

**The Impact of Conflict and Political Change
on Northern Industrial Towns, 1890 to 1990**

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Abstract

It is a universal truth that everything living is at the same time dying, and it is equally true that anything which exists is obsolete. The stock of a nation's success is embodied in the skills of its work force, not in the perceived desirability of some companies to survive.

Firms exist because of the products they deliver and, in a capitalist free market system, need to constantly evolve. Technology constantly evolves and technology becomes obsolete. If firms do not evolve they die. In a totally free market poverty and even starvation are integral to its functioning and any efforts to avoid these unacceptable manifestations skew its function. Likewise any formation of oligopolies, cartels and price signalling associations subvert the free market.

The 1914 - 1918 war created a largely command economy wherein the means of production were harnessed for the common purpose of defeating the enemy. The command economy prolonged, artificially, the existence of some firms and fundamentally disrupted the normal functioning of others which led to their failure.

Between the two world wars the government at first tried to return to the market economy then attempted to protect British industry from foreign competition. Between 1939 and 1945 a command economy was reintroduced and following the Second World War the attitudes of various governments were largely interventionist, although changes from labour to conservative produced structural changes. After 1979 industry was totally exposed to competition from foreign companies which enjoyed protection in their home markets, either overtly or covertly.

Two of Lancashire's leading engineering towns, Bolton and Oldham, each contained significant companies almost all of which failed at some stage between 1890 and 1990. Moreover, even though Britain imported large amounts of engineering products, they were not replaced by other manufacturers.

The research focused mainly on a number of firms in Bolton and Oldham, the apparent reasons for their survival or their failure and the possible effects on the prosperity of the towns.

As with Lancashire, Bolton and Oldham had fewer inhabitants in 1990 than in 1890 and neither town houses companies of significant size or importance. The best and brightest move to London or the South East in order to fulfil their aspirations.

The free market only functions effectively if society is prepared to accept the social consequences of change. The idea that British industry was already flawed in the late nineteenth-century is true only because in an evolving market all that exists is obsolete.

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Chapter 1, 1890 to 1913

Politics

Between 1890 and 1913, and particularly following the Liberal party's landslide victory in 1906, the British government rarely intervened directly in the way in which industry functioned. Nevertheless, legislation such as the Red Flag Act of 1865, while ostensibly enacted to protect passengers of horse drawn transport, had the effect of protecting the railway companies on the one hand and retarding the development of motor vehicles on the other. Somewhat more directly, the 1882 Electric Light Act, which enabled local authorities to install electricity generating stations to replace gas lighting systems, led to many small, privately owned, electricity generating companies being set up at around this time.¹

After 1911 quasi-government organisations such as the Royal Aircraft Factory played a prominent role in the development of industry in Britain. This institution, which was responsible for the design and specification of aircraft for the Royal Flying Corps, not only produced aircraft at its Farnborough plant, but subcontracted production to firms like Vickers and Armstrong Whitworth. A further similar intervention was the setting up of the Naval and Military Aeroplane Engine Competition which offered a prize of £5,000.00 for the submission of a suitably designed aircraft engine.²

Until 1907 there was no legal distinction between private and public companies, but the Companies Act of that year differentiated between firms which used private finance and those which raised capital through public subscription. Thereafter, existing firms tended to convert from partnerships to joint stock and limited liability companies, while adeptly assuring that they remained largely family controlled.

Raising finance for private enterprise was, however, still rather problematic. By far the largest stock market was the London Stock Exchange, whose main business interests lay in raising funds for the British government and for overseas borrowers and, outside of major concerns, there was little public finance available for innovation in the engineering industries. Thus, the infant aviation industry and the emerging motor vehicles industry both relied on a combination of enthusiasm and family wealth.³

Technology

In the mid 1800s most British engineering firms were general engineers and many of them designed and built their own machine tools, just as large textile producers made their own spinning and weaving machines and railway companies produced their own locomotives and carriages. By the end of the nineteenth-century some engineering firms had gained reputations as specialist producers

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1. Allen Skuse, *Government Intervention and Industrial Policy, Second Edition*, (London: Heinemann, 1978), pp. 21, 27.
 2. David Edgerton, *England and the Aeroplane, An Essay on a Militant and Technological Nation*, (London: Macmillan, 1991), pp. 1 – 8; E. J. Hobsbawm, *Industry and Empire*, (Harmondsworth: Penguin, 1970), p. 219.
 3. Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), pp. 392 – 393.

of certain types of equipment, such as Sharp Roberts and Co. in textile machinery, Sir Joseph Whitworth and Co. in machine tools, and Nasmyth, Wilson and Co. in locomotives.⁴

By the third quarter of the nineteenth-century standard sized parts and precise specifications had become possible and by 1900 the introduction of High-Speed Steel, an alloy which contained tungsten, chromium and vanadium, enabled engineers to cut metal at speeds up to twice as high as previously possible. This development led, by necessity, to the design of more rigid and more massive machine tools, able to take full advantage of the new technology, which in turn led some firms to specialise in the design and manufacture of this type of equipment.⁵

By the 1890s the steam locomotive had reached a point of near perfection although several enhancements and refinements were introduced after 1900. Light electric railways had been introduced in Germany and Britain as early as 1879 and electric street cars were operating in the USA by 1888. The City and South London Railway was the first of the London underground electric railways, although a steam powered system had been opened in 1863.⁶

The internal combustion engine was first developed during the 1860s by French and German engineers. Otto's gas fuelled 'silent engine', which was exhibited in Paris in 1867, was so successful that his company had difficulties in filling orders until a businessman, L. A. Roosen-Runge, bought shares in the enterprise in 1869. Roosen-Runge had Manchester connections and, in line with the new company's strategy, agreed terms with Crossley Motors, a company started in 1867 by the brothers Frank and William John Crossley, for the licensed manufacture of the Otto engine in Britain.⁷

The only British built automobile to be shown at the Crystal Palace Exhibition in 1896 was a four wheeled petrol powered car designed by John Henry Knight of Farnham. The first commercially motivated venture into motor vehicles began when the British Motor Syndicate was floated. BMS acquired patents from Daimler of Germany and purchased a twelve acre site near Coventry from which the first British Daimlers began to appear in 1897. These cars were more-or-less copies of

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4. Roy Church (ed), *The Dynamics of Victorian Business: Problems and Perspectives to the 1870s*, (London: George Allen and Unwin, 1980), pp. 93 – 95; see also S. B. Saul, 'The Mechanical Engineering Industries in Britain, 1860 – 1914' in Barry Supple (ed.), *Essays in British Business History*, (Oxford: Clarendon, 1977), pp. 31 – 48.
 5. Charles Singer (ed.), *A History of Technology, Volume 5*, (Oxford: Oxford University Press, 1958), pp. 641 – 657.
 6. D. S. L. Cardwell, *The Fontana History of Technology*, (London: Fontana, 1994), pp. 348, 355 – 356; Charles Singer (ed.), *A History of Technology, Volume 5*, (Oxford: Oxford University Press, 1958), pp. 346 – 348.
 7. Roy Church (ed), *The Dynamics of Victorian Business: Problems and Perspectives to the 1870s*, (London: George Allen and Unwin, 1980), p. 105; D. S. L. Cardwell, *The Fontana History of Technology*, (London: Fontana, 1994), pp. 342 – 344; D. G. Rhys, *The Motor Industry: An Economic Survey*, (London: Butterworths, 1972), pp. 1 – 3.

French Panhards powered by imported German engines and the level of production was, at least initially, relatively low.⁸

In Lancashire, Marshall and Company built its first car in 1897. Powered by a French built Buchet engine, it was a copy of a French design which was itself a copy of a German Benz Velo. The firm's first factory employed around 90 workers and covered a one acre site near Clayton. In 1901 Marshall merged with Walter Radermacher's Belsize bicycle works and by 1913 the company employed around 1,500 people. Another Manchester concern, Crossley Motors, began to make cars in 1903 and Henry Royce started a year later. Neither of these were volume producers, Crossley's output only reaching 650 units in 1913. However, with the advent of the Ford plant at Trafford Park in 1911, the motor vehicles became an important industry in Lancashire. By 1913 Ford, with an annual output of 6,139 cars, was easily the largest car producer in Britain.⁹

Most early powered flights in Britain took place in the London area and Lancashire's aircraft industry was started more or less by chance. Alliot Verdon Roe, an enthusiastic amateur aviator from a well to do Lancashire family, was also a trained engineer and he applied his technical skills to aircraft design. When Roe needed a workshop his brother Humphrey, who owned a factory in Manchester, offered him an empty basement which, if photographs are anything to go by, was barely adequate for the purpose. By 1912, however, the first of many government orders for Roe's aircraft had been completed and by 1913 the firm had moved to more suitable premises at Clifton Street, Miles Platting.¹⁰

Markets

The second phase of the industrial revolution was, according to Hobsbawm, based on capital goods, products which depended on coal, iron, steel and skilled labour. The growth of industrialisation throughout the world, which created an increasing demand for engineering products, caused British exports of machinery to double between 1880 and 1900. At the same time as textile exports were falling, Lancashire's engineers were producing innovative equipment for the new industries. An appraisal of three Bolton based engineering firms' engine books reveals that the late nineteenth-century world market for large industrial steam engines was buoyant. India was their largest export market but equipment was shipped to practically every industrialised, and partly industrialised, nation on earth. Bolton companies had strong connections in Russia, particularly between 1890 and 1911,

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8. Martin Adeney, *The Motor Makers*, (London: Collins, 1988), pp. 18 – 19, 36 – 41; Nick Georgano, 'The Pioneers', in Nick Georgano (ed.), *Britain's Motor Industry The First Hundred Years*, (Yeovil: Foulis and Company, 1995), pp. 12 – 13; Nick Baldwin, 'The Background', in Nick Georgano (ed.), *Britain's Motor Industry The First Hundred Years*, (Yeovil: Foulis and Company, 1995), p. 21; Nick Georgano, 'An Industry Gets Under Way', in Nick Georgano (ed.), *Britain's Motor Industry The First Hundred Years*, (Yeovil: Foulis and Company, 1995), p. 23; D. G. Rhys, *The Motor Industry: An Economic Survey*, (London: Butterworths, 1972), p. 7.
 9. Nick Baldwin, 'The Background', in Nick Georgano (ed.), *Britain's Motor Industry The First Hundred Years*, (Yeovil: Foulis and Company, 1995), pp. 18, 20, 21; Nick Georgano, 'An Industry Gets Under Way', in Nick Georgano (ed.), *Britain's Motor Industry The First Hundred Years*, (Yeovil: Foulis and Company, 1995), p. 33; S. B. Saul, 'The Motor Industry in Britain to 1914', *Business History*, 5 (1), 1962, p. 25.
 10. Roe served a five year apprenticeship at the Lancashire and Yorkshire Locomotive works at Horwich. Harry Holmes, *AVRO The History of an Aircraft Company*, (Shrewsbury: AirLife Publishing, 1994); S. B. Saul, 'The Mechanical Engineering Industries in Britain, 1860 – 1914' in Barry Supple (ed.), *Essays in British Business History*, (Oxford: Clarendon, 1977), p. 46.

and other non-imperial trade was done with China, Finland, Poland, Latvia, Argentina, Portugal and Japan. Notably, and almost totally, absent from their lists of customers were buyers in Germany and the USA.¹¹ By 1913, however, technological changes were beginning to have a marked effect on the markets of Lancashire's older engineering firms.

Competition

In the late nineteenth-century competition for Britain's markets had begun to emerge and by 1913 Britain, Germany and the USA shared over 80% of world exports in machinery and transport equipment. America was industrially well developed even by the 1870s and, compared with Britain, both the USA and Germany had natural advantages. Both had large populations compared with Britain's 45.6 million inhabitants. Germany's population was 67 million and the USA's had increased by over 150% since the end of the civil war to 97.2 million.¹² The American civil war had also brought the US government into industry, the legacy of which was an advanced and sophisticated manufacturing engineering sector. Moreover, as Geoffrey Owen has observed, incomes in the USA were more equal and consumer tastes more uniform than in Britain.¹³ Germany possessed one of the Europe's largest deposits of coking coal and by the third quarter of the nineteenth century the province of Westphalia had become heavily industrialised. The population of Germany was more evenly dispersed throughout its territories and, because of its history as a federation of states there was a tendency for industry to be less concentrated. The German government played a much more active and direct role in the development of industry and cartels and protectionism were tolerated, a policy which served to enhance price fixing and market sharing agreements.¹⁴

Lancashire

Between 1881 and 1911 the number of metal workers in Lancashire had practically doubled, the period of phenomenal growth being between 1891 and 1901 when the number of males employed in the industry increased by more than 32%. Between 1901 and 1911 the percentage rate of growth slackened somewhat to 17.5%, but this was still much higher than that of the country as a whole. The number of workers employed in the more advanced branches of machine making and general engineering increased by 22.9%. The growth of electrical engineering was also significant; in 1881 there were just 251 employees working in this branch, while in 1891 there were 2,126; in 1901, 7,917 and in 1911 15,761.¹⁵

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11. E. J. Hobsbawm, *Industry and Empire*, (Harmondsworth: Penguin, 1970), p. 109; Peter Mathias, *The First Industrial Nation, Second Edition*, (London: Methuen, 1969), p. 380; Various Firms' Engine Books, Bolton Library Local History Archive, ref. ZMU, ZWO and ZHH.
 12. H. Tyszynski, 'World Trade in Manufactured Commodities, 1890 – 1950', Manchester School of Economic and Social Studies, no. 19, 1951, quoted in Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 80.
 13. W. Mills, *Arms and Men*, (New York, New American Library, 1963) pp. 102 – pp. 102 – 103; Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p.14.
 14. Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 19.
 15. University of Manchester, *An Industrial Survey of the Lancashire Area (Excluding Merseyside)*, (London: HMSO, 1932), pp. 66 – 68.

Bolton

Although Bolton was well known as a producer of fine textiles, the borough was also an important centre of manufacturing engineering from the early years of the industrial revolution. By 1890, when the population of Bolton was 146,487, there were around 65 engineering companies operating in Bolton. About a third of these were iron founders, a third were general engineers, and a third were machine builders. By 1911 the population had risen to 180,851 and the number of engineering concerns had risen to 75, including 15 electrical engineers.¹⁶

One of the oldest engineering companies in the world, Dobson and Barlow, was founded in 1790 by Isaac Dobson (1767 to 1833) for the production textile machinery. The partnership of Isaac Dobson and Peter Rothwell built mules in Blackhorse Street, and by 1850 the firm had opened a larger factory in Kay Street which produced a much wider range of textile machinery. By 1860 the firm employed 1,600 workers and by the late 1880s they were producing between 600 and 650 looms a year.¹⁷ In 1892 Dobson and Barlow became a limited liability company and, after building a second production facility at Bradley Fold in 1906, it was re-floated as a public limited concern with members of the Dobson family holding key directorships. In 1913, the company employed 4,000 workers.¹⁸

John Musgrave and Sons, founded in 1839, produced steam engines at the Globe Works in Kay Street, 900 of which were built between 1841 and 1890. In 1864 one of the founder's four sons entered the textiles business, starting the Atlas Mill spinning concern on Chorley Old Road which, in 1899, became part of the Fine Cotton Spinners Association. Large numbers of Musgrave engines were exported to Russia, a country with which they remained particularly well connected until the early 1900s. Such was their success that by 1880 the Musgraves, with their engineering and cotton spinning concerns, were the largest ratepayer and employer of labour in Bolton borough and, when the Bolton Royal Infirmary was planned, they donated £5,000.00 towards its construction.¹⁹

Musgraves became a limited liability company in January 1881, and throughout the 1880s they expanded both sides of their business until, by 1894, the Globe Works employed around 1,000 workers. Shortly after the turn of the century, however, and for reasons that are not clear, the company began to experience financial difficulties. In 1902 the boiler making side of the business was relocated to Westhoughton, a small town about six miles from Bolton. Shortly thereafter, two of the Musgrave family members decided to set up a company in Horwich to manufacture porcelain sanitary ware, an enterprise which existed until the 1970s. By 1911 the Globe Works was again experiencing financial difficulties and this time the family decided to place the company into voluntary liquidation. A

16. Isaac Slater, *Slaters Directory of Lancashire*, 1890, Bolton Library Local History Archive; Isaac Slater, *Slaters Directory of Lancashire*, 1911, Bolton Library Local History Archive.

17. Owen Ashmore, *Industrial Archaeology of Lancashire*, (Newton Abbot: David and Charles, 1969), p. 248.

18. Dobson and Barlow, *A Brief History* published by the firm in 1927, Bolton Library Local History Archive ref. ZDB.

19. The level of importance which the firm placed on Russia can be measured by the generous donation made by members of the Musgrave family towards the building of the English Church in Moscow during one of their regular visits to that city. 'A Brief History of Musgraves', *The Flywheel*, September 1984, Bolton Library Local History Archive Ref. ZMU and press cuttings ref. 621/CTG; *Firms Engine Book*, Bolton Library Local History Archive Ref. ZMU - NRA 34860; Geoffrey Timmins, *Made in Lancashire, A History of Regional Industrialisation*, (Manchester: Manchester University Press, 1998), p. 237.

large proportion of the work force was paid off and a court appointed receiver attempted, unsuccessfully, to sell the company off as a going concern. Eventually, in 1913, a member of the family, Walter Martin Musgrave, stepped in with a proposal for financial reconstruction which the creditors accepted, and he was appointed chairman in the same year. Somewhat unusually for a nonconformist, Walter was an active member of the Conservative Party and an organiser of the Bolton branch of the Primrose league.²⁰

Remarkably, after 1902, the vast majority of Musgrave engines were built for local customers and while several were exported to Japan, only a few were sold to Russia and India. There is no evidence that the company attempted to design or build internal combustion engines before 1913, but there is an indication that at some stage they introduced steam turbines.²¹

John and Edward Wood began in 1837 as Stoddart and Knight, and then Knight and Wood. The firm started business in an ex-army barracks in Bolton which later became known as the Victoria Works, starting off as general engineers and specialising after 1850 in steam engines. Thereafter, Woods developed significant export markets in India and Russia, and the firm also had customers in China, Sweden, Egypt, Argentina, Portugal and Denmark. During the last decade of the nineteenth-century, around 40% of its production was exported. By the turn of the century, however, around 85% of their significantly reduced production went to customers in home market, with the rest going mainly to India. By May 1912, when the company employed just 300 workers, the proprietor Mr Henry Wood announced that the firm would cease trading; although the firm had no financial problems, 'Business was so bad.'²²

Hick, Hargreaves and Co. was founded in 1833 by Benjamin Hick, a close friend and associate of James Nasmyth, under the name Benjamin Hick and Son. Hick had earlier been a partner in Hick, Rothwell and Co., a producer of steam engines, which was later absorbed by the Bolton Iron and Steel Company, a manufacturer of steel products and forgings from early times, which was itself taken over by Henry Bessemer and Co. in 1906. Typically Hick, Rothwell and Co. were general engineers and made, among a wide range of equipment, steam engines and locomotives. When Benjamin Hick died in 1842 his son John Hick took over the business. In 1845 he went into partnership with William Hargreaves and the company became Hick, Hargreaves and Co.

John Hick became interested in politics in 1868, retiring from the firm when he was elected Conservative Member of Parliament for Bolton. Thereafter, William Hargreaves became sole proprietor until his death in 1889, by which time the company had established a sound reputation in Great Britain and in many parts of the world. In the mid 1880s, Hick, Hargreaves became associated with S. Z. de Ferranti in the reconstruction of the Grosvenor Gallery electricity generating plant, and in

20. Geoffrey Timmins, *Made in Lancashire, A History of Regional Industrialisation*, (Manchester: Manchester University Press, 1998), p. 237; 'A Brief History of Musgraves', *The Flywheel*, September 1984, Bolton Library Local History Archive Ref. ZMU.

21. Firms Engine Book, Bolton Library Local History Archive, ref. ZMU - NRA 34860; Drawings of machinery and parts (1890 to 1912), Museum of Science and Industry in Manchester, ref. 0281/1-2.

22. List of firm's customers, Bolton Library Local History archive, ref. ZWO; The Bolton Journal and Guardian, 31st May 1912, Bolton Library Local History Archive; The Bolton Journal and Guardian, 27th September 1912, Bolton Library Local History Archive.

1888, they supplied the prime movers for the Deptford Generating Station. These early connections with the power generation industry stimulated the design of complementary power station equipment which eventually allowed it to develop a broadly based business in a number of markets. In 1892 the firm incorporated as a limited liability company and immediately raised finance through a debenture, using the cash to double the size of the Bolton plant.²³

It is important to appreciate the nature of the firm's business at this time. Hick Hargreaves produced large items of machinery on a more or less bespoke basis. By the turn of the century they were offering a range of engines from which customers were encouraged to select the size and type most suited to their needs. For example, triple expansion engines were offered in three basic types and within each type there were eleven layouts and up to 23 sizes according to the required I.H.P. There were also various selections to be made regarding steam pressure. As a result of all these choices and alternatives an average quotation needed five separate sheets of optional extra equipment. Under such conditions the company could not possibly consider using mass production techniques.²⁴

Two significant developments took place between 1891 and 1913. The first of these seems to have happened quite suddenly after 1896, coincidentally the year of the engineer's strike, when the average size of steam engines produced at the Soho Iron Works increased significantly. This was followed in 1911 by the introduction of diesel engines into the firm's product range. These changes apparently coincide with the evolution of internal combustion engines manufactured by firms such as Gardner and Crossley. After 1902 Gardner's M-type engine, which was available in sizes from 5 to 220 bhp and could be fuelled by petrol, paraffin, oil or gas, was replacing steam engines in a wide variety of applications.²⁵

Thomas Ryder and Son was founded in 1865 by the brothers William and Thomas Ryder, who had been awarded a bronze medal for their forging machine at the great exhibition of 1851. Originally, and typically, the company initially offered a wide range of products and offered their services as general engineers, but by the 1870s William had set up a separate business in Bark Street as a producer of textile machines. Thomas Ryder's standard products included textile rollers and a range of solidly built centre lathes, sturdily designed and constructed with heavy cast iron beds and bases. Twice a week Thomas would travel to the Manchester Royal Exchange which was a meeting place for managers and proprietors of various companies where buyers and sellers of products and services

23. Geoffrey Timmins, *Made in Lancashire, A History of Regional Industrialisation*, (Manchester: Manchester University Press, 1998), pp. 222 – 223; Hick Hargreaves, '1833 to 1933 at the Soho Iron Works Bolton', Centenary Pamphlet, Bolton Library Local History Archive Ref. ZHH; John F. Wilson, *Ferranti: A History, Building a Family Business, 1882 - 1975*, (Lancaster: Carnegie, 2001), p. 182; Philip William Pilling, *Hick Hargreaves and Co. The History of an Engineering Firm c. 1833 – 1939*, Unpublished PhD Thesis, Liverpool, 1985, pp. 172 – 245.

24. See Philip William Pilling, *Hick Hargreaves and Co. The History of an Engineering Firm c. 1833 – 1939*, Unpublished PhD Thesis, Liverpool, 1985, pp. 118 – 167, also Appendix 9.

25. Philip William Pilling, *Hick Hargreaves and Co. The History of an Engineering Firm c. 1833 – 1939*, Unpublished PhD Thesis, Liverpool, 1985, Appendix 7, 118 – 167; David Whitehead, *Gardners of Patricroft*, (Oxford: Pergamon, Newman Neame, 1968), p. 14; Nick Baldwin, 'The Background', in Nick Georgano (ed.), *Britain's Motor Industry The First Hundred Years*, (Yeovil: Foulis and Company, 1995), p. 21.

came together. Here the company would learn about the requirements of their potential customers, refine their offers and finalise their contracts.²⁶

By 1906 Ryder had designed a special lathe for machining crankshaft journals for internal combustion engines, and a machine for turning piston rings. These machines complemented the firm's range of forging machines, presses, and metal forming equipment. In 1913, shortly before the First World War, Ryders became a limited liability company. By then the firm had begun to specialise in machine tools, particularly units with specific applications in the emerging automotive industry. Although the company continued to offer a range of standard machine tools as well as machining services, the firm's management had clearly identified the automotive industry as a potential area of growth.²⁷

Oldham

In the mid nineteenth-century Oldham was one of Lancashire's leading engineering towns. In the 1820s there were 32 engineering firms located there, and by 1910 five of these companies each employed over 2,000 workers. Their products were diverse by the standards of the day, ranging from textile machinery, sewing machines, steam engines, electrical equipment, and motor vehicles. Although the production of textile machinery was still the most important sector, Oldham's oldest companies were world leaders in their fields, and the newest firms were at the forefront of the emerging industries. Oldham's population in 1891 was 131,463 and by 1911 the town had 147,483 residents. By 1913 there were probably between 75 and 85 engineering firms established in Oldham.²⁸

Among several companies based on the cotton trade were the textile machinery makers William Bodden and Son, founded in 1858, and Asa Lees and Co., a firm that was started by Samuel Lees at the Soho Foundry in Forge Street, Greenacres Moor in 1816. Lees and Co. was thought to be the largest employer in the textile machinery industry in 1817, and by 1914 the firm employed around 3,000 workers. Buckley and Taylor, founded in 1899, was a late entrant into the steam engine sector of the engineering industry, using the designs of J.H. Tattersall of Preston. Woolstenhulmes and Rye also produced steam engines.²⁹

Bradbury and Company was the first company in Europe to manufacture sewing machines. Production began in 1852 at the Wellington Works and by 1887 the firm's annual output was between 26,000 and 30,000 units. They also produced machine tools, bicycles and motorcycles as well as

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26. Thomas Ryder & Sons, *Machines to Make Machines 1865 to 1968, a centenary booklet*, (Derby: Bemrose & Sons, 1968), passim, Bolton Library Local History Archive ref. 621/RYP.
 27. Thomas Ryder & Sons, *Machines to Make Machines 1865 to 1968, a centenary booklet*, (Derby: Bemrose & Sons, 1968), passim, Bolton Library Local History Archive ref. 621/RYP.
 28. *Commercial and General Directory of Oldham*, Worrall's, 1891; *Oldham and District Chamber of Commerce Annual Report*, Oldham, Hirst, Kidd and Rennie, (various years), Oldham Local History Library Archive; Geoffrey Timmins, *Made in Lancashire, A History of Regional Industrialisation*, (Manchester: Manchester University Press, 1998), p. 105; John K. Walton, *Lancashire a Social History, 1558-1939*, (Manchester: Manchester University Press, 1987), p. 207; S. B. Saul, 'The Mechanical Engineering Industries in Britain, 1860 – 1914', in Barry Supple (ed.), *Essays in British Business History*, (Oxford: Clarendon, 1977), pp. 31 – 48.
 29. Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 58; Geoffrey Timmins, *Made in Lancashire, A History of Regional Industrialisation*, (Manchester: Manchester University Press, 1998), pp. 197, 217, 236.

prams and children's toys. By 1890 the firm employed around 600 factory staff as well as a further 800 personnel in 60 depots. By 1898 Bradbury, although sewing machines continued to be the main product, a vigorous and sustained effort was made to enter the automotive industry and a prototype motor car and a range of motorcycles was developed. Although, for some reason, the firm's cars did not go into production, by the end of 1905, when the company employed around 1,500 workers, a wide range of motorcycles was available.³⁰

Originally known as Shepherd, Rothwell and Hough and later trading as the Oldham Sewing Machine Works, The Eclipse Machine Co., founded in 1872, was also a manufacturer of sewing machines as well as knitting machines and bicycles. Early entrants into the automotive industry, the company exhibited their first car at the Manchester Motor Show in 1897. In 1901, although they were still engaged in the production of sewing machines and knitting machines, the firm started Rothwell Cars. At around the same time the firm had started to make motorcycles and motor tricycles although only a few of these were made, the demand for four wheelers being far greater.³¹

Fred Rothwell, the second eldest son of one of the founders, had been sent to Heidelberg, Germany for part of his education. There, in 1897, he had seen, driven and eventually purchased a Benz Velo which was later shipped to Oldham. Using their experience as a producer for Edward Joel Pennington's proposed 'Raft-Victoria', and perhaps some of the stock of parts they were left with after the collapse of Pennington's enterprise, as well as some ideas garnered from the German vehicle they now possessed, the firm set about producing their own design. The Rothwell 'New Light Car with fully sprung suspension was announced in the 16th November 1901 edition of 'The Autocar'. Four Rothwell cars were exhibited at the Society of Motor Manufacturers and Traders first annual show to be held in Manchester in March 1904. In 1905 A. J. Adams, who had been Henry Royce's first design-draughtsman, joined the company. Adams had joined Royce in 1903 after spending some time in the USA and he probable brought with him a great deal of manufacturing expertise as well as his design skills. By 1910 the firm had established a good reputation at home and abroad and by 1914 between 500 and 600 Rothwell cars had been sold.³²

S. Z. de Ferranti was founded in 1883. Sebastian Ziani de Ferranti worked at Siemens as a research engineer before setting up in partnership as Ferranti, Thompson and Ince in 1882 to manufacture alternators. This company was wound up after about twelve months and Ferranti formed a new company in partnership with C. P. Sparks. In 1887 Ferranti was appointed by the London

30. *Commercial Year Book of the Oldham Chamber of Commerce*, (Derby, Bemrose and Sons, 1918) pp. 69 – 76, Oldham Local History Library Archive; also, 'Bradbury Sewing Machines and Motorcycles', <http://website.lineone.net/~lindave/bradbury.htm> (Internet source); S. B. Saul, 'The Mechanical Engineering Industries in Britain', 1860:-1914, in Barry Supple (ed.), *Essays in British Business History*, (Oxford: Clarendon, 1977), p. 46.

31. Owen Ashmore, *Industrial Archaeology of Lancashire*, (Newton Abbot: David and Charles, 1969), pp. 95 – 96; Nick Georgano, 'The Background', in Nick Georgano (ed.), *Britain's Motor Industry The First Hundred Years*, (Yeovil: Foulis and Company, 1995), p. 19.

32. The Benz Velo had been remodelled in 1897 in a 'leichte Baureihe', Paul Simsa, 'Anlauf in Cannstatt', in *Mercedes-Benz in Aller Welt*, (Stuttgart: Daimler-Benz, 1986), p. 21; J. H. Schofield, 'Oldham Studies No. 1', (Oldham: A Local Interest Publication, 1978), Manchester Museum of Science and Industry Archive, Rothwell Cars General File; Nick Georgano, 'An Industry Gets Under Way', in Nick Georgano (ed.), *Britain's Motor Industry The First Hundred Years*, (Yeovil: Foulis and Company, 1995), pp. 24 – 25.

Electric Supply Corporation to design and build the Deptford Generating Station and by 1889 the firm had become a limited liability company based in London. In 1896 Ferranti moved to Hollinwood, Oldham where a production facility was erected for the manufacture of various items including steam engines, alternators and dynamos.³³

By 1897 it had become clear that the costs of setting up the Hollinwood plant had far exceeded the initial estimates. Cash flow problems became so acute that some suppliers were withholding deliveries, forcing the company to take out a secured overdraft. The overdraft facility was, however, soon exhausted creating a further crisis in 1898 when more cash was raised through the sale of debentures. A merger with T.I. Wire was considered but this fell through and financial reconstruction followed in 1901 when the company changed its name to Ferranti and offered shares on the open market. The initial issue of 120,000 £1.00 nonvoting preference shares largely failed to attract investors and at the end of 1902 Ferranti was obliged to offer 41,000 ordinary shares to private investors.³⁴

By September 1903 the company was again experiencing financial difficulties, this time of such elemental proportions that, at the instigation of the debenture stock holders, it was placed into receivership. The receiver appointed management, which comprised two chartered accountants, immediately rationalised the product line and severely curtailed expenditure on new product development. The latter measure annoyed Ferranti and brought him into conflict with the receiver-managers who, because of their court awarded powers, took steps to limit the former owner's influence. After another financial reconstruction Sebastian de Ferranti's position was reduced to director and technical advisor after which he took a far less active role in the running of the business.³⁵

Between 1905 and 1913 Ferranti's new management improved the firm's financial position, concentrating on marketing those aspects of the product range which were capable of returning a profit. By 1907 the considerable losses of 1903 had been reversed and by 1913 the company employed 1,752 workers. A domestic appliance division was formed in 1912 for the production of electric ovens and fires.³⁶

Platt Brothers and Co. was founded in 1822 by Henry Platt and Elijah Hibbert. Hibbert, Platt and Sons evolved from an assembler of parts manufactured by other suppliers to a fully integrated manufacturer in its own right. In the early 1850s, after the company changed its name to Platt Brothers and Company, the firm began to manufacture looms mainly for export and by the mid 1850's it was reputed to be the largest engineering company in the world. In 1868 the firm became a limited liability company under the chairmanship of John Platt and by 1871 the labour force had grown to 7,000. By 1890 the company employed 12,000 and were producing around 2,300 power looms a year and by

33. John F. Wilson, *Ferranti: A History, Building a Family Business, 1882 - 1975*, (Lancaster: Carnegie, 2001), pp. 125 – 140.

34. John F. Wilson, *Ferranti: A History, Building a Family Business, 1882 - 1975*, (Lancaster: Carnegie, 2001), pp. 125 – 140.

35. John F. Wilson, *Ferranti: A History, Building a Family Business, 1882 - 1975*, (Lancaster: Carnegie, 2001), pp. 125 – 140; see also G. Turner, *Business in Britain*, (London: Eyre and Spottiswoode, 1969), p. 325.

36. John F. Wilson, *Ferranti: A History, Building a Family Business, 1882 - 1975*, (Lancaster: Carnegie, 2001), p. 176.

the late 1890s the number of employees had reached an all time maximum of 15,000. At this time the company was at the forefront of technological innovation and their plant in Oldham was the most highly mechanised of its kind. Platt systematically improved the technique of cotton spinning and perfected the carding machine, the roving frame and the self-acting mule.³⁷

Between 1900 and 1913 the volume and value of world exports of textile machinery more than doubled, but British made equipment peaked in 1908 and Platt's share of British exports fell during this period from 12.4% to 7.8%. In response to the increased competition from both British and foreign competitors, Platt began a study of its rivals and from 1907 a file was compiled regarding their financial performance. By 1908 the number of employees had fallen to pre 1890 levels but in 1912 the company still employed around 13,000 personnel. Between 1910 and 1914 Platt produced and exported between 3,339 and 5,588 power looms a year. Always an exporting business, these figures represented an average export ratio of 97.6%.³⁸

Summary and Conclusions

British politics between 1890 and 1913 had little to do with British industry, particularly following the Liberal party's landslide victory in 1906. After then, the free marketers prevailed and no tariff protection was introduced apart from a modest tax on large motor cars, apparently to protect British petrol engine builders. Much of the reformist legislation enacted between 1906 and 1914, including the introduction of fair wage clauses, trade boards and labour exchanges, has been described as 'socialistic', and the Liberal version of the free market included the freedom of labour to combine and organise.

By the turn of the century some politicians were expressing concern about the growth of foreign competition. During Salisbury's ministry a number of politicians, chief among them Joseph Chamberlain, were in favour of protective tariffs. Chamberlain suggested that Germany and the USA were 'dumping' goods in Britain in order to undermine the manufacturing sector and, unless something was done, Britain would become denuded of industry. He may well have had a point but it was inevitable that, as other countries began to industrialise, Britain would lose its predominance in manufacturing and trade. Later entrants have the advantage of starting out with the latest ideas whereas the originator is encumbered with outdated but not yet amortised equipment.

Technical and scientific education was seen as by some as being a remedy for Britain's perceived decline in engineering pre-eminence and many technical colleges and mechanics institutes were built, often by the larger firms. However, not everyone however agreed. In 1897 – 1898 the engineering employers locked out members of the Amalgamated Society of Engineers who, the employers claimed, were interfering with '*...the freedom to manage their own affairs which has proved*

37. John K. Walton, *Lancashire a Social History, 1558-1939*, (Manchester: Manchester University Press, 1987), p. 206; D. A. Farnie, 'The Marketing Strategies of Platt Bros. and Co. Ltd of Oldham, 1906, 1940', *Textile History*, 24 (2), 1993, pp. 147 – 161; Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 58; S. B. Saul, 'The Mechanical Engineering Industries in Britain, 1860:-1914', in Barry Supple (ed.), *Essays in British Business History*, (Oxford: Clarendon, 1977), p. 33.

38. D. A. Farnie, 'The Marketing Strategies of Platt Bros. and Co. Ltd of Oldham, 1906, 1940', *Textile History*, 24 (2), 1993, pp. 147 – 161.

so beneficial to the American manufacturer'. The lockout ended in a victory for the employers and resulted in the Engineering Trades Agreement which handed control of basic working conditions to the employers including, implicitly, the number and role of apprentices.³⁹

There is evidence that, after 1898, instead of training them to become proficient engineers, some firms were using apprentices as a source of cheap labour. When training was provided it was only in those aspects of the craft which were of immediate use to their current employer, leading to a reduction in the quality and adaptability of skilled workers. Skilled fitters were diluted to machine assemblers and skilled turners downgraded to machine minders. Companies like Platt, who derived a short term advantage through lower wages, later acquired a reputation for poor quality and second grade equipment.⁴⁰

Even at its peak Platt's output levels were by no means approaching mass production and, even at 30,000 units a year, Bradbury's sewing machine business was barely in that category. The introduction of Technical Colleges by the Conservatives under Robert Cecil indicates that there was at least some recognition of the need for skilled craftsmen but the lockout was an effort by some employers to force down the cost of skilled labour which subsequently produced a low wage economy. The combination of low wages and poor standards in training would have serious consequences for the industry in later years.

If, by 1890, the age of steam was drawing to a close there were several Lancashire engineering firms which were either adapting to the new forms of technology or coming into being because of it. Electricity, internal combustion engines, motor vehicles and aircraft were being produced before the First World War and although some old technology companies faded away after the turn of the century these were quickly replaced by new enterprises. The structure of the manufacturing engineering industry was not, as some historians suggest, flawed at this time.⁴¹ Britain's markets were not confined to the empire but embraced practically every part of the world, including Europe. Russia was a potentially huge market for British engineering products and there is much evidence to show that Lancashire's industries were aware of the possibilities for trade with that country. South America was another vast area where Lancashire firms did well. Exports of engineering products were increasing throughout the period, new companies were appearing and new products were being developed.

Only in the area of specialist machine tool builders were there signs of reluctance to develop. Between 1900 and 1913 and after, British engineering seems to have relied heavily on machine tools imported from America. Export statistics indicate that, by 1913, both Germany and the USA were exporting far more machine tools than Britain but these figures may well be somewhat misleading. The

39. Donald MacRaild and David E. Martin, *Labour in British Society, 1830 - 1914*, (London: Macmillan, 2000), p. 160; Carter L. Goodrich, *The Frontier of Control*, (London: Pluto Press, 1975), p. 57.

40. S. B. Saul, 'The Mechanical Engineering Industries in Britain, 1860:-1914', in Barry Supple (ed.), *Essays in British Business History*, (Oxford: Clarendon, 1977), p. 46.

41. See, for example, D. F. Channon, *The Strategy and Structure of British Enterprise*, (Boston: Harvard University Press, 1973), passim; M. Wiener, *English Culture and the Decline of the Industrial Spirit, 1850 - 1980*, (Cambridge: Cambridge University Press, 1981), passim; Correlli Barnett, *The Audit of War: the illusion and reality of Britain as a great nation*, (London: Macmillan, 1986), passim; Correlli Barnett, *The Lost Victory, British Dreams, British Realities 1945 - 1950*, (London: Macmillan, 1995), passim.

rapid rise in exports of British made engineering equipment during the same period would have created a strong market for machine tools here, absorbing not only the majority of home production but also a significant quantity of imports.

One serious threat to Lancashire's engineering industry was the fact that many of its established firms were still in the hands of the descendants of their founders. Unfortunately, to some second or third generation owners, the factory was thought of as the provider of revenue and there was a tendency to use profits to maximise the owner's social position or to invest in gilt-edge stocks. This could deprive the business of capital at times when a crucial change of pace or direction was needed to remain competitive. The need to 'modernise' was often seen as secondary to the much easier alternative of driving down the cost of labour, an attitude which had been the curse of British management. *'Why scrap a perfectly good machine that was superbly made, lovingly maintained and for which the machine makers still had possessed a complete stock of all its parts? How long these machines lasted was one of the finest tributes to British Engineers and one of the worst indictments of British industrialists.'*⁴²

Bolton's engineering industry was well established by the turn of the century, but shortly thereafter problems began to arise for some of its oldest firms. Both Musgraves and Woods would have suffered from the sociopolitical upheavals taking place in Russia after 1905, as well as from the development of internal combustion engines. Although the Musgrave family had developed a diversified business they were not immune to changes in technology and markets and it was probably the firm's status as a public limited company which saved it from extinction at that stage. Neither of these firms appears to have attempted to introduce internal combustion engines and Woods, which had remained a family owned firm, decided to forego making the investment necessary for it to survive.

Hick, Hargreaves, on the other hand, had succeeded in broadening the scope of its markets both by entering the growing field of power generation and by the adding diesel engines to its product range. The firm had apparently returned to its pre 1850s foundations as a producer of modern engineering equipment and avoided the pitfalls of being designated simply as steam engine builders. Never a mass producer, Hick, Hargreaves also retained as its most valuable asset, which was its ability to design and build items of engineering precision and excellence.

One of the few Lancashire engineering companies to specialise in the machine tool sector, Thomas Ryder and Son was well set to exploit its unique position in relation to the region's growing automotive industry. Still with a foothold in general engineering, the company utilised its experience as a quality machine tool builder and its evidently close relationship with Fords to develop American style special purpose equipment. Bolton's oldest engineering company, Dobson and Barlow, on the other hand was apparently locked into a market which was becoming more competitive both at home and abroad. Its strength as a highly specialised producer of textile machinery was also its weakness in as

42. Mathias, Peter, *The First Industrial Nation, An Economic History of Britain 1700 - 1914, Third Edition*, (London: Methuen, 1983), p. 385.

much as its manufacturing facilities were suitable only for the production of this type of equipment and the skills of its labour force had been either diluted or downgraded through such overspecialisation.

Oldham's engineering industry was larger and more diversified than that of Bolton but its largest single company was totally dependent on the textiles industry. Platt Brothers' business had the same weaknesses and faced the same threats as Dobson and Barlow with whom they were in fierce competition by 1913, as were Asa Lees, another large Oldham firm. Between them these three companies alone employed around 20,000 workers and they were by no means the only textile machine makers in Lancashire with employment levels of over 2,000. By 1900 the world's largest textile machinery manufacturer was an American company, an unremarkable development considering the size and phenomenal growth of the US population at that time. Nevertheless, in 1913, Britain's textile machinery exports were worth nearly twenty-eight times as much as the USA's and nearly three times as much as Germany's, and Platt main competitors at that time were mainly Lancashire based companies.⁴³

Remarkably few records have survived relating to the activities of two of Oldham's most diversified manufacturing engineering firms. After 1900, Bradburys were reducing their reliance on the sewing machine market through diversification, and the Eclipse Machine Company had achieved some success in the motor car industry. Both firms were experienced in mass production techniques and by 1913 they were probably set to realise the fruits of previous years work in the development of cars and motorcycles.

Sebastian Ziani de Ferranti's creative genius was adversely affected by his lack of commercial awareness and his apparent inability to work with others as equal partners. Ferranti took out no less than 86 patents between 1882 and 1913, but very few of these were commercially developed, at least not by him. Neither the Grosvenor Gallery nor the Deptford generating stations were completed under Ferranti's supervision and the projected costs of both schemes were seriously exceeded. Although Ferranti was not actually discharged by the London Electricity Supply Company, the fact that his contract was not renewed and the alleged deterioration of his relationship with senior LESC directors suggest that their parting was not amicable. For a few years, following the Deptford episode, Ferranti concentrated on producing and supplying electrical equipment for power stations, seemingly profitably. The move to Hollinwood was based on Ferranti's perceived dissatisfaction with British steam engine builders, and his desire to be in control of every aspect of power generation contracts. Further vertical integration, including a foundry and a pattern shop, indicates Ferranti's predilection towards personal micromanagement.

Ferranti's profligacy, his lack of regard for commercial constraints and his autocratic style of management brought his company into successive financial crises. His most serious failure was his almost total disregard for the market and his insistence on maintaining a product oriented business. If Sebastian Ziani de Ferranti could have been persuaded to concentrate on innovation, leaving the

43. D. A. Farnie, 'The Marketing Strategies of Platt Bros. and Co. Ltd of Oldham, 1906, 1940', *Textile History*, 24 (2), 1993, pp. 147 – 161; Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 147; S. B. Saul, 'The Mechanical Engineering Industries in Britain, 1860:-1914', in Barry Supple (ed.), *Essays in British Business History*, (Oxford: Clarendon, 1977), p. 32.

financial administration of the firm to more commercially minded managers, there is no doubt that the company would have developed into a major force in the emerging electrical engineering industry. As it was, while he appears to have embodied the firm's most potent strength, he was also its most serious weakness as well as its most dangerous threat.⁴⁴

44. Philip Kotler, *Marketing Management: Analysis, Planning and Control*, Fifth Edition, (Englewood Cliffs: Prentice-Hall, 1984), pp. 47 – 48.

Chapter 2, 1914 to 1938

Politics

As war broke out an initial proposal for the requisition of the larger arms industries was rejected by the government on the basis that the production of munitions would be undertaken by private industry. However, when Lloyd George visited the Woolwich Arsenal where he saw shells being filled by hand, he realised that modern warfare was one of the machine, both on and off the battlefield. *The Times* headline on May 14th 1915 blazed 'Need for Shells: British Attacks Checked: Supply Cause'. As a result, Herbert Asquith's government collapsed and a new Ministry of Munitions was created in May 1915 with Lloyd George at its head. Thereafter, production of shells increased from half a million in 1914 to 76 million in 1917, with comparable increases in the output of heavy artillery, machine guns, and explosives. 'Business as usual' was abandoned and all available resources and manpower were utilised to equip the army with the means to conduct modern warfare in France, and to become the arsenal for the weaker industrial allies in the war, Russia and Italy. During the conflict, the British companies' profits, although controlled, were enormous.⁴⁵

Arms and munitions were normally produced by skilled craftsmen but it soon became clear there simply were not enough to fill the number of jobs created by the war and even unskilled male workers were in short supply due to the vastly increased size of the army. The Munitions of War Acts of 1915 and 1916 gave the government powers to enforce dilution and to suspend restrictions on the employment of women. The Act also required labour disputes to be settled through arbitration and banned strikes for the duration of the war. Wages and prices were fixed and labour relations were controlled. There were also various Military Service Acts and the development of a system of reserved occupations. Thus, government control of industry was almost total and was not restricted to arms production and food.⁴⁶

In 1915 the so-called McKenna duties of 33.3% were applied to imports of some products, and the Safeguarding of Industries Act of 1921 placed a 33.3% *ad valorem* duty on competitive imports of certain strategic industries. Before the war there had been 120 private railway companies in Great Britain, but the Railways Act of 1921 compelled them to merge into four regional groups. Other legislation between 1934 and 1937 attempted to attract industry into areas which were defined as being particularly depressed. The scheme was only partially successful, however, and unemployment in the designated areas remained much higher than in the rest of the country.⁴⁷

The idea of Imperial Preference, first mooted by Joseph Chamberlain in the 1890s, was established after the Ottawa Agreements of 1932. The general idea was that imports of food and raw materials from the dominions would be exempt from duties, while they would give preferential tariff treatment to British manufactured goods. In 1932 the Import Duties Act placed a general 10% tariff on

45. Allen Skuse, *Government Intervention and Industrial Policy*, Third Edition, (London: Heinemann, 1972), pp. 21, 27; Peter Dewey, *War and Progress, Britain, 1914 – 1945*, (London: Longman, 1997), pp. 27, 38.

46. Allen Skuse, *Government Intervention and Industrial Policy*, Third Edition, (London: Heinemann, 1972), pp. 21, 27; Peter Dewey, *War and Progress, Britain, 1914 – 1945*, (London: Longman, 1997), pp. 25 – 27.

47. A. E. Musson, *The Growth of British Industry*, (London: Batsford, 1978), p. 287; Peter Dewey, *War and Progress, Britain, 1914 – 1945*, (London: Longman, 1997), p. 76.

most imports with the exception of produce from the dominions and colonies. The British Iron and Steel Federation was set up in 1934 and the protective tariff on iron and steel imports was raised to 50%. These measures reinforced the existing bias of British export trade towards the empire, a natural and prudent outlook considering the degree of protectionism being exercised by Germany and other competitor nations at the time. In 1938 around half of Britain's exports of electrical engineering products went to India, Australia, South Africa and New Zealand.⁴⁸

In 1922 the engineering employers locked out the members of the newly formed Amalgamated Engineering Union, again over questions of apprentices, and pay and conditions for skilled workers, and again the engineers suffered a crushing defeat. Instigated by the employers, the episode can be seen as a result of munitions work dilution during the war. An immediate effect was to make widespread the practice of dismissing journeymen as soon as they had completed their apprenticeship and qualified for skilled wages, a development highlighted in a report published in the August 1929 edition of the AEU journal. Samuel Frith, a union official, had attended a Central Conference during which a case which concerned youths employed at Howard and Bullough of Accrington, a large firm of textile machinery manufacturers, was discussed. It was alleged that the firm was sacking young men as they reached the age of 21 because they did not want to pay the adult wage. *'These youths are only paid the apprentice rates during the time up to 21 years of age, and we hold that if youths are not serving apprenticeship to a skilled trade then they ought to receive much more than the apprenticeship rate during the whole time, from them starting, to becoming 21 years of age.'* Clearly it was cheaper to employ youths as 'apprentices' than to employ them as unskilled or semiskilled workers.⁴⁹

Technology

Other than the great advances made in powered flight there were few significant developments in the field of mechanical engineering as such between 1914 and 1918. Although there were some improvements in manufacturing methods, mainly in order to facilitate the use of unskilled labour, these were applied to the mass production of munitions, and companies that were not normally mass producers derived little if any benefit from such developments. Even those companies which were able to produce more or less their normal products were directed by the Ministry of Munitions to supply such products within strictly limited parameters which gave the end user little or no choice or selection. The infant British automotive industry had, outside of military vehicles, practically stagnated during the conflict. The more traditional branches of engineering, including textile machine builders and manufacturers of steam prime movers, discovered that their markets were being captured by competition from new technology and new entrants.⁵⁰

48. Allen Skuse, *Government Intervention and Industrial Policy, Third Edition*, (London: Heinemann, 1972), pp. 27 – 28; Peter Dewey, *War and Progress, Britain, 1914 – 1945*, (London: Longman, 1997), pp. 222 – 224, 227.

49. W. R. Garside, 'Management and Men: Aspects of British Industrial Relations in the Inter-War Period', in Barry Supple, *Essays in British Business History*, (Oxford: Clarendon, 1977), pp. 252 – 253; Jim Ainsworth, *Accrington and District 1927 - 1934, The cotton Crisis and the Means Test*, (Accrington: Hyndburn and Rossendale Trades Union Council, 1997), p. 211.

50. Peter Dewey, *War and Progress, Britain, 1914 – 1945*, (London: Longman, 1997), pp. 99 – 100; D. G. Rhys, *The Motor Industry: An Economic Survey*, (London: Butterworths, 1972), pp. 10 – 11.

Markets

During the conflict exports of British engineering products fell in terms of value to around 50% of their 1913 levels. Few of the traditional markets were available to manufacturers of non-military equipment mainly because virtually all production capacity was employed in war work. Not only was it practically impossible to maintain supplies of non-military equipment, but it would have been just as difficult to obtain the raw materials with which to manufacture them. It is not surprising that the years of war gave rise to the emergence of local producers in dominion and commonwealth countries.

When no agricultural machinery could be imported and parts were difficult to obtain the Voigt Voortrekker Oil Engine was designed and built in the South African town of Paarl by Wilhelm Voigt, a German born engineer. After the war Voigt continued to make machinery for the wine industry as well bicycles and a range of equipment which had previously been imported from Britain. In 1913 the Canadian firm Massey-Harris purchased the American Deyo-Macey Engine plant in Binghamton, New York. 1916 they shipped the complete Deyo-Macey plant to Toronto and by the end of the war the firm had become a major supplier of stationary engines. After 1918 the company developed into a major exporter of diesel engines and agricultural machinery.⁵¹

The British Empire remained intact after the First World War and was slightly enlarged through the acquisition of German colonial territories in Africa. The disarray of Germany's industries allowed British manufacturers to penetrate European markets, but by the mid 1930s Germany had re-established herself as a major exporter of high precision machine tools, and by 1937 Germany had overtaken Britain in exports of machinery and transport equipment.⁵²

World economic factors beyond the control of individual companies governed the development of markets in which an advantage was created either by protection or by tacit agreements with competitors. The empire and dominions were a natural attraction for British manufacturers, particularly after the Ottawa Agreement, and the development of international cartels reinforced this bias at the expense of the more advanced European and North American markets. Russia's potentially huge markets, with which many British companies had developed strong contacts, had disintegrated after the 1917 revolution and would not re-emerge until after the Second World War.

Competitors

Between 1914 and 1918 French and German production facilities were, like those of Britain, almost totally given over to the manufacture of arms. In Germany, Wanderer produced thousands of bicycles and motorcycles for the German army, Horch made mainly munitions, DKW produced

51. Arthur D. Wilding, 'Stationary Engine News', http://www.veteranfarmer.com/issue_20; see also http://www3.sympatico.ca/watership_down/MasseyRegistry.htm ; 'Massey Harris Buys Another US Plant, Branches Out Into the Gasoline Engine Business, Planned Canadian Factory, Will Undertake to Manufacture Gasoline Engines in Canada This Year, Taking Over the New York Plant in the Meantime.', *The Globe*, Toronto, Monday, March 17th 1913; Parenthetically, Massey Ferguson changed its name to Varsity in 1986 and moved to the USA.

52. Derek H. Aldcroft and Harry W. Richardson, *The British Economy, 1870 – 1939*, (London: Macmillan, 1969), p. 75.

munitions and also tried to develop a steam driven vehicle, and Audi produced munitions and collaborated with the German army on developing tracked vehicles and armoured cars.⁵³

After the war the German economy suffered severe inflation which affected the middle classes so that German car manufacturers tended to concentrate on small, cheaper cars. American car manufacturers, including Ford and General Motors, penetrated the German market via assembly plants and acquisitions to the extent that American vehicles held 40% of the German market by the end of the 1920s. By 1924, the flow of American capital into Germany stimulated the economy of the Weimar Republic and German industry was able to re-establish its dominance in some of its traditionally strong areas such as motor vehicles and machine tools. Further American competition evoked a period of industrial concentration with mergers and take-overs reducing the number of German owned vehicle builders from around 71 in 1924 to 19 in 1928. Once the full effects of the Wall Street Crash had been felt, this number fell further to 12. The exposure to American competition forced German manufacturing engineering companies to seek products and markets in which they could develop. Thus, as a response to American strengths in the area of scale intensive production, German manufacturers tended to concentrate on skill intensive products, particularly machine tools.⁵⁴

During the war, American companies were able to take advantage of the absence of their main competitors in the traditional export markets, and they were also in a position to supply equipment to the European allies on a commercial basis. Even after the USA entered the war American forces were supplied mainly by private firms whose profits were, if anything, even larger than British companies. By the time Imperial Preference had been established, British manufacturers were being squeezed between American mass produced products on the one hand, and by German high precision engineering expertise on the other.

Lancashire

Shortly after the war the number of people employed in all branches of engineering in Lancashire was around 200,000. In 1923 Lancashire's general engineering industry employed 91,414, but by 1931 this number had fallen to 54,579, whereas employment in the electrical engineering sector grew from 13,770 to 16,796 over the same period, and employment in the motor vehicles and engines sector grew by 6.70%. Although there were difficult times in Lancashire during the 1930s, there were other areas of Britain which were more deeply affected by the world economic depression. Central Scotland, Wales, West Cumberland, Tyneside and parts of Durham were designated special areas for which commissioners were appointed with powers to grant financial support in the form of subsidised rents, rates and taxes as well as the authority to award government contracts and to attract foreign companies. It is probable that Lancashire lost at least some investment because of this government intervention.⁵⁵

53. Audi AG, *A History of Progress*, (Munich: Audi Info-Service, 1992), pp. 38 – 39.

54. Audi AG, *A History of Progress*, (Munich: Audi Info-Service, 1992), p. 43.

55. Board of Trade, 'An Industrial Survey of the Lancashire Area (Excluding Merseyside)' (London: HMSO, 1932), p. 148; A. E. Musson, *The Growth of British Industry*, (London: Batsford, 1978) p. 287.

Bolton

By 1921, the population of Bolton had fallen from its pre-war peak to 178,683, although the number of engineering companies remained at more or less the same level as at the turn of the century. Significantly however, the number of electrical engineers had increased to 21 and the number of general engineers was also slightly higher at 28. There were eleven machine makers, six of which were classified as textile machine specialists, as well as a solitary motor vehicle manufacturer; Walter Hilton, makers of the 'Mab-Jap' motorcycle. Throughout the 1930s, the number of engineering firms in Bolton remained fairly static at between 65 and 70. By 1938, although the population of Bolton had fallen slightly, the number of engineering firms remained the same, although by then the borough's sole motorcycle manufacturer seems to have vanished.⁵⁶

During war, Dobson and Barlow became one of the most important manufacturers of munitions in the region, producing a wide range of equipment including Mills No. 5 hand grenades, artillery shells, field kitchens, engineer's carts, naval mines, and search lights. As well as the significant disruption to their normal activities caused by munitions production, some 1,600 male employees had volunteered for the armed forces. Between 1918 and 1921 a large number of orders were received from Belgian and French textile producers who were re-equipping and refurbishing their factories after the devastation of the war. The firm's activities at this time included the design, erection and equipping of complete textile production plants on a 'turnkey' basis, services in which several of their competitors were also engaged, and many such projects were completed in the Indian subcontinent during the 1920s and 1930s. After 1931 Dobson and Barlow were incorporated into the Textile Machinery Makers cartel and lost much of its independence thereafter.⁵⁷

In July 1915, the Westhoughton boiler plant of John Musgrave and Sons was acquired by the Admiralty and re-equipped to manufacture naval guns. At that time around 200 employees were working there, and it was anticipated, fallaciously, that 'hundreds more' jobs would eventually be created. In August 1920, ordinary shares in the firm were being offered on the open market, but by December 1924 the company was again experiencing serious financial problems. An announcement shortly thereafter that insufficient cash was available to meet the next weekly wages bill of £3,000.00, prompted the shareholders to appoint official receivers who were successful in securing temporary relief by means of a restructuring agreement which raised £5,000.00 in cash from the debenture holders. The business continued to trade for a further two years, but by March 1927, when the number of employees had fallen from the 1918 peak of around 1,200 to just 250, it was announced that the

56. *Bolton and District Directory and Buyers Guide*, (Walsall: F. F. Cope and Co., 1921), Bolton Library Local History Archive; *Bolton and District Directory and Buyers Guide*, (Walsall: F. F. Cope and Co., 1934), Bolton Library Local History Archive.

57. Dobson and Barlow, a short history of the firm published in 1927, Bolton Library Local History Archive ref. ZDB; see also Bolton Library Local History Archive ref. ZDB, NRA 27108 Dobson and Barlow.

business would be run down. The firm finally closed in December 1927, when Galloway's of Manchester acquired Musgrave's goodwill, designs and drawings.⁵⁸

During the war, Hick Hargreaves and Company produced mines, shells, and recoil gear for 18 pounder quick firing guns as well as military equipment more in line with their peacetime activities, such as oil engines for submarines. Although large sections of the firm's factory were adapted for their production, peacetime market activities were not entirely suspended. Power generation equipment, such as two-stage steam jet air ejectors, and high vacuum condensing plant, both introduced in 1916, would prove to be an advantage once the conflict had ended. After the war Hick Hargreaves continued to develop its wide range of power generation related products, many of which had applications in various diversified process industries, a strategy that enabled the firm to maintain its leading position in the field of power generation equipment, and facilitated entry into other markets. Their position benefited from the establishment of the Central Electricity Generating Board in 1926, after which larger and more efficient power stations began to replace many small, privately run electricity supply companies. Hick, Hargreaves became a major supplier to the CEGB, and probably for this reason they did not suffer the hardships of the 1930s which forced many other British engineering companies to choose between merger and collapse. By 1933 Hick Hargreaves had purchased the complete records, drawings and patterns of John and Edward Wood and John Musgrave and Sons, and Galloways, all of which were by then defunct. For many years thereafter, the supply of replacement parts and technical services for the large number of existing engines delivered by these three companies ensured a steady income.⁵⁹

Thomas Ryder and Son began war work with the production of shell fuses, for which their textile roller production department, staffed mainly by women operating small, single purpose lathes, was particularly suitable. After the firm's designers introduced improvements to their existing equipment, which greatly increased the efficiency of fuse production, the Ministry of Munitions directed the company to concentrate on the design and production of special machine tools. Ryder lathes were installed in many workshops throughout Great Britain, and a significant number were shipped to empire and dominion countries. During the early post-war years, a marked decline in the market for Ryder's machine tools obliging the company to revert to general engineering as a strategy for survival. In the early 1920s the firm employed around 150 personnel, probably less than half the wartime number. During this time they took on almost any kind of work including subcontract machining and the production of parts for textile machinery, and the refurbishment of road vehicles – including the purchase, renovation and reselling of second-hand Standard cars.⁶⁰

58. (Presumably, after 1915 Musgraves purchased boilers from Galloways.) Bolton Library Local History Archive ref. ZDB, NRA 27108 Dobson and Barlow; The Bolton Journal and Guardian, 9th July 1915, 6th August 1920, 5th December 1924, 18th March 1927, 23rd December 1927, Bolton Library Local History Archive.

59. Hick Hargreaves, '1833 to 1933 at the Soho Iron Works Bolton', Centenary Pamphlet, Bolton Library Local History Archive Ref. ZHH; 'Unveiling of Plaque Commemorating Benjamin Hick', Hick Hargreaves and Company, Historical Notes, statement to the press, 27th October 1982, Bolton Library Local History Archive Ref. ZHH; see also Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 181.

60. Thomas Ryder & Sons, *Machines to Make Machines 1865 to 1968, a centenary booklet*, (Derby: Bemrose & Sons, 1968), passim, Bolton Library Local History Archive ref. 621/RYP.

By the end of the 1920s, in common with many other British engineering concerns, Ryder was experiencing severe cash-flow problems, had very little work and was close to bankruptcy. In 1931, the firm received an order from Ford, which had by then moved to Dagenham, for six special purpose lathes. This probably saved Ryder from extinction, and further Ford orders helped the company to survive the severe slump following the Wall Street crash. For the rest of the 1930s Ryder continued to specialise in the design and supply of special-purpose machine tools, as well as in the production of textile rollers. The firm's expertise in these areas meant that, as rearmament began, Ryders were awarded government contracts for the supply of automatic lathes and other machine tools for shell production.⁶¹

Oldham

An indication of Oldham's industrial firms' confidence that there would soon be a return to normal trading after the end of the First World War can be perceived by the scope and quality of the Commercial Yearbook published by the Oldham Chamber of Commerce in 1918. Not only is this publication superbly printed, using several high quality colour plates, it is also translated into French, Spanish and Russian. By 1921, the population of Oldham, which had reached its peak shortly before the outbreak of the First World War, had fallen to around 145,000, and ten years later it had fallen again to 140,314. During the same period, the number of engineering firms changed only slightly.⁶²

During the war Bradbury and Company supplied motorcycles and bicycles to the British forces. They probably also supplied machine tools to munitions factories and in all likelihood produced munitions themselves. After the war the company reintroduced its range of sewing machines and other products, but by the end of 1923 they were experiencing financial problems and it is believed that all production ceased around this time, and Bradburys was officially dissolved in May 1929.⁶³

The last Rothwell car was built in 1915, after which the plant was converted to a munitions factory for the production of shells and grenades. Practically nothing is known of the reasons for the firm's sudden closure but it is evident that, following the conflict, its owners were either unable or unwilling to return to peacetime production. Rothwell finally closed in 1919.⁶⁴

The Ferranti plant was extensively re-equipped and extended following an initial contract to manufacture shrapnel cases for Vickers. In September 1915 the War office financed the construction of additional floor space and the purchase of machine tools for the production of shells and fuses. American built automatic machine tools were installed, mass production techniques were adopted and the company's turnover and gross profit more than doubled for the remainder of the conflict. Exports of

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61. Thomas Ryder & Sons, *Machines to Make Machines 1865 to 1968, a centenary booklet*, (Derby: Bemrose & Sons, 1968), passim, Bolton Library Local History Archive ref. 621/RYP
 62. *Commercial Yearbook of the Oldham Chamber of Commerce*, (Derby: Bemrose and Sons, 1918), passim, Oldham Local Studies Archive.
 63. *Commercial Yearbook of the Oldham Chamber of Commerce*, (Derby: Bemrose and Sons, 1918), pp. 69 – 76, Oldham Local Studies Archive; see also <http://website.lineone.net/~bradbury1852/bradburyindex2.htm>.
 64. J. H. Schofield, Oldham Studies No. 1, A Local interest Centre Publication, 1978, Manchester Museum of Science and Industry, Ref. Rothwell and Hough General File.

non-arms related products, particularly electricity meters, were maintained during the war, although at a much reduced rate.⁶⁵

Sebastian Ziani de Ferranti became a member of the executive committee set up in 1915 to monitor arms production, a position which again gave him a direct input into production matters. Between 1915 and 1919 the firm was able to update its range of large transformers for power station applications and other research departments were set up at the end of the war leading to improvements in various products. In 1923 they began to manufacture audio frequency transformers, followed in 1924 by radio components and moving coil loud speakers. In 1926 the domestic appliance division was reopened and, after some reorganisation, began to produce radios as well as ovens and electric fires. In 1935, a new factory was built at Moston for the production of radios and by 1937, when production of television sets began, the whole of the domestic appliance division had been relocated there.⁶⁶

Ferranti re-entered the armaments market in the mid 1930s, successfully tendering for a contract to produce fuses and subsequently receiving several large contracts which lasted well into the Second World War. In 1936, Ferranti began to manufacture for fighter aircraft, and when contracts for the production of radar were distributed in 1938, the firm was chosen as a supplier in co-operation with Metropolitan-Vickers.⁶⁷

The firm of Foster and Seddon was started in 1919, when it operated trips to the seaside using a 26 seater charabanc. The firm later became vehicle dealers and haulage contractors, eventually going into truck reconditioning and rebuilding. In 1938, they developed a design for a six ton diesel lorry which was powered by a Perkins diesel engine and fitted with the firm's own transmission system. Within a year of its introduction around 200 'Seddon six-tonners' were in service.⁶⁸

No textile machinery was produced by Platt Brothers and Co. between 1914 and 1918, and by 1915 the firm's production facilities had been converted to the manufacture of munitions. In some cases whole workshops were emptied of their peacetime equipment and replaced by machinery to produce shells and grenades. At the end of the war Platt clearly had difficulties in returning to peacetime production, and whereas companies like Dobson and Barlow had enjoyed a short period of prosperity between 1918 and 1921, Platt's business languished. The company was re-floated in 1922 but by this time the whole of the textile machinery industry was in recession, and by the mid 1920s it was clear that the sector was experiencing a serious slump. Thereafter, textile machinery began to

65. John F. Wilson, *Ferranti: A History, Building a Family Business, 1882 - 1975*, (Lancaster: Carnegie, 2001), pp. 182. – 184.

66. John F. Wilson, *Ferranti: A History, Building a Family Business, 1882 - 1975*, (Lancaster: Carnegie, 2001), pp. 259.

67. John F. Wilson, *Ferranti: A History, Building a Family Business, 1882 - 1975*, (Lancaster: Carnegie, 2001), pp. 269 – 272.

68. Pat Kennett, *World Trucks, Seddon Atkinson*, (Cambridge: Patrick Stephens, 1978), p. 7.

engage in price competition, and by 1927 Platt's profits had fallen so far that, for the first time in its history, no dividend was declared.⁶⁹

In 1929 Platt negotiated an agreement with Toyoda which allowed it to manufacture the Japanese firm's automatic looms and to sell them in markets other than Japan, China and the USA. More beneficial to Toyoda than to Platt, this arrangement has been regarded by some as the enabling basis of Toyota Motor multinational automotive concern.⁷⁰ To avert bankruptcy Platt's bankers appointed Sir Walter Preston as Chairman of the Board. Preston, along with Stanley H. L. Greaves of Dobson and Barlow and others, devised a scheme which they believed would both reduce competition and avoid casualties. Textile Machinery Makers which was formed in 1931 was a cartel composed of Dobson and Barlow, Platt Brothers, Howard and Bullough, Asa Lees and Brooks and Doxey with Tweedales and Smalley a member with associate status. Greaves became Secretary of TMM at its inception and Preston was its Chairman. As a group these companies attempted to control prices through agreements with foreign competitors and they also undertook a certain amount of 'rationalisation' within their own operations. The amalgamation of these competing firms was not a fusion of technology and design. As Farnie observes; '*Proposals made to the board of Platt in 1937 reveal the limited achievement of the merger during six years of association...*' There appears to have been no rationalisation of product lines and no attempt to achieve scale economies through specialisation of individual plants. The formation of TMM was an attempt to control the market through the reduction of competition and price fixing. For most of the 1930s TMM negotiated with several international organisations in order to form agreements on trade and price restrictions.⁷¹

After 1930 there were several attempts to diversify Platt product range, most of which failed. Some of the more successful ventures include low technology equipment such as sanding machines, colliery tubs, gas and water pipes, manhole covers, pit props, and excavator buckets. Salvation arrived for Platt and TMM in the form of munitions contracts awarded by the British Government after 1936, and by 1939 Platt were again employing around 12,000 workers and making enough profit to resume dividend payments. This prosperity was, however, not achieved through success in the textile machinery market.⁷²

Summary and Conclusions

The disruptions and distractions of the First World War had a marked and lasting effect on the British manufacturing engineering industry. The free market was suspended after 1914 and, except for a brief period in 1924, would not to be restored for many years. Control of the economy and the control of industry were, after 1915, complete and successive post-war governments were reluctant to

69. D. A. Farnie, 'The Marketing Strategies of Platt Bros. and Co. Ltd of Oldham, 1906, 1940', *Textile History*, 24 (2), 1993, pp. 147 – 161.

70. Eric Bailey, 'Toyota', *Weekend Telegraph*, October 1984, Manchester Museum of Science and Industry Archive, Platt Brothers General File.

71. D. A. Farnie, 'The Marketing Strategies of Platt Bros. and Co. Ltd of Oldham, 1906, 1940', *Textile History*, 24 (2), 1993, pp. 147 – 161.

72. D. A. Farnie, 'The Marketing Strategies of Platt Bros. and Co. Ltd of Oldham, 1906, 1940', *Textile History*, 24 (2), 1993, pp. 147 – 161.

relinquish the powers they had acquired. The short post-war boom was probably a result of relaxed wartime restrictions combined with a certain amount of pent-up demand being satisfied. British firms certainly ended the war in good condition financially, or at least they should have, but trading in the home market was made difficult by excess capacity and the availability of war surplus equipment being sold off by the government. For example, the Lancashire truck builder, Atkinson and Co. of Preston, did well between 1918 and 1924, but by then the large number of ex-military vehicles which the Ministry of Supply were then selling on the open market was a cause of concern. Another factor appears to have been the abruptness of the ending of war work contracts. Gardners of Patricroft, for example, were approached just eight days after the armistice by an official from the Ministry of Munitions who asked how quickly they could return to normal production without throwing people out of work.⁷³

Although it is clear that the post-war government failed to anticipate the degree of hardship firms would experience in returning to normal conditions, it is difficult to suggest what realistically could have been done to make the change more gradual other than that the army could have built up a stockpile of weapons. To suddenly sell off large amounts of war surplus equipment was another mistake, but the alternatives - either to retain it or to destroy it - may well have been politically unacceptable. If the structure of British industry was flawed before 1914, it was shattered after 1918. The market was skewed by a glut of goods which had been either imported or manufactured under extraordinary conditions and it would have taken a remarkable expansion of trade to absorb them, a visionary economic plan to create such expansion and a great deal of manipulation. Some companies were apparently saved through arms contracts whilst others, which seem to have been thriving prior to the conflict, collapsed within a few years of the armistice.

It is difficult to discover a satisfactory explanation for what happened to the British economy after 1921. The sharp rise in exports of engineering equipment between 1918 and 1921 was followed by an equally sharp decline between 1921 and 1923. Between 1923 and 1929 export trade in engineering products recovered steadily, after which there was a second period of decline which lasted until 1932-33. Thereafter, exports of engineering products did not again reach 1928-29 levels until 1938. There was strong competition in the export markets first from the USA and later from Germany, whose industry recovered remarkably quickly after 1918. Notwithstanding the peaks and troughs of the inter war years the general trend in exports of engineering products was continuously rising throughout the period from 1919 to when the world's financial systems collapsed in 1929. Overall, while the growth in exports of British built machinery was positive, Britain's share of the growing world market was falling.

The engineering lockout of 1922 had a profound effect on the quality and quantity of skilled labour in Britain. Since the 1897 lockout, the practice of using apprentices as cheap labour had become widespread and was particularly rife in larger companies. Thereafter, firms could employ as many 'apprentices', whose wages were lower than those of labourers, as they wished. The result was

73. Pat Kennett, *World Trucks, Seddon Atkinson*, (Cambridge: Patrick Stephens, 1978), pp. 43 – 44; David Whitehead, *Gardners of Patricroft*, (Oxford: Pergamon, Newman Neame, 1968), pp. 23 – 33.

that, especially in lean times, young journeymen were dismissed as soon as they qualified for skilled wages, a rapacious and short sighted attitude that led to long-term skill shortages as well as a low wage mentality among some employers. It is also clear that many apprentices were not being properly trained, learning only those aspects of engineering which were of immediate use to their particular employer. While artillery shells are easy to make, especially in large quantities when mass production techniques break down the manufacturing process into multiple, simple operations, machine building is a skill intensive task which cannot effectively be undertaken by half-trained people.

Although the impact of wartime economics on Lancashire's engineering industry was profound, there is much evidence of its inherent ability to recover if the conditions to do so would have been created. The speed in which firms were expected to return to 'business as usual' was incredible considering the fundamental nature of the disruption caused by war work.

Shortly before the war Bolton had lost one of its prime mover manufacturers and by 1927, when export trade was in a recovery phase, a second engine builder went out of business. Woods and Musgraves were steam engine builders and it is probable that their products had become obsolete, being replaced by internal combustion engines and electric motors. Moreover, both companies had strong trading links with Russia, a market which was no longer available to them.

The conflict likewise affected other firms with similarly, if not quite so fundamentally, outdated products. Dobson and Barlow actually withdrew from the textile machinery market in order to produce munitions, having to adopt an entirely different type of production strategy to achieve this. The fact that they could do so is not so much a demonstration of their flexibility as of the simplicity of munitions manufacture in terms of production engineering. Dobson and Barlow seem to have re-entered its pre-war markets with far more success than other similar firms who were in financial difficulties almost immediately after the war work ran out.

Hick, Hargreaves was fortunate to have been able to produce war equipment of a more sophisticated nature than many Lancashire engineering companies. The production of oil engines in particular greatly assisted their transition, which had already started before the conflict, from steam to internal combustion. Because the firm became a major supplier to the CEGB they did not suffer the hardships of the 1930s which led other engineering companies either to seek mergers or go under. Clearly, Hick, Hargreaves took cognisance of the ways in which their capabilities could be matched to the market and adapted accordingly.

During the war, Ryder's design department was enlarged and their expertise in the development of specialised machine tools increased their peacetime ability to compete, particularly in the automotive industry. Unfortunately the massive influx of American built machine tools during the war provided a cheap and ready supply of second-hand equipment, practically flooding the market for several years after 1918. Nevertheless, as a small and flexible business, Ryder was able to struggle through the lean inter war period by a mixture of adaptability and good fortune.

Company failures in Oldham during this period included two firms with diversified product ranges, both of which had developed motor vehicles before 1914. Bradbury ceased all production at the lowest point of the post-war slump in 1924, and Eclipse failed very shortly after the armistice. Both

were sewing machine manufacturers and were in competition with the Jones Company of Audeshaw as well as the Scottish subsidiary of the American firm Singer. Curiously, although neither Jones nor Singer was as diversified as the two Oldham companies, both firms continued to exist for many years.

A period of intense Darwinian competition between Lancashire's textile machine builders would, in all likelihood, have resulted in Platt's demise and the creation of a smaller and more responsive industry. As painful for Oldham as it would have been, Platt's failure would have left the textile machinery industry in the hands of several smaller and still competing companies who instead these found themselves tied to their least efficient competitor. Probably the creation of a monopoly was politically preferable, in the 1930s, to the prospect of seven or eight thousand people being thrown out of work.

Ferranti, which was a profitable company in 1915, became even more profitable throughout the conflict. In peacetime however, the firm seems to have been incapable of profitably exploiting most of the numerous innovative product it created. This may well have been due to S.Z. de Ferranti's apparent propensity for constant experimentation and modification of design.⁷⁴ Although the company was, or should have been, in a strong position to take a leading role in the creation of the national grid and to profit from the rise in domestic consumption of electricity, it generally failed in both areas. Even after protective tariffs were imposed on domestic appliances, Ferranti did not establish itself in this expanding market. By the mid 1930s the attraction of lucrative arms contracts had lured the firm away from any serious attempt to market its other products.

No-one at the end of the 1930s could have predicted that, within thirty or forty years, the British Empire would collapse, the USA would come to dominate world trade and that Europe would become a major trading block. Protectionism and Imperial Preference were a response to the erection of tariff barriers which were themselves a reaction to a century of British success.

74. John F. Wilson, *Ferranti: A History, Building a Family Business, 1882 - 1975*, (Lancaster: Carnegie, 2001), p. 182.

Chapter 3, 1939 to 1978

Politics

Late in 1939, fundamental changes were made in the structure of the Civil Service. Shortly before war was declared, the Ministry of Supply was formed. Once the declaration was made several new Ministries were created; the Ministry of Home Security, the Ministry of Shipping, the Ministry of Food, the Ministry of Economic Warfare and the Ministry of Information. Shortly thereafter, the Ministry of Aircraft Production was established and subsequently the Ministry of Transport and the Ministry of Shipping were amalgamated into the Ministry of War Transport, and later the Ministry of Production was created. Just as in the First World War, the government took control of industry but because of the preparations which had been made since 1937, in the Second World War this control was more complete and more effective.⁷⁵

The 1945 general election swept the Labour Party into power with a large majority and on a programme of Socialist Reform. A series of Acts of Parliament confirmed many of the central controls which had been imposed on industry during the war. During 1946 the government nationalised the Bank of England and, through the Borrowing (Control and Guarantees) Act, made it an offence to raise more than £50,000.00 in a year by the issue of shares without consent of the Treasury. In the following year the Exchange Control Act regulated capital movements to, and dealings in, non-sterling countries. The government also took control of large sectors on industry including coal, iron and steel, gas supply, electricity supply, the railways, road haulage and other transport. The suspension of the pound/dollar convertibility in August 1947 was followed by devaluation from \$4.03 to \$2.80 in September 1949.⁷⁶

In June 1950 North Korean forces invaded South Korea. The ensuing war caused world commodity prices to rise and led to a shortage of raw materials as the western allies, particularly the USA and Britain began to rearm themselves. A world-wide shortage of steel caused a serious financial crisis in the British economy and by July 1951 the government introduced financial tightening, price controls and restrictions on dollar imports. Controls were also imposed on steel supplies to the motor and other industries.⁷⁷

The Conservative Party which was elected to power In October 1951 immediately embarked upon a programme of reversing most of the economic measures enacted by the previous regime, a pattern which was to be followed by successive governments throughout this period. The Korean War, which lasted until 1953, continued to have adverse effects on the British economy, particularly on the

75. D. N. Chester (ed.), *Lessons of the British War Economy*, (Cambridge: Cambridge University Press, 1951), p. 1.

76. J. C. R. Dow, *The Management of the British Economy, 1945 – 1960*, (Cambridge: Cambridge University Press, 1964), pp. 168 – 172; Peter Dewey, *War and Progress, Britain, 1914 – 1945*, (London: Longman, 1997), pp. 292 – 293, 302 – 303.

77. Sir Alexander Cairncross, *The British Economy Since 1945, Economic Policy and Performance, 1945 - 1990, Second Edition*, (Oxford: Blackwell, 1995), p. 101; Allen Skuse, *Government Intervention and Industrial Policy*, Third Edition, (London: Heinemann, 1972), pp. 36 – 44; Robert Millward, 'Industrial and commercial performance since 1950', in Roderick Floud, and D. N. McCloskey, (eds.), *The Economic History of Britain Since 1700 Second Edition, Vol. 3: 1939 – 1992*, (Cambridge: Cambridge University Press, 1994), p. 106.

increased cost of imports. By November 1951 the government were trying to damp down domestic demand through import restrictions and increased lending rates. In spite of these measures, by January 1952 a balance of payments crisis loomed. Restrictions were placed on hire purchase and in the spring of 1952 the bank rate was further increased, from 2.5% to 4.0%. Two downward adjustments during 1953 and 1954, when unemployment had reached around 279,000, brought the rate back down to 3.0%, but by February 1955 it had been increased again to 4.5%. Successive Acts in 1953 denationalised the road transport and the iron and steel industries.⁷⁸

After the Conservative Party was returned to power in May 1955 under Sir Anthony Eden, emergency economic measures were constituted including bank credit restrictions and more hire purchase restrictions. These were followed in October 1955 by further limitations on capital investment and in February 1956 the bank rate was increased to 5.5%, investment allowances suspended and hire purchase restrictions tightened even further. The invasion of Egypt by Israel, France and Britain in October 1956 created further economic problems, many of which were caused by the closure of the Suez Canal, which led to petrol rationing and to HP restrictions being tightened further. As Britain's balance of payments continued to worsen the government announced reductions in defence spending, applied more restrictions on bank lending and increased the bank rate to 7.0%.⁷⁹

In 1957 the Conservative Party, which was again returned to power under Harold Macmillan, immediately announced cuts in defence spending and its intention to reduce the aerospace industry to two airframe producers and two engine builders. Between March and November 1958 a series of economic measures eased financial restrictions and reduced the bank rate from 7.0% to 4.0%, causing the balance of payments situation to deteriorate sharply. The Conservatives were again returned to power in the 1959 general election and by 1960 a credit squeeze was again applied and HP restrictions returned. In 1962 import duty on cars was 28% and in 1963 automotive manufacturing plants were opened by Ford at Halewood, by Roots at Linwood, and by Vauxhall at Ellesmere Port.⁸⁰

The National Economic Development Council first met in March 1962 in an effort to introduce French style indicative planning. The council was made up of six employers' representatives; six trade union representatives; two representatives of the nationalised industries; two independent members, and three ministers including the Chancellor, the Minister of Labour and the President of the Board of Trade. In February the following year the NEDC published its first programme which forecast an annual growth rate of three percent. Before the 1964 General Election the NEDC had established nine Economic Development Committees including those for Electronics and Mechanical Engineering.⁸¹

78. Allen Skuse, *Government Intervention and Industrial Policy, Third Edition*, (London: Heinemann, 1972), pp. 44 – 50.

79. Andrew Shonfield, *British Economic Policy Since The War*, (London, Penguin, 1959), p. 9.

80. Andrew Shonfield, *British Economic Policy Since The War*, (London, Penguin, 1959), p. 9; Anders Ditlev Clausager, 'The Swinging Sixties', in Nick Georgano (ed.), *Britain's Motor Industry The First Hundred Years*, (Yeovil: Foulis and Company, 1995), pp. 149 – 183.

81. Allen Skuse, *Government Intervention and Industrial Policy, Third Edition*, (London: Heinemann, 1972), pp. 57 – 58; Robert Millward, 'Industrial and commercial performance since 1950', in Roderick Floud, and D. N. McCloskey, (eds.), *The Economic History of Britain Since 1700 Second Edition, Vol. 3: 1939 – 1992*, (Cambridge: Cambridge University Press, 1994), pp. 161 – 162.

Two days after the Labour Party was elected to power in 1964 the government established the Department of Economic Affairs. The NEDC was reorganised into four groups; the Economic Planning Group, the Industrial Policy Group, Economic Co-ordination Group and the Regional Policy Group. Each Group was responsible for various aspects of the economy within its sphere of function. In April 1965 the National Board for Prices and Incomes was established and a White Paper was published entitled 'Prices and Incomes Policy'. Annual pay increases were restricted to 3.5%, the projected rate of growth, unless there were 'exceptional circumstances' such as productivity increases, the national interest, existing wage levels were too low or there was disparity between similar workers. In 1966 a White Paper published by the Department of Economic Affairs proposed the setting up of the Industrial Reorganisation Corporation with an initial funding of £150 million and with a remit to promote mergers in industries where larger companies could be more effective in the world market. Conversely the 1965 Monopolies and Mergers Act allowed the Board of Trade to suspend proposed mergers and to dissolve monopolies.⁸²

As well as introducing Capital Gains Tax and Corporation Tax in 1965, Selective Employment Tax, which effectively penalised employers in service industries and rewarded employers in manufacturing industries, was introduced in 1966. In the same year initial investment allowances in some industry sectors were replaced by cash grants or, if they did not qualify for grants, by higher initial allowances. By July 1966 the government felt the necessity to impose a moratorium on prices and incomes until December, followed by a period of 'severe restraint' for a further six months. This had some success and in 1967 the Prices and Incomes Act formally regulated pay and price increases.⁸³

The Six-day Arab Israeli War of 1967 created severe economic problems for Britain and other industrialised countries. The Suez Canal was again blocked and oil shortages caused price increases and a balance of payments crisis. In autumn 1967 the government devalued the pound by 14% and in 1968 HP restrictions were first eased then tightened as imports continued to rise more steeply than exports.⁸⁴

A January 1968 White Paper introduced the Industrial Expansion Bill which gave increased powers to government departments, notably the Ministry of Technology and the Department of Economic Affairs, to use state finance for industrial purposes including purchasing companies and

82. Robert Millward, 'Industrial and commercial performance since 1950', in Roderick Floud, and D. N. McCloskey, (eds.), *The Economic History of Britain Since 1700 Second Edition, Vol. 3: 1939 – 1992*, (Cambridge: Cambridge University Press, 1994), pp. 161 – 162; Allen Skuse, *Government Intervention and Industrial Policy*, Third Edition, (London: Heinemann, 1972), pp. 58 – 72.

83. Robert Millward, 'Industrial and commercial performance since 1950', in Roderick Floud, and D. N. McCloskey, (eds.), *The Economic History of Britain Since 1700 Second Edition, Vol. 3: 1939 – 1992*, (Cambridge: Cambridge University Press, 1994), p. 160; Allen Skuse, *Government Intervention and Industrial Policy*, Third Edition, (London: Heinemann, 1972), pp. 58 – 72.

84. Allen Skuse, *Government Intervention and Industrial Policy*, Third Edition, (London: Heinemann, 1972), pp. 58 – 72.

setting up new state industrial ventures. In April 1968 a White Paper recommended a ceiling on prices and incomes of 3.5% for the next two years.⁸⁵

The Conservative Party under Edward Heath which was voted into office in 1970 were, at least initially, determined to disengage government from industry and to restore market forces to competitive conditions. Five Ministries were abolished and replaced by two new ones; the Department of Trade and Industry, which incorporated the Ministry of Technology and the Board of Trade, and the Department of the Environment which was formed by the unification of the Ministry of Housing and Local Government, the Ministry of Transport and the Ministry of Public Works. The Department of Employment and Productivity became simply the Department of Employment, having lost its 'productivity' activities to the new DTI. Investment grants on plant and machinery were abolished and replaced by a depreciation allowance permitting 60% to be written off in the first year and 25% of the reducing balance in subsequent years. The reflationary budget in the spring of 1971 halved SET and increased the initial depreciation allowance on plant and machinery to 80%. The IRC was also abolished in May 1971, but in the same year the strategically important aero engine manufacturer Rolls-Royce was nationalised to save it from bankruptcy. A few months later the DTI again stepped in to rescue Upper Clyde Shipbuilders and, by doing so, abandoned its policy towards 'lame duck' industries. The 1972 Industry Act, which reinforced and strengthened Labour's Industrial Expansion Act of 1968, provided special provisions for assistance to particular sectors or enterprises in regions of high unemployment and aid for accelerated investment projects including interest relief or capital grants of up to 20%. The Counter Inflation Act of 1972 and 1973 was a wages and prices law which created the Price Commission and Pay Board.⁸⁶

By the middle of 1972 the economy was again in crisis. Inflationary pressure had cancelled out the gains won by the 1968 devaluation, and the country was once again faced with a massive balance of payments problem. In 1972 the pound sterling was allowed to float, producing a *de-facto* devaluation of 25% against the US dollar which, initially, generated a sharp rise in industrial output. The adoption of *laissez-faire* economics by Richard Nixon in 1968 and his subsequent return to interventionism in 1970 may, according to some historians, have influenced Heath's so called U-turn. In any case the 'lame duck' policy was abandoned, public spending was increased and the government, through the DTI, again intervened in industry.

Britain became a member of the European Economic Community in January 1973. In the same year the October War in the Middle East precipitated another severe economic and industrial crisis

85. Robert Millward, 'Industrial and commercial performance since 1950', in Roderick Floud, and D. N. McCloskey, (eds.), *The Economic History of Britain Since 1700 Second Edition, Vol. 3: 1939 – 1992*, (Cambridge: Cambridge University Press, 1994), pp. 163 – 164; Allen Skuse, *Government Intervention and Industrial Policy*, Third Edition, (London: Heinemann, 1972), pp. 58 – 72.

86. Sir Alexander Cairncross, *The British Economy Since 1945, Economic Policy and Performance, 1945 - 1995, Second Edition*, (Oxford: Blackwell, 1995), pp. 183, 194; Sir Alexander Cairncross, 'Economic Policy and Performance, 1964 – 1990', in Roderick Floud and Deirdre McCloskey (eds.), *The Economic History of Britain Since 1700, Volume 3, 1939 - 1992*, (Cambridge: Cambridge University Press, 1994), p. 77; Richard Coopey and Nicholas Woodward, 'The British Economy in the 1970s: an Overview', in Richard Coopey and Nicholas W. C. Woodward (eds.), *Britain in the 1970s: The Troubled Economy*, (London: University College London Press, 1996), pp. 1, 17-18; Allen Skuse, *Government Intervention and Industrial Policy*, Third Edition, (London: Heinemann, 1972), pp. 73 – 87.

and world wide inflation increased dramatically. The 1973 miners strike, a confrontation over pay and a revolt against the Pay Board, led to a declaration of a State of Emergency and a three day week.⁸⁷

The February 1974 general election produced a minority Labour government in alliance with the Liberals but, after Wilson went to the country a second time in October 1974, Labour with was returned with an overall majority of just three. The Social Contract was an attempt to secure wage restraint in return for economic, industrial and social measures, effectively giving trade unions a say in government.⁸⁸

The White Paper 'The Regeneration of British Industry' which was published in 1974 led to the establishment of the National Enterprise Board in 1975. There followed some internal tension between the Labour Left and the Labour Right as well as some attempts to get the unions to show restraint in wage claims. In November 1975 the White Paper 'An Approach to Industrial Strategy' was published which listed the main reasons for Britain's poor industrial performance. The list comprised almost everything imaginable, but significantly included '*too frequent changes of policy by successive governments making it difficult for companies to plan ahead*' as well as '*government intervention in nationalised industries' pricing*'. The proposed solution was to be increased government intervention in practically all aspects of industry and commerce. A 'new style' of planning was set in motion; one that would identify key sectors for future national growth which would be '*industries which on past performance and current prospects seemed intrinsically likely to be successful*'.⁸⁹

Shortly thereafter NEDO set up thirty nine separate sector working parties together with steering groups and committees and such. The National Enterprise Board was to be the instrument of state intervention in industry. Recommendations made by the various NEDO working parties, such as the financing of a special stock building scheme for the machine tool industry and a similar stockpiling scheme in the steel industry, were acted upon by this body. The effects of the Social Contract had been a drop in real average earnings of around 8%. The 'Winter of Discontent' came about through the refusal of several trade unions to accept the government's recommendation that wage increases should be around 5%, a figure below the rate of inflation.⁹⁰

Technology

In contrast to the First World War, aircraft production was introduced on a massive scale between 1939 and 1945. The Shadow Factory scheme involved several engineering companies in the

87. Michael Shanks, *Planning and Politics, the British Experience 1960-76*, (London: George Allen and Unwin, 1977), pp. 60 – 61; Sir Alexander Cairncross, 'Economic Policy and Performance, 1964 – 1990', in Roderick Floud and Deirdre McCloskey (eds.), *The Economic History of Britain Since 1700, Volume 3, 1939 - 1992*, (Cambridge: Cambridge University Press, 1994), pp. 79 - 80; Keith Laybourn, *A History of British Trade Unionism c. 1770 - 1990*, (Stroud: Alan Sutton, 1992), pp. 196 – 197; Sir Alexander Cairncross, *The British Economy Since 1945, Economic Policy and Performance, 1945 -1995, Second Edition*, (Oxford: Blackwell, 1995), p. 199.

88. Michael Shanks, *Planning and Politics, the British Experience 1960-76*, (London: George Allen and Unwin, 1977), pp. 72 – 84.

89. Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 437.

90. Michael Shanks, *Planning and Politics, the British Experience 1960-76*, (London: George Allen and Unwin, 1977), pp. 72 – 84; Keith Laybourn, *A History of British Trade Unionism c. 1770 - 1990*, (Stroud: Alan Sutton, 1992), pp. 202 – 203; Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 437.

construction and operation of government owned factories which, after the war, would be acquired by private industry and used for peacetime production. The scale of production required new manufacturing techniques and these were quickly developed by British industry, greatly assisted by the Ministry of Aircraft Production which co-ordinated the programme. As a result British engineering companies manufactured over 20,000 military aircraft in 1941 and nearly 400,000 workers were employed in the aircraft industry. During the war the gas turbine engine was developed for aircraft propulsion and advances were made in the efficiency of the internal combustion engine.⁹¹

Some aspects of the war economy were retrogressive, such as the conversion of the railway system from steam to diesel and electric locomotives which were halted abruptly in 1939 as a measure to save on imported oil fuel. There were, however, rapid developments in electrical and electronic equipment including radio communications and radar as well as in computing. The transistor emerged in the late 1940s as a replacement for the thermionic valve, but it was the development of semiconductors in the 1950s which had the most immediate effect on industry, and these were to have a dramatic influence on manufacturing engineering during the 1950s and the 1970s.⁹²

The link between mechanical devices and electronics, first established by manufacturers of office machinery in the USA, led to the use of electronic systems as automation devices, which developed rapidly after 1970, particularly numerical control for machine tools which eventually made mechanical automation obsolete. By the end of the 1970s electromechanical devices had replaced purely mechanical devices in a wide range of applications and numerical control was the cheapest, as well as the most efficient, method of automation. Tungsten carbide cutting tools were developed as standard items with indexable and replaceable tips, coated carbide and ceramic cutting tools further enhanced the performance of machine tools and, in some cases, investment casting techniques eliminated altogether the need for machining.⁹³

Markets

The near geographic totality of the Second World War and the complete conversion of Britain's industries to the production of military equipment precluded normal trade. There were few areas untouched by the conflict and the advanced neutral countries, such as Sweden and Switzerland, became suppliers to the allies. In the dominions Canadian factories manufactured aircraft parts and weapons, as did plants in South Africa and Australia and these countries received a great deal of assistance in becoming self sufficient in manufactured goods. South American markets, in which Britain had been active since the late nineteenth-century, were supplied by US manufacturers.⁹⁴

After the war imperial preference came under pressure from the Americans who wanted Britain's markets to be opened up to competition and when Britain was invited to join the European

91. Peter Dewey, *War and Progress, Britain, 1914 – 1945*, (London: Longman, 1997), pp. 289 – 292.

92. Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 259.

93. David Gibbs, *An Introduction to CNC Machining*, (Eastbourne: Cassell, 1984), pp. 38 – 65.

94. Peter Dewey, *War and Progress, Britain, 1914 – 1945*, (London: Longman, 1997), pp. 279 – 284; Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), pp. 217, 301; E. J. Hobsbawm, *Industry and Empire*, (Harmondsworth: Penguin, 1970), pp. 255 – 256.

Coal and Steel Community in 1950, the government of the day declined. Britain's relationship with the USA and Europe in the immediate post-war years had a long lasting effect on industry in general and on engineering in particular. Continental currencies were soft and Britain's exporters preferred to concentrate their efforts on North America and on their traditional commonwealth markets in which they were already well established. The advantages of this strategy were overwhelming when compared with Europe. The commonwealth and the USA both used the inch system of measurement and they also shared English as their lingua franca. The Continent, on the other hand, was a complex, multilingual, metric standard confusion of border controls, national rules, import duties and trade regulations.⁹⁵

Whereas in the long term Europe would become an important market for British engineering products, in the immediate post-war years it hardly merited a second glance. After 1950, when the European nations were beginning to emerge from the post-war period of economic disarray, the British engineering industry made the mistake of virtually ignoring them as a potentially lucrative market. By the time the empire had evolved into the commonwealth there were few countries left which could afford British manufactured engineering products, and many of those which could were located close to the rapidly developing Japanese industrial powerhouse. The richer dominions of Australia, Canada, South Africa and New Zealand all, with the possible exception of the latter, found both customers for their primary resources and suppliers of manufactured goods closer at hand. South Africa would have bought large amounts of British made weapons, but was placed under a United Nations arms embargo because of its political regime. In the 1970s India was developing and protecting its own engineering industry as indeed were Canada, Australia and South Africa. By the time Britain's politicians had decided to embrace the European Community the withdrawal from the traditional markets had become a retreat and when, in 1978, import duty on motor vehicles was reduced to zero for European Union countries the industry plunged into decline.⁹⁶

Competitors

The US engineering industry gained considerably during the early years of the Second World War, before America became directly involved in the conflict. Not only were American firms furnished with lucrative arms contracts, they also gained significantly from British technological developments. British jet engine technology was transferred to America when, in 1941, a Whittle gas turbine and its design drawings were handed to General Electric. The Swiss company Sulzer supplied large marine engines and other equipment to the British government and Georg Fischer supplied Britain with machine tools. The Swedish gun maker, Bofors, also established itself through arms supplies to the British forces.⁹⁷

95. Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), pp. 47 – 50, 185.

96. Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 186; Peter J. S. Dunnett, *The Decline of the British Motor Industry: The Effects of Government Policy, 1945-1979*, (London: Croom Helm, 1980), pp. 154 – 155.

97. David Edgerton, *England and the Aeroplane, An Essay on a Militant and Technological Nation*, (London: Macmillan, 1991), pp. 36 – 38; Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 303.

After the war Germany's engineering industry was prohibited from producing weapons and aircraft, technologies in which British companies had become particularly advanced during the conflict. A huge amount of finance and a high proportion of British technical expertise were invested in defence electronics, military aircraft and weapons systems whilst German manufacturers were forced to evolve as suppliers of non-military products. Apart from France no other European nation was large enough to develop advanced weapons systems. Nevertheless, it had been expected that the German engineering industry would eventually regain its pre-war position as a supplier of equipment to its European neighbours, and this may well have been the main reason that British engineers tended to concentrate on non-European markets.⁹⁸

Japan's emergence as a competent supplier of machinery was, on the other hand, largely unexpected. 'Made in Japan' was at first synonymous with cheap, shoddy, goods and operating instructions written in unintelligible English. By the mid 1970s however, Japanese machine tools had gained much respect in the advanced markets and were even competing with German built equipment on the European continent. Beaten on price by Japanese machinery, and on quality by Germany, the British machine tool sector was decimated by the time its largest operator, Alfred Herbert, became virtually bankrupt in 1975. As the Japanese engineering industry moved into the high quality, high cost market sectors, other Far Eastern nations such as Taiwan and South Korea, were emerging to compete for the low price markets. By the late 1970s the Japanese machine tool builders had overtaken their British and American competitors in terms of exports and were well set to outperform German companies.⁹⁹

Lancashire

The impact of the Second World War on Lancashire's industries was total and irrevocable. Cotton mills as well as engineering plants were used for the production of munitions and arms and a huge aircraft industry was, overnight as it were, established throughout the region. The Lancaster Group was centred on the Avro plants in the Manchester area; the group comprised A.V. Roe and Co., Metropolitan Vickers, Armstrong Whitworth Aircraft, Vickers Chester, Vickers Armstrong (Castle Bromwich) and Austin Aero. The main plants were located at Chadderton, Newton Heath, Ashton, Failsworth, Royton, Woodford, Wythenshaw and Yeadon, (Yorkshire). There were also depots and stores at Langar, Middleton and Oldham. In total the Lancaster Group employed 38,644 personnel during the war, the largest plants being Chadderton (11,267 personnel) and Yeadon (10,240 personnel).¹⁰⁰

Bolton

In 1951, the first post-war census, Bolton's population had fallen by around ten thousand from its pre-war level. In 1959 the number of engineering firms was also slightly lower at 62 and by 1964

98. Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 185.

99. D. G. Rhys, *The Motor Industry: An Economic Survey*, (London: Butterworths, 1972), pp. 120 – 123; Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 193.

100. Jonathan Zeitlin, 'Flexibility and Mass Production at War, Aircraft Manufacture in Britain, the United States, and Germany, 1939 – 1945', *Technology and Culture*, 36, (1), 1995, pp. 46 – 49; Harry Holmes, *AVRO, The History of an Aircraft Company*, (Shrewsbury: Airlife Publishing, 1994), passim.

this number had fallen further to around 57. By 1969 the number of engineering firms had risen to 71, most of which are general engineers. During the same period, i.e. 1959 to 1969, the number of textile machinery engineers was constant at 9 companies. The Bolton Chamber of Commerce Directory lists just 33 engineering firms in 1978 and only 3 of these are described as textile machinery specialists. This trend may be compared with the borough's other major industry; in the 1950's there were still 103 cotton mills in Bolton, in 1966 there were 34, and by 1978 just 8 remained.¹⁰¹

Between 1939 and 1945 Dobson and Barlow produced bomber wings at the Bradley Fold plant. These units were totally unlike their normal production and were mostly hand built using mainly skilled, male workers. By the end of the war the company had built 6,065 pairs of wings. After 1945 the firm was returned to the TMM group which was, by 1948, desperately trying to recruit apprentices as well as skilled engineering workers.¹⁰²

After the war Hick Hargreaves and Co. again became a major supplier of equipment to the Central Electricity Generating Board. The company's specialist expertise allowed it to offer similar products to various other industries including food processing, oil refining, petrochemicals and offshore oil production. In 1968 the Hargreaves family relinquished their interest in the firm, selling it to Electrical and Industrial Securities Ltd, later the EIS Group plc although the firm retained its technical independence.

During the conflict Thomas Ryder and Son produced automatic lathes for shells, aircraft parts and barrels for mortars. After the war there was a surplus of machine tools due to the closure of armaments plants and the availability of used and partly used machines. To compensate the company started peacetime production of textile equipment, mainly rollers, but by the 1950s the firm's motor industry machine tools were in high demand as the vehicle industry expanded rapidly. In 1960 Ryders employed 380 personnel and by 1965 this had risen to 620. The company's production facility, particularly the machine shop, was extensively reequipped during this period and they also started their own apprentice training school. By 1964 the British motor industry was producing over 2 million vehicles a year, a position which was generally maintained until 1972. By 1966 Ryders were winning orders from all over the world including China, Japan, Russia, Poland and South America and the number of employees had at this time increased to around 700. Their product range was enhanced through licensing agreements with USA based companies including Kreuger Inc. of Detroit, a manufacturer of in-line transfer equipment and in 1969 the plant was extended to include a new assembly hall.¹⁰³

During the 1970s the firm's position deteriorated, at first slowly then more dramatically as their home market languished and their export markets were usurped by German and Japanese competitors. At some stage they were acquired by the Whitecroft Group plc of Wilmslow, Cheshire

101. *Slaters Directory of Lancashire*, (Manchester: Isaac Slater, 1938); *The County Borough of Bolton Chamber of Commerce Report and Directory*, (St Annes on Sea: Blair Publications, (various years)), Bolton Library Local History Archive.

102. Bolton Library Local History Archive ref. ZDB, NRA 27108 (misc. papers).

103. Thomas Ryder & Sons, *Machines to Make Machines 1865 to 1968, a centenary booklet*, (Derby: Bemrose & Sons, 1968), passim, Bolton Library Local History Archive ref. 621/RYPD.

which was a mixed bag of barely compatible firms with interests in textiles, building supplies, electric lighting, plastics, engineering and clock making.[1] By 1978 the company employed less than 500 personnel.¹⁰⁴

Oldham

The population of Oldham fell from an estimated 137,000 in 1939 to less than 100,000 by 1978. During this period the town's reliance on textiles created serious unemployment problems as both cotton mills and textile machinery builders declined. In 1939 there were approximately 70 engineering companies in Oldham but by 1978 the figure was around 50 firms among which were some which had originally been established in the nineteenth century.¹⁰⁵

By the time war was declared in 1939 Ferranti were at an advanced stage in the supply of weapons related products to the British government. Radar contracts led by necessity to a great deal of research into various aspects of aircraft electronics and by the end of the war Ferranti had acquired a separate production facility at Chadderton for these activities. Chadderton alone achieved an annual turnover of £406,507.00 by 1945. Gyro stabilisers, used in a variety of weapons applications, were produced at premises in Bury acquired during the war and other capacity was taken in Hyde, Ardwick and Newton Heath.¹⁰⁶

By 1945 the company had moved into electronics, avionics, electromechanical instrumentation and fuses and the firms output had risen from £1.9 million to £5.6 million. The production of domestic appliances, radios and televisions had been totally suspended and meter production had fallen by 50%. In 1947 the company decided to expand the production of large transformers to which end a new plant was established adjacent to the Crown Works and by 1949 Ferranti transformers were being supplied to over thirty countries world-wide. By the mid 1960s the transformer department, as well as the meters division, was struggling to survive. The transformers business was first combined with English Electric in 1967 under a new company called Distribution Transformers and two years later sold to Reyrolle Parsons. In the late 1970s the meters department was sold Siemens of Germany.¹⁰⁷

In 1949 Ferranti formed the computers division and in the same year the company produced the world's first commercially available computer which was sold to Manchester University. Initially government assistance helped to offset the significant costs of developing computer technology but the department nevertheless consumed increasing amounts of cash and produced very few sales. Eventually, in July 1963, ICT was persuaded to buy the struggling division and by 1968 ICT itself had merged with English Electric Computers to form ICL, Britain's only mainframe computer manufacturer.¹⁰⁸

104. Press Cuttings, Bolton Library Local History Archive, ref. 901.91/eve/380/tra.

105. Town and County Directories (various years), Oldham Local History Library Archive.

106. John F. Wilson, *Ferranti: A History, Building a Family Business, 1882 - 1975*, (Lancaster: Carnegie, 2001), pp. 276 – 279.

107. John F. Wilson, *Ferranti: A History, Building a Family Business, 1882 - 1975*, (Lancaster: Carnegie, 2001), pp. 282, 299, 505, 510.

108. John F. Wilson, *Ferranti: A History, Building a Family Business, 1882 - 1975*, (Lancaster: Carnegie, 2001), pp 341 – 398.

In 1954 Ferranti began guided weapons research at Wythenshaw. By the spring of 1955 the company received its first order for the Bloodhound, a missile developed in co-operation with Bristol Airplane Co. The Bloodhound was a successful weapon in terms of performance and sales and it was especially profitable for Ferranti. In October 1963 the company was informed that government auditors had discovered 'serious discrepancies' in Ferranti's Bloodhound programme cost calculations. Because the company refused to treat with the Ministry of Aviation, an independent enquiry, chaired by Sir John Lang, was set up. In the face of its findings Ferranti offered to refund a total of £4.25 million, or 86% of the firm's final profit on the Bloodhound project, to the MoA. It was indeed unlikely that Ferranti would ever be considered for further such contracts.¹⁰⁹

Radio production was restarted at Moston in 1945. Government restrictions on the number of radio sets the company was allowed to produce induced Ferranti to promote export sales. Domestic expenditure on radio sets rose substantially after the war, but the firm not only lost market share but failed to make a profit on what it did sell. The firm's television business performed little better and by 1954 both ventures were hampered by low volume sales and mounting losses. Financial difficulties eventually forced Ferranti to sell off its radio and television business to Ekco in 1957 for around £300,000.00.¹¹⁰

Although sales of domestic appliances in Britain increased significantly in the late 1950s, Ferranti's share of this market remained fairly insignificant. The domestic appliance division suffered, as did its competitors, from successive tightening and relaxing of credit controls but, unlike them, found no way to minimise their impact on sales. The company failed in virtually every area of consumer durables and in 1958 the domestic appliance department was closed down. By 1974 the company had serious financial problems, mainly due to deterioration in its liquidity position. The bankers, National Westminster, had pressed for the company to be floated but the Ferranti family was against the idea. In August 1974 the NatWest instigated a detailed investigation of the business and three weeks later the findings prompted the bank's limitation of financial support. An approach was made to the Department of Trade and Industry and a dialogue initiated with Arnold Weinstock of GEC. The firm's creditors were said to be considering calling in the receivers but, by mid September informal assurances were given by the DTI to NatWest regarding the Ferranti overdraft. Shortly after the Labour victory in October 1974 the DTI acquired 50% of the company's shares and injected £15 million into the business. The management structure was changed and within a year the Ferranti family had been removed from executive positions. In 1975 the transformer division was closed down and in 1976 Ferranti Engineering was set up.

In 1939 part of the Oldham factory complex of Platt Brothers was converted into a facility for the reconstruction and refurbishing of bomb damaged machinery for the duration of the war and for a short period after. Other parts were completely retooled for the manufacture of armaments. Platt's lucrative diversification into munitions manufacture was suddenly terminated at the end of the conflict,

109. John F. Wilson, *Ferranti: A History, Building a Family Business, 1882 - 1975*, (Lancaster: Carnegie, 2001), pp. 399 – 428.

110. John F. Wilson, *Ferranti: A History, Building a Family Business, 1882 - 1975*, (Lancaster: Carnegie, 2001), pp. 309 – 312, 317.

but the wartime prosperity provided them with sufficient funds and commercial momentum to survive the immediate post-war years. The German economy was truly devastated on a wider and more fundamental scale than had been the case after 1918. Japan, the other great competitor nation, was equally ravaged. It seems rather curious that Platt escaped nationalisation in 1948, but none of the TMM companies were taken into state ownership and went on to experience a brief period of prosperity. At that time TMM controlled 80% of the British capacity for the production of textile spinning machinery and had acquired a reputation for supplying poorly built, badly designed and overpriced equipment as well as a bad record for after sales service.¹¹¹

In 1949 TMM acquired buildings in Haslingden from the Ministry of Supply which were converted into a research station for the group companies. Whether this was a serious effort to develop more advanced equipment or merely an attempt to impress the Ministry of Supply's Committee of Investigation into the Textile Machinery Industry is open to discussion. In view of an article published in the Textile Recorder in September 1948 which offered apprenticeships to 'holders of the Higher School Certificate in mathematics or science' and other more stringent pre qualifications the sincerity of TMMs quality drive is highly questionable. Platt had been at the heart of the engineers lockouts of 1897 and 1922 when the training of craft apprentices, exactly the type of skills which were now in such short supply, was turned into a charade. By the mid 1950s German and Japanese manufacturers had begun to re-emerge and Platt, although still a successful exporter, began to feel the effects of technological innovations then being developed by their competitors. The research facility evidently failed to keep pace with the competition and by 1960 Germany had re-established its pre-war lead.

In 1958 Platt merged with J. Stone and Co. of Deptford and Charlton, a diversified engineering group and under the name Stone-Platt Industries Ltd attempted to regain its technical leadership. The Cotton Industry Act of 1959 was an attempt to revitalise both the textile industry and the textile machinery industry. Under the Act the government would provide two thirds of the costs of scrapping surplus machinery. Grants would be made available by the Board of Trade for re-equipping mills with more up-to-date machinery. To be eligible for these grants, existing machinery had to be scrapped by March 1960. The Act failed to stimulate any significant re-equipping. In Nelson, for example, the Act resulted in the closure of 11 firms, the scrapping of 7,000 looms and the loss of 2,500 jobs. There was a great deal of resentment that the compensation paid to the mill owners under the scheme was not used to invest in new equipment. By 1964, of the 22 firms which had participated in the scheme since 1959, only 3 had installed automatic looms, and then only 800 units.¹¹²

Since the merger of the 1930's the original companies which had formed Textile Machinery Makers had continued to operate under their original names. By the late 1960s it was deemed necessary for various reasons to bring all these firms under a single title and in 1970 Platt

111. Walter W. Kempe, Notes, Platt International, November 1970, Manchester Museum of Science and Industry, Platt International General File; John Singleton, *Lancashire on the Scrapheap, The Cotton Industry 1945 - 1970*, (Oxford: Oxford University Press, 1991), p. 112.

112. Jeffrey Hill, *Nelson - Politics, Economy, Community, Town and City Histories*, (Edinburgh: Keele University Press, 1997), pp. 129 – 131.

International was created. In an attempt to broaden its range of products and to acquire a technological advantage, Stone Platt purchased Saco-Lowell from the American company Maremont Corporation in 1973. By 1978 Britain's textile machinery industry had lost around half of its 1960 share of the world market and was being outstripped by both Japan and Germany.¹¹³

In 1939 the Ministry of Supply suspended normal production at Foster and Seddon. Initially required to manufacture trailers for the army, their production later included three trucks a week for civilian use for the duration of the war. After 1945, the firm resumed production of a more diversified model range, and soon acquired larger premises in order to cope with an increased rate of production. In 1948 Seddon moved into their new Woodstock Factory in Oldham, purchasing a second building from the Ministry of Supply at around the same time, and the number of employees increased to over 600. By 1958, responding to the increased level of competition from Continental European manufacturers, the company launched a further expansion of its model range which involved the production of heavier trucks for market segments previously dominated by Foden and ERF of Cheshire, and Atkinson of Preston. Although, because the new Seddon models soon gained a reputation for poor reliability, this plan basically failed, by the end of the 1960s the Woodstock Factory was producing 2,200 chassis a year and employed just over 1,000 personnel.¹¹⁴

In mid 1970, the Preston heavy truck manufacturer Atkinson Vehicles became the target of a hostile takeover bid from its rival, ERF of Sandbach, Preston. ERF's initial bid of around £2.8 million was rejected out of hand, but it succeeded in drawing other would be buyers into a series of offers and counter offers. This ultimately ended when an offer from Seddon was accepted by the shareholders, which included its rival Leyland Motors. The perceived principle advantage of the merger of Seddon and Atkinson was that the model ranges of the two firms were complimentary, but a serious disadvantage was the barely frank and intense opposition of most of the Atkinson management. Most of the erstwhile Atkinson directors and senior managers resigned shortly after the take-over, and integration of the two companies was hampered by the level of bitterness on the part of the remaining Atkinson personnel. There followed a prolonged programme of divestment of any aspect of the company not considered to be essential to core operations. By the time this was completed the new company was itself the subject of acquisitive attention by International Harvester of America, an aggressive and moneyed predator who, on 1st July 1974, succeeded in purchasing the entire share capital of Seddon Atkinson.¹¹⁵

The hyper inflation of the 1970s, coupled with the pending removal of tariff protection following Britain's membership of the Common Market, were doubtlessly contributing factors to Seddon Atkinson's decision to sell out to the Americans. By 1978, the firm's model range had been rationalised and standardised after a process which had taken seven years to accomplish, the company was producing around 5,000 units a year. Naturally, the new models incorporated components produced

113. Geoffrey Timmins, *Made in Lancashire, A History of Regional Industrialisation*, (Manchester: Manchester University Press, 1998), p. 301.

114. D. G. Rhys, *The Motor Industry: An Economic Survey*, (London: Butterworths, 1972), p. 249; Pat Kennett, *World Trucks, Seddon Atkinson*, (Cambridge: Patrick Stephens, 1978), p. 7.

115. Pat Kennett, *World Trucks, Seddon Atkinson*, (Cambridge: Patrick Stephens, 1978), pp. 75 – 79.

by the new owner's subsidiaries, and in many of these German made International Harvester diesel engines replaced British built Rolls-Royce and Gardner units.¹¹⁶

Summary and Conclusions

Between 1945 and 1950 government control of industry remained more or less as rigorous as during the years of conflict. Transformation from wartime production to normal market conditions naturally proved more difficult for those firms which had undergone the most fundamental changes, but in some cases post-war government policies exacerbated their problems. The textile machinery sector, which had been completely diverted to arms production during the war, was regarded by the government as a potentially rich source of foreign exchange. Consequently, high export targets were set and enforced through steel allocations. The TMM monopoly was in a position to control both prices and output which it did to the detriment of both the textile machinery industry and the cotton industry.

In 1951, when the Conservative government came to power, many of the state controls and regulations which had existed since 1939 were either relaxed or completely removed. The balance of payments problems which began to undermine the economy were brought about by increased demand for goods which British industry either could not or would not supply. The government's response, which was to reduce demand by manipulating the supply and the cost of credit, also made it expensive for British manufacturers to expand. The denationalised industries, which relied on private investment, were therefore even less capable of responding when demand increased and, in the knowledge that a recession would inevitably follow, even more reluctant to invest in additional facilities.

Although the impact of the Korean conflict had been negative, the Suez crisis deprived industry, for a time, of the oil fuel upon which it depended and served to emphasise to investors the vulnerability of British industry to the exigencies of foreign politics. Successive changes in government fiscal policy during the 1950s and early 1960s produced cycles of high demand followed by severe and sudden decline, a phenomenon which became known as 'boom and bust'. Capital goods and machinery cannot be manufactured by low cost labour using mass production techniques and often need to be individually designed. Even relatively unsophisticated equipment like textile machinery, if it is to keep pace with technological developments, has to be periodically modified and updated. Short business cycles make it difficult for manufacturers to bring improved products to a market which is ready to adopt them because demand for such products is derived from the demand for the consumer goods which they produce. The use of interest rates and credit restrictions to control the economy between 1951 and 1964, coupled with the effects of two regional conflicts, created market conditions which were not favourable to long-term investment and the incentive for innovation was therefore suppressed.

Between 1964 and 1970 the Labour government attempted to control the way in which industry, particularly manufacturing engineering, developed. The main instrument of intervention was the IRC which used its powers to create artificially large companies by merging together companies which had

116. Pat Kennett, *World Trucks*, Seddon Atkinson, (Cambridge: Patrick Stephens, 1978), pp. 75 – 79.

previously been competitors. The most well know IRC mergers took place in the electrical engineering and the motor industries, but there were many others which took place with the hidden agenda of simply removing competition and had nothing too with scale economies. One example of the gross misuse of IRC powers was the take-over of Churchill grinders, a company with an excellent world-wide reputation, by Alfred Herbert which by then had lost much credibility. Churchill's Manchester plant was soon closed and production was moved to Coventry after which the quality of both design and build deteriorated to such an extent that within a few years a used Manchester built Churchill commanded a higher price than a new Coventry built machine. Labour's strategy, which was ostensibly based on grafting successful firms onto inefficient failures, was seriously flawed as the eventual demise of British Leyland proved. The idea that governments can absolutely control the market is an impossibly naive notion, even if the iniquitous motives of many who took advantage of the situation could have been excepted. Once again a foreign, regional conflict wrecked whatever chances of success Labour's economic strategy may have had as instability in the Middle East caused commodity prices to increase and threatened fuel supplies.

If there was uncertainty during the second post-war Labour administration, under Heath's Conservative government during 1970 to 1974 confidence was shattered. The instruments of state control were dismantled, investment incentives cancelled and support for industry discarded. Less than two years after the election, however, a different position had been adopted. If, based on conditions prevailing in 1970, an engineering company had implemented a business plan, the basis of that plan would have been obsolete well before it could have been executed. In addition to the ineptitude of the Heath administration in terms of economic management, a further outbreak of hostilities between Israel and her neighbours precipitated not only fuel shortages but a prolonged period of high inflation. Perhaps the most momentous event of Heath's prime minister ship was Britain's admittance to the European Economic Community at a time when many British engineering companies were totally unprepared for the level and type of competition to which they were to be exposed.

The impact of Second World War on the communities and industries of Bolton and Oldham was profound and long lasting. Bolton's engineering industry was less disrupted as most of its remaining firms were directed to produce similar or at least complementary equipment to their peacetime activities. Only Dobson and Barlow were obliged to undergo a complete change as were the other TMM plants in Oldham and elsewhere. Ferranti's propensity to mutate from time to time was, between 1939 and 1945, for once strength and the company thrive as a 'technology led' operation during the war. The emergent vehicle builder, Seddon Diesels enjoyed a period of relative calm, untroubled by the need to find customers for its newly developed products.

Virtually nothing was produced which was not essential and virtually everyone of employable age, who was not in military service, was engaged in some kind of war work. Even during the conflict plans were being prepared for major post-war government intervention in industry and after 1945 successive governments attempted to control more or less directly the development of Lancashire's largest firms. The textiles and the textile machinery industries, two of Lancashire's most important employers, were subjects of particular attention between 1945 and 1970. The aircraft industry suffered

from changes in government policies relating to defence and nationalisation. The motor industries' most successful business, Leyland, was practically forced to combine with less efficient and failing midlands based vehicle builders.

The sharp decline of the British motor industry exposed Thomas Ryder and Son's dependency on a narrow product range and on a single industry sector. Ryder's main failing was in its reluctance to develop numerically controlled lathes, a strategy which would have created possibilities for diversification. Of the companies examined in this study, Ryders was probably the most suitable enterprise to take advantage of some of the interventionist policies. It would, however, be harsh to indict Ryder's management with lack of foresight considering the economic conditions with which they had to contend during the time when numerical control was being introduced. On the one hand they had developed a successful product range with which their customers were well satisfied; on the other hand they were forced by necessity to endure periods of political change and fuel shortages brought about by factors beyond their control. Numerical control had been developed by more than one British company and by 1969 the IRC had identified this type of automation as an area of potential growth. The Ferranti system, which was based on magnetic tape input and needed a main frame computer to produce its programmes, was only practicably available for large companies. By 1970 Plessey, whose system operated on punched paper tape which could be programmed on a Flexo-Writer, had, with the financial support of the IRC, acquired Ferranti's NC business. By then the Heath government was in power and government sponsored development projects were, at least temporarily, suspended.

Even before Britain joined the Common Market the heavy commercial vehicle sector was under threat from Continental competition. During the 1960s imports of heavy trucks from Volvo and Scania of Sweden had been rising as a result of tariff reductions between EFTA members. The advantage of the Seddon take-over of Atkinson was principally that the model ranges of the two firms were complimentary the disadvantage was that the Atkinson management team were very much against the deal. Nearly all the Atkinson directors resigned shortly after the take-over was completed. Integration of the two companies was not achieved without some difficulty and much bitterness on the part of the Atkinson personnel. Scale economies would have been achieved only where major components such as engines and transmissions were sourced from a single supplier but, as the end customer had the final choice of these items, it is difficult to imagine that significant reductions were made. Perhaps the government's long stated preference for larger companies influenced Seddon's management but it was a curiously ill timed strategy at a time when Heath was still ostensibly following the path of laissez-faire. As it turned out, the timing of the take-over was as unfortunate as it was undoubtedly misjudged. The hyper inflation of the 1970s coupled with the pending removal of tariff protection following Britain's membership of the Common Market were contributing factors to Seddon Atkinson's decision to sell out to the Americans.

More uncertainty was introduced by the results of the 1974 general election and, even after the second poll gave Labour a slim overall majority. The return of the IRC under the guise of the National Enterprise Board was, if anything, even more interventionist than its precursor. Identifying 'key sectors of growth' not only requires a highly trained and experienced market oriented intellect, it is also, in view of the powers exercised by the various working parties, potentially exposed to private agendum

By the time Callaghan was forced to go to the country Britain's engineering industry was being wracked by strikes, starved of investment and decimated through exposure to competition from European rivals. When, in 1978, import duty on motor vehicles was reduced to zero for European Union countries the industry plunged into decline.

It seems likely, in retrospect, that Platt would have either failed or contracted substantially had it not been for the lucrative war-work contracts they were awarded during rearmament and the Second World War. After the war, when their German and Japanese competitors were recovering from the devastation of defeat, Platt had an opportunity to develop and consolidate its market position. Instead the company reassumed its pre-war dominance of TMM and exploited its brief period of grace to maximise profits and control prices. Textile Machinery Makers, an aberration from its inception, would probably have disintegrated had it not been for the advent of the Second World War, and even after the war its monopolistic position precluded the necessity to respond to its home market's requirements. As Singleton points out, the distrust of TMM '...may have been a contributory factor to the general feeling of malaise in the spinning section' (of the textile industry). It is a reasonable speculation that the artificially created TMM served to prolong the existence of Platt to the severe detriment of Dobson and Barlow and others.

Ferranti's inability to develop marketable products and its fragmented structure, coupled with an apparent fascination with the armaments industry to the detriment of its non-military business, can only be ascribed to singularly inept management. The prolific number of innovative products which the company succeeded in developing through the introductory phase of the product life cycle was never, except during the period of receiver appointed management between 1905 and 1913, capable of progressing to the growth and maturity phases. The Ferranti ethos, that of a family controlled and product led business, clearly created a situation which was not commercially viable. Profits from the first and second world wars enabled members of the Ferranti family to perpetuate the mistaken belief that firms could exist without taking cognisance of what their customers wanted to buy.

Chapter 4, 1979 to 1990

Politics

'The Conservative Government that came into office in 1979 claimed to be, and indeed was, very different from its Conservative predecessors.' Mrs Thatcher's government attempted to squeeze inflation out of the system and to this end applied the doctrine of monetarism. The result of this experiment was a sharp contraction of the manufacturing sector between 1979 and 1982. Output fell by 16%, investment by 30%, GDP by 6%, and unemployment increased from 1.3 million to over 2.8 million. The average short term interest rate rose from 11.6% in 1978 to 15.8% in 1979 and remained high through 1981 and 1982. Although by 1983 an economic recovery was perceived by many as being established, there were huge regional differences and unemployment remained at over three million. By 1987 the British economy was booming but the revival was brief.¹¹⁷

Between 1979 and 1989 employment in the UK manufacturing industry fell by 31.6% or 1.74 million. Although manufacturing employment had been falling since the 1960s, and more so in Britain than in the rest of Europe, the UK decline during Mrs Thatcher's administration was almost twice as acute as France, the only other large EU country to experience a reduction. German and Italian manufacturing employment actually rose slightly in the 80s and the Netherlands employed nearly 10% more people in manufacturing in 1989 than in 1979. On 19th October 1987 the New York stock market index fell by 23% followed by a similar fall in the value of shares in London and other markets. By July 1988 the monthly current account payments deficit reached £2.2 billion and in May 1989 the government increased the base interest rate to 14%. Inflation was out of control and heading for 9% which it reached in 1990, official unemployment was still high at 1.76 million and base rates had increased to 15% by October.¹¹⁸

Technology

By 1979 manufacturing engineering technology was showing signs of maturity and computer numerical controlled machine tools were the established norm for the automatic production of metal parts. Electronic automation of traditional types of machinery, such as printing presses and textile machines, greatly improved their efficiency. Mechanical typesetting machinery was superseded by the computer and desk top publishing systems destroyed the market for small printing machines. Throughout the 1980s electronic devices continued to reduce the mechanical content of all types of machinery and the need for metal components declined sharply. British machine tool builders had, with few exceptions, failed to embrace CNC and the UK market was dominated by German, Japanese and American machine tools and, for a significant period, the Swedish company SMT held a technological lead.¹¹⁹

117. Ian Gilmour, *Dancing With Dogma*, (London: Simon & Schuster, 1992), p. 206; Stephen Bazen and Tony Thirlwall, *Deindustrialization*, (Oxford: Heinemann, 1992), p. 52.

118. Stephen Bazen and Tony Thirlwall, *Deindustrialization*, (Oxford: Heinemann, 1992), p. 15.

119. Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 206.

Alfred Herbert, once the largest British owned employer in the machine tools industry, had been taken over by the NEB in 1975. The firm had never made significant progress in the new technology and its range of automatic and semi automatic lathes were hopelessly outdated by those of Okuma, Gildemeister and Warner and Swasey. Herberts were broken up in 1980 and a successor company, renamed Matrix Churchill, retained the more advanced products of the Herbert line. Other established British machine tool companies, such as Dean, Smith and Grace and Jones and Shipman, who had also failed to develop viable CNC machines, became involved with US or Japanese companies whose more advanced machines they produced in Britain under license. Several American machine tool companies such as Warner and Swasey and Brown and Sharp, were already building machine tools in Britain and, in 1987, the Japanese CNC lathe manufacturer Yamazaki opened a manufacturing plant in Worcester.¹²⁰

Markets

By the end of the 1970s Britain's traditional markets in the old empire and dominion countries had been lost, either to the aggressive marketing strategies of established competitor nations such as Germany and America, emerging industrial countries like Japan, South Korea and Taiwan, or to the growth of industrialisation in countries like India, Canada, Australia and South Africa. Britain's new opportunities lay closer to home, on the European continent, but the nature of these markets were vastly different to the old ones. The twelve countries which, in 1979, formed the European Union were sophisticated, mature markets with fully developed manufacturing engineering industries. Branded products are notoriously difficult to establish in most continental countries, motor vehicles being a particular example, and British engineering products, with very few exceptions, had acquired a negative image.

One field of expertise in which British companies could compete was aerospace, an industry which was emerging in the EU in the 1980s. The British aerospace industry was based mainly on the arms trade, having lost much credibility in the civil aircraft sector after the De Havilland Comet disasters of the 1950s, but had regained a certain amount of kudos from the Concorde project. The Anglo-French Jaguar military aircraft programme and the Tornado, in co-operation with Germany and Italy, established the viability of pan-European collaboration and British firms had done well, both as major partners and as component suppliers, out of these projects. The initial reluctance of the British government to back European co-operation in the development of a subsonic passenger aircraft cost British aerospace companies a major stake in Airbus Industries, but eventually a 20% share was agreed. Government support in the form of launch-aid made available on two occasions, in 1983 and 1987, was contrary to perceived Thatcherite policy, but it secured a British interest in a European growth industry.¹²¹

120. Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 206.

121. Harry Holmes, *AVRO The History of an Aircraft Company*, (Shrewsbury: Airlife Publishing, 1994), passim; Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 322.

Competitors

By the end of the 1970s the world market for engineering products had begun to reach the stage of maturity. By 1990 large multinational groups dominated most sectors, particularly motor vehicles, and the production of long-range civil aircraft was in the hands of two companies, Boeing and Airbus. A British company, Rolls-Royce plc, which had been saved from bankruptcy in the early 1970s by government intervention, was the only firm outside the USA capable of producing large jet engines. One tier below the multinationals was a large number of component suppliers and subcontractors which were beginning to become multinational as transnational mergers and take-overs created competing groups. Purchasing policies adopted by the major companies forced their suppliers to adapt as longer term contracts were negotiated on the basis of complete systems or subsystems rather than discrete components. Many British engineering companies became members of such groups which competed for business on a global basis, seeking to supply identical systems through their subsidiary manufactures in whichever country they were required. A subtle change in the nature of industry had shifted from nationally based, to globally based competition.¹²²

Lancashire

Lancashire, or more accurately Greater Manchester, in the late 1970s was still one of the largest urban areas in Britain with a population of 2.5 million and an area of 728,674 hectares. Greater Manchester was subdivided into ten district authorities, all but one having populations of over 200,000. By the early 1980s just over one million people were employed in the region, a fall of around 120,000 compared with the 1971 figure, most of the losses apparently occurring as a result of a fall in employment in manufacturing from 41.4% in 1971 to 30.4% in 1981. By 1990 it is probable that only one in five of Lancashire's workers were employed in manufacturing. There was a 4.2% decline in the population of the region between 1979 and 1985, the most notable changes being in the dramatic fall in the number of children below school age and the increase in the number of people over 75. By February 1987 the rate of unemployment in Greater Manchester was 14.6%, representing 172,756 people, an increase from 11.2% in 1981.¹²³

Bolton

In 1981 the population of Bolton had fallen by around 10,000 compared with 1971 to 143,960 and by 1991 a further fall of just fewer than 5,000 was registered. The number of engineering firms listed in the Bolton Chamber of Commerce and Industry Report and Directory for 1979 was 34, general engineers being the most numerous with 26 companies. There were 4 electrical engineers and the number of textile machine builders had fallen from 9 to 6.¹²⁴

By 1990 24.8% the population of Bolton in employment had jobs in the manufacturing sector and 69.6% were employed in service jobs. The 1991 edition of the Bolton Chamber of Commerce and Industry Report and Directory lists 28 engineering companies although most of these were relatively

122. Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 201.

123. *The Counties and Regions of the UK*, (Aldershot, Gower Publishing, 1988), pp. 46 – 47.

124. *Bolton Chamber of Commerce and Industry Report and Directory*, (various years), Bolton Library Local History Archive ref. 380/bol.

new companies. Hick, Hargreaves was the only company listed in both the 1890 and the 1991 directories.¹²⁵

As part of Platt Sacco-Lowell the much depleted Dobson and Barlow plant employed less than 200 in 1979. In May 1980, 86 of the remaining workers were made redundant, and in early 1981 the receivers were called in, and in January 1982 the factory was closed down completely.¹²⁶

Hick Hargreaves and Co. responded to the conditions of the early 1980s in a similar way to other companies of its type. After 1979 the firm undertook a period of rationalisation creating two operating divisions; machinery and special products. The machinery division produced rotating equipment such as positive displacement blowers and liquid ring pumps. The special products division produced vacuum technology equipment, a market which required a high degree of expertise and experience. Despite the high value of the pound a high percentage of the firm's production was exported. In 1990 the company employed around 350 personnel, slightly more than in 1979.¹²⁷

By 1979 Thomas Ryder and Son was struggling to survive as their home market remained in recession and vehicle production in Britain continued to fall. Export markets of machine tools were by then dominated by German and Japanese equipment and, in May 1980, the company was constrained to cut its work force from 500 to 300. Behind the scenes Whitecroft had been attempting to sell Ryders as a going concern, rumours of which probably preventing many of the highly skilled employees from leaching away. As it was, by October 1980 when Whitecroft announced that the company was to be closed down, there were just 235 workers left to be made redundant. A last minute offer for Ryders by the US group Gulf Western was accepted by the receivers, but less than 100 jobs were saved. In late 1982 the firm's main activities were those of service and the supply of spare parts. Not long after the company moved to premises in the Derby, all trace of Thomas Ryders and Sons disappeared.¹²⁸

Oldham

The population of Oldham declined from 90,867 in 1981 to 88,243 in 1991. During the same period the number of engineering companies in the town was fairly constant at 48 but, as with Bolton, by 1991 most of the firms were relatively new. By 1990 around 23.5% of people in work in Oldham were employed in the manufacturing sector and 62.1% were in service industry jobs.¹²⁹

In 1982 the National Enterprise Board sold its 50% holding in Ferranti on the stock exchange for around £50 million. In 1987, after merging with the little known International Signal and Control Inc. of America, the firm changed its name to Ferranti International plc. Less than two years later the new

125. Geoffrey Timmins, *Made in Lancashire, A History of Regional Industrialisation*, (Manchester: Manchester University Press, 1998), p. 321; *Bolton Chamber of Commerce and Industry Report and Directory*, (various years), Bolton Library Local History Archive ref. 380/bol.

126. Bolton Library Local History Archive, Local Press Cuttings 1967 to 1998, Ref. 621/ctg.

127. Untitled typescript, 'Historical Notes', 27th October 1982, Hick, Hargreaves and Company, Bolton; EIS Group plc, *Annual Report and Accounts, 1990*, FT Annual Reports Service.

128. Bolton Library Local History Archive, Local Press Cuttings 1967 to 1998, Ref. 621/ctg.

129. Thompson Local Directory (Oldham), (Farnborough: Thompson Directories, 1990), passim; The Counties and Regions of the UK, (Aldershot, Gower Publishing, 1988), pp. 46 – 47.

company became the centre of an international scandal when it was discovered that the American company had defrauded its shareholders of some £215 million. The resulting litigation caused the stock market value of Ferranti to fall below an acceptable level and shortly thereafter the firm went into final receivership after selling off many of its subsidiary companies. Some individual divisions were eventually, with the help of the DTI, rescued through management buyouts. Ferranti Air Systems of Wythenshaw survived as part of Ultra Electronics Holdings plc but the company which was started by S.Z. de Ferranti ceased to exist in all but name.¹³⁰

When the British economy plunged into recession in 1980, Stone-Platt Industries discovered that its diversified foundations were insufficiently substantial to ward off financial crisis. The group's bankers appointed new managers who immediately began an attempt at rationalisation. Redundancies were announced and endeavours were made, unsuccessfully, to sell off individual parts of the group as going concerns. By 1981 receivers had been appointed and, although some aspects of the group were bought from the receivers, the core business eventually failed completely. Platt Oldham plant closed and the last 950 employees were discharged at the end of January 1981, around 200 workers being retained by Platt Power Transmissions at the same site.¹³¹

The recession severely affected Seddon Atkinson. In October 1980, the firm's 1,400 strong workforce was put on a one day week, which increased to a three day week in January 1981. However, in February 1981 the situation had further deteriorated to the extent that 810 employees were sacked in an effort to reduce fixed costs. By June 1982, the firm's parent company, International Harvester, was itself in financial difficulties. Seddon Atkinson's association with International Harvester lasted less than nine years. In February 1983 the Spanish group ENASA purchased the company from IH for an undisclosed sum and made it a subsidiary of Pegaso, a manufacturer of medium commercial vehicles. In July 1983 a further 170 employees were sacked when ENASA decided to close down Seddon Atkinson's components division. In January 1985 it was announced by the state owned ENASA that they were undertaking a review of their European activities, made necessary by Spain's impending entry into the European Union. Seddon Atkinson was effectively put on the market and its manufacturing facilities were run down.¹³²

Over the next five years the work force fell through natural wastage from 680 to below 300. In January 1991, under the terms of an agreement with Pegaso, the Italian multinational commercial vehicles manufacturer Iveco, itself part of Fiat, acquired Seddon Atkinson Vehicles¹³³ By then the

130. The Ferranti Collection, Manchester Museum of Science and Industry Archive, ref. 1996.10; Ultra Electronic Holdings plc, Annual Report and Accounts, Greenford, Middlesex, 1999.

131. Geoffrey Owen, *From Empire to Europe*, (London: Harper Collins, 1999), p. 199; Oldham Local History Library Archive, Press Cuttings ref. V52 - P15 (OEC).

132. Oldham Local History Library Archive, Press Cuttings ref. V52 - P15 (OEC); Oldham Local History Library Archive, Press Cuttings ref. V53 - P74 (OEC); Oldham Local History Library Archive, Press Cuttings ref. V55 - P30 (OEC); Oldham Local History Library Archive, Press Cuttings ref. V55 - P58 (OEC); Oldham Local History Library Archive, Press Cuttings ref. V56 - P50 (OEC).

133. Source: Iveco BV, Public Relations Department Statement, Prof. Bavincklaan, Amstelveen, Netherlands.

number of employees had fallen to less than 200, vehicle exports had practically ceased and annual production dropped from 1,400 vehicles to just over 1,000.¹³⁴

Summary and Conclusions

Margaret Thatcher's laissez-faire economics had an immediate and long-lasting affect on Britain's manufacturing engineering industry. For many companies the result was analogous to a domesticated animal being suddenly released into the wild. After decades of protection, subsidies and economic manipulation firms were exposed to fierce competition from foreign companies, many of which enjoyed government support in their own home markets. State subsidised Belgian, German and French quasi government steel producers and vehicle builders, like Hoogovens, Krupp, Peugeot and Renault, increased their share of the British market as subventions for Rover and British Steel were run down. Far from producing the promised stability, Thatcher's economic strategy created even more pronounced cycles of recession and prosperity. The high value of the pound, which increased against the \$US by over 20% between 1978 and 1980, made it impossible for British engineering companies to compete. In 1983, probably for the first time in history, Britain imported more manufactured goods than it exported and by 1990 the annual deficit had reached nearly £14 billion. The trade deficit in machinery and transport equipment was £7.95 billion, more than 60% of which was accounted for by road vehicles.

The Thatcher government had little, politically, to lose by allowing Lancashire's industries to collapse and it was for this reason alone that nothing was done to at least alleviate some of the severe conditions caused by its passing. After 1978 import duty on manufactured goods was reduced to zero for European Union countries and by 1980 it had become clear that most of the regions engineering companies were struggling to survive against European competition. If, to some already failing companies, the shock of Thatcherite economics simply provided the *coup de grace*, it is also possible that some viable firms disappeared along with those which were not.

By 1980 the Ryder product range had become outdated in as much as they were single purpose machines. Motor vehicle manufacturers were beginning to develop into assembly operations, relying more on subcontractors to undertake machining and even some subassembly work. 'Just in Time' contracting placed strict conditions of delivery on suppliers who needed reliable, flexible machine tools in order to remain competitive and they needed machine tools which could undertake a variety of work. Ryder's lathes were reliable but not at all flexible, normally being designed specifically to produce a single component or a small range of similar components. Even in 1980 it would have been possible, because of Ryder's excellent reputation, for the firm to adapt and survive. Unfortunately, because it was in the hands of a financial group, itself in difficulties, the required imaginative solution was not found and a viable engineering company was lost.

134. Society of Motor Manufacturers and Traders, *Motor Industry of Great Britain - World Automotive Statistics*, (London: Society of Motor Manufacturers and Traders, 2000), passim.

The Ferranti - International Signal and Control debacle was, perhaps, an appropriate finale for a company which had existed since 1915 mainly as a result of arms profiteering and dubious accounting practices. Although S.Z. de Ferranti had no doubt been a brilliant innovator it is difficult to believe that he was a practical engineer and he was certainly a very poor business man and his descendants appear to have followed his example. Some aspects of the company did achieve reputations for quality and, fittingly, they survived as separate entities.

In terms of the vagaries of international finance and the arbitrary nature of corporate decision making, Seddon Atkinson was more of a victim than a failure. Seddon's impulsive take-over of Atkinson was ill conceived particularly as it apparently overextended their finances so that the International Harvester bid was irresistible. Spain was not an EEC member in 1983 and ENASA was a fully state owned corporation, factors that surely should have been taken into consideration by the British government. It is unimaginable that a nationalised British company would, in 1983, have been allowed to gain ownership of a private sector company and under any other administration Seddon Atkinson would have been returned to some form of private, if not British, ownership when IH began to fail. Although Seddon Atkinson has survived it has done so only as a minor subsidiary of Iveco, a large European corporation which was until recently in direct receipt of government subsidies.

Platt was virtually bankrupt in 1979, partly as a result of high inflation and high interest rates. The end came when the cost of borrowing increased further as a result of Mrs Thatcher's deflationary economic policy. The company had survived because of its protected position and because it controlled a large proportion of the British market for spinning machinery. A protected monopoly is not necessarily inefficient but Platt has been accused by more than one journalist of indolence and of abusing its position. In a market economy, no company had a god given right to exist. As previously suggested, it would have been better for the British textile machinery industry if TMMs component firms would have been allowed to compete with one another, instead of being coerced into an ill founded cartel.

Hick, Hargreaves and Co. is the only company to survive and maintain its integrity, character and independence. It did so because it avoided becoming over specialised and because it realised its true strengths and exploited them to the benefit of their customers as well as their shareholders and work force. Hick, Hargreaves is today very similar in nature to the firm which started in the nineteenth century by providing engineering solutions rather than 'products'.

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