjoyed over others in respect of access to markets and raw materials and because it possessed resources of highly-skilled labour which other areas lacked. Capital and entrepreneurial skills acquired in the pre-American Revolutionary period, mainly in other textile industries, were utilized to build up the new industry, which also appears to have based its initial expansion on the exploitation of markets previously served by the linen industry. These proved to be inadequate, however, and new products had to be developed to ensure continued expansion while avoiding direct competition with Manchester. The industry relied heavily on supplies of immigrant labour to man its factories. The working conditions within the factories varied from place to place according to the

attitudes of individual managers, and wages, too, varied from one factory to the next, and even from man to man in any one mill. In general, factory wages fluctuated with the trade cycle, while wages in the remaining domestic section of the industry, handloom weaving, seem to have declined steadily at least from 1806. The concentration of the labour force in large units offset the advantages which the employers had always enjoyed in disputes with labour, and permitted the foundation of strong and effective militant labour organizations.

The development of the cotton industry led to the expansion of other industries in Scotland, notably the secondary textile industries like bleaching and dyeing. Its adoption of mechanized techniques of production promoted the growth of the engineering industries in the Clyde Valley, and the increased demand for chemicals for cloth-finishing which resulted from its expansion led to considerable expansion of the chemical industry. In these ways, the cotton industry laid the basis of the Scottish economy of the twentieth century.

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SCOTTISH ECONOMIC DEVELOPMENT FROM THE UNION OF  
1707 TO THE AMERICAN REVOLUTION

Before discussing the growth of the Scottish cotton industry from 1780 onwards, it is necessary to consider Scottish economic development from the Union with England in 1707 to the closing stages of the American War of Independence. Several of the developments of this period have a direct bearing on certain aspects of the cotton industry's growth, such as its specialization in certain types of fabric, its geographical location, and the resources of capital and entrepreneurial skill which it exploited. The Union of 1707, has, therefore, been chosen as the starting point of this study.

## I

The Union held out to the Scots the hope of escaping from the economic difficulties which had beset them since before the Restoration of the Stuarts in 1660. Scotland's alignment with England in matters of foreign policy since the two thrones had been united under the Stuarts in 1603 had interfered with the traditional pattern of Scottish overseas trade. A state of commercial rivalry existed between England and Scotland's main trading partners, France, Holland and the Scandinavian states. As a result, the Scots sometimes found themselves dragged into war against their best customers in unwilling support of their oldest enemy. The erection of tariff barriers against English goods by France, Holland and

Norway also affected Scottish exports to those countries. Nor were the Scots compensated for the decline of their traditional markets by increased opportunities for trading with England and her colonies. The Navigation Acts operated against Scottish shipping in exactly the same way as they did against French or Dutch shipping. Various enactments of the English Parliament, culminating in the Aliens Act of 1705, threatened Scottish goods with exclusion from the English market. Scotland, again by reason of the Navigation Acts, was excluded from direct participation in the colonial trade,<sup>1</sup> and when an attempt was made to set up a Scottish colony on the Isthmus of Darien in Central America in 1695, it met with the hostility of English colonial interests. The attempt failed catastrophically for this and other reasons. The outcome of all this, as one recent commentator has said, was that,

"After 1688, all the evidence points to the onset of genuine long-term decline both in Scottish overseas trade and in those industries most dependent upon it." 2

By 1703, when the last independent Scottish Parliament convened in Edinburgh, the decline had gone so far that the Scottish economy was on the verge of complete collapse.

1. Some Scottish merchants evaded the Acts by chartering English ships and operating out of Whitehaven, on the English side of the Solway Firth: see R.H. Campbell, "The Anglo-Scottish Union II: the economic consequences," Economic History Review (Ec.H.R.), 2nd series, vol XVI, 1963-64, 469.
2. T.C. Smout, "The Anglo-Scottish Union I: the economic background," Ec.H.R., 2nd series, XVI, 1963-64, 459. The account of the Scottish economy before 1707 is largely based on this work.

The Treaty of Union, ratified in 1707, offered a way out of the impending crash.<sup>1</sup> Article XV, which with Article IX concerned the fiscal and financial relations between Scotland and England, offered financial encouragement to Scottish industry. £2,000 per annum from the funds of the "Equivalent" were to be devoted to this purpose.<sup>2</sup> A small enough sum by modern standards, this represented a substantial addition to the resources of a country where the shortage of capital for industrial development was chronic, and was to remain so for some time to come.<sup>3</sup> More important from the point of view of long-term economic growth was Article IV of the Treaty, which granted the Scots unrestricted access to the English and English colonial markets and extended the protection of the Navigation Acts to Scottish shipping and overseas trade. An alternative was thus obtained to the declining European markets; further costly attempts to develop Scottish colonies were rendered unnecessary; the practice of trading out of English ports to evade the Acts could be abandoned, to the benefit of Scottish ports and shipping; and Scottish goods would no longer be threatened with exclusion from England.

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1. For the text of the Treaty, see G.S. Pryde, The Treaty of Union of Scotland and England, 1707, Edinburgh 1950, 83-102.
  2. The Equivalent was the capitalized value of existing Scottish revenue-yield, £398,085, which went towards servicing the English National Debt; see Campbell, "Anglo-Scottish Union I," Ec.H.R., 2nd ser., XVI, 1963-64, 473.
  3. R.H. Campbell, "An Economic History of Scotland in the Eighteenth Century," Scottish Journal of Political Economy (S.J.P.E.), vol. XI, 1964, 20.

If the Union encouraged the expansion of Scottish industrial and commercial activity, it did not guarantee that expansion would take place. Before any benefit could be derived from the new trading conditions, steps had to be taken to put the Scottish economy on a sound footing. Trading activity had to be reorientated: Edinburgh, the centre for trade with Northern and Western Europe, was not located in a position from which trade with America and the West Indies could easily be conducted. Glasgow, on the west coast of Scotland, was much better placed to compete with the established English colonial-trading ports. An ocean-going merchant fleet had to be built to carry on the trans-Atlantic colonial trade: existing Scottish shipping, built for the relatively short European routes, was not suitable for this purpose. A share of the colonial trade had to be wrested from the entrenched English interests. A completely new basis had to be found for Scottish industry, which had been built up in the pre-1707 mercantilist setting to compete with English industry in a highly-protected Scottish domestic market. In the free market created by the Union, the principle of competition with England could not always be maintained, as the fate of the Scottish woollen industry demonstrated.<sup>1</sup> Scottish manufacturers, therefore, had to apply themselves to developing products which complemented those of English industry instead of competing with them.

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1. H. Hamilton, Economic History of Scotland in the Eighteenth Century, Oxford 1963, 131-4. The subsidy granted to this industry in Article XV of the Treaty was largely wasted, as the industry could not make the adjustment and declined in the face of competition from the old-established and highly-developed English woollen industry.

## II

It is difficult to judge whether the Scots took immediate advantage of the opportunities which the Union presented for expanding industrial output by increasing the volume of trade with England and her colonies. No record was kept of the flow of Scottish goods to England after 1707, since no Customs barrier was maintained between the two countries from then on and Scottish goods destined for English consumers were no longer regarded as exports. No satisfactory record of Scottish industrial output was kept until after the Board of Trustees for Manufactures and Fisheries was set up in 1727, and available Customs registers only cover the period after 1755. It appears, however, that the response was not very rapid. The cattle trade with England expanded immediately, it is true; but this seems to have been the only sector of the economy to do so, and the effectiveness of its response was hampered by inefficiency due to poverty.<sup>1</sup> Judging from the comments of a petitioner to the House of Commons in 1720,<sup>2</sup> little had been achieved in the way of industrial and commercial development even by that date. He observed that,

"Scotland is a country the most barren of any Nation in these parts of Europe, they have nothing of their own growth to export, except corn, coals, cattle and some wool; nor nothing to form any Manufacturers but what they receive from their neighbours. There is nothing hinders Scotland from being a trading Nation but the want of goods to export."

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1. For the response of the cattle-trade, see A. Smith, The Wealth of Nations, ed. E. Cannan, London 1961, vol. I, 246-7. For the general response, see Campbell, "Anglo-Scottish Union I," Ec.H.R., 2nd ser., XVI, 1963-64, 468-477.
  2. Quoted by Hamilton, Economic History of Scotland, Introduction, xiii.

Since Scotland needed time to adjust her economy to her new situation and to recover from the precarious economic condition she was in at the time of the Union, no immediate response could be expected of her.

After 1720, progress was made towards remedying the situation described by the petitioner, and industrial development gathered momentum. The efforts of private individuals in this field were supplemented by the activities of the Board of Trustees for Manufactures and Fisheries, which was set up in 1727 with an annual income of £6,000 which was to be devoted to Scottish economic development. The Board's function was to develop new and improved production techniques, and to encourage their adoption by teaching the producers how they could best be utilized. The Board instituted prizes for high-quality production and also provided cash-grants to concerns whose financial resources did not match their potential. It exercised a supervisory function, laying down standards of quality and maintaining a permanent inspectorate to see that these were kept.<sup>1</sup> Another official body, the Forfeited Estates Commission, which had been set up in 1752 to administer the estates of convicted Jacobites, exercised a similar function in the Highlands.<sup>2</sup>

The Board of Trustees devoted most of its attention to the textile industries of central Scotland, and especially to the linen industry.<sup>3</sup> The textile industries had been second

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1. An account of the Board's activities is given in Hamilton, Economic History of Scotland, 134-141.
  2. Ibid., 146. The Commission actually took over the Board's functions in the Highlands to a great extent.
  3. The linen industry became the most important textile industry after the decline of the woollen industry. See above, 4, n.1.

only to agriculture in the economic life of Scotland in 1707, and remained in that position throughout the period under discussion because the economy remained primarily agrarian, and domestic spinning and weaving were easily combined with agrarian pursuits.<sup>1</sup> Responding to the opening of new markets and to the encouragement given by the Board, linen-cloth output rose from 2 million yards in 1728 to 3.9 million in 1731, then to 7.9 million in 1751 and 13.4 million in 1771.<sup>2</sup> The linen industry consisted of two quite distinct sectors: one, in the east of Scotland, specialized in the production of coarse fabrics; the other, in the south-west, produced fine high-quality goods, which could stand comparison with the best continental fabrics.<sup>3</sup> The south-western counties of Lanark and Renfrew between them produced 23% of the total yardage of linen-cloth made in Scotland in 1768, but this represented 40% of the total value of Scottish linen output.<sup>4</sup> The development of both sectors was hampered by the poor quality of home-grown flax, which produced yarn of uneven thickness and strength.<sup>5</sup> Both, therefore, turned increasingly to imported raw materials, and by the outbreak of the American War of Independence the coarse-linen trade relied on flax and hemp imported from Riga and St. Petersburg, while the fine-linens were manufactured from French and Flemish yarns.<sup>6</sup>

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1. Linen, for instance, accounted for 20% of Scotland's home-produced exports in 1771: Campbell, "Economic History of Scotland in the 18th century," S.J.P.E., XI, 1964, 18.

2. Hamilton, Economic History of Scotland, Appendix IV, 404-5.

3. D. Chapman, "The establishment of the Jute Industry; a problem in location theory," Review of Economic Studies, vol. VI, 1938-9, 45; also, Hamilton, op.cit., 148-9.

4. Ibid., 149.

5. The Board of Trustees tried hard to over come this, without success.

6. As above, note 3.

The skills which the weavers of the south-west acquired in the manufacture of lawns, cambrics, and the other fine cloths were to prove useful in building up the cotton industry later in the century, and were to give that region an advantage over others in Scotland as a cotton-manufacturing centre.<sup>1</sup>

Other industries expanded after 1720 in response to the opportunities for increasing their sales in the new markets. In the thirties, English ironmasters seeking new resources of timber for charcoal set up a number of furnaces in the wooded areas of the Highlands.<sup>2</sup> This boom in charcoal-fired iron smelting was comparatively short-lived - most of the furnaces were out of blast by 1760 - but the decline was to some extent offset by the erection of a coke-fired ironworks at Carron in Stirlingshire in 1759.<sup>3</sup> This development stimulated the demand for coal, the output of which had been growing in any case as a result of expansion in the glass, salt and sugar-refining industries since 1720.<sup>4</sup>

Most of the industrial development had been undertaken as a result of the granting of free access to the English market. Over 85% of the linen industry's output, for instance, was meant for consumption within the United Kingdom in 1771.<sup>5</sup>

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1. See below, 45-7 and 70-1. Among the other fine fabrics made in the south-west were silk-gauze and hybrid cloths called "blunks" or "bengals" with a linen warp and a cotton weft. For the variety of fabrics made and sold in Glasgow, see J. Gibson, History of Glasgow from the earliest accounts to the present time, Glasgow 1777, 239.
  2. Hamilton, Economic History of Scotland, 189-93.
  3. Ibid., 193.
  4. Ibid., 205.
  5. The last peak year in Scottish overseas trade before the American War. For linen output and exports, see Hamilton, op. cit., Appendix IV, 404-5 and Appendix VI, 410-11.

The remaining 15% or so of the linen output, and probably a smaller proportion of other industrial output, was intended for overseas markets. Scottish produce, in fact, only contributed 27% of the value of Scotland's total exports.<sup>1</sup> The most important element in overseas trade was the entrepot trade in Virginia tobacco, which the merchants of Glasgow had built up in the face of stern competition from the established English colonial-trading ports such as London, Bristol, Liverpool and Whitehaven. By the beginning of the second half of the eighteenth century, Glasgow was well on the way to securing a monopoly of the Virginia trade.<sup>2</sup> A less important entrepot trade in West Indian produce, mainly sugar, was carried on from another Clyde port, Greenock in Renfrewshire. Imports of these two commodities, tobacco and sugar, accounted for 41.5% of the value of Scotland's total imports in 1771, with tobacco by far the major contributor. Exports of tobacco and sugar in the same year contributed 53.8% of the value of Scotland's total exports.<sup>3</sup> The Navigation Acts, which required that colonial produce destined for markets other than the United Kingdom and its colonies should be shipped first to British ports, were an important factor in the growth of these trades. Without the Acts, no such development could have taken place. But they were not a sufficient cause of growth: other factors also operated to produce the virtual

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1. Campbell, "Economic History of Scotland in the 18th century," S.J.P.E., XI, 1964, 18.
  2. R. Miller and J. Tivy (eds.), The Glasgow Region, a general survey, Glasgow 1958, 156.
  3. Hamilton, Economic History of Scotland, Appendices VIII, IX, XI, 414-7, 419-20.

monopoly of the tobacco trade which Glasgow enjoyed. The city's geographical position was superior to that of her main English rivals from the point of view of the American trade: the shorter voyages which it allowed gave the city's merchants an advantage in transport costs.<sup>1</sup> In addition, it emerged from an enquiry conducted in 1721 into the business practices of the Glasgow merchants by the Lords of the Treasury, that their trading methods were more frugal than those of their rivals.<sup>2</sup>

As a result of the development of the tobacco trade, the Clyde replaced the Forth as the focal point of economic activity in Scotland: in 1772, 56% of the Scottish shipping engaged in overseas trade was Clyde-registered.<sup>3</sup> Despite this shift, Edinburgh had remained the centre of Scottish banking. The three chartered banks did not even open branches in Glasgow until 1783.<sup>4</sup> The chartered banks pursued very conservative lending policies, and took little part in the financing of industry and trade.<sup>5</sup> Although some of the private Edinburgh banks may have been more adventurous,<sup>6</sup> it seems that to assist their efforts to build up overseas trade the Glasgow merchants had to form their own credit institutions, whose

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1. Miller and Tivy, The Glasgow Region, 157.

2. Ibid., 156.

3. Loc.cit.

4. They were the Bank of Scotland, the Royal Bank of Scotland and the British Linen Bank. The first to open in Glasgow was the Royal Bank, in 1783.

5. Campbell, "Economic History of Scotland in the 18th century," S.J.P.E., XI, 1964, 20-21.

6. e.g. Coutts and Co., which had some interest in the tobacco trade. See Sir W. Forbes of Pitsligo, Memoirs of a Banking House, first publ. 1803, reprinted Edinburgh 1860, the reminiscences of Coutts manager in 1775.

lending policies were more liberal. The Ship Bank, founded in Glasgow in 1750, and the Thistle Bank, set up in the city in 1761, both had tobacco merchants as partners.<sup>1</sup>

Sales organizations for the disposal of Scottish goods, both in overseas markets and in the United Kingdom, were built up in conjunction with the growth of industry and of the entrepot trades. The linen merchants set up a network of "packmen", or pedlars, who made their way into the most remote districts of England and Scotland to sell Scottish linens and gather information about the markets, which was transmitted back to Glasgow or Dundee, the centres of the wholesale linen-trades.<sup>2</sup> Some of them had connections with Virginia or West India traders, who acted as agents for the linen merchants in the colonies.<sup>3</sup> Some Glasgow linen-houses had continental agencies too, presumably arising out of their connections with the French yarn-merchants.<sup>4</sup> The same was probably true of the Dundee linen-merchants, whose raw materials came from the Baltic.

Communications improved with the growth of trade and industry. Most of the improvement naturally took place around the main centre of trade, with the result that Glasgow's

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1. For the foundation of the Ship Bank, G. Stewart, Curiosities of Glasgow Citizenship, Glasgow 1881, 25. The prospectus of the Thistle Bank was published in The Scots Magazine, No. 23, 1761, 614. The Ship Bank at least became very conservative after the American War; see, Stewart, op.cit., 186-8.
  2. G. Stewart, Progress of Glasgow, Glasgow 1883, 93-4.
  3. James Finlay and Company Limited, 1750-1950, Glasgow 1952, 4.
  4. Loc. cit., and Hamilton, Economic History of Scotland, 269.

position as a communications-centre was unrivalled in Scotland by the time the American War broke out in 1775. Harbour facilities on the Clyde were improved and extended and the river deepened and widened. Besides the existing ports at Greenock, Dumbarton and Irvine, new harbours were built at Ardrossan and Port Glasgow, the latter by the Virginia merchants, whose ships were prevented from reaching Glasgow itself by shoals and rock-outcrops.<sup>1</sup> Although Glasgow's harbour at the Broomielaw had been extended at the end of the seventeenth century, the obstructions in the river made its regular use impossible - at low water it was blocked even to lighters.<sup>2</sup> In 1755, John Smeaton was called in by the Glasgow magistrates to carry out a survey of the river-bed with a view to making it more easily navigable, but his plans for improvements were rejected. The magistrates then called in John Golbourn of Chester, who surveyed the river in 1769. In 1770, an engineer named Watt began to implement Golbourn's plans, and in 1775 vessels drawing just over six feet of water could reach the Broomielaw at low tide.<sup>3</sup>

Canal-communications were also built up with a view to improving access to the markets for tobacco. The advantages of a canal linking Glasgow with the east coast had been pointed out as early as 1727 by Defoe, who observed in his "Tour of

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1. Sir John Sinclair (ed.), Statistical Account of Scotland, Edinburgh, 1791-99, vol. V, 546-7. Referred to hereafter as Old Statistical Account.
  2. One shoal, 300 yards below the Broomielaw, was only 15 inches below the surface at low water; J.D. Marwick, The River Clyde and the Clyde Burghs, Glasgow 1909, 177.
  3. J. Cleland, Enumeration of the Inhabitants of Glasgow, Glasgow 1832, 153, gives an account of the operations of Smeaton, Golbourn and Watt.

Britain" that,

"If this city could have a communication with the firth of Forth so as to send their tobacco and sugar by water to Alloway, below Stirling, as they might from thence again to London, Holland, Hamburg and the Baltic, they would very probably in a few 1 years double their trade".

The merchants took up the suggestion, and work on the Forth-Clyde canal began in 1768, after some argument as to the best route. By 1775, the eastern outskirts of Glasgow were linked up with the village of Grangemouth, on the Forth. The full canal, from Grangemouth to Bowling, Dunbartonshire, was completed in 1790, when the Monkland canal, which linked Glasgow with the Lanarkshire coalfield, was also completed and joined the Forth-Clyde canal in Glasgow.<sup>2</sup>

Road communications appear to have been less well developed before 1775. Nevertheless, there were signs of real interest by then. Plans were being considered for turn-pikes to link Glasgow with the chief towns of the south-west and with England. But little action was forthcoming before 1785. Between that date and 1788, however, the turn-pikes from Glasgow to Ayr and Glasgow to Carlisle via Dumfries had been started, as had the Stirling to Dumbarton pike, which had a feeder route to Glasgow, a little to the south of the main highway.<sup>3</sup>

These developments in communications by land and water were later to influence the location of the cotton industry, which came to be concentrated in the Glasgow area, within a radius of 25 miles from the city.<sup>4</sup>

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1. Quoted by Marwick; The River Clyde, 178, n.2.
  2. Ibid., 178-9, gives an account of canal-building.
  3. Hamilton, Economic History of Scotland, 222-28.
  4. See below, 46.

## III

The American War of Independence interrupted the course of development which had begun with the Union. One of the first acts of the colonists was to repudiate the Navigation Acts, upon which the prosperity of Scottish overseas trade depended. Tobacco imports, which had been kept at a very high level from 1771 to 1775, fell away badly in 1776 and were reduced to a mere trickle in 1777.<sup>1</sup> Thereafter, they recovered somewhat, but never regained the importance which they had enjoyed before the war. Re-exports of tobacco slumped as well, and again never recovered their former importance.<sup>2</sup> Most of the tobacco merchants escaped from the collapse of their trade without very great loss,<sup>3</sup> but the effects of the collapse on Scottish overseas trade were nothing short of catastrophic. Re-exports, which formed the bulk of Scotland's export trade, fell from an annual average value of £1,138,247 (1770-74 inclusive) to one of £331,925 (1775-83 inclusive). As a result, the annual average value of total exports also declined, from £1,626,066 for the period 1770-74 to £864,043 in the period 1775-83. Total imports to Scotland fell, because of the loss of the tobacco trade, from an annual average of £1,225,606 in the period 1770-74 to one of £872,773 for the

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1. Between 41 and 47 million lbs. per annum was imported between 1770 and the end of 1775. In 1776, imports were 7½ million lbs., and in 1777, just over ¼ million lbs.; Hamilton, Economic History of Scotland, Appendix IX, 416-7.
  2. From an average of c. 45 million lbs., 1771-3 to 23½ million in 1776 and 5½ million in 1777. Loc.cit.
  3. They anticipated the revolt, stockpiled tobacco for sale at famine prices and liquidated their assets in America. M.L. Robertson, "Scottish Commerce and the American War," Ec.H.R., 2nd series, IX, 1956, 123-4.

period 1775-83. The annual balance of overseas trade, which had been favourable to Scotland since at least 1755, swung the other way in 1775, and remained adverse until 1800.<sup>1</sup>

With the loss of the American colonies and the collapse of the tobacco trade, Scottish industry lost its most important overseas market. But after an initial slump of home-produced exports in 1775, new outlets were found for them by Scottish agents in Europe, the West Indies, Canada, Nova Scotia and Florida.<sup>2</sup> The annual average value of home-produced exports actually stood higher in the wartime period, 1775-83, than it had been for the pre-war period, 1770-74.<sup>3</sup> Industrial production seems to have been rising: certainly, linen-cloth output rose from an annual average of 12.3 million yards (1770-74) to one of 14.2 million yards (1775-83).<sup>4</sup> Neither the outbreak of the war nor the entry into it on the colonists' side of France (1778), Spain (1779) and Holland (1780) seems to have had any serious effect on Scottish industry as a whole, but some sectors probably did suffer. Indeed, some of the industries of the Glasgow area, which were closely connected with the tobacco-trade, ceased to exist.<sup>5</sup> The fine-linen trade, which depended on supplies of French and Flemish yarn, was probably hit by the entry of France and Holland into the war and by the operations of hostile warships and privateers in the English Channel and the Atlantic. But neither of these

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1. Trade figures from Hamilton, Economic History of Scotland, Appendix VIII, 414-5.
  2. Ibid., 269-70.
  3. As for note 1, above.
  4. Ibid., Appendix IV, 404-5.
  5. Stewart, Progress of Glasgow, 68-71.

effects to the industries of Glasgow and to the fine-linen trade was sufficient to counteract the general tendency towards expansion experienced in other sectors of the industrial economy.

#### IV

With the end of the war in 1783, it became obvious that the tobacco trade could never be rebuilt in its original form. The success of the colonists in achieving their independence, which confirmed their earlier repudiation of the Navigation Acts, saw to that. Scotland, as one recent commentator has said,

"had to find other outlets for its energies and resources if it wished to regain its pre-war prosperity".<sup>1</sup>

More specifically, the gap left in Scottish overseas trade by the loss of the entrepot trade in tobacco had to be filled, and the trade balance restored to a position favourable to Scotland. These objectives could be achieved either by building up a new entrepot trade in some other colonial product or by stepping up exports of home-produced goods, or by the simultaneous adoption of both policies.

Many of the tobacco-merchants began to participate in the West Indian trade, which expanded rapidly from 1786 to 1790.<sup>2</sup>

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1. Robertson, "Scottish Commerce and the American War," Ec.H.R., 2nd ser., IX, 1956, 128.

2. Exports to the West Indies from Scotland rose from £139,984 (1786) to £318,805 (1790), and imports from the West Indies to Scotland from £235,763 (1786) to £371,656 (1790); Ibid., 128.

The names of John Riddell, Patrick Colquhoun, John Robertson, James Hopkirk and Robert Findlay appear both in a list of the principal Glasgow Virginia merchants of 1783 and a list of the office-bearers of the Glasgow West India Club in 1789.<sup>1</sup> The principal component of this trade was sugar, which was re-exported in quantity from the Clyde, but cotton wool or raw cotton, which had been imported in varying but generally small quantities before the war, began to figure prominently among the commodities imported from the West Indies.<sup>2</sup> In 1786, raw cotton valued at £42,298 had been imported, as against sugar imports worth £136,156. In 1792, however, the gap between the two had narrowed considerably: raw cotton imports had risen to £138,557 in value, sugar imports to £183,450.<sup>3</sup> The actual amount of raw cotton imported had risen from an annual average of 170,697 lbs. (1770-75) to one of 228,720 lbs. (1776-83) and to 1,715,300 lbs. (1784-92). This last was the result of an uninterrupted rise from 330,051 lbs. in 1784 to 3,076,715 lbs. in 1792.<sup>4</sup>

Very little of the raw cotton imported after 1783 was intended for re-export. The rapid expansion of raw cotton imports from then on was, in fact, indicative of the growth of an entirely new industry - the manufacture of pure cotton

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1. 1783 list in Stewart, Progress of Glasgow, 76, 1789 list in N. Jones, Jones's Directory...of the City of Glasgow for the year 1789, reprinted Glasgow 1866, 69.
  2. See Hamilton, Economic History of Scotland, Appendix VII, 412-3.
  3. Loc.cit. and Appendix XI, 419.
  4. For these and all subsequent raw cotton import figures, see Appendix, table I.

-fabrics, which had been technically impossible in Scotland before the war.<sup>1</sup> Established Scottish industries in 1783 were unable to expand their output, using existing production-techniques, to an extent sufficient to offset the loss of the tobacco trade by making more home-produced goods available for export. The situation of 1783 called for "new or improved forms of organization and new ideas for the reduction of waste".<sup>2</sup> A deliberate policy of encouraging the new industry, with its new techniques and forms of organization, was adopted by the Board of Trustees and by the newly-formed Glasgow Chamber of Commerce, which embraced the manufacturers and merchants of the city and surrounding burghs.<sup>3</sup> The industry's potential as an exporter and as a sector capable of rapid growth had already been demonstrated in England before the war. Perhaps the Board of Trustees and the Chamber of Commerce saw in it the solution to the problem of replacing the tobacco trade.

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1. Cotton warp-yarn could not be spun before the invention of the water-frame by Arkwright (patented 1769). This was not in use in Scotland until 1778 (December) at the very earliest; see below, 37.
  2. W.R. Scott, "Economic Resiliency," Ec.H.R., II, 1929-30, 294.
  3. For the Board's attempts to encourage cotton-spinning, see Hamilton, Economic History of Scotland, 170-71. The Chamber of Commerce was set up in Glasgow in 1783, on the initiative of the tobacco merchant, Patrick Colquhoun. Its functions were in many ways similar to those of the Board, though its scope was more confined to local interests. Its approach to encouraging trade was, however, often more direct: for instance, it set up a "Scotch agency" in London in 1788, with Colquhoun as resident agent, to sell Scottish muslins, and later opened a similar agency in Ostend. See Stewart, Progress of Glasgow, 35-6.

## THE GROWTH OF THE COTTON INDUSTRY, 1780-1835

## I

The growth of the new industry after the Peace of Paris in 1783 was very rapid: the increase in annual imports of raw cotton between 1783 and 1792 indicates almost a fifteen-fold increase in annual output in that period.<sup>1</sup> A new peak was reached in 1802, when raw cotton imports, at 10,302,848 lbs., were more than three times higher than in 1792, the previous peak year. In 1810, raw cotton imports amounted to 12,339,977 lbs., in 1818 to over 14 million lbs.,<sup>2</sup> and by 1827, the last year in which a separate record of Scottish foreign trade was kept by the Customs Department, nearly 20 million lbs. was imported to Scotland. An estimate of raw cotton consumption in Scotland in 1833 indicates that the expansionist trend was still going on: according to the estimate, nearly 24.5 million lbs. of cotton yarn was spun in Scotland in that year, which, allowing for wastage of 1½ ounces per pound in the spinning, indicates a total importation of nearly 27 million lbs. of raw cotton.<sup>3</sup> The phenomenon did not go unremarked by contemporaries, especially in the initial stages of development when cotton fabrics, hitherto an

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1. See Appendix, table I. Import figures from Customs Records, are the only reliable guide available to the cotton industry's output. The amount of raw-cotton re-exported was negligible.
  2. Estimated output in 1818 was 105 million yards, valued at £5.2 million. J. Cleland, Enumeration of the Inhabitants of the City of Glasgow and County of Lanark for the Government Census of 1831, Glasgow 1832, 138.
  3. E. Baines, History of the Cotton Manufacture of Great Britain, London 1835, 366-7.

expensive rarity,<sup>1</sup> were coming within the reach of a much larger section of the population and when the processes of production were still regarded with awe and wonder.

Sir John Sinclair's Glasgow correspondents remarked in 1791, when the first peak of expansion was being approached, that although all branches of industry in the city had greatly extended,

"... that which seems, for some years past, to have excited the most general attention, is the manufacture of cotton cloths of various kinds, together with the 2 arts depending on it."

Even in the comparatively remote parish of Rerrick, in Kirkcudbrightshire, the cotton manufacture generated considerable enthusiasm: a local landowner and some farmers had begun to set up a mill, and the minister observed that,

"A spirit of cotton manufacture got in amongst us..."<sup>3</sup>

He could have been reporting the reaction of any one of twenty or more communities throughout Scotland, from Wigtownshire in the south to Aberdeen in the north - ranging in size from towns the size of Glasgow or Paisley, which numbered their inhabitants in thousands, to small villages such as Doune in Perthshire or Bridge of Weir in Renfrewshire, some of them quite isolated.

The spectacular expansion of the industry was matched by the equally spectacular fluctuations with which its growth was

1. They were seldom manufactured in Britain because of difficulty experienced in spinning warp-yarn. Yarn and finished goods were imported from India, by the East India Company, "and brought to that company large sums annually", A. Esilman, Comprehensive View of the Rise and Progress of the Cotton Trade of Scotland, Glasgow, 1823, 7.
2. Old Statistical Account, vol. V, 501-2.
3. Ibid., XI, 56.

attended. In 1793-94, if raw cotton import figures are any guide, output fell to less than a half of the level of 1792. This was followed, apparently, by a period of stagnation lasting until 1798. A setback of rather less severity occurred in 1803, following on the boom of 1798-1802, but a slump of hitherto unparalleled dimensions hit the industry in 1808, when the full force of the Napoleonic Blockade, the American policy of non-intercourse with the participants in the European war and the British orders in Council was experienced. Output in 1808 appears to have been only about one-third of the previous year's. There seems to have been a gradual decline in output lasting from 1811 to 1814, the level of 1814 being somewhat less than half of the 1810 peak-level, and another after the 1818 peak, lasting until 1821. Output apparently rallied in 1822, rose again in 1823, and stagnated rather below the level of 1823 from 1824 to 1826 before making a spectacular recovery in 1827. The fluctuations thus experienced by the Scottish cotton industry did not conform, it seems, to the pattern of fluctuation experienced by its English equivalent.<sup>1</sup> For example, the English industry apparently underwent a slump in 1788 which does not seem to have affected Scotland, where the demand for raw cotton rose without any interruption at all between 1783 and 1792. Similarly, while the English industry appears to have enjoyed

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1. This statement is based on a comparison between the figures for imports of raw cotton into Scotland in Appendix, table I, and one showing imports into Great Britain as a whole, based on Customs returns, in Baines, Cotton Manufacture, 346-7.

a minor boom in 1796, Scottish output in that year was apparently lower than it had been in 1795, rising somewhat in 1797 when English output seems to have fallen. Nor was the boom of 1809-10 in Scotland of anything like the dimensions of that enjoyed in Lancashire. It is difficult to see why this divergence should exist, unless it was because the market served by the Scottish industry was different from that serviced by England. This, of course, is highly probable, since the Scots specialized in high-value fine fabrics,<sup>1</sup> such as muslins, while the English manufacturers tended to cater for the mass-market with lower-priced staples. In the particular case of 1788, it seems likely that the unwillingness of the Scottish banks to assist in financing industrial development may have contributed to the Scottish cotton industry's immunity from a slump. While the banks suffered during the financial crisis of that year,<sup>2</sup> the cotton industry, which was probably financed by private individuals at that early stage of its development,<sup>3</sup> was unlikely to be seriously affected. This may also account for the fact that, while Scottish banks suffered suddenly and severely from the panic consequent upon the unexpected declaration of war early in 1793,<sup>4</sup> it was not until 1794 that a really severe depression hit the cotton industry, probably as a result of the impact

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1. See below, Ch.III, 70-77, for an examination of the type of goods produced in Scotland, 1780-1835.
  2. See, e.g. Forbes, Memoirs of a Banking House, 72-74.
  3. For an examination of the capitalization of the cotton industry, see below, Ch.III, 50-69.
  4. Glasgow was badly affected by this, three of the city's banks failing, Forbes, op.cit., 77-80: Stewart, Curiosities of Glasgow Citizenship, 148-9.

of political and diplomatic events upon Scottish trade with the European continent, in which cotton goods were an increasingly important element.<sup>1</sup> In 1791, Scottish cotton-spinners had been unable to meet the weavers' demands for yarn,<sup>2</sup> so, assuming this to have been the case in 1788 as well, a moderate fall in the demand for cotton cloth was liable to affect the weavers but not necessarily the spinners if the gap between demand for and supplies of yarn were not closed completely. Yarn output could well have been increased in such circumstances, which, if they still existed in 1792-3, would also have cushioned the spinning sector of the industry from the worst effects of the crisis of 1793, and delayed their action until the following year.

The considerable fluctuations of the period 1793-1815 can readily be ascribed to the uncertainty of the market for cotton manufactures in wartime aggravated by the scarcity of American cotton during the war of 1812.<sup>3</sup> As G.W. Daniels has observed in relation to the cotton industry of Britain as a whole, the conduct of business in such conditions rendered sound anticipation, so necessary for commercial stability, an utter impossibility.<sup>4</sup> He quotes a Manchester banker as saying that, during the Napoleonic Wars, profits were made by plunges and

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1. See Appendix, table II.

2. Old Statistical Account, V, 502.

3. Appendix, table I.

4. G. W. Daniels, "The Cotton Trade during the Revolutionary and Napoleonic Wars", Transactions of Manchester Statistical Society, 1915-16, 55.

speculations, which Daniels does not regard as necessarily a condemnation of the business methods used, since every move made by a manufacturer of cotton goods was made speculative by the fact that it was hardly ever possible to know what conditions would be like from day to day or week to week. Scotland, as much as England, was affected by such circumstances; indeed, the effect was liable to be more severe to the Scottish industry in view of its specialization in fine fabrics, for which the market was necessarily more limited than for the products of Lancashire. Fortunes were made, and no doubt lost as well, by Scottish manufacturers who were willing to be unorthodox: the case of James Monteith's reaction to the depression of 1793-94 shows what a daring, or perhaps desperate, individual could do. Monteith had bought Blantyre mill from David Dale at the end of 1792, when trade was brisk, but in the course of 1793, cotton yarn prices slumped to 55% of their 1792 prices, and Monteith begged Dale to release him from his bond: Dale refused. In one respect, Monteith was lucky; he held no stocks of finished cloth as other Glasgow manufacturers did, expensive stocks built up before the crisis which could not be sold profitably once yarn-costs had fallen so low. Taking advantage of low raw material and weaving costs, Monteith employed weavers directly to work up the yarn he spun at Blantyre, and himself disposed of the finished goods by auction wherever he could find a sale. As a result, while the stockholders of cotton cloth were incurring considerable losses, Monteith had embarked on a venture which was to bring

him £80,000 by 1798.<sup>1</sup> The rash of small mills which sprang up all over Scotland, most of them with a relatively short life-span, in, for example, the period between 1783 and 1792,<sup>2</sup> was also symptomatic of the speculative nature of the Scottish cotton industry even in times of comparative diplomatic stability. In the case of the large mills too, speculative enterprises were common, judging from the high turnover in owners which some of them experienced. Deanston mill, one of the largest in the country, had four owners between the time of its erection in 1785 and the depression of 1808: the founder, John Buchanan of Carston, sold it in 1793 to an English Quaker, Benjamin Flounders, who in turn disposed of it to one Mr. Glen in 1805; Glen operated the mill for only a short time, and it was closed down for two years before passing into the hands of James Finlay and Company in 1807.<sup>3</sup> Activity of this kind, if conducted on any considerable scale, could account for the severity of the slumps which the cotton industry of Scotland seems to have experienced in the war years from 1793 to 1815.

The end of the war in 1815 apparently brought no end to the speculation and no great stability to the cotton trade: fluctuations in the industry's productivity continued to be

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1. "Senex", Glasgow Past and Present, Glasgow 1894, vol. II, 51-2.
  2. See below, 38-9.
  3. New Statistical Account of Scotland, Edinburgh 1845, vol. X, 1237.

violent as late as 1826-27. Giving evidence to a parliamentary committee in 1833, one of Scotland's foremost cotton-mill owners, Kirkman Finlay of James Finlay and Company, remarked that, at that date, the industry's profits were low, although the industry's character was "one of great extension, of a rapid sale and activity."<sup>1</sup> Asked to what circumstances he attributed the low state of profits, he replied:-

"Certainly not to any want of demand, if we compare the demand now with the demand at any former period; but to an extremely extensive production with reference to the demand, arising out of a great competition, doubtless caused by the high rate of profit in former times, which, by attracting a large amount of capital to the business, has necessarily led to the low rate of profit we now see." <sup>2</sup>

The competition was both foreign and domestic or internal, the latter element being, according to Finlay, "very formidable";<sup>3</sup> stocks on hand were "inconsiderable", and Finlay considered to be "unhealthy" the prevailing practice of consigning large quantities of goods to foreign destinations on payment of bills in advance; these bills were discounted by "monied persons in London and other parts of the country, which has led to a greater extension of the trade than otherwise would have taken place."<sup>4</sup> Since Finlay's own dealings in foreign markets during the years from 1810 to 1815 had been among the most

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1. Select Committee on Manufactures, Commerce and Shipping, 1833, Report and Evidence, Minutes of evidence, min. 621, 35.
  2. Ibid., min. 622, 35.
  3. Ibid., min. 623, 35.
  4. Ibid., min. 624, 35.

daring carried out by Scottish manufacturers,<sup>1</sup> his strictures on the unhealthiness of the industry in the post-war period must carry considerable weight.

In the post-war period, growing foreign competition was also a serious threat to the stability of the Scottish cotton industry, which was heavily committed to foreign markets: in 1818, for example, more than one-third of its output of cloth was exported, accounting for over 70% of Scotland's total exports by value.<sup>2</sup> Going by Finlay's evidence, this foreign competition was a feature of the period after 1815; when he first entered the trade, in 1787, there was no extensive cotton industry outside the United Kingdom and, a factor of great importance in view of the early Scottish specialization in muslin production, "no finer fabrics of any kind". But since 1814, the French cotton industry had become a "very formidable" rival, and other "very extensive" cotton industries had grown up in Switzerland,

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1. For example, he regularly broke the Napoleonic Blockade by running goods to Europe via Heligoland, and continued trading with the U.S.A. through the island of New Providence and Louisiana during the War of 1812. James Finlay and Company Limited, 1750-1950, Glasgow, 1951, 14-25, gives an account of his activities, 1803-1815.
  2. Of the estimated output of 105 million yards in 1818, over 37 million yards was exported; P. R. O. Customs 14, vol. 30. For the value of cotton exports in relation to total Scottish Exports, see Appendix, table II.

Austria and the United States,<sup>1</sup> all areas in which the fine-goods markets had previously been an exclusively Scottish preserve, served extensively by Finlay's own company and others. In none of these cases had the native industry's capacity for expansion been exhausted by 1833,<sup>2</sup> and the position of Scottish manufacturers who were trying to retain their share of the overseas market was further undermined by the fact that the native industries often operated behind protective tariff walls such as the U.S. tariff of 1815, whose protective effects were considerably enhanced by the so-called "Tariff of Abominations" in 1828.<sup>3</sup> In fact, in so far as it was entirely dependent on overseas sources for its raw-material supplies and heavily dependent on foreign markets for the disposal of its products, the cotton industry of Scotland was as vulnerable to damage by external influences as the old tobacco-trade had been, with the added problem that any interference

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1. Select Committee of 1833, mins. 652-661, 37-8. In the United States, for instance, there were only 2 mills in 1800, 15 in 1807. In 1815, however, there were 165 cotton-mills in the U.S., and 795 in 1831, largely as a result of the protective tariffs and other commercial measures put into force after 1808. See Baines, Cotton Manufacture, 510 and A.D. Gayer, W.W. Rostow and A. Schwartz, The Growth and Fluctuation of the British Economy, 1790-1850, Oxford, 1953, vol. I, 124, 224. There was some controversy about the effects of this competition on the Scottish cotton industry: Finlay's view of its seriousness was disputed in, e.g., P. Mackenzie, Reply to the letter of Kirkman Finlay to Lord Ashley on the Ten Hours Bill, Glasgow 1833. Finlay's view was, however, confirmed by a Glasgow manufacturer operating in the American market, William Graham: Select Committee of 1833, min. 5370-1, 321.
  2. Select Committee of 1833, min. 670, 39.
  3. See above, note 1.

with raw-material supplies or overseas outlets was capable of producing distress among a much wider section of the population than had ever been the case with the tobacco trade, which had not, even at its peak, been such a large-scale employer of labour as the cotton-trade became after 1780. The cotton-trade, however, had one big advantage over the tobacco-trade: it had not been built up on such a precarious, artificial foundation as the Navigation Laws. Its prosperity may not have been stable, but it was never likely to become involved in a catastrophe such as that which engulfed the tobacco-trade in 1776.<sup>1</sup> Furthermore, as will be seen,<sup>2</sup> the growth of the cotton-trade stimulated the expansion of other sectors of the Scottish economy through its demands for machinery and other goods, much more so than the two earlier main contributors to the prosperity of Scotland, the linen and tobacco trades. Despite its many weaknesses, its instability, and its later inability to compete in cost with the industry of Lancashire, the cotton industry was to provide a much better basis for economic development than anything which had preceded it.

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1. It even recovered from the Cotton Famine which resulted from the American Civil War, see below, 128.

2. Below, Chapter V.

## II

The immediate reason for the rapid growth of the cotton industry in Scotland, as in England and elsewhere in the years after 1780, was the application of mechanized techniques of production and, allied to this, a change-over from scattered, small-scale, domestic units of production to concentrated, large-scale, factory units, in all the main processes from preparing the raw cotton to weaving the finished cloth. Before the American War of Independence, raw cotton had been cleaned by hand and spun into yarn on the traditional one-spindle handwheel: while cotton weft-yarn could be spun fairly satisfactorily by this method, yarn sufficiently strong and fine for use as warps could not,<sup>1</sup> though it is difficult to see just why this should be the case, since Indian spinners, using much more primitive techniques than the spinning-wheel, could produce yarns of both types suitable for use in the manufacture of the finest fabrics. The development by Arkwright of the water-frame, patented in 1769, and by Hargreaves of the spinning-jenny, patented in 1770, altered the whole situation, and permitted the cotton-spinning industry to expand much more rapidly than the linen-spinning industry, in which traditional spinning-methods remained in force much longer owing to difficulties in developing machinery which did not damage the fibre.<sup>2</sup> After tracing

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1. Baines, Cotton Manufacture, 113 ff.
  2. Machine spinning in the linen industry was held up by the fact that the machines of the 18th century could not separate the gummy strands of the flax without breaking them. The first really satisfactory mechanized process was wet-spinning, devised by James Kay c.1825. See, e.g. Hamilton, Eighteenth Century, 155.

the development of the new machines,<sup>1</sup> Edward Baines, Junior, summed up their contribution to the expansion of the industry as follows:

"The new machines not only turned off a much greater quantity of yarn than had before been produced, but the yarn was also of a superior quality. The water-frame spun a hard and firm thread calculated for warps; and from this time the warps of linen yarn were abandoned, and goods were, for the first 2 time in this country, woven wholly of cotton".

By applying these new techniques, a considerable increase in the level of output per spinner was achieved. The spinner who had previously operated a one-spindle wheel could, by using a jenny, operate between eight and 120, or even 300, spindles with no more difficulty.<sup>3</sup> Their adoption in Scotland was apparently not very rapid at first, perhaps because the economic conditions brought about by the American Revolution did not favour the application of such innovations: it was difficult enough during the war to dispose of the products of existing industry without introducing new products on to the shrinking markets of the time. But the post-war conditions favoured their introduction because the problems left by the war-- especially that of finding a replacement for such a part of the re-export trade as turned out to have been permanently lost - called for the application of new techniques throughout the industrial sector of the Scottish economy.

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1. Baines, Cotton Manufacture, 147-162.

2. Ibid., 163.

3. Ibid., 159.

The history of the Scottish cotton industry up to 1835 is that of an industry constantly trying to increase its efficiency and lower its production costs, thus widening its potential market, by the continual application of new techniques in every aspect of production. The jenny and the water-frame were improved and enlarged, and Crompton's mule, which combined the best features of both in that it spun finer and stronger yarn than either, was increasingly adopted by Scottish cotton-spinners after its introduction in 1780.<sup>1</sup> This made it possible for Scotland to undercut India in the production of muslins for the English and overseas markets, thereby depriving the East India Company of an important source of profit.<sup>2</sup> The mule started life as a manually-operated machine like the jenny, with all the inefficiencies due to human frailty which this entailed, but by 1792, as a result of the efforts of William Kelly of New Lanark, improvements had been introduced which made its operation more efficient and cheaper in terms of labour-costs. In 1790, Kelly applied water power to the mule, making it possible for one man to operate two standard, 144-spindle, mules. A man's strength was still required to move the carriage of the mule until 1792, when Kelly applied power to this operation as well,

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1. For example, Blantyre mill opened in 1787 with 4,096 water-frame spindles, an extension being built in 1792 for 15,000 mule spindles; Old Statistical Account, II, 217.
  2. Esilman, Comprehensive View, II.

making it possible for a child to operate two machines, as was already the case with the water-frame.<sup>1</sup> By these means, and by increasing the number of spindles operated by each machine, yarn output per spinner was rapidly increased and labour-costs progressively reduced. Greater demands were made by the spinners for rovings, which in turn led to demands for increasing the flow of raw cotton through the cleaning processes. Mechanization was required in the pre-spinning processes as a result, and in this sphere also Scottish technicians were active: the process of preparing the cotton-wool for carding, initially performed laboriously by hand using children and old-people, was mechanized and made more efficient by the invention in 1797 by one Snodgrass of Glasgow of a scutching-machine.<sup>2</sup> Drawing and roving cotton for the mules was performed by Arkwright's carding machine, and other such machines developed in Scotland by James Smith of Deanston between 1807 and 1830 and in England by various inventors after 1782.<sup>3</sup> In weaving, Scotland also took a prominent position in the development of power-operated machinery. The earliest power-loom, that of Cartwright, did not enjoy any great success, but it provided a basis for the work of several other innovators, among them Andrew Kinloch

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1. Baines, Cotton Manufacture, 205-7.

2. Baines, op.cit., 241.

3. New Statistical Account, X, 1239: A.P. Wadsworth and J. de L. Mann, The Cotton Trade and Industrial Lancashire, 1600-1780, Manchester 1931, 496.

of Glasgow who apparently equipped the first power-weaving mill in Scotland, at Milton in Dunbartonshire, with forty looms of his design in 1794,<sup>1</sup> while the first commercially successful power-weaving mill in Britain appears to have been John Monteith's, at Pollokshaws near Glasgow, set up in 1801 with 200 power-looms designed and built by Robert Miller of Glasgow.<sup>2</sup> The power-loom does not appear, according to the testimony of several contemporaries, to have been introduced in Scotland with a view to overcoming any bottleneck in production at the weaving stage, indeed there are indications that there was an oversupply of labour in handloom weaving in Scotland from an early date. Its initial purpose appears to have been to introduce a type of fabric not previously woven in the Glasgow area, but the economies it permitted by increasing per capita output of cloth apparently led to its being developed to perform processes normally carried out by handloom weavers of even the finest fancy-work.<sup>3</sup>

The rapidity with which invention after invention was applied in Scottish cotton-spinning may be seen in the evidence of Henry Houldsworth, another prominent Glasgow spinning-master, to the Select Committee of 1833: while admitting that the rate at which innovations were adopted in Scotland was not as

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1. J. Campbell, History of the Rise and Progress of Power-Loom Weaving, Rutherglen 1878, 1-7.
  2. Rains, op.cit., 230-31.
  3. Select Committee of 1833, mins. 1198, 73. New Statistical Account, VI, 154.

rapid as in Lancashire, he stated that in the ten years or so preceding 1833, the can-frame had been replaced by the fly- or bobbin-frame, which in turn was being rapidly replaced by the American-designed tube-frame. He had no doubt that, in a few years, the tube-frame too would be replaced; in fact the process was already under way. The saving effected by such a process was apparently small, Houldsworth estimated it at less than one penny per pound weight of cotton by permitting the spinning of an inferior grade of raw cotton into yarn comparable to that spun on the can-frame in quality and by producing more yarn without increasing the number of operatives required.<sup>1</sup> But a saving of even a fraction of a penny per pound was not to be lightly dismissed in an industry in which profits were low: the spinner's margin - the difference between the purchase price of raw cotton per pound and the wholesale price per pound of cotton twist - had declined considerably after the Napoleonic Wars, from an average of 14.3 pence between 1803 and 1815 to a mere 5.37 pence in 1832.<sup>2</sup>

The adoption of powered machinery brought with it changes in the organization of the industry's production, from a domestic basis to a large-scale factory basis. The jenny was suitable for application within the existing domestic form of organization which the linen-spinning industry had taken, being small enough to be installed in a cottage or an

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1. Select Committee of 1833, mins. 5217-5225, 310-11.  
 2. Gayer et.al., Growth and Fluctuation of the British Economy, I, 154. Based on a contemporary estimate made by J. Porter.

annexe to a cottage in much the same way as a handloom.<sup>1</sup>

Initially, the mule could be applied in the same way, neither it nor the jenny requiring any source of power other than that of the operatives muscles. Arkwright's water-frames and carding engines, and their derivatives, were an entirely different proposition, as were Kelly's powered and self-acting mules. Of Arkwright's inventions, Baines observed,

"... the water-frame, the carding engine and the other machines which Arkwright brought out in a finished state required more space than could be found in a cottage, and more power than could be applied by the human arm. Their weight also rendered it necessary to place them in strongly built mills, and they could not be advantageously turned by any power then known but that of water." <sup>2</sup>

Not only was Arkwright responsible for making the growth of an independent cotton industry possible, by substituting water-twist for linen warps in weaving, he was also primarily responsible for the development of the form of organization which this new industry took on. The water- or steam-powered cotton mill was a necessary adjunct to his machines, and his factory at Cromford, which he opened in 1771, was as eagerly copied by cotton-spinners as his water-frame. The first known occasion when Arkwright allowed a Scottish manufacturer to make use of his machinery-designs was in 1783, when after a dinner given in his honour by the newly-founded Glasgow Chamber of Commerce, he and David Dale, one of the foremost cambric-manufacturers in the south-west, inspected a site at Falls of

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1. Baines, Cotton Manufacture, 184.

2. Loc.cit.

of Clyde, near Lanark, which was thought to be suitable for the erection of a cotton-mill built on the lines of Cromford. Dale and Arkwright entered into an agreement which permitted the former to make use of Arkwright's patents when fitting out the proposed mill with machinery.<sup>1</sup> But before this, several mills had been built in Scotland, the first going into operation at Penicuik, Midlothian, in December 1778.<sup>2</sup> Between that date and 1786, when the first of the New Lanark mills commenced spinning, mills had been opened at Rothesay, Neilston, Johnstone and Woodside, either using pirated versions of Arkwright's machines or using his patents by private and unpublicised arrangement, or relying on hand-operated machines.<sup>3</sup> These were, by 1792 at least, large-scale enterprises: the Penicuik mill, for example, employed about 500 people by that date,<sup>4</sup> while the combined labour-forces of the two Johnstone mills numbered about 600.<sup>5</sup> By 1787, nineteen cotton spinning-mills were in operation in Scotland, and by 1796 the number had risen to thirty-nine, operating 124,000 spindles, in addition to which 1,200 hand-operated jennies and 600 mules mounting a total of 188,000 spindles were also in use. In 1812, 120 mills and over 900,000 spindles were in operation,

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1. Chambers' Biographical Dictionary of Eminent Scotsmen, revised ed. London 1874, II, 421-2.
  2. Esilman, Comprehensive View, 8; Old Statistical Account, X, 422.
  3. Some of these mills, e.g. Neilston and Woodside, were built on suitable water-courses and probably used powered machinery of some sort from the beginning.
  4. Old Statistical Account, X, 422.
  5. Ibid., VII, 88.

according to a modern estimate, while an official contemporary observer in 1834 put the number in operation in that year at 134.<sup>1</sup>

The mills recorded at those dates throughout the period 1780-1835 showed little in the way of uniformity in size. In the first period of expansion, up to 1792, one finds a proliferation of small mills of the type which the laird and his partners at Rerrick probably erected, like the building at Dalry, Ayrshire, which in 1791 housed 15 jennies and employed about 50 local people.<sup>2</sup> Similar mills, with fifteen to thirty mules or jennies and 40 to 70 employees, were to be found also in the Ayrshire parishes of Monkton, Irvine and Kilwinning, in Renfrewshire at Paisley and Kilbarchan, in Lanarkshire at East Kilbride, Cambuslang and Strathaven,<sup>3</sup> and no doubt in other counties too. The lifespan of such small concerns was frequently short: the jenny-houses of Monkton and Kilwinning apparently had ceased to exist long before 1835, while a small mill at Douglas in Lanarkshire and two others at Lochwinnoch, Renfrewshire, went out of production not long after their completion.<sup>4</sup> But precarious as their existence was, and despite competition from larger concerns

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1. D. Bremner, Industries of Scotland, Edinburgh 1869, 279 (1787); H. Hamilton, Industrial Revolution in Scotland, Oxford 1932, 7 (1796); J. Mackinnon, Social and Industrial History of Scotland from the Union to the Present Time, London 1921, 15 (1812); New Statistical Account, VI, 148, quoting L. Horner, factory inspector, 1834.
  2. Old Statistical Account, XII, 104.
  3. See parish accounts in Old Statistical Account.
  4. The Monkton and Kilwinning houses are not mentioned in the New Statistical Account; for Douglas, see New Statistical Account, VI, 488; for Lochwinnoch, ibid., VII, 103.

and adverse economic conditions during the wars, the small mills with their few mules or jennies and a carding machine or two, sometimes powered by water or steam, more often probably by hand, remained a feature of the Scottish cotton industry until after 1835, despite the belief expressed by Henry Houldsworth in 1833 that such ventures had little hope of success.<sup>1</sup>

Robert Barr's Gryfe Grove mill, built in 1822 and working 1,380 spindles with forty hands, was still functioning in 1836, when another small Renfrewshire mill, Ludovic Gavin's Milhall at Eaglesham with a mere 620 spindles and a labour force numbering sixty-four, was just being completed.<sup>2</sup> The owners of a small mill at Kilbirnie in Ayrshire, which had been destroyed by fire in 1831, thought it worthwhile to rebuild and extend it - to a productive capacity of 4,000 spindles.<sup>3</sup>

The most important element in the revolution of the cotton-spinning industry from a domestic to a factory basis was not, however, the small spinning-mill, but the large mill based on Arkwright's model at Cromford and with powered machinery operating 10,000 or more spindles. David Dale's New Lanark mill, the first Scottish mill known to be of this type, went into operation in 1786, to be followed by others of the same type at Deanston, Blantyre, Stanley, Catrine, Linwood and Lochwinnoch by 1793. The extent to which these mills, rather than the smaller type, contributed to the expansion of

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1. Select Committee of 1833, min. 5305, 316.
  2. New Statistical Account, VII, 51, 402.
  3. Ibid., V, 715.

cotton-spinning in Scotland may be judged from the fact that New Lanark alone, though no fully operational, consumed 12% of the total quantity of raw cotton imported into the country in 1793, while Catrine consumed nearly 10% of the amount imported in 1796.<sup>1</sup> These were extended during the period under examination, Blantyre's capacity for example rose from 20,000 to 30,000 spindles between 1793 and 1834,<sup>2</sup> and new mills of a similar type continued to be built: thus, the average capacity of 44 Lanarkshire mills examined by James Cleland in 1831 was over 14,500 spindles each,<sup>3</sup> while in 1833 the six mills in Neilston, Renfrewshire, averaged 13,193 spindles each.<sup>4</sup>

For some time after the predominance of large-scale units of production in cotton spinning had been established, cotton weaving in Scotland, as in England, remained domestically organized. Some hand-loom weavers were directly employed by spinning-mill owners,<sup>5</sup> but the practice of selling yarn to a "manufacturer" or master-weaver, who put it out to weavers working in their own homes, apparently continued throughout the period under consideration, since, as Kirkman Finlay stated in 1833, the hand-loom was still unsurpassed as a means of

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1. Old Statistical Account, XV, 37 (New Lanark), XX, 176 (Catrine). Estimates based on figures for weekly consumption: 6,000 lbs. per week at New Lanark in 1793, 2,660 lbs. at Catrine in 1796.
  2. New Statistical Account, VI, 322.
  3. *Ibid.*, VI, 146 footnote.
  4. *Ibid.*, VII, 336.
  5. E.g. by Dale at New Lanark, "The yarn is partly manufactured into cloth here by the (324) weavers above mentioned and others in the proprietor's employ; and partly sold to the manufacturers in Glasgow, "Old Statistical Account, XV, 37. Most of the Ayrshire & Renfrewshire weavers were said to be employed by the "manufacturers", i.e. master-weavers, of Glasgow and Paisley.

producing the finest fabrics, fancy-goods of all kinds and limited orders.<sup>1</sup> But in weaving too, after 1814 or so,<sup>2</sup> mechanized production in large-scale units was becoming increasingly common, and was bringing to the production of cotton cloth a degree of integration which was not, perhaps, possible so long as the handloom and the industrial structure within which it was applied made the weaver a semi-independent producer. By 1835, no fewer than 29 power-weaving mills had been set up in Scotland,<sup>3</sup> many of them directly controlled by large-scale spinning firms such as James Finlay and Company, with 302 power-looms in their Deanston Works and an unknown number at Catrine by 1834, and the Lancefield Spinning Company, with 635 power-looms operating at their Lancefield and Partick spinning mills in 1835.<sup>4</sup> Of a list of 19 Glasgow-based firms conducting power-weaving in 1831, all but eight can be matched with a similar list of Glasgow-based spinning firms.<sup>5</sup> The revolution in weaving was by no means completed by that time however, judging both from Finlay's evidence cited above and from the fact that 18,537 handlooms were in operation in Glasgow in 1831.<sup>6</sup> In adopting the power-loom, the mill-owners were probably motivated by a desire to offset their steadily shrinking profits by cutting out the middle-man of the domestic

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1. Select Committee of 1833, min. 1198, 73.
  2. Finlay's estimate of the date when the power-loom was being widely adopted in Scotland, loc.cit.
  3. Campbell, Progress of Power-Loom Weaving, 10.
  4. New Statistical Account, VI, 154.
  5. Cleland, Enumeration of 1831, 291.
  6. New Statistical Account, VI, 154.

system and taking his share for themselves. By doing so, they may even have been able to reduce the price of goods to the consumer, thereby widening the market somewhat. The example given by James Monteith in 1793-98 was unlikely to have been forgotten by a community as close-knit as the Scottish mill-owners.<sup>1</sup>

### III

In its early stages of development, the cotton industry was established in widely scattered locations throughout Scotland. Of the nineteen mills known to exist in 1787, four were in Lanarkshire, four in Renfrewshire, three in Perthshire, two in Midlothian, the remaining six being located in different counties from Wigtownshire in the extreme south-west of Scotland to Sutherland in the north-east Highlands.<sup>2</sup> By 1834, however, a considerable degree of geographical concentration was shown in mill-locations. Leonard Horner, Scottish area factory-inspector in 1834, noted in his report that,

"... with the exception of some large establishments at Aberdeen, and one at Stanley, near Perth, the cotton manufacture is almost entirely confined to Glasgow and the country adjoining, to a distance of about 25 miles radius; and all these country mills, even including the great work at Stanley are connected with Glasgow houses or in the Glasgow trade."

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1. Some of whom were closely related, e.g. Finlay and the Buchanans: see also Stewart, Curiosities of Glasgow Citizenship, 101, for the corporate activities of the Anderston "manufacturers", many of whom became mill-owners.
  2. Bremner, Industries of Scotland, 279.

In fact, 123 of the 134 cotton mills in Scotland in 1834 were located within a radius of 25 miles from Glasgow, either in the city itself or in the counties of Lanark, Renfrew, Bute, Dunbarton, Perth and Argyll.<sup>1</sup>

The factors which governed location had apparently undergone a change between 1787 and 1834. As far as cotton mills were concerned, the most important factor in their location had probably been the availability of adequate sources of water power, with adequate labour supply and plentiful water-supply as important subsidiary factors.<sup>2</sup> Profits in the cotton-trade remained at a very high level until 1802,<sup>3</sup> and mills located in areas which lacked good access to raw materials and markets could still return a fairly high profit, though rather less than those which possessed relatively easy access to raw materials and markets. There were several areas in Scotland which possessed plentiful resources of water-power and water-supplies, as well as supplies of labour recruited from other textile industries. Attempts were, therefore, made in almost every area which had supported a linen industry at the time of the American War to establish a cotton industry, which had captured the public attention since the end of the war. The Glasgow area enjoyed no

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1. Horner's report, quoted in *New Statistical Account*, VI, 148.
  2. Rivers which supply water-power do not necessarily provide a sufficient water-supply, which was required primarily for finishing processes such as washing and bleaching.
  3. Select Committee of 1833, min. 649, 37 (Kirkman Finlay's evidence), "What was the highest state of profit? - The best time that I ever knew in the spinning was about 1802." Finlay had participated in the cotton industry since 1788.

marked advantages over other areas, Perthshire and Angus for example, in respect of water-supply and resources of water-power, though the high degree of skill in working with fine yarns which its weavers had acquired in the manufacture of lawns, silk-gauzes and blunks provided that area with some advantage in labour-supply. Thus, the early mills were geographically dispersed.

The availability of water-power remained the most important factor governing mill-location until at least the end of the first decade of the nineteenth century. The first steam-powered mill in Scotland came into operation in 1792,<sup>1</sup> but this form of power was only slowly adopted in the industry. By 1800, only eight steam engines were in use in Scottish cotton-mills.<sup>2</sup> By 1825, however, water-power was being superseded by steam-power: 3,200 horse-power was generated by steam-engines in cotton mills, as against the 2,480 provided by water-wheels.<sup>3</sup> The coal-consumption of these early steam engines was high, and it was desirable that they should be sited either on the coalfields themselves or at a point where easy access to coal supplies could be obtained. Lanarkshire and Ayrshire had important coalfields, with which Glasgow was linked by water-transport via the Monkland canal and the

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1. Old Statistical Account, XIV, 284.

2. G.M. Mitchell, "The English and Scottish cotton industries; a study in inter-relations," Scottish Historical Review, XXII, 1924-5, 108.

3. Baines, Cotton Manufacture, 390.

River Clyde. Water-power was a factor of declining importance in the location of cotton mills presumably because most of the best sites had been taken up by about 1810, though some manufacturers still preferred water to steam power even in 1833.<sup>1</sup>

Other factors had, meanwhile, increased in importance. The increasing concentration of the Scottish cotton industry on the production of fine goods such as muslins, gave an advantage to the south-west, where the highest standards of quality in weaving had been achieved. Other regions were less able to compete in this type of work. The decline of profits, increasing after 1815 with the intense internal competition which developed in the industry, brought in transport-costs, both of the raw material to the mill and of the finished product to the market, as an increasingly important factor in mill-location. Those mills located at some distance from Glasgow, the main port of entry for raw cotton and the major wholesale market for fine fabrics, were at a greater disadvantage than mills in the Glasgow area when margins began to fall, because of their higher overheads. The Glasgow region had an advantage, too, in the commercial uncertainty which the French wars brought in their train, and which continued after the war. Information about the state of the markets, especially the overseas markets, could be

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1. E.g. Kirkman Finlay. See Select Committee of 1833, min. 1193, 73. For another example, William Arrol, see New Statistical Account, VII, 52.

quickly passed on from the merchants of Glasgow - which was the centre of Scottish overseas trade - to local manufacturers, both through informal social contact and through formal organizations such as the Chamber of Commerce. Manufacturers in other areas did not have such ready access to this vital information. Glasgow's position as a communications-centre heightened this advantage: the city's manufacturers could take advantage of the land and water links with their markets to make the best use of the commercial information which they received, whereas the manufacturers in areas whose communications were less well-developed were often slow to act.

The factors which favoured the development of mills in areas outside the south-west had declined in importance by about 1810, and the advantage of siting mills inside that area had become more apparent. This led to the closure of many of the mills in other areas from about that date. The case of the Perthshire cotton industry was typical.<sup>1</sup> This had developed quite prosperously after 1780, but declined steadily from about 1812 onwards, and in 1814 even the great mill at Stanley was closed. Technically, the Perthshire industry was inferior to those of Lanarkshire and Renfrewshire: the small-scale spinners were trying to compete with hand-operated jennies against the powered and self-acting mules of

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1. For an account of this, see W.H.K. Turner, "The Textile Industry of Perth and District," Institute of British Geographers, Transactions and Papers, 1957, 123-39.

New Lanark and Blantyre. The quality of goods produced in Perthshire was inferior to that of fabrics made at Glasgow or Paisley. The remoteness of Perth from the main distribution centre at Glasgow meant that the response of Perthshire manufacturers to changes in demand was generally too slow. Their position was summed up by one of their number in 1834:-

"... we are out of the way of the market and when we send goods to Glasgow we have to pay a commission for selling, and we are destitute often of that information that would be very useful to us, besides the carriage and various other things." 1

After 1820, therefore, Perth turned to re-establishing its connection with the linen industry of eastern Scotland.<sup>2</sup>

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1. Quoted by Turner, *op.cit.*, 126. Evidence of John Stalker of Perth to Select Committee on Handloom Weavers' Petitions, 1834.
  2. Other remote centres suffered the same fate. The cotton-mill at Newton Stewart, Wigtownshire, was dismantled in 1820, after lying idle for several years: New Statistical Account, IV, iii, 186. The Midlothian mills had passed into oblivion before the New Statistical Account was compiled, it seems. The mill at Spinningdale, Sutherland, had burned down in 1804, and was not considered worth rebuilding: New Statistical Account, XV, 19.

## THE FOUNDATIONS OF EXPANSION

The development of large-scale units of production and the adoption of mechanized production-techniques in the cotton industry required the application of considerable amounts of capital. This could only be attracted to the industry if sufficient incentives to invest existed, especially in the earliest stages of the industry's growth, when its potential was largely unexplored. It is intended to examine in this chapter the sources from which the cotton industry drew its financial support, and the factors which influenced investors to apply their capital to its development. But capital is only one of the foundations of expansion: it is also necessary, before expansion is undertaken, to ensure that there is sufficient demand for the industry's products. The changes in the Scottish cotton industry's production which were made to meet changes in demand or to create further demand, will also be examined here.

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## I

In 1790, John Dunlop informed Hugh Hamilton of Pinmore that to set up a spinning mill, in the old sugar-houses the two had bought for that purpose, would require the sum of "about £4,000 besides the price of the Houses". Their mill would employ about 170 hand working 9,360 jenny-spindles, as well as carding, roving and slubbing machines, on sixty jennies, on which point Dunlop remarked,

"30 Jeaniès is reckoned a very handsome establishment, and I am informed there is no work about Manchester <sup>1</sup> that exceeds 40."

However accurate his information about the Manchester mills, there were in Scotland at that time mills substantially larger than the one projected by Dunlop and Hamilton, and consequently more expensive, such as the Newton Stewart mill of Dale and Douglas which had cost £20,000 to build and equip in 1787.<sup>2</sup> The use of more sophisticated machinery, bringing with it the need for larger and more expensive buildings, required the investment of ever-greater amounts of money, so that by 1833 the cost of building and equipping a mill which could effectively compete in the conditions of intense internal

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1. S.R.O. Hamilton of Pinmore Muniments, bundle 12, 1785-1828. Letter of John Dunlop to Hugh Hamilton, 15/12/1790.

Machinery costs were estimated at:-

5 carding machines @ £20 each	£100
5 roving " @ £16 "	£80
5 slubbing " @ £40 "	£200
60 x 156 - spindle jennies @ £43 "	£2,580
	Total £2,960.

2. New Statistical Account, IV, iii, 186.

competition which the industry was then experiencing. According to Houldsworth, an investment of between ten and twelve thousand pounds on buildings and machinery might suffice to set up a small spinning mill, but such an establishment would have little hope of survival.<sup>1</sup> The need to maintain a high rate of machine-replacement in order to remain competitive added considerably to the costs involved.

Scottish industrial development before 1780 is said to have been hampered by "the chronic and almost universal inadequacy of funds".<sup>2</sup> It seems rather remarkable, in that case, that by 1787 no fewer than nineteen cotton mills whose erection involved capital investment of as much as £20,000 each should have been in operation in Scotland. It seems likely that large accumulations of capital did, in fact, exist in Scotland before 1780, but for some reason they simply were not being applied to industrial projects. Considerable sums must have been required to build up Glasgow's merchant shipping for the tobacco and sugar trades, and for the improvements in communications which were undertaken in connection with these trades. Large reserves of circulating capital must have been required for the maintenance of the trades themselves. But the profits of the re-export trades were considerable, and yet they seem to have made little impact

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1. Select Committee of 1833, mins. 5300-04, 315-6.

2. Campbell, "Economic History of Scotland in the Eighteenth Century," S.J.P.E., XI, 1964, 20.

on Scottish industry. In a primarily agrarian economy such as Scotland's before 1780, a high proportion of the available funds would be applied to agricultural improvement, which was undertaken with increasing intensity in Scotland after 1750. Besides absorbing any surplus funds which the established landed proprietors may have accumulated, this seems also to have attracted a large proportion of the profits of overseas trade. Scottish merchants, like their English and French counterparts, tried to obtain high social status by investing the profits of their trading activities in land. John Glassford, for example, was one leading tobacco-merchant who bought an estate - at Dougalston in Dunbartonshire - and Robert Dunmore was another - his lands being the estates of Ballindalloch and Ballikinrain in Stirlingshire.<sup>1</sup> These were not isolated cases by any means, nor was the tendency confined to the Virginia merchants. Even the cotton magnates, once the industry had been established, sought to achieve landed status with the profits they derived from their mills. David Dale, for instance, bought the estate of Rosebank, Lanarkshire, near the mills of New Lanark. James Buchanan bought the Woodlands estate, on the western outskirts of Glasgow. Kirkman Finlay, as befitted a member

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1. For Glassford, see Stewart, Curiosities of Glasgow Citizenship, 215-7. His social status was enhanced by his second marriage, to the daughter of an earl. For Dunmore, see Campbell, "Anglo-Scottish Union II," Ec.H.R., 2nd ser., XVI, 1963-4, 472. The achievement of landed status did not lead to their withdrawal from trade.

of parliament, bought land at Castle Toward out of the proceeds of his widespread activities.<sup>1</sup> Only when improvements in agriculture had been completed by the merchant-landowners of Scotland in the pre-American War era of commercial expansion and agrarian renewal could they devote their interests, and their money, to industrial growth. Since these processes were not completed before the war broke out, the contribution of these groups to industrial growth, though important, was limited.

Alternative sources of capital certainly existed: the government, through the Board of Trustees, and the English, Samuel Garbett for one, made important contributions to the capitalization of Scottish industry before the war.<sup>2</sup> The banks were less forthcoming, though they did provide some cash and credit for short-term financial purposes. The linen trade, with the aid of the Board of Trustees, was probably ploughing back profits into its own development. But in none of these cases presumably, with the exception of the linen trade, was enough money forthcoming to finance expansion of the order apparent in the cotton industry between 1783 and 1792, if the record of the pre-war period is any criterion. Some factor, an event or a series of coincident but not

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1. Chambers' Biographical Dictionary, II, 421-4; Stewart, op.cit., 45-64 (Dale). "Senex", Glasgow Past and Present, I, xxxvi (Buchanan). James Finlay and Company, 28 (Finlay).
  2. The amount of English capital invested in Scotland in 1761 was estimated by contemporaries to be about £500,000: see Hamilton, op.cit., 308.

necessarily related events, must have come into operation in the immediate post-war period to unlock the accumulation of capital which the various potential sources of loanable funds had at their disposal, and to provide an incentive to apply that capital to the development of an industry whose potential, as far as Scotland in 1783 was concerned, was completely unknown.

Scottish economic historians now agree that in the development of the cotton industry, the main source of capital, entrepreneurial and managerial ability was the fine linen industry of the south-west. David Dale of New Lanark is perhaps the best-known example,<sup>1</sup> but the fact is that he is distinguished from the others only by the number of enterprises in which he had an interest. Apart from New Lanark, he was instrumental in founding cotton mills at Catrine, Blantyre, Spinningdale, and Newton Stewart, and he was involved, after their foundation, in similar undertakings at Stanley and Rothesay. Dale's early experience had been gained in the fine-linen trade, first as a handloom weaver, then as an employer of weavers and an importer of French and Flemish yarns, which, according to one biographer,

"brought him large profits and laid the foundation  
of his fortune." 2

His fortune, by 1783, when he first became interested in the

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1. Various short lives of Dale are extant, for references see above, 52, n.1.
  2. Andrew Liddell in 1854. Liddell's sketch was incorporated in Chambers' Biographical Dictionary in that year, reprinted in 1874 without alteration.

cotton industry, was considerable; in that year he had a house built for himself in Charlotte Street, one of Glasgow's most exclusive residential areas, at a cost of £6,000 - almost enough, on John Dunlop's estimate, to finance a cotton-mill. The Finlays had a similar background; as yarn importers, manufacturers and textile exporters since before 1769, when old James Finlay was made a burgess of Glasgow. Their entry into the cotton trade was first as weaving-masters in Glasgow and Paisley, then as mill-owners in 1798, when Kirkman Finlay bought Ballindalloch mill: he later acquired Catrine, in 1801, and Deanston, in 1807.<sup>1</sup> Finlay's relations, the Buchanan brothers, founders of Deanston, managers of Catrine and later owners of Stanley, as well as technical innovators, came into the cotton industry after a successful career as "English merchants", marketing Scottish linens through a network of pedlars or "packmen", during which they had become Arkwright's Glasgow agents.<sup>2</sup> James Monteith, father of that James who bought Blantyre from Dale, was the most important linen yarn-importer in Glasgow at the time of the American war; his sons, James, Henry and John, were all "bred to the loom" and all became prominent members of the cotton-trading community in Glasgow as spinners, calico printers and the like.<sup>3</sup> John Freeland, who founded an 18,000 spindle mill at Houston

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1. James Finlay and Company, 7. See also New Statistical Account, X, 1238 (Deanston); VIII, 294 (Ballindalloch); V, 134 (Catrine).
  2. Stewart, Curiosities of Glasgow Citizenship, 181-3.
  3. Ibid., 93-116.

in Renfrewshire, was another example of the linen-merchant turned cotton manufacturer, as was William Gillespie - bleacher and weaving-master in the linen trade, and a friend of the elder James Monteith - who built the first spinning-mill in the Barony of Glasgow, at Woodside, in 1784.<sup>1</sup> David Todd, of Todd and Stevenson, was yet another Glasgow linen-manufacturer who turned to cotton after the American war.<sup>2</sup> The founders of the Paisley cotton-mills at the same time - the Carliles, Orrs and Browns, and later the thread-manufacturing dynasties of Coats and Clark,<sup>3</sup> all entered the cotton industry from existing textile industries such as linen and silk, while the Sandeman family of Redgorton, Perthshire, were linen-spinners and weavers before turning to cotton.<sup>4</sup>

It was, perhaps, inevitable that the main contribution of capital and entrepreneurial skills came from the older textile industries, since the participants in these older industries would obviously be the groups most aware of the potential of cotton as against the better-known fibres in 1780-90. Other groups, however, did contribute capital to the foundation of the cotton industry. Modern commentators,

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1. Ibid., 209-13.

2. Ibid., 241-2.

3. M. Blair, The Paisley Thread, Paisley 1907, 34-61. There appears to have been a strong contingent of religious non-conformists among the entrepreneurs' involved. The Coats and Clarks, for instance, were Baptists, while Dale and the Monteiths broke with the Church of Scotland to found or join various sectarian religious bodies. William Gillespie, too, was a Secessionist. See the biographical notes on Dale, Monteith and Gillespie in Stewart, Curiosities of Glasgow Citizenship.

4. Old Statistical Account, XV, 531: New Statistical Account, X, 170.

while agreeing over the supreme importance of the contribution made to the industry's development by participants in other textile sectors, are divided in their opinions of the importance of the contribution made to the capitalization of the industry by these other groups. The late Professor Hamilton, in 1932, was convinced that an important contribution was made by the Virginia-merchants, whose resources were freed for industrial development by the collapse of the tobacco-trade in 1776, from which most of them emerged comparatively unscathed financially.<sup>1</sup> His later views were more indefinite, largely, one suspects, for lack of concrete evidence of a large-scale transfer of capital from the tobacco-trade to the cotton industry, though by indicating the widespread participation of ex-tobacco lords in industrial enterprises other than cotton he seems to have left the possibility of similar participation in the cotton-industry open.<sup>2</sup>

Professor Campbell, on the other hand, deprecates the possible contribution of the tobacco-merchants and other participants in the pre-war expansion of Scottish foreign trade, and makes a convincing case for the importance of the contribution made by the landed gentry to the foundation of the cotton industry, in which he has been ably abetted by Dr. Smout.<sup>3</sup> There is something to be said for both sides of the argument, in so

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1. H. Hamilton, Industrial Revolution in Scotland, 121.
  2. H. Hamilton, Eighteenth Century, 168.
  3. E.g. in a review of Hamilton, Eighteenth Century, in S.J.P.E. 1964, 17-24. See also T.C. Smout, "Scottish Landowners and Economic Growth", S.J.P.E., 1964, 218-34.

far as examples of tobacco-merchants and landed proprietors who participated in the financing of the cotton industry are known. Robert Dunmore, for instance, had been in the Virginia trade at the time of the American war, and after it financed the erection of Ballindalloch mill at Balfron:<sup>1</sup> he may also have been involved, with John Monteith, in the foundation of a cotton mill at Pollockshaws, near Glasgow, in 1793.<sup>2</sup> Dunmore, with Robert Bogle, another ex-tobacco merchant, also contributed some of the capital necessary for the erection of the mill at Spinningdale in Sutherland, though their contributions to this enterprise, £100 apiece, were small in relation to the total costs involved.<sup>3</sup> On the side of the landed interest's participation in the industry's capitalization, the most commonly cited examples are Claud Alexander of Ballochmyle, who partnered Dale at Catrine, Sir William Douglas of Penninghame, Dale's partner in the Newton Stewart mill, and George Dempster of Dunnichen and Skibo, founder of Stanley mill in Perthshire in 1785 and, again with Dale, one of the originators of the Spinningdale scheme.<sup>4</sup> Others in this category are known, of course - Hamilton of Pinmore, for instance, and possibly Clark of Penicuik, on

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1. Stewart, Curiosities, 202-3.
  2. J.O. Mitchell, Old Glasgow Essays, Glasgow 1905, 124. There is some doubt as to the identity of John Monteith's partner: see below, 62.
  3. Old Statistical Account, VIII, 383 gives a list of the shareholders in Spinningdale together with the number of £100 shares held by each one.
  4. Old Statistical Account, XX, 176 (Catrine): XVII, 576 (Stanley): and VII, 375-83 (Spinningdale). For Newton Stewart mill see New Statistical Account, IV, iii, 185-6.

whose land the first Scottish mill stood<sup>1</sup> - but Alexander, Douglas and Dempster stand apart from them as the founders of large-scale, fully-mechanized concerns which operated successfully.

On the surface, there appears to be more justification for arguing in favour of a large-scale transference of capital from land to cotton-manufacturing, rather than from foreign trade, the more so since, as Campbell has pointed out, the only known example of an ex-tobacco merchant participating in the foundation of a large-scale cotton-spinning mill, Robert Dunmore, was in fact proprietor of the estates of Ballindalloch and Ballikinrain before he financed the building of Ballindalloch mill.<sup>2</sup> This seems to put Dunmore into roughly the same category as Claud Alexander and others of that ilk, but, in fact, what Campbell has done is to emphasize the danger of fitting known participants into rigid categories as either landed proprietors or overseas traders. These pitfalls are further underlined by consulting Burke's "Landed Gentry", whence it emerges that Claud Alexander had bought his estate at Ballochmyle out of the proceeds of his service as an official of the Honourable East India Company and that George Dempster had been a director of the same Company at the time of the Stanley mill's foundation. Dempster's main estate, Dunnichen, had been purchased earlier

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1. S.R.O. Clerk of Penicuik Muniments, 1790.

2. Campbell, "Anglo-Scottish Union of 1707", Ec.H.R., 1964, 472.

in the eighteenth century by his grandfather, also George Dempster, from the profits of business as a merchant-banker in Dundee.<sup>1</sup> In any case, Dunmore was, in 1789 at any rate, also a member of the West India trading-community in Glasgow, while also the proprietor of Ballikinrain.<sup>2</sup> The possession of land, it seems, was not necessarily a characteristic of the retired merchant in Scotland, only of the successful merchant: commercial success must not only be achieved, it must be seen to be achieved by setting up as a landed gentleman. Once this had been done, and the improvement of the estate undertaken in the manner of Norfolk, any surplus funds could be devoted to other activities upon which a sufficient return could be expected. Some proprietors turned to the exploitation of the mineral resources of their estates,<sup>3</sup> which the growth of a coal-consuming metallurgical industry after 1750 made an economic proposition. Others took to the cotton industry, perhaps because their estates were deficient in coal-bearing strata, or perhaps because the water courses provided easily-tapped resources of power for machinery. It seems likely, however, that whatever course was taken, it would be that one in which it had been shown beyond doubt that the highest rate of return on capital invested could be obtained. The promotion of an entirely new industry, as cotton spinning

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1. Sir B. Burke, *Genealogical and Heraldic History of the Landed Gentry of Great Britain and Ireland*, London 1871; "Alexander of Ballochmyle", 10; "Dempster of Dunnichen", 342.
  2. Jones' *Directory of Glasgow*, 1789, 69.
  3. Or allowing others to do so in exchange for part of the mine's profits.

was in Scotland in the seventeen-eighties, would not be undertaken by men whose previous activities had not been related directly with the textile sector. It may be significant in this respect, that the main landed and commercial participants were associated in most of their activities in the cotton industry with men such as Dale and John Monteith, whose lifetime had been devoted to the expansion of textile output and the disposal of textile-goods, whose knowledge of production-methods, industrial organization and marketing was probably unequalled in Scotland. The nature of the relationship between the two groups was described in 1854 by Andrew Liddell, one of Dale's biographers: Liddell observed that Dale served as a co-partner and advisor to landed proprietors who, having first expressed hostility to rurally-situated cotton-mills on the grounds that they would attract undesirable elements from the towns, wished to lay claim to the profits which New Lanark had shown to accrue from cotton-spinning.<sup>1</sup> This only serves to underline the fact that without contribution of the group of men within the traditional textile trade, little progress in founding a large-scale mechanized cotton-spinning industry would have been made. The contributions made by men from outside that group was of secondary importance, and such men never, at any time, as Dr. Smout has observed, dominated the new industry.<sup>2</sup>

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1. See Chambers' Biographical Dictionary, II, 422.

2. Smouth, "Scottish Landowners," S.J.P.E., 1964, 227.

A group whose contribution has never received much attention is the English, whose part in promoting the economic development of Scotland between the Union and the American war had not been unimportant. The participation of English capital in the initial development of the Scottish cotton industry was limited, but Englishmen were responsible for the erection of the first mill in the Clyde Valley, where the industry later became concentrated, at Rothesay in 1779. The Rothesay mill was put up for sale as a going concern, small but fully equipped, which was bought by David Dale in 1785, the year before the first New Lanark mill went into operation:<sup>1</sup> the experience he must have gained as its owner must have been valuable and encouraging if his subsequent activities are any guide. Other Englishmen shared in the industry's growth by, like Kirkman Finlay, buying up established mills and keeping them in operation. The career of Robert Owen, who managed New Lanark from 1799 to 1827 as a partner in English-dominated companies is well known, but Owen's case was typical of several others. Benjamin Flounders, an English Quaker, took over Deanston from Buchanan of Carston in 1793.<sup>2</sup> Henry Houldsworth came from Manchester in 1799 to take over Gillespie's Woodside mill and built two others at Anderston in 1801 and 1803.<sup>3</sup>

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1. Bremner, Industries of Scotland, 279.

2. Old Statistical Account, XX, 87.

3. Stewart, Curiosities, 214-5; Factory Commission 1832, Supp. Rep., 133.

The Scottish chartered banks, as might be expected, do not appear to have taken any direct part in the provision of capital for the building and equipping of cotton mills at first,<sup>1</sup> though they may well have had a role in financing the day-to-day business of the industry. The Royal Bank of Scotland opened a branch in Glasgow in 1783 and appointed as its agents David Dale and Robert Scott Moncrieff;<sup>2</sup> it seems doubtful that, with Dale as chief agent, the Royal Bank could avoid transactions connected with the cotton industry, especially when Scott Moncrieff too began to take an interest in the industry.<sup>3</sup>

## II

Each of the groups involved in the transference of capital from other sectors of the Scottish economy to the cotton industry must have reacted to some stimulus which made such a departure from their established spheres of activity desirable or even necessary. The immediate incentive to invest in any enterprise, in the eighteenth century as in any other age, was the possibility of a handsome return on the investment. But it is necessary to probe deeper into the motives of the various participating groups than that.

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1. Judging from the following works:- C.A. Malcolm, The Bank of Scotland, 1695-1945, Edinburgh n.d., and The British Linen Bank, 1746-1946, Edinburgh 1950: Sir W. Forbes, Memoirs of a Banking House: A.W. Kerr, History of Banking in Scotland, 4th edn., Glasgow, 1926.
  2. See, e.g. Chambers' Biographical Dictionary, II, 421.
  3. He has been suggested as John Monteith's-partner at Pollokshaws, "Senex" Glasgow Past and Present, II, 72-3.

What made the cotton industry such an attractive area of development that it succeeded in releasing reserves of capital on a scale which no other development within the Scottish economy had hitherto been able to approach?

In connection with this problem of motives, it must be remembered that the establishment of a large-scale cotton industry in Scotland had been preceded by the growth of a similar industry in England before the outbreak of the American revolution. The machines invented by Arkwright and Hargreaves, or pirated versions of them in some cases, had been enthusiastically adopted by the spinners of Nottinghamshire, Derbyshire and Lancashire to such effect that one commentator has observed that within five years of Arkwright obtaining his patent, that is between 1769 and 1774, "the success of roller spinning was assured".<sup>1</sup> If so, it was unlikely to have gone unremarked in Glasgow, where people like the Buchanans, Arkwright's agents in 1783, whose dealings with the textile trades in England were extensive, were bound to be aware of the potential dividends to be gained by switching from the use of linen to cotton. If a place could be found for Scottish enterprise within the new industry, such men were the ones most likely to find it.

The event which, probably more than any other, may have prompted the lawn and cambric manufacturers to search

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1. Wadsworth and Mann, The Cotton Trade and Industrial Lancashire, 448.

for an opening in the cotton-trade was the entry of France and Holland into the American War in 1778. This threatened supplies of the fine-linen yarn upon which Glasgow's manufacturers and weavers were so heavily dependent. It may well be that the manufacturers of fine linen goods deemed it advisable to look for a substitute fibre, supplies of which were not so vulnerable to interruption as a result of the actions of foreign governments. What better substitute to adopt, then, than West Indian cotton, which was becoming more easily obtainable in the south-west as more and more merchants and shipping, displaced from the trade with the former colonies, turned their attention to the Caribbean?<sup>1</sup> The English had shown what could be achieved with such a substitution when it was allied to the adoption of the new production-techniques which made cotton goods cheaper to produce than linen goods by permitting economies of scale in spinning. Depending on the comparative profit margins in the cotton and linen trades,<sup>2</sup> cheaper goods, with their potentially wider market, could be sold without any decline in absolute returns. The case of the jute industry of Dundee provides an interesting guide to the events leading up to the foundation of large-scale cotton spinning around Glasgow.<sup>3</sup> The coarse-linen industry centred on Dundee was dependent on Riga and St. Petersburg for supplies of

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1. See above, 16-17.
  2. Information on margins in linen is not available. It seems likely, however, that they were not so favourable as in cotton, because the quantity of linen yarn produced per spinner was, for technical reasons, not as high as that of cotton using the more sophisticated machinery available after c. 1770.
  3. Chapman, "The Establishment of the Jute Industry", Rev. Econ. Studies, 1938, 45-9.

flax and hemp, which were subjected to a series of interruptions and threatened interruptions from 1793 onwards because of diplomatic and other conditions. Efforts were made to find a substitute raw material, and the possibilities of using jute, more easily obtainable once the East India Company's monopoly of the Indian Trade was completely revoked in 1813, were explored. About 1836, improvements were made to machinery which facilitated jute-spinning and it was found that a market for jute fabrics existed - it could be used advantageously in the bulk packaging of coffee and raw cotton. These developments coincided with a fear that war with Russia, which would threaten flax and hemp supplies yet again, was imminent and Dundee manufacturers turned increasingly to using jute instead, the jute industry being firmly established by 1848. The possibility of a parallel with the development of the south-west's cotton industry seems very striking. The linen-manufacturers of the south-west may also, of course, have been inspired to take up cotton-manufacturing by the fear that the growing English cotton industry would undercut them and deprive them of their markets. Certainly the Paisley silk-trade was very prone to injury resulting from changes in female fashions,<sup>1</sup> and presumably the fine linen trade

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1. See Old Statistical Account, VII, 65. The minister of Paisley burgh parish notes, "It is true, that the change of fashion, upon which this trade so entirely depends, has of late had an unfavourable aspect towards it." Muslin, he later remarks, "has so far come in its room."

could be affected by similar changes in taste: cotton fabrics of similar texture and appearance to lawns and silk-gauze, but cheaper than either, were capable of effecting just such a change.<sup>1</sup>

The motives of other participating groups were not necessarily those which had affected the actions of the textile manufacturers, since these groups were unlikely to be directly affected by the circumstances suggested above. Dr. Smout has suggested that the landed proprietors engaged in the financing of cotton mills as a means of increasing the rent-returns from their estates and of providing employment, perhaps for those agricultural labourers who had been displaced during the process of land-improvement.<sup>2</sup> His other point, that they only engaged in cotton-spinning for as long as this remained compatible with other agrarian activities, withdrawing when the industry began to attract large-scale immigrant labour and when it became possible to locate mills in urban areas,<sup>3</sup> tends to confirm this. Any large-scale activity on the part of Scottish foreign-trading interests, if these can be divorced from landed interests, was likely to be inspired by the possibilities of exploiting the cotton industry's potential as an exporting industry, coupled with a desire to ensure that any developments in foreign markets could be instantly passed

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1. It is perhaps significant that James Monteith's success after 1793 was based on the sale of "book muslins dressed as lawns". See "Senex", Glasgow Past and Present, II, 52.
  2. Smout, "Scottish Landowners", S.J.P.E., 1964, 231.
  3. Loc.cit., and 227.

on to the producers. The English are more difficult to assess, though the higher rate of profit to be obtained from muslin production than from the manufacture of goods with a less fashionable appeal may have been a factor in their participation.

### III

The type of product in which the Scottish cotton industry began to specialize after 1783 reflected the part played in the industry's development by the weavers of the south-west. They had produced high-quality fine linen fabrics, so it was more or less inevitable that, when the switch-over to cotton had been carried out, that they should continue in this specialization. Muslin replaced silk gauze in Paisley, and in the ten years before 1794, the 3,000 looms of the Barony parish of Glasgow had gradually ceased to be employed in manufacturing lawns and cambrics and were reported to be "almost wholly in the muslin line".<sup>1</sup> In Lanarkshire's Cambuslang parish, a similar change was evident, the minister observing in 1793:-

"In 1783, the weaving of muslin was introduced, which, for several years past, has given employment to all the weavers here..."

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1. Old Statistical Account, XII, 112.  
2. Ibid., V, 258.

A demand for muslins was known to exist in Britain - the East India Company having monopolised it for years<sup>1</sup> - and, tempted no doubt by the prospect of robbing the Company of the high profits to be gained in the muslin-trade, cotton-manufacturers all over Britain tried to break into it once the mule's introduction after 1780 made it possible to spin cotton yarn fine enough.<sup>2</sup> The Scots were, for a time, faced with strong English competition; so strong was this, in fact, that Salte, Samuel Oldknow's agent in the main centre of the muslin-trade at London, could write in a memorial to the House of Lords in March, 1786:-

"The Scotch began first - they took the lead in this infant Manufacture - although every degree of patient Industry must be allowed them, they have not been equally successful with the Lancashire Manufacturer." <sup>3</sup>

By May of the same year, however, Salte's rather patronising attitude was not so evident, as he wrote frantically to Oldknow,

"Arkwright must lower his Twist and he must spin finer, tell him the reputation of our Country <sup>4</sup> against Scotland is at Stake."

The mule had apparently begun to make its qualities as a spinner of fine yarn obvious to Scots spinners, and in 1786 the first really large-scale Scottish mills were coming into operation. By the end of May, 1786, Salte was becoming indignantly sarcastic about the quality of the Scottish muslins - "if cheapness proves any excellence they have it indeed... the Scotch Impudence and perseverance is beyond all"<sup>5</sup> but by

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1. Esilman, Comprehensive View, 11. See above, 32.
  2. See Unwin et al, Samuel Oldknow and the Arkwrights, 3-4.
  3. Ibid., 63.
  4. Unwin, Samuel Oldknow etc., 65.
  5. Ibid., 66.

-June, he was forced to admit that the Scots' supremacy in the muslin-market was an established fact:-

"The Sattin Stripes in colours will not do... The Scotch have done much better this two months in the same...indeed the Scotch perseverance & ingenuity are doing wonders... The Scotch have sent up many Spotted Muslins, indeed too good and too cheap."<sup>1</sup>

By 1794 Oldknow's interest in muslin manufacturing at least, if not that of other more tenacious English manufacturers, had decline to insignificance.<sup>2</sup> In Scotland in 1792 it seems to have become the most important section of the cotton industry: certainly, muslins accounted for 63.7% by value of the pure-cotton goods exported from Scotland in that year.<sup>3</sup>

The success of the Scots in the muslin-trade must, it seems, be attributed more to the skills of their weavers and the commercial acumen of their "manufacturers" than to their spinners, though undoubtedly they too had a part to play. English spinners, using the same machinery, could produce yarn as fine as, or even finer than, that produced by their Scots counterparts: in 1792, Robert Owen was spinning what seems to have been the finest yarn in Britain, number 250 to number 300, at Drinkwater's mill in Manchester. The fine muslin woven from this, described by Owen himself as "the greatest curiosity of British manufacture," was made at Kilbarchan, Renfrewshire,<sup>4</sup> a fact which, if not proving the

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1. Loc.cit., and 67.

2. Ibid., 105-6.

3. P.R.O. Customs 14, vol. 5.

4. Account from Owen's Autobiography, quoted in Unwin, op.cit. 133. Yarn is measured by the number of standard hanks to the pound weight (1 hank = 840 yards). The higher the number, the finer the yarn, No. 200, i.e. 200 hanks per lb., is very fine.

superiority of Scots over English weavers, says a great deal for their ability. Quite apart from the fact that the Scottish weaver's skill gave him the edge over his English opposite number, the decision to specialize in the manufacture of fine-fabrics was probably thrust upon the Scots by the necessity, apparent as long before as 1707, to complement English industry rather than trying to compete with it.<sup>1</sup> They had probably been excluded from producing goods in the medium and low quality ranges by the fact that the cotton industry of Lancashire and elsewhere, having been established before the American Revolution and having been able to expand virtually without competition before 1780, had been able to establish an unassailable lead in that quarter using the rather coarser yarn spun by jennies and water-frames. Muslins had been woven in England as early as 1764, but English-spun yarn was not altogether suitable for this purpose until Crompton's mule became available after 1780, being the first machine which could be relied upon to spin sufficiently fine warps and wefts. When James Monteith the younger wove the first muslin web in Glasgow in 1780, from imported Indian "bird-nest" yarn, the market for fine cotton goods was still wide open, apart from the Indian goods brought in by the East India

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1. See above, 4.

merchants.<sup>1</sup> In such a situation, the weaving skills of the south-west were eminently suitable for exploitation.<sup>2</sup>

The muslin trade laid the foundations of the Scottish cotton industry's prosperity, but by 1818 it had apparently been overshadowed by the production of coarser fabrics.<sup>3</sup>

The contribution of muslin to the export trade in cotton-goods had certainly declined considerably from the level achieved in 1792, amounting to only 19.4% of the value of cotton-goods

exported.<sup>4</sup> Kirkman Finlay was of the opinion that the change

in emphasis had come with the introduction of the power-loom to general use about 1814-15.<sup>5</sup> At about the same time, an

entirely new sector of the industry seems to have made its appearance in an around Paisley - the large-scale production of cotton thread. Paisley had been the centre of the

thread-manufacturing industry since the beginning of the eighteenth century, when the raw material had been linen.

But although some cotton thread was probably made between 1780 and 1815, the majority of the firms engaged in this

1. "Senex", Glasgow Past and Present, I, 69, for the weaving of the first muslin web in Glasgow. East Indian competition in muslins continued to be a threat until 1792, and was one of the main reasons for Glasgow Chamber of Commerce's opposition to the renewal of the Company's monopoly when the latter's charter became due for revision in 1793; Stewart, Progress of Glasgow, 37.
2. The Board of Trustees was active in encouraging muslin-weaving at least until 1783; "Senex", op.cit., III, 376.
3. But not yet as coarse as Lancashire fabrics. The bulk of the yarn produced in Glasgow was no. 40 to no. 60, and upwards to 180. Lancashire seems to have spun mainly lower counts such as no. 16. See Select Committee of 1833, mins. 1167-8, 71.
4. P.R.O. Customs 14, vol. 30. Calicoes, plain and printed, made up 74.9%.
5. Select Committee of 1833, min. 1198, 73.

appear to have been founded between 1812 and 1840.<sup>1</sup> Despite the apparent change, however, the principle of complementarity with England was maintained, judging again from Finlay's evidence in 1833:-

"We find, in practice, that it is impossible, with all the knowledge and the opportunities that we have at Glasgow, to transfer from Manchester to Glasgow the manufacture of a particular articles. Now at Manchester, again, efforts have been made to manufacture particular articles that they make at Glasgow and Paisley, and it is found impossible to do them with the same advantage." 2

So long as this was the case, then Scotland had little to fear from Manchester, despite the fact that some costs appear to have been higher in Glasgow than in Manchester and despite the apparent technical inferiority of the Scottish spinning-industry to that of Manchester between 1820 and 1830.<sup>3</sup>

For the health of the industry, if for no other reason, the diversification into heavier fabrics and thread was a sensible precaution. Since the weaving of fine fabrics even in 1833 was still apparently done on a handloom in Scotland,<sup>4</sup> a continued reliance upon plain, printed and flowered muslin must have inhibited the expansion of cotton-spinning in

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1. Blair, The Paisley Thread, 59-61. One firm at least had been in business since 1784, but whether it spun linen or cotton thread at that time is not known.
  2. Select Committee of 1833, min. 662, 38.
  3. For differences in costs between Glasgow and Manchester, see Ibid., min. 1162, 71. Houldsworth's evidence on technical superiority of Manchester is cited above, 34-5. The comparison of costs was made on the basis of 1,000 hanks of no. 16 yarn, but Finlay said not much no. 16 was spun in Glasgow: min. 1164, 71.
  4. Ibid., 1198, 73.

Scotland. If spinning output continually over-ran the demand for yarn for hand-woven muslins, as it appears to have done for instance in 1793-4, profit-margins would decline to the point where it would no longer be economical to continue spinning in Scotland. In that event the inevitable gainer would have been, not the Scottish weaver, but Lancashire. Diversification of output may, therefore, have been inspired by a desire on the part of the spinners to maintain a high level of expansion by by-passing the muslin-weaving bottleneck through spinning heavier yarns suitable for power-loom weaving. This would also account for the fact that a high proportion of the power-weaving concerns in the Glasgow region were directly controlled by the spinners.<sup>1</sup> In addition, diversification may have been inspired by a desire on the part of the entrepreneurs to introduce a measure of stability into an industry whose markets, on the basis of the muslin-trade, were limited by the high-value of the goods, notoriously uncertain, and to an increasing extent, being undermined by the manufacture of fine-goods abroad after 1815. Finlay at least, was aware of the problems involved in specializing in fancy-goods with a limited and unstable market:<sup>2</sup> it does not seem unreasonable to suppose that he was aware of the possibilities of diversification in providing a solution.

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1. See above, 41.

2. Select Committee of 1833, min. 1215-7, 75.

The rapid expansion of the cotton industry from being a comparatively minor branch of the linen industry to being the most important single industry in the Scottish economy between 1780 to 1835 indicates a considerable widening of the market for the industry's products, without which expansion of output would have been pointless. Initially, the cotton industry probably exploited the market for fine fabrics which had been built up by the participants in the lawn, cambric and silk gauze trades. The evidence of a wholesale switchover from these fabrics to muslins by the weavers, and therefore presumably by the "manufacturers" too, and of the tendency, apparent in the case of James Monteith, to "dress" muslins as lawns, all tends to support this, as does the fact that from 1778 onwards the output of linen in Lanarkshire, Renfrewshire and Ayrshire - the only areas in which fine linens were manufactured to any great extent - declined rapidly.<sup>1</sup> To expand the market in a way which justified expanding output to the extent apparent between 1780 and 1833, prices to the consumer were lowered by the rapid adoption of more efficient techniques of production<sup>2</sup> and new outlets for increased sales, heavy fabrics and thread, were explored and exploited wherever possible. When sales of finished goods abroad were affected by foreign competition, the

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1. See Hamilton, Eighteenth Century, App. V, 408-9, giving linen yardage produced by each Scottish county, 1767-1822 (selected years).

2. See above, 32-35, 41.

decline was offset to some extent by exploiting the demands of the growing foreign cotton industries for yarn, which they themselves were not always capable of supplying. Exports of cotton twist and yarn from Scotland took an upward turn after 1815: in 1801, these had been negligible, but in 1827 they contributed 5% of the value of cotton goods exported from Scotland.<sup>1</sup>

As had been the case with the linen industry before the American Revolution, the British home market was the most important to the cotton industry during its period of expansion. Of the 105 million yards of cotton cloth which Cleland estimated was produced in Scotland in 1818, 37.2 million were exported, so 64.5% of the total output in that year was intended for consumption within the United Kingdom.<sup>2</sup> The proportion intended for the home market in 1827 was apparently even greater: output, based on raw cotton import figures, was 39.5% higher than in 1818, but the yardage exported was only up by 13.5% on the 1818 level.<sup>3</sup> Apparently, Kirkman Finlay's warnings about the strength of foreign competition were not without substance. Nevertheless, despite the decline in the proportion of output which went for export, the cotton industry's position as Scotland's main exporting industry was stronger in 1827 than it had been in 1818.

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1. P.R.O. Customs 14, vol. 39.

2. Cleland, Enumeration of 1831, 138; P.R.O. Customs 14, vol. 30.

3. Ibid., vols. 30 and 39.

In 1792, the value of exports of cotton goods contributed only 5.4% of the value of Scotland's total exports; in 1801, it had risen to 47.25% of the total, in 1818 to 60.6% and in 1827 to no less than 78.25%.<sup>1</sup>

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1. P.R.O. Customs 14, vols. 5, 14, 30, 39.

THE PROBLEMS OF INDUSTRIALIZATION: LABOUR IN  
THE COTTON INDUSTRY

I

In the early stages of the cotton industry's development when it still formed a branch of the linen industry organised upon domestic-production lines, the provision of an adequate supply of labour probably provided few problems, since the numbers of people involved in both spinning and weaving were relatively small. The development, however, of large-scale factory spinning after 1780 brought problems in its wake, requiring as it did large concentrations of labour around the mills, which, because of the fact that their locations in the early stages were governed largely by the availability of suitable water-supplies, were often not built in areas of existing population concentration.<sup>1</sup> Difficulties were therefore encountered in providing the large-scale labour forces for the new mills as was the case at New Lanark, which required a labour force of 1157 in 1793.<sup>2</sup>

"Although comfortable dwellings were erected at the village of New Lanark for the workers, and good wages and constant employment insured, great difficulty was felt in getting the spinning-mill filled with operatives. It arose from prejudice on the part of the people, more particularly in the Lowlands, against all factory labour".

To overcome the problem, mill proprietors had to adopt several expedients in order to attract people away from other pursuits, usually agricultural, and from other localities to work in

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1. For example, New Lanark, Deanston, Catrine! Other mills such as Woodside in Glasgow, were better placed.
  2. Old Statistical Account, XV, 36-7.
  3. Chambers' Biographical Dictionary, half vol. ii, 423.

the mills. The most obvious method of doing this, perhaps, was to offer higher wages for mill-workers than were normal for agricultural labour, and this was, in fact, done with some success, as the parish accounts of Lanarkshire and Renfrewshire show: cotton mills are often specifically named by ministers as a contributory cause of depopulation in rural parishes.

For instance, the minister of Carluke, Lanarkshire, remarked,

"As there is a continual drain from the parish, both of young men and women, to the neighbouring cotton mills, iron works, etc., the farmer is often at a loss for labourers; the servants' wages are thereby rendered much higher, than the master can well afford at present, being from £6 to £10 per annum for a man and from £3 to £4 for a woman". 1

The Glasgow account noted, at the same time, that wages were for

"old men and boys and girls, at different branches (spinning, preparing the yarn and cotton wool etc., for weaving), from 6s. to 8s." 2

which meant that the lowest grade of factory operative was being paid between £15 and £20 per annum. It appears, however, that the promise of wages higher than those in most other occupations was not sufficient to attract people away from their established settlements and pursuits; the prejudice of local labour against factory work in the case of New Lanark has been noted, and other comments of a similar type are to be found, for instance in the parish account for

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1. Old Statistical Account, VIII, 138-9.
  2. Ibid., V, 505-6.

Kilmartin, Argyllshire, the minister observed:-

"Three families this year have gone to the cotton work, and some others speak of following them, though it seems to be with reluctance, as they consider the employment to be rather unfavourable to health." 1

Their reluctance is understandable, not only on the grounds that factory work was unhealthy, but simply because the attraction of higher wages was counterbalanced by the fact that to work in a spinning mill meant uprooting oneself from one's native parish or village, and submitting to a system of discipline and a set of conditions of work which differed radically from those to which one was accustomed. This latter factor by itself would probably be enough, in an age of strong local loyalties and comparative immobility of labour to discourage many people from seeking employment in the factories although to do so would probably have meant an improved standard of living. So long as agricultural employment was available in their accustomed area of residence, many may have preferred to stay where they were, rather than to move even a few miles to a new and perhaps materially better, but completely unfamiliar, environment. When Sir John Sinclair compiled his Statistical Account in the last decade of the eighteenth century, agricultural improvement had by no means been universally adopted in Scotland,<sup>2</sup> and the proportion of the rural

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1. Ibid., VIII, 108.

2. It had, however, made considerable strides since 1750. See, for example, H. Hamilton, Eighteenth Century, 70-79.

population displaced by it in the Central Lowlands was not, apparently, very significant: work on the land being available, there was no real pressure on the Lowland rural population to force them to take up or seek out new occupations.

What was true of the Lowlands did not hold good in the Highlands, especially in the north-west. Dr. Gray has shown that, after the Jacobite Rebellion of 1745 the Highland economy and Highland society were forced to undergo drastic change, in the course of which the old motive of political and military prestige, which had encouraged Highland landlords to maintain large groups of dependent clansmen on their lands, was replaced by the profit motive, which encouraged the same landlords to replace their military retainers with sheep or beef-cattle.<sup>1</sup> This change in motives and in Highland agricultural organization was accompanied by a rapid population growth, particularly in the north-west, which in turn led to increasing pressure on the diminishing supply of land made available by the landlords for the support of their tenants. In the Highlands, therefore, agricultural improvement did provide the incentive to emigrate to the growing factory districts of the Central Lowlands, as the "great sheep" or the black "stirk" replaced the small farmer as the occupant of the land in the Highland counties such as Sutherland and Argyll. The process was recorded by the

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1. M. Gray, The Highland Economy, 1750-1850, Edinburgh 1957, 11f.

minister of Strachur and Stralachlan, Argyll:-

"Within these last 30 years, especially since sheep-stocks have been introduced, it is remarked, that a number of people from this district have become sailors; but it appears that necessity, and not choice, has been the cause. By joining together 2, 3 or more farms, and converting them into a sheep-walk, 12 or 16 tenants, with their families, were thrown out of their usual line of employment." 1

The Clearances have been, and still are, the subject of a great deal of indignation, righteous and otherwise, but they were probably not the evil influence on Scotland's development that they are often thought to be. In fact, by helping to overcome the problem of labour-supply faced by the cotton-spinning mills, they may have been a positive benefit to the country's economic growth. The spinning-masters of the south-west took advantage of the Highland emigrations of the last two decades of the 18th century to make good some of the deficiencies in their labour forces. Prominent among those who tried to make use of Highland labour was, as always, David Dale, of whose works and village at New Lanark the minister of Lanark parish recorded:-

"A great proportion of the inhabitants are Highlanders from Caithness, Inverness and Argyleshires. In 1791 a vessel carrying emigrants from the isle of Skye to North America was driven by stress of weather into Greenock; about 200 were put ashore in a very destitute situation. Mr. Dale . . . offered them immediate employment, which the greater bulk of them accepted. And soon after . . . he notified, to the people of

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1. Old Statistical Account, IV, 574.

Argyleshire and the isles, the encouragement given to families at the cottonmills; and undertook to provide houses for 200 families in the course of 1792. These were all finished last summer (1793), and a considerable number of Highlanders have of late come to reside at New Lanark". 1

The fact that Dale had to offer to build houses and built a school and a church as well as providing free medical services in addition, and the fact that he had to "notify"<sup>2</sup> the people of Argyllshire and elsewhere of the benefits accruing to them from employment in his mills, provide a measure both of the seriousness of the labour shortage and of the unwillingness of the Lanarkshire people to move from their homes and work on a reclaimed morass. Even though the displaced Highlanders often had no alternative but to seek employment outside their normal areas of settlement, they were not easily recruited for factory-work.

Other expedients had to be adopted to provide an adequate labour force for the mills, and since the operation of water-powered machinery required neither great skill nor great physical strength, children were used in the mills to carry out some of the spinning process. Housing at New Lanark was provided for

"Families from any quarter possessed of a good moral character, and having three children fit for work, above nine years of age....." 2

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1. Ibid., XV, 574.

2. This was done by sending agents into these areas where labour might be recruited to publicise the mills and to contact any who might be willing to take employment in them, Chambers Biog., Dictionary, 11, 423.

And widows with families were assured of a living so comfortable from the labour of their children, that they often became "tempting objects for a second husband".<sup>1</sup> At Blantyre, James Monteith employed 60 "barrack children", or orphans from 8 to 12 years of age,<sup>2</sup> and at New Lanark in the same year, 1793, 275 of these unfortunates were employed.<sup>3</sup> In both cases, the mill-owner provided lodgings, food, clothing, education and medical services for these pauper children, and they seem, in general, to have been quite well cared for by the standards of the time.<sup>4</sup>

For their attempts to alleviate the plight of widows, orphans and emigrant Highlanders, Dale and other mill-owners have built up a reputation as philanthropists which is not altogether undeserved. But although they may have been motivated to some extent by a genuine desire to help people whose position in life was more precarious than their own, their philanthropy seems, on the whole, to have been based on sound economic motives in keeping with their reputation as leading businessmen - the need to ensure a return on their investments in cotton mills and machinery by maintaining an adequate staff to carry out the production processes. Their

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1. Old Statistical Account, XV, 41.

2. Ibid., II, 217.

3. Ibid., XV, 37.

4. At New Lanark, they were lodged in that part of the unfinished, unequipped fourth mill which was not being used as a tradesmen's workshop or a raw-cotton store; Ibid., XV, 39. But their diet of potatoes and meat or fish or cheese compared favourably with the normal orphanage diet: T. Ferguson, The Dawn of Scottish Social Welfare, Edinburgh 1948, 35, 96.

paternalism towards the labour forces employed in their mills, their provision of housing, medical services and educational and religious facilities for their workers, was inspired by a very real need to attract labour to their mills and, as far as possible, to keep it there.

By the third decade of the nineteenth century, the problem of supplying a labour force appropriate to the cotton industry's requirements appears to have been solved, indeed there seems to have been a surplus of skilled labour by 1833. Henry Houldsworth, the proprietor of two mills in Glasgow submitted in evidence to the Select Committee on Manufactures, Commerce and Shipping of 1833 that the cotton spinners' association in Glasgow feared that the labour market was becoming "overstocked with hands" and was engaged in the promotion of an emigration scheme by which about one eighth of the total number of cotton-spinners in Glasgow had gone to New York between 1830 and 1833, having had their own and their families' fares paid by the union which also provided a cash-grant of £6 to £20 per family on arrival in America.<sup>1</sup> This superfluity of skilled labour may have been purely temporary, the result of the depression through which the cotton trade was passing between 1830 and 1833, coupled with an influx of Irish labour into the south-west of Scotland and the introduction of improved techniques in cotton-spinning

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1. Select Committee on Manufactures, Commerce and Shipping 1833 Minutes of Evidence and Report, H.M.S.O., 1833 minutes 5234-54, 311-2.

about 1830, in the form of the self-acting mule developed by Archibald Buchanan, manager of James Finlay and Company's Catrine mill, and James Smith, the same firm's manager at Deanston, between 1815 and 1830. Of these three factors, however, the two long-term ones, Irish immigration and technical innovation, were likely to exert a greater influence on the labour market than the purely temporary depression. The demand for labour after the depression was liable to be less than that which had preceded it, because of innovation, and the supply of labour greater than before, due to immigration.

According to one account, the purpose of the invention of Smith and Buchanan was to replace the male cotton-spinners, who were "the chief movers in all the combinations of the cotton trade", with female spinners who were more amenable to discipline, thereby breaking the power of the Cotton Spinners Association in Finlay's mills.<sup>1</sup> But the effects of its introduction were to be more far-reaching than that, as the parish account of Balfron, Stirlingshire, where the company's Ballindalloch mill was situated, showed:-

"Two hundred and fifty-eight hands or thereby, and these chiefly females, are now employed at the works... Originally, there were employed at this mill 400 persons, young and old. The difference in point of numbers can be readily accounted for, by the improvements introduced into machinery. For example, in 1792, there were in what is termed a "pass", four men, each having two piecers, that is to say twelve persons in all. Now, one woman spins in one pass with

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1. New Statistical Account, X, 1237, Referring to Deanston Mills.

the assistance of three piecers, that is four persons in all do what the twelve originally did. In point of numbers, the reduction will be greater still, if the self-acting jennies (sic) are as successful as they promise in the meantime to be. One woman by herself, with one of these is able to spin as much as four with the jennies in common use." 1

This continuous process of developing labour-saving techniques which had begun with Hargreaves' work in the 1760's and even earlier with Wyatt and Paul, may have been the factor which caused the fears of redundancy among the spinners in 1830 and after. Certainly in 1833, William Graham of Glasgow had tried to blackmail his spinners into accepting lower wage-rates by threatening to bring in the self-acting mules to replace them. They were not inclined to accept, so the mules were ordered and the spinners' jobs placed in jeopardy.<sup>2</sup>

That the apparent overabundance of labour in the thirties was not based on native resources, but rather on Irish immigration, may be seen in the evidence of Scottish mill-proprietors examined by the Select Committee of 1833. Houldsworth submitted that

"The greater proportion of the hands in the mills of Glasgow are either Irish themselves or of Irish parents, born in Scotland". 3

Indeed the tendency among Scottish labour seems to have been much the same in 1833 as it had been in 1790 - unwillingness

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1. Ibid., VIII, 293-4. Account dated 1834.
  2. Select Committee of 1833, minute 5241, 324.
  3. Ibid., min. 5255, 312.

to go into the mills. Of his own mills, Houldsworth observed that "we can scarcely get a Scotchman for a porter or a watchman",<sup>1</sup> and that, as far as all the mills in Glasgow were concerned,

"there would not have been Scotch hands sufficient to have supplied our manufactories".<sup>2</sup>

He may have experienced rather more difficulty than other proprietors in attracting Scots labour to his mills, since the wages paid by Henry Houldsworth and Co. were among the lowest in Glasgow: for example, the company paid 9/1d per week to men aged 21 and above, the lowest wage for that age-group in a list of 29 mills whose wages were tabulated by James Cleland in 1831.<sup>3</sup> But Houldsworth's assessment of the situation, that Irish labour manned most of the Glasgow spinning-mills and power-weaving factories, was supported by other, more generous, proprietors.<sup>4</sup> The Irish in Glasgow in 1831 numbered 35,554 out of a total population of 202,426 in the city, the Barony and Gorbals; of these 17,165, or nearly 50% of the total Irish population, were concentrated in the Barony, where most of the Glasgow cotton-mills were situated.<sup>5</sup> The Irish influx had begun in 1796, with 7,000 people from the linen-producing county of Armagh, and had continued and increased in subsequent years as a result of the unsettled

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1. Ibid., min. 5233, 311.

2. Ibid., min. 5257, 312.

3. Cleland, Enumeration of 1831, 291.

4. E.g. William Graham, Select Committee of 1833, min. 5520-22, 329.

5. Cleland, op.cit., 211. Cleland's figures given here apply only to those born in Ireland.

political and economic conditions of Ireland, where the abortive risings of 1798 and 1803, coupled with the decline of the Ulster linen and woollen industries, had put the inhabitants in a situation similar to that of the Highlanders in the last half of the eighteenth century.<sup>1</sup> The Irish, in fact, replaced the Highland immigrants of earlier years, on whom the pressure to emigrate had eased as a result of the temporary benefits bestowed on the Highland economy by the Napoleonic Wars which had increased the demand for Highland kelp and cattle.<sup>2</sup>

Weaving was not beset by the same problems of labour shortage as spinning even in the earliest stages of the cotton-industry's development because the process of weaving fine cotton yarn was no different from that of weaving fine linen or silk. The existence in Glasgow and Paisley of concentrations of weavers who were accustomed to working with fine yarns provided the cotton industry with a ready, and ample, supply of skilled labour. Indeed, it appears that there was more than enough labour available in some sections of the weaving trade,<sup>1</sup> as early as 1787: Bremner ascribes the abortive Paisley weavers' strike of that year, which was occasioned by

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1. J.E. Handley, The Irish in Scotland, Glasgow 1964, 52-3.
  2. M. Gray, op.cit., 107-151.
  3. It is necessary to distinguish between weavers of plain goods and weavers of fancy goods. For the latter, the decline in wages started later and was less marked, partly because it required special skills and so was less open to infiltration by immigrant labour, partly because the power-loom was not adapted to this type of work by 1835. Baines, History of the Cotton Manufacture, 485.

an attempt on the part of the master-weavers to reduce the prices of certain types of work, to the fact that "a redundancy of hands had entered the trade",<sup>1</sup> and it was observed that although the number of cotton mills in and around Glasgow had increased rapidly in the ten years preceding 1792,

"yet they are unable to supply the necessary quantity of yarn required by the increased manufactures, as a considerable quantity is still daily brought from England."<sup>2</sup>

In the period between 1795 and 1830, the position of the handloom weavers steadily worsened. Esilman calculated that for every shilling a weaver earned on a given piece of work in 1792, he earned four-pence in 1823, after which prices paid by "manufacturers" continued to decline.<sup>3</sup> The process, as has been noted, began in Glasgow in 1787, and Baines estimated that the process of decline speeded up throughout Britain after the reopening of war with France in 1803.<sup>4</sup> While admitting that the introduction of the power-loom in the years following the turn of the century may have been a factor in the decline in wages, which in undoubtedly was in some cases, Baines lays most of the blame for the weavers' distress on the fact that a surplus of hands was building up in the trade throughout the period because it was so easy to learn. Children aged between 10 and 12 were capable of working a passable web, and so

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1. Bremner, Industries of Scotland, 283-4.
  2. Old Statistical Account, V, 502. This tends to support Bremner, and to indicate that the position had not improved by the outbreak of the French War in 1793. The long wartime depression, 1793-99, must have made the position worse.
  3. Esilman, Comprehensive View, 24.
  4. Baines, Cotton Manufacture, 492.

weavers' families were generally "bred to the loom"; this in itself would have produced a sufficiency of hands, but in addition to these native sources of labour, the market was flooded with displaced Irish weavers from Ulster, which factor operated to force wages down even further. This factor may very well have operated in the Glasgow area, where, according to Sir Thomas Munro, there were 25,000 Irish weavers in 1825,<sup>1</sup> who came after 1796 to swell the ranks of the native weavers of Lanarkshire, Renfrewshire, and especially Ayrshire, in which parts of Ardrossan and Girvan, two of the main Irish packet-stations, were situated.

## II

Working conditions in the mills were the subject of considerable comment throughout the period from the foundation of the first mills, from 1779 onwards, until well into the nineteenth century. They were also the object of a certain amount of attention on the part of Parliament, which resulted in the passing of legislation to govern the hours and conditions of work imposed on the labour force, especially on children, between 1802 and 1833, most of it directed specifically at cotton-mills. Peel's Act of 1802 prohibited the employment of "barrack-children", or apprentices for

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1. Sir Thomas Munro, Letter to Kirkman Finlay, 15th August, 1825, quoted in Cleland, Enumeration of 1831, 271.

more than ten hours per day, its operation being confined to cotton-mills. Another Act sponsored by Peel, an emasculated version of a bill originally introduced through the influence of Robert Owen, was passed in 1819, by which no children under nine years of age were to be employed in cotton mills, and the hours worked by children aged between 9 and 16 were limited to 12 per day. This was reinforced in 1831 by the passing of a bill sponsored by Sir John Hobhouse which extended the twelve-hour day, 69 hour week, to all employees under 18 years of age. Hobhouse had aimed at reducing the hours to 11½ per day and had intended that his bill should cover other factories besides cotton mills, but he failed to achieve either of these objects. One important after-effect of Hobhouse's Act however, was that a Royal Commission was set up to investigate the actual observance of the Act by mill-proprietors, and a series of inspections of mills was carried out by the District Factory Commissioners. As a result of the Factory Commission's investigations and report in 1832, a further Act was passed by the Peel administration of 1833 which, while not altering the hours of work laid down by the Hobhouse Act, extended the 69-hour week to all workers in all types of textile mill and, most important, set up a permanent inspectorate to ensure that the terms of the Act were observed and to report back regularly to the Home Office about hours and conditions.<sup>1</sup> This step meant that the terms of any

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1. For a contemporary discussion of factory legislation as it affected cotton mills, see Baines, Cotton Manufacture, 477-9. A detailed, modern, left-wing account of the operation of the acts in Scotland is in T. Johnston, History of the Working Classes in Scotland, Glasgow 1929, 321-7.

factory legislation could no longer be avoided with impunity by employers, as had only too often been the case in the past, and that the main barrier to effective legislative control, that of enforcement, was overcome for the first time.

Because of the composition of the labour-force, any limitation on the working hours of children became effectively a limitation on all working hours, so great was the number of children engaged in spinning, and later in power-weaving. At New Lanark in 1793, children aged between 6 and 17 formed 69% of the total labour force of 1,157;<sup>1</sup> at Catrine, the proportion of children employed was considerably lower, 55% of the total labour force being under 20 years of age;<sup>2</sup> by 1833, the proportion was lower still - of the total labour force employed in the mills examined by the Factory Inspector in Glasgow, 35% were under 16 years of age, 62.5% being under 21.<sup>3</sup> Since the piecers to the cotton-spinners came within the 12-21 age group, the extension of the 12-hour day to all persons aged up to 18 by Hobhouse's Act meant that all spinning was, in theory at least, confined to the same hours, since, until the introduction on a large scale of the self-acting mule c. 1833, the operation simply could not be carried out without the aid of piecers.

The Highlanders of Kilmartin, Argyllshire, it has been noted, considered the work in cotton mills somewhat prejudicial

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1. Old Statistical Account, XV, 36-7.
  2. Ibid., XX, 176-7.
  3. Factory Enquiry Commission, Supplementary Report, part 1, H.M.S.O. 1834, 33.

to health, and this point was one which generated considerable dispute among commentators in the period under discussion.

The minister of Doune Parish, Perthshire, observed in the Old Statistical Account of Deanston mill that,

"The confinement of so many people in one house rendered the air they breathed very impure; the heat necessary in preparing the cotton kept the workmen constantly in a sweat... the noise of the machinery rendered them soon deaf; and the flying particles of cotton, and constant labour of the eye in watching the texture of the threads, 1 weakened and destroyed the sight".

This and similar judgments from other ministers in whose parishes cotton mills were situated, led Sir John Sinclair in his analysis of the account to conclude that factory-labour was uniformly unhealthy. "Eager application, scanty food and want of proper exercise", he wrote of factory-hands,

"enfeebles the constitution, produces nervous disorders and brings on various infirmities which render their lives uncomfortable and hurry them on to a premature old age". 2

From the Reports of the Factory Commissioners of 1832-34,<sup>3</sup> it is apparent that the conditions condemned by Sir John Sinclair and many of his correspondents still existed in the early thirties. The temperature in some mills was kept as high as 136<sup>o</sup>F,<sup>4</sup> and in many the atmosphere remained clogged with fine particles of cotton dust, especially in

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1. Old Statistical Account, XX, 88.
  2. Sir John Sinclair, Analysis of the Statistical Account of Scotland, Edinburgh 1825, 325.
  3. Factory Inquiry Commission 1832, 1st and 2nd Reports H.M.S.O. 1833, Supplementary Reports, parts 1 and 11, 1834.
  4. Ibid., 1st and 2nd Reports, Examination by District Commissioners, Northern Region, Sect. A.2, 80.

those in which poor-quality cotton was being processed.<sup>1</sup> Messrs. Mackintosh and Stuart, District Commissioners charged with inspecting Scottish mills in 1833, commented that such conditions apparently affected the health of operatives, especially the respiratory system,<sup>2</sup> and this may account for the high incidence of consumption, phthisis and tuberculosis among the population of Glasgow around the middle of the nineteenth century.<sup>3</sup> Although no cases of physical distortion as a result of labour in cotton mills were reported, and no cases of blindness or deafness such as the minister of Doune attributed to the work, many of the workers interviewed complained of swollen ankles and leg-pains as a result of long hours standing at machinery, and in many mills accidents involving machinery which usually resulted in some degree of mutilation, were not infrequent - indeed, the loss of a finger appears to have been something of an accepted occupational hazard for workers in power-weaving mills. Sanitary arrangements were often unsatisfactory, and in the case of James Oswald and Company's mill in Glasgow, were said to contribute to the prevalence of fevers among the workers.<sup>4</sup>

As the Commissioners no doubt realized, conditions in all mills were not alike, and to balance the picture of unhealthiness and squalor presented by the critics of factory

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1. Ibid., A.2, 84.
  2. Ibid., A.2, 84: A.1, 88.
  3. T. Ferguson, The Dawn of Scottish Social Welfare, Edinburgh 1949, 74-5.
  4. Factory Commission 1832, A.1, 81.

labour, there was no lack of support for the factory system. Sir John Sinclair apparently ignored evidence which conflicted with his own viewpoint, but even his Statistical Account contains statements from possibly disinterested parties which tend to indicate that all was not quite as bad as he tended to believe. The minister of Catrine parish, for instance, observed that,

"It is but justice to add, that both old and young enjoy uniformly good health. The different apartments are kept as clean and free of dust as possible; and stated that hours are allowed for amusement and exercise. The writer of this report...has met with fewer diseases of any kind than might reasonably have been expected among the same number of people, engaged in any other employment." 1

And in its first report the Factory Commission of 1832 singled out three Scottish mills for special mention because of the excellent conditions which prevailed in them and because of the general appearance of good health manifested by their operatives.<sup>2</sup> Although their examples of all that was worst in cotton-mills conditions were also very largely drawn from Scotland,<sup>3</sup> even they in no way compared with the appalling conditions which prevailed in some of the flax-spinning mills of Fife and Angus.<sup>4</sup>

Working conditions were, in fact, dependent on the attitude of individual mill-managers and proprietors to their workers. In the three mills set up by the Factory Commission

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1. Old Statistical Account, XX, 177.
  2. Factory Commission 1832, 1st Report, 16-18.
  3. Ibid., 1st Report, 18-20.
  4. Ibid., Examinations, A.1, 61 No. XXVI, Finhaven flax-mills were among the worst.

as examples of the best in the country, New Lanark, Deanston and Bannerman's of Aberdeen, the proprietors had taken care to ensure that the flats were kept clean and well-ventilated, that the rooms were spacious and well-lit, that the machinery was "fenced" to avoid injury to worker and that sanitary arrangements were adequate for the numbers and kept in good repair.<sup>1</sup> The difference in attitudes between one management and another can be illustrated in the case of Deanston mills; the conditions of which the minister of Doune complained were those which prevailed when the mills were owned and managed by John Buchanan of Carston, the founder; when, in 1793, the works passed into the hand of Benjamin Flounders, an English Quaker, the minister of Doune observed that his "laudable conduct"

"has, however, wrought a very great reformation of these abuses, and in a great measure provided <sup>2</sup> remedies to the evils mentioned above."

The proprietors and managers of those mills in which conditions were condemned by the Commission appear to have been unaware of what went on in their works, and to have cared little about it, either because they were interested only in the commercial side of the business, and consequently were seldom actually in the works, or because they relied for their knowledge of conditions on the "shop-floor" on reports from foremen and overseers, who were anxious to present things in the most

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1. Factory Commission 1832, 1st Report, 16-18.  
 2. Old Statistical Account, XX, 89.

favourable possible light.<sup>1</sup>

Little information is available at present on the wages paid to cotton factory-workers. It has been seen that, in the early years of the industry's growth, these tended to be higher than in other occupations because of the need to attract labour to the mills<sup>2</sup>: but wages seem to have varied considerably from one mill to another, and even from worker to worker within the same mill. Thus, at Deanston in 1794, although some hands could earn 2 guineas per week, nett weekly wages depended on the quality and quantity of each individual's output.<sup>3</sup> At about the same time, in a small mill at Cambuslang, Lanarkshire, "an ordinary cotton spinner can gain about 10s. a week",<sup>4</sup> a far cry from the top level of wages at Deanston. The upper level of wages in another small mill, this time at Irvine in Ayrshire, was about 9 shillings per week - presumably paid to spinners - while the lowest-paid workers received one shilling.<sup>5</sup> The lowest-paid group in Glasgow in 1791, the pickers and cleaners, were given 6 to 8 shillings per week.<sup>6</sup> The same situation apparently prevailed in 1831.<sup>7</sup> At that time, the 29 Glasgow-owned mills from which Cleland received wage-returns paid wages varying from 9 to 35 shillings per week to men in the over-21 age-group, with similar variations for other

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1. E.g. Stewart's of Johnstone, Factory Commission 1832 Examinations, A.2, 83-4. Oswald's of Glasgow Ibid., A.1, 80-81.

2. See above, 78.

3. Old Statistical Account, XX, 87.

4. Ibid., V, 259.

5. Ibid., VII, 174.

6. Ibid., V, 505-6.

7. See Appendix, table IV.

age-groups.

A number of factors contributed to this situation. The general prevalence of the piece-work system was one: this meant that, as at Deanston in 1794, a worker's nett weekly earnings depended on the quantity of his output. The quality of his output, again as at Deanston, could also affect his nett weekly earnings: if a spinner's yarn did not reach the required standard of quality he could be fined; alternatively, if he was spinning a coarse yarn, say number 40, the rate of pay per piece would be lower than for a fine yarn, say number 150, which required more care and skill.<sup>1</sup> The type of machinery used could also affect nett wages: coarse-yarn spinners in Glasgow in 1835 were paid at different rates for working mules of 180 and 300 spindles.<sup>2</sup> Local factors such as the availability of labour in a given district could raise or depress wage-rates in different mills: Deanston, a large mill in a sparsely populated parish, may have been forced by this factor to offer higher rates than the small mill at Irvine, a fairly large town and one of the ports of entry for immigrants from Ireland.

The lack of material for the years between the publication of the Old Statistical Account and of the Factory Commission and other reports of the 1830's makes it difficult to comment on the movement of wages. One commentator, Cleland, postulated a high degree of wage-stability, at least

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1. Baines, Cotton Manufacture, 442.

2. Loc.cit.

after 1810. In a report on wages in Glasgow mills published in 1833, he said,

"The wages of cotton spinners did not vary much in the 10 years preceding 1820, and very little since that period". 1

Other evidence suggests that, in fact, wages fluctuated considerably with the state of the market for cotton goods. Wages in Manchester almost certainly did this: the average nett weekly wage of Manchester spinners, for example, fell from 42/6 in 1810, when the South American boom was at its height, to 18/- in 1811, after the boom had collapsed.<sup>2</sup> In his evidence to the 1833 Select Committee, Houldsworth stated that spinners in Glasgow had their wage-rates cut by 15-20% during the depression that followed the end of the Napoleonic war.<sup>3</sup> Graham attempted to cut his spinners wages in 1833, as has been noted.<sup>4</sup> Indeed, it is inconceivable that an industry which suffered such severe trade fluctuations as the Scottish cotton industry should have enjoyed a high degree of wage-stability as suggested by Cleland. As Adam Smith pointed out in 1776, the masters in every industry were in permanent combination, tacit or open, to reduce wages.<sup>5</sup> It seems most unlikely that, at a time when profit margins were declining, they did not do so. In fact, the violent trade union activity conducted by the cotton-spinners in Glasgow

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1. Tables of Revenue, Commerce, etc., quoted by Baines, Cotton Manufacture, 442.

2. Ibid., 438.

3. Select Committee of 1833, min. 5198, 309.

4. See above, 86.

5. Smith, The Wealth of Nations, I, 75.

after 1816 suggests that the masters tried hard to cut their wage costs.<sup>1</sup>

Information is more readily available on the wages of handloom weavers, probably because almost every parish in central Scotland had its community of weavers either engaged in local work or working for the "manufacturers" of the main textile centres, and because the decline of wages in handloom weaving with the distress which accompanied it was a notable topic of contemporary comment. Weavers in Glasgow in 1791 earned between 12 and 20 shillings per week depending on the quality of work they undertook.<sup>2</sup> An industrious weaver in Paisley at the same time could earn between 25 and 30 shillings per week,<sup>3</sup> probably because the finest work in the country was undertaken by weavers in Paisley and district. In the Barony of Glasgow, where the largest single concentration of handloom weavers was situated, their wages ranged from 10 to 20 shillings per week, again depending on the quality of the work done.<sup>4</sup> By 1833, however, the handloom weavers' wages were very much below the level of the seventeen-nineties: average nett wages for weavers of plain goods had fallen to between 4/6 and 5/6 per week, while weavers of fancy goods then earned about 8 shillings per week.<sup>5</sup> The decline appears

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1. See below, 107. Smith also pointed out that violent unionism was the workman's only answer to the masters' combination; Smith, *op.cit.*, I, 75.
  2. Old Statistical Account, V, 505.
  3. *Ibid.*, VII, 90.
  4. *Ibid.*, XII, 117, note.
  5. Baines, *op.cit.*, 487 based on evidence from Glasgow manufacturers to Select Committee on Handloom Weavers, 1834.

to have begun very early in the period of the cotton industry's development, in 1787, but it did not immediately affect all weavers. With the passage of time, however, more and more weavers were affected, for a variety of reasons, until in 1823 Esilman could say that, in general, weavers' earnings on any given piece of work in that year were but one third of the wages paid for the same piece of work in 1792.<sup>1</sup> The decline does not appear to have been a constant one, judging from information available on handloom weavers' wages in Glasgow between 1810 and 1831,<sup>2</sup> probably because of fluctuations in trade; but the overall trend was downward, and the overall effect on the weavers was to take them from a position of modest prosperity to one of real poverty.

Contemporary opinion is divided as to the causes of the decline. The New Statistical Account of Glasgow states that

"The extension of the use of the powerloom has for the last twenty years borne hard upon the power hand-loom weavers, who have long suffered from low wages with exemplary patience".<sup>3</sup>

Baines, however, discounts the influence of the power-loom, on the basis of evidence presented to the Select Committee of 1834 on Distress among Handloom Weavers by William Kingan, a Glasgow weaving-master.<sup>4</sup> Kingan pointed out that the power loom was used in Scotland for a completely new type of fabric, heavy cambrics and printing cloths, which had not been woven

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1. See above, Sect. I, 89.

2. Baines, *op.cit.*, 488, See Appendix, table III.

3. New Statistical Account, VI, 154.

4. Baines, *op.cit.*, 498-9.

in Scotland before by handloom weavers. The real reason for the decline in handloom weavers' wages, according to Baines, was that the trade was so easy to learn that there were simply too many people in it.<sup>1</sup> In coming to this conclusion, Baines seems to be underestimating the contribution of the power-loom which was continually being adapted to new uses: without doubting the accuracy of Kingan's evidence as regards the initial use of the machine, it is unrealistic to assume, as Baines seems to do, that it was not taking over other types of weaving in the time between its introduction into the Scottish cotton industry in 1792 and the time of Kingan's evidence, 1834. In fact, it appears to have been developed to such a point by 1835 that it was capable of weaving most plain fabrics, even the finest muslins, and was threatening the livelihood of even the elite group of highly-skilled weavers of fancy figured patterns.<sup>2</sup> Baines' assessment of the situation may be right in so far as the factor of the root of the handloom weavers' troubles was the overabundance of labour, certainly the downward spiral of wages appears to have begun before the power-loom could exert much influence: but the increasing rapidity with which wages declined, by 33% between 1795 and 1806 and by almost 60% between 1806 and 1817 in Bolton,<sup>3</sup> may well have been the result of increasing competition from the power-loom. Some handloom weavers, it

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1. Ibid., 500. See above, Sect. I, 89-90.

2. New Statistical Account, VI, 153 (Glasgow).

3. Baines, op.cit., 489.

is true, might not have suffered quite so badly from the decline in wages as most commentators claim. Those with families could find employment for their wives and children in the spinning mills, or even the power-weaving mills, and so maintain the family's total income at a level sufficient to provide a tolerable livelihood. Those weavers whose family income was derived solely from the handloom, on the other hand, could barely reach an income-level sufficient to supply the necessities of life, and they were in the majority.<sup>1</sup>

### III

It had been recognized for some time before the introduction of large-scale units of production in the cotton industry - and indeed before the industry's foundation - that the interests of capital and labour did not coincide.

Adam Smith, in 1776, had neatly summed up the differences between the two in the statement that "The workmen desire to get as much, the masters to give as little as possible".<sup>2</sup>

Each party, he continued, formed its organizations to further its interests and to resist those of the other. In the situation of which Smith was writing, when industry was

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1. Only a few of the handloom weavers interviewed by Stuart and Mackintosh in the Scottish area for the Factory Commission in 1833 had families who worked in the mills. Many of them would not hear of such a thing; see, e.g., Factory Commission, 1832, Examinations, A.2, 82, nos. 5 and 6. Wages in power-weaving mills were on much the same level as in spinning; see Appendix, table IV.
  2. Smith, The Wealth of Nations, I, 74.

organized in small domestic units of production, the masters had all the advantages. They were fewer in number than their workers, and generally gathered in the commercial centres, which made effective combinations easy to form. The workers, in their dispersed domestic units, were difficult to organize effectively. The economic resources of the masters were greater than those of the workers, and consequently their ability to conduct a prolonged struggle was greater. The masters were not hampered by the forces of law and order in forming their organizations, the workers were.<sup>1</sup> As a result, the masters seldom, if ever, lost a dispute.

The development of large-scale units of production in the cotton industry offset some of the masters' advantages. Factory labour, concentrated in the new units, was much easier to organize than domestic labour, especially for action against individual capitalists. The high wages paid in many of the factories also tended to increase the workers' ability to fight prolonged actions. But factory-labour in the cotton industry was not organized very quickly; the first recorded spinners' combination did not come into existence until

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1. Simple combination was not an offence in Scots law. But, as Smith said, the workers often resorted to violence to bring a dispute to a speedy conclusion: the violence was indictable. Scots judges, anxious to preserve the separate identity of the Scottish legal system never applied the Combination Acts of 1799-1800, which did not conform to Scottish precedents and legal phraseology; but a reinterpretation of existing law in 1813, after the Glasgow weavers' strike, made combination an offence if it were proved to involve conspiracy, either to commit violence or in restraint of trade. For the legal position, see J.L. Gray, "The Law of Combination in Scotland," Economica, vol. VIII, 1928, 332-50.

1806.<sup>1</sup> It remained a rather weak body until 1810, after which it embarked on a wave of militant action which lasted well into the 1830's.<sup>2</sup> By that time, it was the most powerful textile-workers' organization in Britain, and was opposed to the most powerful masters' combination in Britain, the Glasgow master cotton-spinners' association.<sup>3</sup>

The first labour combinations in the industry were formed by the handloom weavers, and they suffered the fate which Smith had foretold, ending "in nothing, but the punishment and ruin of the ringleaders".<sup>4</sup> In 1787, the weavers of Paisley combined to resist an attempt by the masters to reduce the wage-rates for certain types of work. The combination organized a strike, during which webs woven at the new rates were burned and dissenting weavers molested. This brought in the militia, who fired on a group of weavers, killing a few and wounding many. The intervention of the authorities put an end to the strike. The weavers accepted the new rates and the leaders of the combination were imprisoned.<sup>5</sup>

In 1812, the weavers tried again to resist wage reductions, which were becoming increasingly common in handloom weaving by that time. At first they sought legal redress for their grievances, and managed to secure a decision

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1. Bremner, Industries of Scotland, 284.
  2. S.J. Chapman, The Lancashire Cotton Industry, Manchester 1904, 193; Bremner, op.cit., 284.
  3. Ibid., 207.
  4. Smith, Wealth of Nations, I, 76.
  5. For a description of the strike, see Bremner, Industries of Scotland, 283.

in their favour from the Court of Session in Edinburgh, which empowered the local magistrates to arbitrate in wage-disputes and fix wages in their areas. But the magistrates sympathized with the masters - in many cases they were the masters anyway<sup>1</sup> - and did not make use of their powers. The weavers' union, accordingly, called a strike, which involved 40,000 weavers all over Scotland and even in Carlisle in the north of England. The strike was peaceably conducted and lasted for several weeks, but the resources of the strikers were exhausted before they gained their point. Once again the reductions had to be accepted, and once again the strike-leaders in Glasgow faced imprisonment, this time on charges of conspiracy.<sup>2</sup>

The strike of 1812-13 broke the power of the handloom weavers' union in the Scottish cotton industry. They were involved in small disputes thereafter, such as the attempted boycott of a master-weaver called Hutchieson in 1824, but after the failure of their great effort in 1813 they were unable to impose the union's policies even within their own ranks.<sup>3</sup> But at the time when the weavers were making their last-ditch attempt to halt the decline in their wages, the spinners were just beginning to resist their employers. The

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1. David Dale and Henry Monteith both became Lord Provosts of Glasgow, and many other manufacturers served on the city council.
  2. For an account of the dispute, see Bremner, op.cit., 284; Chapman, Lancashire Cotton Industry, 186-8.
  3. Such as that of limiting the number of apprentices which each Scottish weaver was allowed to take on besides his own children, drawn up in 1824; see Chapman, Lancashire Cotton Industry, 197. For the Hutchieson incident, Ibid., 193, note 1.

-strategy they seem to have employed was the one to which their concentration best suited them; they did not stake all in one great strike, but rather seem to have taken action against individual masters. The spinners appear to have used violence quite freely to further their aims. Threats of mill-burning, the assassination of oppressive masters, the mutilation or disfigurement of recalcitrant spinners, all of these seem to have been part of their policy.<sup>1</sup> Some of the threats were, in fact, carried out. This inevitably brought the law against them, and spinners were imprisoned on several occasions and transported to Botany Bay on at least one, in 1838.<sup>2</sup> Unlike the handloom weavers, however, their efforts did enjoy a measure of success, despite the existence of an extremely powerful, if informal, employers' combination. In 1832, they succeeded in forcing Henry Houldsworth and Sons into granting wage concessions, after calling a strike and picketing the works.<sup>3</sup> When, in the same year, J. Dennistoun and Co. tried to bring in female spinners at lower wages than were paid to males, the spinners' association demanded that the undercutting of male wages cease. After both managers and female spinners had been threatened, the latter with disfigurement by vitriol, Dennistoun's agree to pay women at

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1. Select Committee on Combinations of Workmen, 1838, Minutes of Evidence, min. 1851-91, 97-101.
  2. Two of the trials, in 1825 and 1838, produced a considerable number of pamphlets, setting out both the masters' and the spinners' points of view, and each led to investigations by Parliamentary committees. The transported spinners were pardoned in 1840.
  3. Select Committee on Combinations, 1838, min. 23-8, 2 (evidence of Thomas Houldsworth).

the same rates as men, though the women were retained.<sup>1</sup> As a result of these limited disputes, the spinners' association had succeeded in forcing fine-spinning wages up to such an extent that Glasgow masters were finding fine work unprofitable by 1838.<sup>2</sup>

Two problems emerge from this. The first is to discover why the factory employees were so slow to organize, or alternatively, why the weavers organized first. The second is to discover why the spinners were more successful than the weavers. The second question is probably the easier to answer. As has been suggested above, the concentration of spinning-labour in large-scale units of production offset some of the advantages enjoyed by management when industry was organized on a basis of domestic production such as existed in handloom weaving.<sup>3</sup> The adoption of a strategy which made the best use of local concentrations of labour was also important in the relative success of the spinners.

When it comes to answering the second question, the solution is not so readily discoverable. It may well lie in the probability that early cotton factory employees did not appreciate the divergence of interests which existed between themselves and their employers, and which Smith described so well. This had, no doubt, been made abundantly clear to the weavers employed by the capitalists of the linen and silk

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1. Factory Commission, 1832, Examinations, A.1, 84-5.  
2. Select Committee on Combinations, 1838, min. 44-8, 3.  
3. Above, 104.

trades, and the need to combine for their own protection had probably been brought home to them in the days before the cotton industry's development. To them, the cotton industry brought no change in the conditions of employment, nor even of employer. Thus, while the cotton handloom weavers were in no doubt of their position and of the need for protective organization, the labour employed in the early mills may not have appreciated that need. Many of them, recruited from the ranks of agricultural labour, and especially those from the Highlands, would be entering an environment which was not only completely strange to them, but in which they were materially better off than they had been in their previous pursuits. The high wages, schools, churches, low-rental housing and medical services which the early millowners provided in order to attract labour to their works probably tended to foster the illusion of a community, rather than a divergence, of interest between master and man. As a result, the emigrant from Sutherland who was given work at New Lanark or Deanston, grateful for the alternative to sailing for America or eking a living from an acre or so of sour Highland soil which this presented, was very unlikely to be good union material. But the successors of this first generation, who knew no life but that of the mill and whose wages had suffered from successive cuts in the depressions which started with the outbreak of the French wars in 1793, were less likely to accept the apparent harmony of their interests with those of the employers. This generation was more

likely to appreciate the true position as defined by Smith and experienced by the handloom weavers. The formation of combinations among spinning operatives, accordingly, had to wait until this second generation came to maturity between 1805 and 1810.

THE EFFECTS ON SCOTTISH INDUSTRIAL  
DEVELOPMENT IN THE 19th CENTURY

I

The expansion of cotton cloth output after 1780 had an obvious corollary in the expansion of the industries in which the cloth-finishing processes were carried out, bleaching, printing and dyeing. It was observed in Glasgow in 1791 that, as a result of the cotton industry's growth in the years after the American War of Independence,

"bleachfields and printfields have been erected  
on almost all the streams in the neighbourhood..." 1

and new dyeworks, at Barrowfield and Dalmarnock in Glasgow for instance,<sup>2</sup> were set up after 1785 to cope with the rapidly growing output of cotton fabrics. New processes were developed in the finishing trades: Charles Tennant introduced a solid bleaching agent in 1799 which cut bleaching costs to one halfpenny per yard, and permitted the bleaching process to be completed in a matter of hours, where it had required several months in 1750:<sup>3</sup> George MacIntosh and David Dale had imported a French dyer, M. Papillon, to set up a Turkey-red dyework in 1785, the first of its kind in the United Kingdom.<sup>4</sup>

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1. Old Statistical Account, V, 502.

2. *Ibid.*, XII, 112-3.

3. Baines, *Cotton Manufacture*, 253.

4. Old Statistical Account, XII, 112; Baines, *op.cit.*, 277. Attempts to introduce the process in Manchester failed, and Glasgow "has ever since then been famous for dyeing Turkey red."

In printing, a Mr. Bell of Glasgow developed the technique of cylinder-printing, also in 1785.<sup>1</sup>

Impressive as the development of the finishing trades was after the establishment of the independent cotton industry in Scotland, the fact was, of course, that in this sphere, as in spinning and weaving, the cotton industry was heavily indebted to the linen industry, whose growth since the late 17th century had fostered the establishment of the finishing trades. The improvements of 1785 and after were being applied in industries which were highly developed by that date; indeed, some of the improvements then being applied were the logical outcome of research which had been going on for almost half a century. Tennant's bleaching powder, for example, was the lineal descendent of the sulphuric acid bleaching mixtures developed independently by Roebuck, Home, Cullen and Black before 1754 under the auspices of the Board of Trustees, and improved upon by Scheele in Sweden and Berthollet in France, as well as by James Watt in Glasgow.<sup>2</sup> Cloth-printing had been introduced into Scotland in connection with the linen industry in 1738, and Bell's process was simply a mechanized refinement of the process then used.<sup>3</sup> Only in dyeing did it prove necessary to develop a completely new process, that of Turkey-red

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1. Bremner, Industries of Scotland, 297.

2. Stewart, Curiosities of Glasgow Citizenship, 37-40; Hamilton, Eighteenth Century, 140-1.

3. Bremner, op.cit., 302. Cylinder printing had not entirely replaced block-printing by hand even by 1868.

dyeing, since the techniques and materials in use prior to 1785 were suitable only for dyeing the traditional fabrics, linen, wool and silk.<sup>1</sup> But even in this field, the prior existence of a dyeing industry, with which George MacIntosh was closely connected, must have helped in the rapid development of the Turkey-red trade for which Glasgow and the Vale of Leven subsequently became famous. With one exception, the growth of the cotton industry in Scotland after 1780 did not lead to the establishment of any new cloth-finishing trades. But its expansion necessitated the expansion of existing bleaching and printing facilities and to the provision of new facilities in these trades and in dyeing, using new and traditional techniques. It also led to some expansion in the size of the production-units in these trades, but no major changes in industrial organization took place as a result. Production had been concentrated in factory-type units before mechanized cotton production was first undertaken.<sup>2</sup>

The sole exception, the new only branch of the textile sector to develop as a result of the establishment of the cotton industry in Scotland, was the embroidered muslin trade. In 1861, when it was already on the decline, this branch employed 7,224 women in Scotland, chiefly in Ayrshire. Its

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1. Stewart, op.cit., 72. MacIntosh had opened a substantial Dyework at Dennistoun, Glasgow, in 1777 for the manufacture and application of "cudbear" dyes.
  2. Bremner, Industries of Scotland, 298; Stewart, Curiosities of Glasgow Citizenship, 121, 124. E.g., Stirling's Dalquhurn bleachfield (1723) and Cordale printworks (1770), and George MacIntosh's Dennistoun dyeworks.

novelty lay in the formal organization as an industry of what had been, before the mechanization of cotton-spinning, a recreation for ladies of quality and fashion - the embroidering on a frame or "tambour" of fine fabrics. Mechanized spinning virtually destroyed domestic spinning in the south-western counties of Scotland, and the women who were thus deprived of a source of income sought an alternative occupation in tambouring for "manufacturers" in Glasgow such as Messrs. MacDonald, whose share of the trade amounted to £500,000 in 1857.<sup>1</sup> Attempts to mechanize the embroidering processes were made early in the nineteenth century, by "manufacturers" in the flowered muslin trade,<sup>2</sup> but these do not appear to have come to anything, as production was still carried out on a domestic, hand-craft basis when the trade declined after 1857, when MacDonald and Company failed.<sup>3</sup>

## II

The cloth-finishing industries were, of course, inherently dependent on the expansion of the cloth-producing industries for their own growth. Other industries, however, which had also started life as subsidiaries of the textile industries, were able to break the ties and develop

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1. Bremner, *op.cit.*, 306-7.
  2. John Duncan, "manufacturer" in Glasgow, had patented a tambouring machine in 1804. S.R.O., Chancery Records, Specifications of Inventions, John Duncan, 1804.
  3. Contributing to the failure of the Western Bank, see C.A. Malcolm, *The Bank of Scotland, 1695-1945*, Edinburgh, n.d., 122.

independently. By the middle of the nineteenth century these industries - chemicals, mechanical and marine engineering - had reached an advanced state of development, where they were almost as important to the economy of south-west Scotland as the cotton industry.

Even these industries stood deeply in debt to the cotton industry for their initial growth, their relationship being in some ways similar to that of the cotton industry's relationship with the linen industry in the 1780's. This is perhaps most obvious in the case of the mechanical engineering industry. In 1868, Glasgow was the centre of great activity in this field, between 12,000 and 15,000 people being employed in it. A flourishing export trade in machinery had been built up, to the value of £500,000 in that year, and Glasgow's engineers and mechanics enjoyed a reputation second to none.<sup>1</sup> The development of this industry appears to have been the outcome solely of the mechanization of cotton-spinning and weaving. Although the earliest spinning and weaving machinery had been developed in England, the Scots were, by 1790, developing and putting into use machines which were technically superior to English machines, such as William Kelly's self-acting and water-powered mules and Robert Miller's power-looms.<sup>2</sup> In 1791, it was remarked

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1. Bremner, Industries of Scotland, 132-33.

2. See above, 32-34.

that the introduction of the cotton industry

"has given rise to many new manufactures, and to the making of machinery of all kinds, which, with all kinds of work in cast and malleable iron, and in brass and lead, are now made here (Glasgow) in great quantities."

No such industry had existed in Glasgow previous to the introduction of mechanized cotton-spinning, although certain skills such as the smith's or the carpenter's, which could be utilized for machine-making, did exist in the area. There simply had not been any substantial demand for machinery prior to the time of the cotton industry's growth, since no highly-mechanized industry existed. In 1783, there were no machine-makers or engineers in Glasgow.<sup>2</sup> By 1789, two "cotton machine-makers" were listed in the city directory,<sup>3</sup> and in 1801 the number had risen to four, with three engineers also listed.<sup>4</sup> In the 1810 directory, nine machine-making firms were listed, with five engineering firms.<sup>5</sup> Certainly, the coincidence in the timing of this development with the growth of the cotton industry is very striking. Some cotton-spinning firms set up machine-making branches to supply their own requirements and those of others: James Finlay and Co., for instance, made machinery at Deanston to the patents of James Smith and Archibald Buchanan, two of the firm's managers,<sup>6</sup> and the firm of Douglas, Cook and Co. of Glasgow

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1. Old Statistical Account, V, 504.
  2. At least, none were listed in J. Tait, Directory of the City of Glasgow, etc., Glasgow 1783, 13-71.
  3. N. Jones, Directory for the year 1789, Glasgow, rep. 1866, 1-64.
  4. W. McFeat, The Glasgow Directory, Glasgow 1801, 5-101.
  5. W. McFeat, The Glasgow Directory, Glasgow 1810, 9-139.
  6. New Statistical Account, X, 1236.

also combined cotton-spinning and machine-making.<sup>1</sup> By 1833, however, Glasgow was undergoing severe competition from Manchester in the production of cotton machinery, and this branch of industry had begun to decline.<sup>2</sup> Finlay's gave up their Deanston machine-shop in 1834,<sup>3</sup> and 1833 one-half of the mechanics trained in Glasgow were said to be emigrating.<sup>4</sup>

But the mechanical skills which had been built up in the manufacture of cotton machinery could also be applied to the making of machines for other purposes, and the personnel displaced by the run-down of cotton machine-making put to other work. The firm of Girdwood, Pinkerton and Co., listed as cotton machine-makers in the 1798 Glasgow directory, were employed in 1832 in making lifting-gear for the new Glasgow docks, as well as making sawmill equipment.<sup>5</sup> It may well be the case that other rising businesses like Blairs, Ltd., Duncan Stewart and Co., Mirlees Watson and Co. - all manufacturers of sugar-refining equipment and all founded between 1836 and 1840 - and Neilson and Co., general engineers founded in 1836, were built up by utilizing mechanical skills which had been developed in the manufacture of cotton machinery.<sup>6</sup>

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1. Glasgow Directory of 1810, 39.
  2. Select Committee of 1833, Houldsworth's evidence, min. 5213, 310; Graham's evidence, min. 5443-5, 325. Houldsworth said Manchester had the edge over Glasgow simply because it had always served a more extensive demand for machinery.
  3. New Statistical Account, X, 1239-40, note.
  4. Select Committee of 1833, min. 5330, 317.
  5. New Statistical Account, VI, 198.
  6. For the growth of these firms, see Miller and Tivy, The Glasgow Region, 191.

The same may well be true of the growing marine-engineering industry, which later became the main growth-industry in the Scottish economy. The significant factor in its growth was the existence in and around Glasgow of a steam-engine building industry, and it was by assisting in the development of this that the cotton industry may have played a part in shaping the future of Clyde shipbuilding.

"When the possibility of propelling vessels by steam was successfully tested on the Clyde," wrote one commentator in the mid-nineteenth century,

"the enterprising mechanics of the west did not neglect to improve the occasion. As soon as the demand for steam-vessels arose, they were ready to supply the motive power..."<sup>1</sup>

Between 1812, the year in which Henry Bell's "Comet" was launched,<sup>2</sup> and 1831, 57 steamships were built on the Clyde and fitted out with engines built at Glasgow or Greenock.<sup>3</sup>

Before 1812, the demand for rotary steam-engines, the type of power-unit used in ship-propulsion, had almost certainly come from the cotton industry, which used this type of engine for powering spinning, weaving, scutching and calendering machinery.<sup>4</sup> It was demand from that industry which promoted the growth of steam-engine building in and around Glasgow between 1801, when Watt's patent on rotary-motion lapsed, and

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1. Bremner, Industries of Scotland, 132.

2. The first steam-boat for open-water use in Britain.

3. Cleland, Enumeration of 1831, 159.

4. Of the 310 steam-engines in use in 1825 in the Glasgow area, 176 were employed in various branches of the cotton industry; Ibid., 262.

1812, when the "Comet" was built.

Indirectly the cotton industry was largely responsible for the fact that in 1831 Glasgow possessed, in Charles Tennent's St. Rollox chemical-works, the largest chemical plant in Europe.<sup>1</sup> This was one of a number of chemical works in the city, all of which had started up to produce materials required for various textile-finishing processes. Tennent, in partnership with a man named Knox, had set up his works in 1800 with the express purpose of producing in quantity the bleaching-powder he had patented in 1799 to satisfy the demand of the textile trades of Great Britain, of which the cotton industry was by that time the largest. The other chemical companies, too, owed their growth primarily to the increased demand for chemicals arising from the expansion of the cotton industry. Charles MacIntosh, for instance, had set up plant in the Barony of Glasgow in 1790 to produce the "sugars" of alum and lead used in Turkey-red dyeing, a process only applicable to cotton.<sup>2</sup>

The cotton industry was directly responsible for the establishment of a number of individual chemical-producing concerns, but not for the foundation of the Scottish chemical industry. The first Scottish chemical-plant, the sulphuric-acid works of John Roebuck and Samuel Garbett set up at Prestonpans in 1749, was set up to produce acid for linen-bleaching.<sup>3</sup> It was, however, only after the cotton industry

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1. Cleland, Enumeration of 1831, 137.

2. Old Statistical Account, XII, 113.

3. Hamilton, Economic History of Scotland, 141.

provided additional demand for chemicals, that new chemical-works were set up. The build-up of plant to meet this considerable demand enabled the chemical industry to develop other processes not connected with textiles. Thus, in 1830, Tennent's works were not only producing bleaching-powder but also soda, soap and sulphuric-acid for steel-making.<sup>1</sup>

In addition to stimulating the growth of new industries by providing a demand for their products, the cotton industry provided a direct financial stimulus to some other sectors of the Scottish economy. Capital accumulated in the production of cotton-goods was often directed towards financing other projects. One of the major beneficiaries was overseas trade, which is not surprising in view of the cotton industry's complete dependence on foreign and colonial raw-materials and its heavy commitment to overseas markets. To give a few examples, John Freeland, grandson of the founder of the Gryfe mill at Houston in Renfrewshire, became a prominent West-India merchant in Glasgow, while maintaining an interest in cotton-spinning:<sup>2</sup> Kirkman Finlay, for many years an outspoken critic of the East India Company's monopoly of the Indian trade, pioneered Scottish trade with India after the Company's monopoly was revoked in 1813, and had trading-interests going far beyond cotton.<sup>3</sup> Industry benefitted as well as trade: in 1796, David Dale invested, and lost

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1. Cleland, Enumeration of 1831, 137.
  2. Stewart, Curiosities of Glasgow Citizenship, 210.
  3. James Finlay and Company, 6-32.

£20,000 in a coal-mining project at Barrowfield, in the Barony of Glasgow.<sup>1</sup> The Houldsworths, Henry and Thomas, left the cotton industry completely to set up a large ironworks at Coltness, Stirlingshire, in 1842.<sup>2</sup> Few others followed the Houldsworths in their desertion, but many emulated Dale, Freeland and Finlay and extended their interests, especially when profit margins in cotton were falling after the Napoleonic Wars.

### III

The growth of new industries, which the expansion of the cotton industry stimulated, and the diversion of capital from cotton to other sectors of the economy in the pursuit of higher profit-margins inevitably meant a decline in the position of the cotton industry relative to other Scottish industries. Some writers, in fact, have suggested that the cotton industry went into an absolute decline between 1835 and 1860.<sup>3</sup> There is little evidence to support such an argument. The number of mills in operation in 1838 was well above the number in 1834 - 198 as against 134.<sup>4</sup> In 1850, the number of mills in operation was, it is true, lower than that of 1838 - 168 as against 198<sup>5</sup> - but the industry's productive capacity was

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1. Chambers' Biographical Dictionary, II, 422.
  2. W.H. MacLeod and Sir H.H. Houldsworth, The Beginnings of the Houldsworths of Coltness, Glasgow 1937, 121 f.
  3. For example, G.M. Mitchell, "The English and Scottish Cotton Industries," Scot.H.R., 1924-25, 113.
  4. Bremner, Industries of Scotland, 286.
  5. Ibid., 287.

actually higher in 1850 than in 1838: 23,564 power-looms were in use and the total labour-force employed was 36,325, compared with 15,000 power-looms and 35,576 employees in 1838. Production was simply becoming concentrated in fewer, and probably larger, units. In 1856, however, the number of mills in operation, the number of power-looms, and the size of the total labour-force were all smaller than in 1850, at 152, 21,624 and 34,698 respectively. On the other hand, spinning capacity was higher in 1856 than in 1850 - with 2,041,129 spindles against 1,683,093.<sup>1</sup> There is evidence of a recovery by 1860. The number of mills in operation in that year was 163, eleven more than in 1856 but five fewer than in 1850. The number of power-looms and the size of the total labour-force in 1860 - 30,110 and 41,237 respectively - were the highest ever recorded; and the number of spindles - 1,915,398 - was almost up to the level of 1856 and well above that of 1850.<sup>2</sup> It seems, then, that the cotton industry continued to expand towards 1860, though the number of units in production was contracting, presumably to offset falling margins. There is certainly more evidence to support this conclusion than there is for absolute decline.

It has been argued from other evidence that the cotton industry entered on a period of stagnation and decay from 1840 onwards.<sup>3</sup> This argument rests primarily on the estimated weekly consumption of raw cotton in Scotland

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1. Loc.cit.

2. Bremner, Industries of Scotland, 287.

3. Campbell, Scotland Since 1707, 108-111.

contained in the records of the Clyde Sugar Market, the main Scottish centre of deals in raw cotton. In 1831, an average of 1,652 bales were consumed per week. This rose to 2,035 bales weekly in 1835, and to 2,364 bales per week in 1840. Thereafter, the trend was stable, at about the 1840 level with fluctuations according to the state of the market, until the American Civil War broke out in 1861. Convincing as this evidence looks, it is nevertheless open to serious objection. The measurement of consumption in bales is unreliable, as the weight of raw cotton per bale varied considerably according to the bale's place of origin. A Brazilian bale weighed, on the average, 183 lbs.; the average weight of a bale from the U.S.A. was 354 lbs.; the average weights of Egyptian, East Indian and West Indian bales were 220, 330 and 300 lbs. respectively.<sup>1</sup> In any case, no industry in a state of stagnation and decay could have recovered rapidly from such a setback as the Cotton Famine of 1861-66, which resulted from the American Civil War. This was the industry's greatest period of trial: as one contemporary observed,

"At no time was it so seriously disturbed as during the period between the years 1861 and 1866. The American war almost completely disorganized the trade."<sup>2</sup>

Yet in 1867, exports of cotton piece-goods and yarn from Scotland were some 30% greater in volume and 50% higher in

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1. Baines, Cotton Manufacture, 367. The Sugar Market Reports do not state the number of bales drawn from each possible source.
  2. Bremner, Industries of Scotland, 288.

value than the previous peak-levels of 1861,<sup>1</sup> and the same writer could comment in 1868:-

"The cotton manufacture has now nearly resumed its normal condition."<sup>2</sup>

Apparently the industry had not lost any of its buoyancy and resiliency during the two decades preceding the war.

More information than is at present available is required before an accurate assessment can be made of the Scottish cotton industry's condition after 1840. Such information may, of course, confirm the traditional pessimistic point of view, but there seem to be grounds for believing that the state of the industry between 1840 and 1870 was not as unhealthy as it is normally assumed to have been.

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1. Ibid., 288. Average weekly consumption of raw cotton in Scotland fell from 2,500 bales in 1866 to 1,700 in 1867 (Bremner, Industries of Scotland, 288). This may, however, have been the result of a return to American cotton and, since American bales appear to have been the heaviest, may not represent any real decline in the quantity of raw cotton consumed. See note 1 above, p. 123.
  2. Ibid., 290.

### SUMMARY OF CONCLUSIONS

The development of the Scottish economy between the Union with England in 1707 and the American War of Independence laid the foundations for the establishment and growth of the Scottish cotton industry after 1780. From the textile industries which had been built up from 1707 to 1780, and especially from the fine-linen and silk industries of the south-west, came most of the capital which financed the cotton industry. The entrepreneurial and technical skills which had been acquired as a result of their development were put to use in organizing the cotton industry and in developing products which enabled the industry to survive in Scotland in the face of English and East Indian competition. The markets which the cotton industry served in the early stages of its development had been served by the older textile industries. The development of Scottish overseas trade in the period 1707-1783 assured the cotton industry of ready access both to its raw materials and to the overseas markets which eventually absorbed over one-third of its output.

The cotton industry's expansion after 1780 was rapid, but it was beset by considerable fluctuations in output as a result of the loss of markets and raw-material supplies during the French and American wars of 1793-1815, the highly speculative activities of its participants after the wars, and the narrowness of its range of products. Despite these difficulties, however, it became the country's most important industry within forty years of the establishment of Scotland's

first cotton mill in 1778, its products accounting for over 60% of the value of exports from Scotland. By that time, the industry was becoming heavily concentrated in the south-west, around Glasgow, after an initial tendency towards dispersal throughout the country had been checked by a change in the relative importance of the various factors governing its location.

The means by which the expansion of output was undertaken was the adoption of new techniques and forms of organization of industrial production which had been developed in England before the American Revolution and which could not be applied to the older textile industries. The establishment of the cotton industry brought a change-over from the traditional manual production-techniques and small-scale domestic units of production to mechanized production concentrated in large-scale factory units, though this process was not complete in weaving by 1835. The expansion of consumer demand, and therefore the expansion of output, was maintained partly by the regular introduction of improved machinery throughout the period 1780-1835, and partly by diversifying output, especially after 1815.

The capital required for the application of the new techniques was recruited, as has been said, from the old textile industries and, to a much lesser extent, from other sectors of the economy. It is, however, rather dangerous to fit the participants into rigid categories as some recent historians have tried to do. The American War of Independence

was probably an important factor in securing the release of resources for the initial capitalization of the cotton industry, and the high rate of return on capital invested in the early stages of the industry's growth, until 1802 at least, ensured that an adequate flow of capital for further expansion was maintained.

The concentration of production in large-scale units brought problems of labour-recruitment, which were solved by a heavy reliance on immigrant labour, first from the Highlands and later from Ireland. Wage-rates higher than those paid in other activities were also resorted to as a means of attracting labour to the mills. As regards wages and conditions of work, however, the labour-force was very much at the mercy of management. Conditions of work varied from mill to mill depending on the interest of the man in charge in the welfare of his workers. Wage-rates varied from mill to mill and from job to job, and were raised or lowered by management according to the state of trade. But concentration also increased the effectiveness of resistance on the part of the labour-force to such treatment, although the first generation of mill-hands did not seem to realize this because of the benevolent paternalism of the early masters.

Other industries in Scotland benefitted from the rise of the cotton industry. The secondary textile industries expanded in response to the increased pressure placed on their facilities by the expansion of cotton cloth output; new bleachworks, dyeworks and printworks were set up, and existing

ones were enlarged. This in turn led to expansion in the chemical industry, which provided the materials for cloth finishing, and gave Glasgow the largest chemical-works in Europe in 1830. The demands of the cotton industry for machinery of all kinds led directly to the foundation of a mechanical engineering industry in and around Glasgow, and rather indirectly, contributed to the growth of the marine engineering industry which became basic to the economy of Clydeside towards the end of the nineteenth century. Through the engineering industries, the cotton industry also contributed to the development of the Scottish iron, steel and coal industries. Capital accumulated in the cotton industry found its way into several other sectors of the economy, including iron and coal as well as overseas trade.

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Hamilton of Pinmore Muniments.

Clerk of Penicuik Muniments.

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Cotton wool imports into Scotland, 1770-1827

Section I - 1770-1800

Year	America		West Indies		Totals	
	Wt. (lb.)	Value (£)	Wt. (lb.)	Value (£)	Wt. (lb.)	Value (£)
1770	2,534	127	464,055	23,205	466,589	23,330
1771	1,100	55	63,686	3,185	64,786	3,240
1772	1,230	62	96,701	4,835	97,931	4,897
1773	498	25	95,687	4,784	96,185	4,809
1774	-	-	145,224	7,262	145,224	7,262
1775	40	2	153,425	7,672	153,465	7,674
1776	-	-	84,280	4,214	84,280	4,214
1777	300	15	256,350	12,701	256,650	12,716
1778	-	-	216,870	11,060	216,870	11,060
1779	5,500	275	256,800	12,841	262,300	13,116
1780	29,065	1,453	193,874	9,694	222,939	11,147
1781	1,800	90	265,732	15,554	267,532	15,644
1782	5,400	270	284,432	13,895	289,832	14,165
1783	800	40	228,557	11,130	229,357	11,170
1784	-	-	330,051	16,503	330,051	16,503
1785	40	2	627,648	32,059	627,688	32,061

TABLE I.

Year	America		West Indies		Totals	
	Wt. (lb.)	Value (£)	Wt. (lb.)	Value (£)	Wt. (lb.)	Value (£)
1786	-	-	845,953	42,298	845,953	42,298
1787	-	-	1,364,193	68,210	1,364,193	68,210
1788	27,426	1,372	1,496,243	74,812	1,523,669	76,184
1789	2,998	150	2,165,732	108,285	2,168,730	108,435
1790	2,086	104	2,723,160	136,158	2,725,246	136,262
1791	-	-	2,757,458	137,869	2,757,458	137,869
1792	604	30	3,076,111	138,557	3,076,715	138,587
1793	2,400	106	2,650,142	132,505	2,652,542	132,611
1794	15,000	750	1,402,340	70,117	1,417,340	70,867
1795	52,800	2,640	2,094,631	104,732	2,147,431	107,372
1796	196,260	9,812	1,334,678	66,734	1,530,938	76,546
1797	392,040	19,602	1,316,274	65,813	1,708,314	85,415
1798	1,191,648	59,581	1,621,053	81,051	2,812,701	140,632
1799	1,411,275	70,564	1,804,331	90,215	3,215,606	160,779
1800	2,610,222	130,610	2,254,932	112,745	4,865,154	243,355

From: H. Hamilton, *Economic History of Scotland in the Eighteenth Century*, Appendix VII, 412-3. While excluding imports from sources other than America and the West Indies, Hamilton's figures probably convey an accurate picture of the Scottish cotton-trade's fluctuations since these were the two main sources of supply throughout the period 1770-1827.

Cotton wool imports into Scotland, 1770-1827

Section II - 1801-1824

Year	America		West Indies		Other Sources		Totals	
	Wt. (lb)	Value (£)	Wt. (lb.)	Value (£)	Wt. (lb.)	Value (£)	Wt. (lb)	Value (£5)
1801	3,731,814	186,623	3,802,054	190,103	675,686	33,784	8,209,554	410,510
1802	5,411,124	270,553	3,328,701	166,432	1,563,033	78,151	10,302,858	515,136
1803	4,661,382	233,158	2,195,594	109,775	1,289,962	64,497	8,146,938	407,410
1804	4,277,058	213,847	3,852,122	192,603	1,033,918	51,695	9,163,098	458,145
1805	4,854,205	242,710	2,636,793	131,838	979,995	49,000	8,470,993	423,548
1806	4,532,940	226,645	3,478,813	173,937	1,120,884	56,127	9,132,637	456,709
1807	6,589,953	329,476	4,379,336	218,965	571,216	28,560	11,540,505	577,001
1808	1,325,096	66,234	3,399,953	169,990	30,270	1,513	4,755,319	237,737
1809	Customs Ledger Missing							
1810	4,934,283	211,868	5,680,086	283,699	1,725,608	86,279	12,339,977	581,846
1811	6,598,016	329,900	4,095,597	205,924	835,111	41,754	11,528,724	577,578
1812	3,409,025	170,448	4,145,242	175,242	1,185,442	59,269	8,739,709	404,959
1813	195,686	9,784	4,022,942	201,146	2,247,867	112,395	6,466,495	323,325
1814	80,543	4,027	4,447,051	222,352	1,223,165	61,657	5,760,759	288,036
1815	3,701,785	185,089	3,760,101	188,004	1,083,581	54,184	8,545,467	427,277
1816	5,206,189	260,309	2,950,884	147,544	258,747	12,938	8,415,820	420,791
1817	8,572,005	428,583	2,739,940	136,997	1,257,285	62,864	12,569,230	628,444

Year	America		West Indies		Other Sources		Totals	
	Wt. (lb.)	Value (£)	Wt. (lb.)	Value (£)	Wt. (lb.)	Value (£)	Wt. (lb.)	Value (£)
1818	8,742,507	437,125	3,531,433	176,570	1,784,993	89,249	14,058,933	702,944
1819	7,291,972	364,598	2,442,428	122,107	2,584,383	129,219	12,318,783	615,924
1820	7,376,079	358,717	2,268,894	113,445	1,083,969	54,198	10,728,942	526,360
1821	7,248,001	362,399	1,391,256	69,564	1,059,743	52,988	9,699,000	484,951
1822	9,147,002	449,146	2,051,209	102,560	550,808	27,541	11,749,019	579,247
1823	9,798,947	489,947	1,350,570	67,529	112,866	5,643	11,262,383	563,119
1824	7,530,848	376,542	1,445,455	73,276	388,422	19,421	9,364,725	469,239

From: Inspector-General of Imports and Exports for Scotland, M. S. Ledgers (Customs 14), vols. 14-36. Entries in the "Other Sources" column include imports from Portugal, the East Indies, British North America, South America, etc.

### Section III, 1825-1827

Year	Total cotton-wool imports into Scotland	
	Wt. (lb.)	Value (£)
1825	9,655,335	482,767
1826	8,343,442	417,172
1827	19,609,710	980,485

Source: Customs 14, vols. 37-39, abstracts. Separate Scottish customs records were not kept after 1827, but Baines, History of the Cotton Manufacture, estimates that approximately 26.8 million lbs. of raw cotton was imported into Scotland in 1833 for the use of the Scottish cotton industry (pp. 366-7).

Exports of Cotton Manufactures from Scotland - selected years

Year	Value of cotton goods exported (£)	Value of home-produced exports (£)	Value of Scottish total (£) exports, including re-exports
1792	66,398	886,238	1,230,884
1801	1,343,973	2,449,185	2,844,516
1818	4,104,876	6,254,725	6,769,534
1827	4,740,941	5,932,852	6,059,503

TABLE II

From: P.R.O. Customs 14, vols. 5, 14, 30, 37. In the entries for 1818 and 1827, the value given is the official value, as for 1792 and 1801.

Daily wages of cotton handloom weavers in Glasgow, 1810-1819 and 1831.

Fabrics Woven	1810	1811	1812	1813	1814	1815	1816	1817	1818	1819	1831
	s. d.										
4/4 Cambric, 1,300	2 7½	1 3	1 6	2 0	2 6	2 0	1 9	10½	1 3	9	1 0
6/4 Book muslin, 1,400	2 7	1 8	1 11½	2 3½	2 11	2 6½	1 8	1 2½	1 8	1 2½	1 4
4/4 Jaconet, 1,200	1 0	1 0	1 6¼	1 7½	2 0½	1 8¾	10¾	9½	1 0	8¼	11
4/4 Pullicate, 1,300	2 0	1 0	1 8	2 2	2 4	1 8	1 1	1 0	1 0	10	1 1
4/4 Checks, Blue & White, 1,000	1 7½	1 3	1 5	1 7½	1 7½	1 7½	9½	9½	1 1¼	8¼	11
5/4 "	2 4½	1 10	2 0½	2 3	2 3	2 3	1 2½	1 2½	1 7½	1 0	1 2
11/8 Ging-ham, 1,300	1 11	1 3	1 7½	2 0¼	2 2	1 11	11	11½	1 1	10	1 0

From: E. Baines, History of the Cotton Manufacture, 488. These are daily nett wages, after deductions for loom-rent, heat, light, etc., on an average of 12 hours work per day.

TABLE III

Specimen weekly wages in cotton-spinning, Glasgow-based firms, 1831

	Age-group: 9-10		Age-group: 12-14		Age-group: 16-18		Age-group: 21 and over	
	Male	Female	Male	Female	Male	Female	Male	Female
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
J. Batholomew & Co.	-	2 6	3 3	4 9	6 10	6 6	24 5	9 2
J. Finlay & Co.								
Catrine	1 4½	1 4½	3 6	3 6	7 6	6 9	14 0	6 6
Ballindalloch	-	1 6	2 9	2 9	5 0	5 0	10 6	10 6
Deanston	2 0	2 0	3 0	3 0	5 0	5 0	12 0	7 6
J. M. Graham	-	-	-	-	-	-	23 5	6 6
H. Houldsworth & Co.	1 3½	1 3½	3 6½	3 6½	6 0	6 0	9 1	9 1
R. Marshall & Co.	2 0	2 3	5 0	4 1	7 0	6 6	35 0	7 6
H. Monteith & Co.	2 0	2 6	4 3	3 0	8 5	6 0	24 1	8 2
J. Oswald & Co.	2 6	2 6	4 0	4 0	6 0	6 0	24 0	7 0
Shields & Sinclair	-	-	6 0	6 0	6 0	-	20 0	20 0
Lancefield Spinning Co.								
Spinning	2 6	2 6	4 3	4 3	6 10	6 10	25 0	8 3
Power-Weaving (Lancefield mill)	-	-	-	5 9½	6 8	6 1½	19 0	7 1

From: J. Cleland, Enumeration of the Inhabitants of Glasgow, 1831, 291.