NOTTINGHAM LACE: STORIES OF INDUSTRIAL DECLINE AND TEXTILE HERITAGE

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INTRODUCTION

Nottingham's relationship with technological innovation in textile manufacturing began in the sixteenth century with the invention of the Stocking Frame by Rev Lee. It was this technology which paved the way for the production of machine-made lace by the beginning of the nineteenth century in the region. It is both the manufacturing technology and the fabric which elevated the city of Nottingham to have global influence as the manufacturing capital of lace.

The technological innovation to manufacture lace was driven by the demand for the consumption of handmade lace which was, until the early-nineteenth century, limited to the wealthy and considered a luxury product. In the eighteenth century the technology was adapted to create lace-like structures, using a knitted net, and later patterned lace, but the fabric was unstable and unraveled if a thread was broken.

At the beginning of the nineteenth century, John Heathcoat invented a different way of making net by replicating the actions of bobbin lace makers and twisting threads together. This resulted in the 'twist-net machine' which created a more stable net fabric which could be hand embroidered to make lace. Shortly afterwards John Lever developed the 'Leavers lace machine' which integrated lace patterns to be constructed directly on the machine.

Early exports

The lace industry in Nottingham became a fragmented one which included lace machine makers, lace manufacturers and makers, auxiliary and finishing trades (washing, bleaching, dyeing etc), and the wholesalers who sold and distributed the finished product. There were also numerous technical and design roles from draughtsman to lace designers as well as yarn merchants. In addition, lace production was split into three divisions: plain net, curtains, and dress laces (made on Leavers machines). This complex industry became a global phenomenon which relied upon imported raw materials coming into Nottingham and machines and lace being exported around the world.

However, there were initially Government prohibitions on the export of lace machinery and skilled workers, with heavy penalties in place: "by 1818 the penalty for exporting lace machinery was £500."[1] Despite the restrictions, twist-net machines and their operators were smuggled into Calais, France in 1816. The early lace machines, as illustrated in Figure 1., were about 1 meter wide and therefore easy to dismantle and be taken by boat as 'scrap' metal.

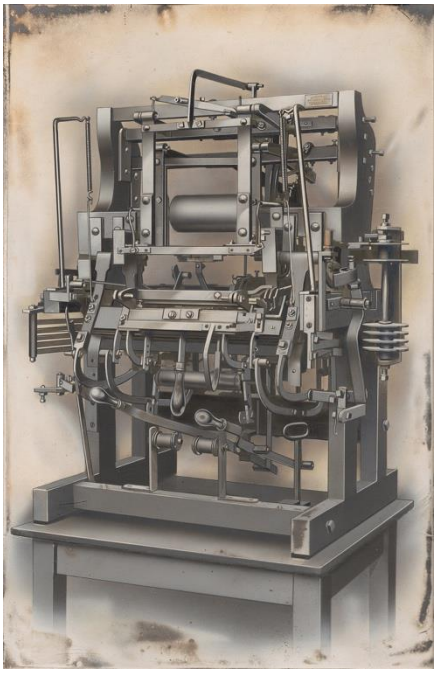

Figure 1. Early Leavers Lace Machine

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According to Kelly, in the wake of the success of these first machines "by the end of 1820 there were 14 manufacturers in Calais who owned 32 machines."[2] In the 1820s lace makers headed across northern France and into Paris. Others, as export controls eased, "travelled to Belgium, the US, Prussia, Vienna…and by 1839 there were at least seven machines built in Nottingham that were operated in Moscow by British workers."[3]

Expanding export trade

John Jardine & Co. were Nottingham's largest lace machine builders, they also traded in second-hand lace machines and other equipment. Jardine's produced a monthly 'Lace Machinery Register' which advertised machinery available for sale and gave information on the state of the industry. Between 1897 and 1899 the company exported lace machinery to France, Belgium, Spain, Italy, Germany, Austria, Russia and the United States (US). The bulk of these sales were to France, Germany and the US.[4] In August 1899, in addition to listing lace machinery for export, Jardine's Register also carried an advertisement for skilled twisthands to work in the US.[5] Between 1921 and 1961, their export trade took machines as far afield as: Argentina, Brazil, Canada, France, Germany, India, Italy, Japan, Korea, Mexico, US and Yugoslavia.[6]

Lace products were also widely exported. In the 1840s one-third of British lace production was exported to Germany. By the early 1850s the three largest customers were Germany, Netherlands and the US.[7] According to Mason, between 1878 and 1883 lace exports to the US increased by over 200% and in the early-twentieth century accounted for one-million pounds worth of lace annually (just under one-hundred-million pounds today).[8] Inevitably this market declined as the US increased their own manufacturing capacity with machinery imported from Nottingham.

In 1948 Simon May & Co., listed Agents selling in twenty-two countries, from Europe to Australia and South America to West Africa.[9] The incumbent Lord Mayor of Nottingham, John E. Mitchell wrote praising the company's export achievements: "Our City is known throughout the world as the 'City of Lace' …Today perhaps more than at any time in the nation's history we are dependent upon our export trade for survival, and we know that the whole of your endeavours are applied to more and more goods for export."[10] The Nottingham lace industry was based on a two-way trade of exports and imports. This

is exemplified by the carving, illustrated in Figure 2., above the entrance to one of the major lace wholesalers which shows Britannia, flanked by figures representing Trade and Industry, the ships which transported the goods and the industrial facilities that produced them.

Figure 2. Tympanium at the Adam's Building, Nottingham Lace Warehouse
Photo: Briggs-Goode

Imported fibers

Nottingham lace relied on global connections for importing fiber. The UK climate does not enable the commercial growing of any plant fiber other than linen (which is unsuitable for most lace machines) and therefore they required imports of silk coming from Italy and India and long-stapled cotton from America, Egypt or the Sudan.

Mason indicates that "by 1831 the trade was using over one and half million pounds of Georgian 'Sea Island Cotton'" accounting for at least 85% of British lace production.[11] This came predominantly from the US, it should therefore be acknowledged that it is highly probable that cotton produced by enslaved people was a significant part of lace manufacturing in Nottingham. To further support this, Andrews draws our attention to the wider supply chain stating that: "By 1850, 40% of British exports were finished cotton goods at least three-quarters, and in some years 95%, of the raw materials imported into the Liverpool docks was from US plantations."[12]

It is also likely that cotton production relying on enslaved people within British colonies was being utilized in the region for both lace and hosiery. Atlantic raw cotton was key, not only the development of quality fabric, but also the technological innovation required to process it and as Berg and Hudson describe: Richard Arkwright Senior's water frame (patented in 1769) relied on increased supplies of Barbadense cotton with its longer staple and that without it, it is unlikely that the jenny would have been developed or widely adopted at this time. They also note that hosiery manufactures from Nottingham, were Arkwright's main backers in developing the jenny, who were able to utilize these stronger yarns to further facilitate developments of the knitting frame.[13] Despite acknowledging the challenges of piecing together details of this supply chain, Seymour notes that: "There are often missing or only fragmentary records and scattered archives and piecing together product supply chains in particular is time consuming."[14] Her team were able to establish that in "1790, Richard Arkwright Junior bought 1,300 bags of raw cotton worth £36,000".[15] And following the trail, they found that the cotton brokers he bought them from, including Nicholas Waterhouse & Sons, were later claimants for compensation to former slave owners after 1833 when UK slavery was abolished.[16]

The State of the Trade

Historical figures for employment in the lace industry are difficult to confirm due to the fragmented nature of the industry and the vast numbers of auxiliary and outworkers. However, Mason cites almost eight-thousand males and just over fourteen-thousand females in 1851,[17] in comparison with Calais and Saint Pierre workshops, where in the same year there were one-thousand-two-hundred men, four-hundred women and five-hundred children.[18] In England this rises to twelve-thousand males and fifteen-thousand females in 1891. Leading to the peak of the Nottingham Industry from an employment perspective in the early-twentieth century when over forty-thousand people were employed in 'lace manufacture', and 60% were women. By 1924 these numbers had declined to a little over six-thousand males and nine-thousand females with well over one-thousand female outworkers.[19] And currently estimates are below a one-hundred people employed directly within the lace trade in the region.

There were, of course, many more working at centers across the globe. In 1948 a publication by the American Lace Manufacturers Association reported that: "There are 54 lace mills and 730 Leavers lace machines in the United States today, manufacturing all types of Leavers lace in most gauges up to fifteen points. The Leavers lace industry in this country employs 5000 people and does an annual business of approximately 30 million dollars."[20]

Challenges to Nottingham's dominance began to emerge through the number of centers of lace manufacturing that Nottingham businesses had established, mainly in Europe. The frustration of the impact on the home market in 1886 can be seen in this quote from the Nottingham Chamber of Commerce which stated that "enormous quantities of (lace) curtains are shipped from Saxony to Nottingham…they are unpacked and repacked with English labels and thrown into our home markets as of 'English' manufacture."[21]

The practice of 'reimporting' was still seen as a threat as late as 1968, when, in a speech to the British Lace Federation, Arthur Faber, of the Austrian-based firm of Faber & Faber[22] mentioned a number, including his own, of British lace manufactories abroad, including Thomas Adam's curtain factory at Turin, Italy, which had been founded in 1888.

Nottingham machine owners WJ Walker ceased trading, due to loss of premises, and put their 15 machines up for sale. In a letter of November 23, 1956, it was stated that all of the machinery had been sold: "…part to the Argentine, part to Portugal and the bulk to Calais."[23] The machines had been offered to companies both locally and abroad including France, Chile, Argentina, USA, Spain, Portugal, Italy. The geographical diversity of this list gives a sense of how international the production of lace had become and coincidentally, as Hayes puts it "how export markets were lost, [as] manufacture elsewhere expanded."[24]

The situation also foregrounds the post-war onset of globalization which saw a wide range of industry dispersed to newly industrializing parts of the world.

New technologies

In parallel with these issues grew another threat which emerged from the 1950s in the form of the new technology of warp-knit machines, known broadly as 'Raschels'. These machines were enhanced to innovate – they were faster, cleaner, quieter, more flexible, electronic, and later computer-controlled. And importantly they could work with synthetic yarns, including those with stretch properties.

These machines were able to produce high quality lace which 'imitated' that made on the Leavers machines. Karl Mayer, of Germany, were, and still are, at the forefront of this technology.

This new technology began to appear across the globe, and also within Nottinghamshire, to replace the traditional Leavers machines.

Nottingham manufacturer Richard Granger noted that: "by 1968, the rapidly improving quality of Raschels lace was making serious inroads into the traditional leavers lace market. As a result, the first

Karl Mayer machines were brought from Germany" By 1988 they were using "15 fine gauge Raschels machines and 13 leavers machines – a comfortable balance."[25]
These challenges to the industry were also further impacted in the 1950s and 1960s by mergers and takeovers which were occurring across the whole UK fashion and textile industry. The lace industry was not immune, and it was not only small companies that were affected. One of the largest and oldest lace companies in Nottingham, and a leader in Leavers lace, was Birkin and Co., who merged with the mainly Raschels firm of J Guy & Co, and then formed a partnership with machine builders Karl Mayer of Germany.
In 1997 Birkin produced sets of lace edged handkerchiefs, illustrated in Figure 3., celebrating the one-hundred-and-fiftieth anniversary of the foundation of Birkin & Company – the lace was made on Raschels machines, perhaps intended as an indication that they were a forward-looking company working with the latest technology.

Figure 2. Handkerchief set produced by Birkin & Co. in 1997 with Raschels lace edging

The Guy Birkin/Karl Mayer partnership in machine development came to fruition in 1982 with the launch of the first Jacquardtronic lace machine. Britain's high street stalwart department store, Marks & Spencer, partnered with Guy Birkin in the development of all over stretch lace underwear sets. These were a new phenomenon and a direct result of the pioneering technology. Guy Birkin Managing Director, Eileen Measures, stated that: "The arrival of stretch lace meant that there is no longer a need to choose between comfort and glamour."[26] She also noted that "We are in a period of significant changes, with new markets opening up and older ones forming alliances. The easing of trade between USA, Canada and Mexico will mean new thinking in how we and our competitors approach these markets as the potential is high."[27] In 1995, Birkin of Borrowash, Derbyshire, were the world's largest manufacturers of Raschels lace, producing fourteen tonnes of lace weekly, over half of which was exported.[28]

'Textile Tales'

A faster, electronic machine, was not always well received by those involved with Leavers lace, and here we can turn to some of the testimonies collected in the 'Textile Tales' project.[29]
The Nottingham Trent University (NTU) led 'Textile Tales' project, ran for eighteen-months, and was funded by the National Lottery Heritage Fund in 2019. NTU worked with seven partner organizations, and trained volunteers to interview former and current textile workers in the region. The twenty-five volunteers gathered over fifty-five oral history recordings. The project carried out 'roadshow' events which were situated in museums and arts venues, a working factory and a specially commissioned vehicle to enable recordings in smaller towns around the region. The recordings are publicly available at East Midlands Oral History Archive.[30]
The project including oral history recordings from two twisthands, the highly trained lace machine operators. Joe W, now retired, had been a leavers lace twisthand all his life and had worked for various lace companies, including Guy Birkin until they ceased trading in the early 2000s. He was asked his opinion on the new Jacqardtronic machines and if he was keen on the link between Mayer and Birkins. His answer was plain: "No, no, no, not at all. We wanted to put stickers on ours saying 'Leavers lace, made in Britain'."[31]

Alternative yarns and consumer demands

There is a suggestion that this new, faster technology had been developed in response to the frequent changes in garment design driven by market demand. This in turn hints that the rise of fast fashion and disposability had a part to play in the 'boom and bust' of the lace industry. This later era saw the frequent experimentation with different yarns. As Joe W explained, some experiments were more successfully than others: "I were working wool! Wool, in a lace machine! I mean it's got no twist or nowt on it you know! ... I worked one acetate that was gold, you know when it were dressed up, and in a certain light, you couldn't see it! I had to go along the footboard and feel to see if it was still there. But it made beautiful golden lace…"[32]
Tensions emerged between 'old analogue – technology' and 'new digital – technology'. In her 1994 interview, Eileen Measures emphasised the new innovative technology and the consumer 'demand' for continual design change: "But styles are not generally being retained for several selling seasons – the market demand for frequent change means that we must bring a constant flow of new ideas and find ways to get those ideas from sketch and into the hands of garment stylists in lace form even faster. Therefore, we must be prepared to invest in any innovation which will enable us to shorten this cycle, whether it is more advanced computer aid in draughting or machinery where the design set-up is faster."[33]

Impact of deindustrialization

Whilst management may have been enthusiastic about the innovative new technology the impact on the skilled twisthands who had operated the analogue technology could be devastating. 'Textile Tales' interviewee, Brian M, spoke of his personal feelings on the changes: "The Machines were sold for Scrap – broke my heart."[34] Social historians, such as Tim Strangleman and Steven High, have likened the deindustrialisation process to a type of bereavement, and we can understand this through the lace and textile workers oral histories. Workers watching the factory and machines they had developed a bond with being scrapped came through in the oral histories as a deeply emotional experience, even perhaps a type of grieving. Many of the interviews from 'Textile Tales' refer to the changes being 'sudden', and whilst the move to offshore industry and machine imports from abroad had been coming for some time, it still seemed to be a shock to many of the workers when the industry in Nottingham all but ended. 'Textile Tales' respondent, Brian L, had worked in the lace trade all his life working his way up in the business, working the machines, becoming a mechanic, a foreman, a manager and then a director, before

retiring. He summed up the situation for many in his comment that "...when you set [lace] factories up and then you see them die, you don't expect that happening. I mean, in coal mining, you set a coal mine up you know it's going to die one day because you're going to run out of coal, but we never thought that the lace trade would finish. We thought you could always look back and watch these machines running again, it wasn't to happen."[35]

CONCLUSION

The fragmented and complex global nature of the Nottingham lace industry could be said to have contributed to its demise. Whilst the closure of local coal pits, with hundreds made redundant, made national newspaper headlines, no-one really noticed the individual lace factories, or the supporting industries, slipping away one by one. The impassioned letter of July 17, 1956, from W.J. Walker to his MP expressed personal distress at the loss of a company: "…we will have to turn out of this mill where we have been housed for the past fifty years. This will mean that the machinery will have to be sold probably abroad or at heart breaking prices at home on account of the credit squeeze and the general slump in trade."[36] The loss of many small businesses, with perhaps only a dozen or so workers each, didn't seem that important in the great push for faster, more efficient production.

Ultimately the cumulative effect of these small closures devastated the industry. Today Nottingham Leavers lace is being produced by one small manufacturer, Cluny of Ilkeston, Derbyshire, with less than ten employees. They had long lost the auxiliary industries for dyeing and finishing and were thus forced to send their lace to France for washing and finishing. In a letter to the Financial Times newspaper Director of Cluny Lace, Charles Mason, remonstrated his frustration at the extra taxes which were imposed retrospectively after the UK left the European Union and had almost caused their demise, while they remain active there is still a hint of the industry that once dominated world production.[37]

The global lace industry is currently thriving, but the vast majority is being produced on the latest technological innovations in the field: clean, fast, efficient, computer controlled, Raschels warp-knit machines. However, in Nottingham lace manufacturing is hanging by a thread, a very minor part of the global lace market, restricted to relatively small batch production for high end clients.

NOTES

[1] Patricia Earnshaw, *Lace Machines and Machine Laces* (London: B.T. Batsford, 1986), 72.
[2] Gillian Kelly, ed., *The Lacemakers of Calais* (Queabeyan, NSW: Australian Society of the Lacemakers of Calais, 1998), 57.
[3] Fabrice Bensimon, "The emigration of British lacemakers to continental Europe (1816–1860s)," Continuity and Change (2019): 34.
[4] Jardine's Lace Machinery Register, "Lace Machinery Sales," September 1899, 23.
[5] Jardine's Lace Machinery Register, "Work People Wanted," September 1899, 29.
[6] Sheila Mason, *Nottingham Lace 1760s-1950s* (Stroud: Alan Sutton Publishing, 1994), 211.
[7] Mason, 148.
[8] Mason, 184.
[9] Simon May & Co., *1849-1949 A Century of Achievement: The Simon – May Story* (Nottingham: Simon May & Co., 1949), 58-59.
[10] Simon May & Co., 5.
[11] Mason, *Nottingham Lace 1760s-1950s,* 43.
[12] Kehinde Andrews, *The New Age of Empire* (UK: Allen Lane, 2021) 104.
[13] Maxine Berg and Hudson Pat, *Slavery, Capitalism and the Industrial Revolution* (Cambridge: Polity Press, 2023) 153-154
[14] Susanne Seymour, Lowri Jones and Julia Feuer-Cotter, "The global connections of cotton in the Derwent Valley mills in the later eighteenth and early nineteenth centuries," in *The Industrial Revolution: Cromford, The Derwent Valley and The Wider World,* ed. Chris Wrigley (Derbyshire: Arkwright Society, 2015), 166.
[15] Seymour, 154.
[16] Seymour, 163.
[17] Mason, *Nottingham Lace 1760s-1950s,* 159
[18] Fabrice Bensimon, "Women and Children in the Machine-Made Lace Industry in Britain and France (1810-1860)," *Textile,* 18:1 (2020): 66-69.
[19] Mason, 159.
[20] Vittoria Rosatto, *Leavers Lace: A Handbook of the American Leavers Lace Industry* (Rhode Island: American Lace Manufacturers Association, 1949), 15.
[21] Mason, *Nottingham Lace 1760s-1950s,* 151.
[22] Faber & Faber had also taken lace machines out of England in 1832.
[23] W.J. Walker, *Letter to Col Scott, Owner of Birchwood Mill,* November 23, 1956. Nottingham Trent University Lace Archive NOTLC:2007:36
[24] Nick Hayes, "Heritage, Craft, and Identity: Twisthands and Their Machinery in What is Left of the British Lace Industry." *Labour History Review* 83 (2) (2018): 151.
[25] Patricia Earnshaw, *Lace Machines and Machine Laces Volume 2* (Guildford: Gorse Publications, 1995), 33.
[26] Eileen Measures interview, *Dessous Mode International: Guy Birkin special ed,* No 31 August 1994, 29.
[27] Measures, 29.
[28] Earnshaw, *Lace Machines and Machine Laces Volume 2*, 33.
[29] https://www.textiletales.co.uk/
[30] https://le.ac.uk/emoha/collections/all/textile-tales
[31] Joe W, Oral history interview, Textile Tales project recordings, September 6, 2019. https://le.ac.uk/emoha/collections/all/textile-tales
[32] Joe W, Oral history interview, Textile Tales project recordings, September 6, 2019.
[33] Measures, 29.
[34] Brian M, Oral history interview, Textile Tales project recordings, 22nd November 22, 2019. https://le.ac.uk/emoha/collections/all/textile-tales
[35] Brian L, Oral history interview, Textile Tales project recordings, 28th June 28, 2019. https://le.ac.uk/emoha/collections/all/textile-tales
[36] W.J. Walker, *Letter to John Jennings, MP,* July 17, 1956. Nottingham Trent University Lace Archive NOTLC:2007:37.
[37] Charles Mason, Letter: "One company's bitter experience of Brexit." Financial Times, August 7, 2023. https://www.ft.com/content/7d2fa6d1-1994-4f74-a59f-b2c63b301f1c

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