The Hand-Loom in Ulster’s Post-Famine Linen Industry: The Limits of Mechanization in Textiles’ ‘Factory Age’

KEVIN J. JAMES

This article explores conditions in the Ulster linen trade which sustained hand-loom weaving through the second half of the nineteenth century. In particular, it investigates the role and limits of technology in this process, and the impact of the American Civil War and its aftermath on mechanization.

INTRODUCTION

The historiography of the Irish linen trade in the second half of the nineteenth century has focused on its mechanization, while acknowledging the continuing presence of hand-loom branches in the sector. Generally, the structure of hand production in the Irish linen sector after 1850 has received less attention than mechanized weaving, although there is a growing historiography on co-extensive hand- and mechanized weaving in other branches of textile manufacture in the United Kingdom. Partly this neglect of the hand-loom results from greater interest in technological developments which so quickly transformed the spinning sector in the 1820s and 1830s. In spinning, the displacement of hand production by machine was relatively swift and complete — even the small demand in Ireland for super-fine yarn after the 1820s was largely met by imported hand-spun continental varieties. Indeed, contemporary observers claimed that weaving was developing in the same direction — but their predictions of the hand-loom’s obsolescence proved inaccurate and premature. In 1852, for instance, the Belfast and Province of Ulster Directory quoted J. MacAdam’s comments in the Journal of Design in which he predicted the hand-loom’s demise:

There are many reasons for believing that the future progress of the Irish linen trade will at least keep pace with its past development. One cause of linen fabrics being dearer than cotton is, that the great mass of the latter are woven by power, while all the former, except some of the coarsest kinds, are woven by hand. Although many attempts have been made to adapt the power loom to linens, they have hitherto not been successful, chiefly owing to the fact, that flax-fibre is not so elastic a substance as cotton-wool. Nevertheless, late experience has given more satisfactory results, although not yet sufficiently matured to warrant the belief that the power-loom can be soon made generally available [...]. It is scarcely possible that the difficulties which have heretofore prevented power-loom weaving from being adopted in the linen manufacture, should prove insuperable. Mechanical science has achieved many triumphs, where much greater obstacles lay in the way. We may, therefore, conclude that, sooner or later, the system will be fully carried out, and its results will have a powerful effect on the advancement of the manufacture.

There is no doubt that many observers of the trade believed that they stood on the threshold of a new era of mechanized weaving. Remarkably on the transformation of
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the British cotton industry, and reflecting on the mechanization of spinning, James Haughton in 1851 predicted that prosperity would soon accompany the adoption of steam-powered weaving and expressed enthusiasm in 'anticipation of the happy prospects which await Ireland, when the further triumph of mechanic power shall enable the manufacturers of these lands, to overcome the difficulties now in the way of spinning and weaving linen yarn'. But the transformations which he anticipated were belied by the continuing strength and importance of Ulster's hand-loom labour force — a fact which led C. F. Bastable to write as late as 1884 that the linen trade 'commenced with a system of domestic manufacture, which is not, even now, entirely swept away by the competition of the power-loom'. Such sources, many of which have not been employed to analyse the linen trade, offer extensive evidence that the adoption of power-loom technology in the Irish industry was incomplete in the 1860s — a decade in which the differentiated character of the Irish linen industry was in marked evidence. By the end of the American Civil War, coarser branches of the trade had experienced unparalleled demand and widespread mechanization, while finer cloth continued to be woven on hand-loom. This article examines the extent to which technical limitations and uneven demand during the Civil War restricted the viability of mechanization in some branches of the Irish linen trade. Underscoring the incomplete character of the steam-loom's triumph in Ireland, this article incorporates the hand-loom trade within the study of Ulster's linen industry during its fitful Factory Age and underscores the structural diversity of the trade in the second half of the nineteenth century.

THE HAND-LOOM IN ULSTER'S POST-FAMINE LINEN TRADE

While the persistence of hand-loom production has been largely over-looked in the history of the later nineteenth-century Irish linen trade, the position of the hand-loom workforce in the British cotton industry during the era of mechanization has stimulated considerable scholarly debate. Historians are divided over whether the sector experienced a decisive contraction by the 1830s, or whether its resilience after that decade demands particular attention — and explanation. Among scholars who explore the hand-loom's resilience, there are divergent interpretations of the persistence of hand-production, with some citing the supply of cheap weaving labour as a critical factor in retarding capital investment in power-loom, and some arguing that the limits of technology must assume a central importance in accounting for the uneven diffusion of steam power in textile trades. In the case of the Irish linen weaving sector, technical considerations demand specific attention. Several fine branches of the trade were not amenable to mechanical production, even as other branches began to employ steam power. These technical limitations retarded the adoption of the power-loom and enabled a hand-loom workforce to find employment in branches of the trade through the turn of the century.

Mechanization of weaving did not commence in the Age of Steam; it had been attempted in the first decades of the century, with water used as a source of power in several concerns in the 1820s. These innovations were ill-adapted to most branches, and it was not until the 1840s that steam power was adopted, when some manufacturers erected steam-powered machinery in Belfast. During the 1840s and
early 1850s, the spread of steam-powered weaving was limited. Widespread in the British linen industry, which concentrated on coarser varieties of cloth, the steam-loom proved ill-suited to weaving fine webs because of the delicacy of such work, militating against its use in many of the specialist Irish branches of manufacture. Observers such as James Haughton, however, predicted that these problems were far from insuperable, and that the power-loom would soon become the mainstay of the Irish linen sector.\textsuperscript{12}

In reports on the trade in the 1850s, the sector's continuing dependence on the hand-loom was betrayed by preoccupations with the extent and character of the weaving labour force in the post-Famine era. The \textit{Linen Trade Circular}, a publication of the Belfast Linen Trade Committee and the leading organ of the trade through the second half of the nineteenth century, surveyed the state of the industry in 1852. It noted that emigration had substantially reduced the number of weaving smallholders and expected that steam-weaving would soon prevail over the hand-loom:

Up to the period 1847, hand labour was so cheap and plentiful that the question remained in abeyance. The wide social changes brought about by the failure of the potato crop have, since then, materially affected this important department of manufacture. The weaving of linens, in the North of Ireland, was chiefly carried on by small farmers, cottiers and labourers, seldom as a separate employment, but as an adjunct to the work of the farm. Consequently, at the more pressing period of field-labour, such as seed-time and harvest, the production of linen cloth was greatly curtailed, by the transference of weavers to out-door work, on the conclusion of which they again returned to their looms, and production at once increased [...]. The class of small farmers is gradually becoming extinct, because they have found it difficult to live on the produce of their farms, and the labour of their looms, after deducting rent and other permanent charges.\textsuperscript{13}

Emigration in the late 1840s and early 1850s had indeed diminished sections of Ulster's weaving population, but the most striking change in the weaving labour force was its redistribution, resulting in a greater concentration of hand-loom weavers in north-eastern counties of the province. The geography of production shifted towards Counties Antrim, Down and Armagh, especially towards the provincial urban centre of Belfast, and away from regions (such as County Donegal) which traditionally supplied yarn to weaving districts.\textsuperscript{14} This process continued a pattern of geographic contraction during which the linen sector in western parts of Ireland, and the markets of County Louth and other places, diminished in scale from the 1820s. Even within this smaller area of manufacture, production remained highly regionalized, with one commentator noting:

As is always the case in kindred manufactures, the different sorts of linen fabrics are confined to certain localities. Thus, in Ireland, coarse linens for blouses \&c., and for the common kinds of export goods are chiefly made in the county of Armagh; medium and fine kinds of export cloth about Ballymena and Coleraine; damasks and diapers at Lurgan, Lisburn, and Belfast; lawns at Lurgan and Dromore; cambrics at Lurgan, Warringtown, and Dromore; heavy linens and sheetings for the home market at Banbridge; hollands in the counties of Antrim and Armagh; shirt fronts, woven in plaits, at Dromore; and the coarsest fabrics, such as bed-ticks, coarse drills \&c., at Drogheda.\textsuperscript{15}

To some observers, steam power offered new opportunities to increase weaving output during a decade in which the output of mechanized spinning mills was growing. But even as manufacturers experimented with steam-loom technology in
Ulster in the 1850s, they encountered trading conditions which deterred capital investment and limits in technology which restricted opportunities for mechanization.

Commercial considerations in the 1850s tempered enthusiasm for the powerloom.\(^6\) Although the early part of the decade saw an up-turn in exports, it was also punctuated by periods of protracted dullness. In 1854, manufacturers reduced the number of hand-loom operatives in their employ as demand fell for many classes of linen goods. This two-year period of low demand impeded the erection of power-looms,\(^7\) and, combined with high costs for flax, also depressed the spinning trade. In November 1854, prices in the trade were reported as depressed, owing to an expansion of spindle capacity in 1852 and 1853 (amounting to a 20 per cent increase in output), which had ‘glutted foreign markets’.\(^8\) The Crimean War also affected the supply of Russian and Baltic flax\(^9\) and the trade generally, resulting in a down-turn which was reversed in 1856, when increased demand led to a revival of interest in the power-loom.\(^10\) In this unstable environment, manufacturers approached the much-heralded power-loom cautiously. In the mid-1850s, some manufacturers experimented with them, and it was reported in 1855 that ‘Several firms who had erected power-looms had succeeded in making a fair quality of light linens, at a price which would leave an additional margin of profit over hand-loom goods, and some being so well satisfied with these results, were about to increase their machinery’.\(^11\) It was also reported that the production of ordinary light export linens by power-loom had advanced in 1856 and that a large proportion of the 25 firms and 2,200 power-looms in operation that year were directed towards the manufacture of heavy linens for the home trade, coarse drills and some light sets of goods.\(^12\) But technical problems limited mechanization to these branches, even when the commercial environment was more favourable to their adoption. Before the 1850s, the adoption of the power-loom was particularly impeded by the quality of flax yarn, which lacked the elasticity of cotton. Improvements to the power-looms, and better dressing of linen warps to increase their elasticity, expanded the range of goods they could be used to produce in the 1850s.\(^13\) In some British centres of linen textile production, they were used to weave canvasses, bagging and drills at the beginning of the decade.\(^14\) This coarser end of the trade was the first to be extensively mechanized,\(^15\) shifting hand-loom production to finer sets. Indeed, by the later 1850s, when the power-loom was employed to weave coarse classes of cloth in Ireland, the earnings of hand-loom weavers working in those branches fell dramatically (see Table 1).

By 1875, a comparable factory operative working ten hours a day was said to earn more than hand-loom weavers who had once worked fourteen-hour days on comparable coarse cloth.\(^16\) As these branches of the trade mechanized, factory weaving also became highly gendered as ‘women’s work’.\(^17\) The leading early historian of the Irish trade, Conrad Gill, suggested that technology enabled the feminization of the workforce; indeed, an increasing sexual division of weaving work had also been developing in the hand-loom sector through most of the nineteenth century.\(^18\) But the gendering of hand-loom weaving ‘skill’, and power-loom work, had little bearing on the physical exertions of either task. They were part of wider economic, social and cultural processes which saw expanded paid work opportunities for women in specific parts of the linen sector, sexual divisions of labour in weaving factories, restricted female access to apprenticeships in remunerative hand-loom branches, and

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<table>
<thead>
<tr>
<th>Weavers</th>
<th>Cloth</th>
<th>1855</th>
<th>1856</th>
<th>1857</th>
<th>1860</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linen, by Hand*</td>
<td>Coarse</td>
<td>9d to 15s</td>
<td>9d to 15s</td>
<td>6d to 9d</td>
<td>6d to 9d</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>1s to 15d</td>
<td>9d to 15d</td>
<td>6d to 15d</td>
<td>10d to 15d</td>
</tr>
<tr>
<td></td>
<td>Fine/</td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>Superfine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linen, by Power</td>
<td>Coarse</td>
<td>1s to 15d</td>
<td>9d to 15d</td>
<td>6d to 15d</td>
<td>10d to 15d</td>
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<tr>
<td></td>
<td>Medium</td>
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<td>Fine/</td>
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<tr>
<td></td>
<td>Superfine</td>
<td></td>
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</tbody>
</table>

Source: ‘Return of Wages Published Between 1830–1886 (Industrial Workers in the United Kingdom)’ [C.5172], HC 1887, LXXXIX.

* Hand-loom weavers were often required to deduct additional expenses for dressing a web, which reduced their net earnings. The Assistant Hand-Loom Commissioner who examined the condition of Rathfriland weavers reported that they paid 5d to 6d to dress the web, and 1s for warping the chain and winding the weft. See the Royal Commission on Hand-loom Weavers, Commissioners’ Reports, III (Yorkshire, West Riding; Ireland) (43–II), HC 1840, xxiii [hereafter referred to as ‘Royal Commission on Hand-loom Weavers’], Report of C. G. Otway, p. 636. In Leeds, linen weavers deducted a total of 2s 6½d weekly for such expenses as winding, dressing and brushes, loom rent (6d weekly), candles and the wear and tear of implements. See the Royal Commission on Hand-loom Weavers, Reports of the Assistant Hand-Loom Commissioners, West Riding of Yorkshire, Macclesfield, & c., Report from Solomon Keyser, p. 479.

differential valorization of male and female labour. By the end of the century, women dominated the ranks of factory weavers — and of hand-loom weavers in the least remunerative branches of hand-loom manufacture. By contrast, the very highest-paid hand-loom work — in damask, for instance — was almost exclusively the province of adult males.

The Linen Trade Circular continued to declare in 1857 that:

hand-loom weavers have become so scarce, and their wages so high, that, were it not for the likelihood of power-looms coming more and more into use, the cost of production might be such as seriously to interfere with the prospects of the export trade, while there would be a considerable difficulty in securing a sufficient make of goods.29

Pressure in many markets for lower prices also led many manufacturers to contemplate means of reducing relatively high labour costs, but commercial conditions remained unfavourable to the levels of capital investment which the power-loom required. At the same time, British firms were improving steam-looms. The mechanical processes involved in making power-loom were similar to their counterparts in cotton. Consequently, British engineering firms were able to build them with relative ease.30 Improvements to the power-loom, including patented technologies developed by these engineering firms, became critical to the expansion of the power-loom into finer, lighter ranges of goods in the 1870s and 1880s. These power-loom suppliers to the linen trade were mainly based in northern Britain, and although some innovations in damask-loom production were made by local figures in the Ulster.
industry, indigenous engineering firms were not generally involved in large-scale production of steam-looms or in the diffusion of new technology at the weaving end of the trade. Such diffusion, moreover, remained markedly modest as new technology became available.

Even after the spurt of power-loom production in 1856, new problems in the trade discouraged their further adoption. The end of the Crimean War in 1856, which some observers hoped might herald more stable and prosperous conditions for the trade, was followed by a commercial crisis in the United States in October 1857, with effects felt far beyond America's shores. They contributed to acute industrial and monetary problems in Britain — conditions which led to several British bank failures — and also had a profound impact on Irish industry and commerce. Demand for linen goods declined in depressed foreign and domestic markets. The number of packages of linen imported into the key entrepôt of New York stood at 13,238 during the first nine months of 1857, in contrast to 22,564 in the corresponding period one year earlier. In the month of November alone, the comparison was even starker: a little more than one-eighth of the volume of trade was transacted in 1857 compared with the same month in the previous year. The Linen Trade Circular lamented that these conditions had led manufacturers to delay plans to adopt steam-looms more widely. In 1858, it was reported by Messrs D. Dewar and Co. that power-loom enterprise was making only halting progress in Ulster, though there were some 3,000 at work, mostly in the regions of Bessbrook, Lurgan and Belfast. The trade recovered in 1859, but the number of power-looms (employed and unemployed) in Ireland stood at only 3,633. That year, the small number of power-loom manufacturers were said to be well-supplied with orders for forward delivery, and the Circular declared the power-loom to be best adapted to meeting renewed demand, owing to its greater productivity, compared to hand-looms. Even so, technical limitations restricted its use and afforded some hand-loom weavers remunerative employment in fine branches of the trade. This was true even as the American Civil War now provided a new impetus to mechanization in some branches of manufacture.

The Linen Trade in the 1860s

The Civil War represented a turning-point for the industry, but the prosperity it brought to the Irish linen trade was unevenly shared. The United States supplied the large majority of raw material to the British cotton industry. In 1861, the blockade of southern ports by the Union navy had a devastating impact on the supply of raw cotton to Britain. At first, the commercial disruption depressed the linen trade as well. Indeed, the Flax Supply Association reported in 1861 that shipments to the United States had dropped from 41 per cent to 18 per cent of all linens exported from the United Kingdom. Ballymena linens had declined by 25 per cent, with Lurgan damasks falling even further. But as severely reduced access to raw cotton induced crisis in that sector, linen manufacturers found growing demand for their goods. Demand for coarse linens in the United States, where they were used for military purposes, increased rapidly in 1863, boosting the coarse Irish and British branches of the sector. Additionally, market opportunities in continental Europe grew after the completion of a supplementary treaty between Great Britain and France in 1860,
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Table 2. Prices of ‘Light’ Linen Sets, 1860, 1862, 1864

<table>
<thead>
<tr>
<th>Set</th>
<th>1860</th>
<th>1862</th>
<th>1864</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°</td>
<td>8d</td>
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<td>15°</td>
<td>11d</td>
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<td>13d</td>
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<tr>
<td>20°</td>
<td>19d</td>
<td>19d</td>
<td>18d</td>
</tr>
<tr>
<td>25°</td>
<td>31d</td>
<td>22d</td>
<td>29d</td>
</tr>
</tbody>
</table>

Source: Hugh McCall, *Ireland and Her Staple Manufactures, being Sketches of the History and Progress of the Linen and Cotton Trades, As Well As Other Details Connected with the Northern Province*, 3rd edn (Belfast: Henry Greer, 1870), p. 310.

* This measurement describes the number of reeds through which linen warp passes in a standard width of 40 inches. No more detailed description is given of these ‘light’ sets.

Table 3. Prices of ‘Heavy’ Linen Sets, 1860, 1862, 1864

<table>
<thead>
<tr>
<th>Set</th>
<th>1860</th>
<th>1862</th>
<th>1864</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°</td>
<td>12d</td>
<td>13d</td>
<td>16d</td>
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<td>15°</td>
<td>17d</td>
<td>18d</td>
<td>19d</td>
</tr>
<tr>
<td>20°</td>
<td>24d</td>
<td>24d</td>
<td>27d</td>
</tr>
<tr>
<td>25°</td>
<td>39d</td>
<td>40d</td>
<td>42d</td>
</tr>
</tbody>
</table>

Source: As for Table 2 above.

Reducing tariffs placed on Irish yams and linens. In the context of this surging demand, prices rose steadily and exports to the United States reached new highs in 1862, reversing price trends which had diminished the earnings of weavers since the end of the Napoleonic Wars (see Tables 2 and 3).

Increasing demand for linen goods at high prices provided an incentive for the expansion of capacity in linen mills and factories. During this period, the normally conservative banking sector in Ireland readily supplied credit for expansion in the industry. This strategy deviated from its historic, cautious approach to the industry, and Irish banks lost large sums of money as conditions in the trade changed in the 1870s and several firms failed. At the spinning end, spindle capacity increased from 592,981 spindles in 1861 to 894,272 by 1868. Power-spinners saw a significant increase in their profit margins, and on the rate of return on fixed and current assets. The construction of new facilities expanded mill capacity and increased competition for labour: spinners’ wages increased from 4s and 4s 6d per week to 8s and 9s per week by the mid-1860s, and the yarn export trade was buoyant. The infusion of capital into the weaving sector was also marked, with the number of power-looms rising to over 10,000 by 1866 (see Table 4). Power-loom manufacturers were supplied with ample forward orders, buoyed by incentives to expand capacity. Weaving factories opened new commercial warehouses and stores in Belfast. At this point, hesitant experimentation with the power-loom gave way to its widespread adoption in several branches of the trade. In 1865, the *Linen Trade Circular* reported that power-looms were producing heavy sheetings, but also ‘all descriptions of serviceable Linens in general use’. They were employed to weave coarse damasks and...
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### Table 4. Power-Looms in Ireland, at Various Years, 1850–1904

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Year</th>
<th>Total</th>
<th>Year</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1850</td>
<td>88</td>
<td>1874</td>
<td>19,331</td>
<td>1890</td>
<td>26,592</td>
</tr>
<tr>
<td>1856</td>
<td>1,871</td>
<td>1875</td>
<td>20,152</td>
<td>1892</td>
<td>28,233</td>
</tr>
<tr>
<td>1859</td>
<td>3,633</td>
<td>1877</td>
<td>20,958</td>
<td>1894</td>
<td>28,764</td>
</tr>
<tr>
<td>1861</td>
<td>4,933</td>
<td>1879</td>
<td>21,153</td>
<td>1897</td>
<td>31,484</td>
</tr>
<tr>
<td>1864</td>
<td>8,187</td>
<td>1880</td>
<td>21,177</td>
<td>1899</td>
<td>32,245</td>
</tr>
<tr>
<td>1866</td>
<td>10,804</td>
<td>1881</td>
<td>21,779</td>
<td>1900</td>
<td>32,245</td>
</tr>
<tr>
<td>1868</td>
<td>12,969</td>
<td>1882</td>
<td>22,279</td>
<td>1902</td>
<td>30,927</td>
</tr>
<tr>
<td>1871</td>
<td>14,834</td>
<td>1883</td>
<td>23,677</td>
<td>1903</td>
<td>31,114</td>
</tr>
<tr>
<td>1872</td>
<td>18,169</td>
<td>1885</td>
<td>24,300</td>
<td>1904</td>
<td>31,174</td>
</tr>
<tr>
<td>1873</td>
<td>19,155</td>
<td>1889</td>
<td>26,360</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


This return was of all power-looms in Ireland — those attached to mills, as well as those in factories.

cambrics, too. With hand-loom weavers diminishing in number, ‘Already the handloom is being rapidly superseded, save in the production of very fine fabrics’. But if the power-loom advanced in many branches of the linen industry, preserves of the hand-loom remained, especially in fine branches of the trade. And in the absence of incentives for heavy capital investment after the war, and in the face of continuing technical limitations, these branches survived and often flourished after the 1860s.

The impact of the US conflict on the UK textile trades is well-documented, but the diverse experience of its branches has only occasionally been underscored. Initial demand for coarse cloth in the American market pushed prices higher and encouraged manufacturers to invest in mechanized weaving in coarse branches, to which power-loom technology was also most suitable. By contrast, while finer cloth experienced a less dramatic rise at the outset of the conflict, there was a steady growth in demand as the substitution of linen for cotton in clothing and household goods increased. This substitution continued to sustain an especially high demand for fine, light linens, even as the war ended and the coarse end of the trade stagnated and then experienced problems of over-capacity. Whereas hand-loom branches had not shared in the most dramatic upsurges in demand and prices, their position was relatively more stable and the trade more prosperous through the end of the decade. Notwithstanding the increasing application of steam-power to finer webs as technology improved, the province of the power-loom also remained limited. Henry Cinnamon, a Portadown linen manufacturer, employed country weavers to produce brown webs: in the 1860s, he claimed that the hand-loom produced a finer finish on webs, and that on such fine work, stoppages of power-looms due to thread breakage obviated their utility. Writing in 1862, William Charley endorsed the view of the *Linen Trade Circular* that the supply of hand-loom cloth was diminishing ‘and there are many circumstances which would seem to indicate, that while the days of progress in power-looms have unquestionably set in, those of decadence in hand-loom weaving give warning of approach’. Still, he noted that the power-loom was suitable only for the production of coarser and medium quality sets, with finer sets from 18°° to 26°° remaining the exclusive province of the hand-loom. Indeed, after the Civil War
The hand-loom in Ulster’s post-famine linen industry ended and as the 1860s drew to a close, difficult trading conditions imposed new constraints on manufacturers, and contributed to an environment in which costly capital investment in new machinery and steam power was deterred.

Gradually, hand-loom preserves were eroded as the power-loom improved, by 1875, working cloth up to a set of 16°. In one factory, it was reported that an 18° web had been made up by power, but not profitably. Improvements in loom design, including better gearing, advanced the power-loom into a wider range of goods; so too did yarn quality, which had significantly improved between the 1860s and mid-1870s. Yet in spite of these developments, damasks, diaper and cambric handkerchiefs, and fine shirtings remained specialist provinces of the hand-loom. Districts such as Lurgan, Portadown and Ballymena, where these branches were concentrated, were centres of Ireland’s hand-loom trade in the second-half of the century — with several branches drawing on seasonal labourers engaged in agriculture. Daughters in farming families who worked at the hand-loom could find, at several points in the year, relatively well-paid seasonal waged field work, for which they left the loom. It was noted in Ballymena in 1898, for instance that ‘Hand-loom goods become scarce in this district at certain seasons, as both men and women go to the field work during harvest time, or hay time, or potato planting &c. Girls at such work earn about 1s 6d a day, a higher rate than can be made by hand weaving’. Other hand-loom branches, including most which offered full-time, more remunerative employment, were dominated by men. Overall, the workforce remained large: indeed, it was estimated that some 30,000 hand-looms were at work in Ireland in 1874. Even when this number was revised to 25,000, an Assistant Commissioner to the Royal Commission on Labour, Clara Collet, reported to the Board of Trade that the actual number of hand-loom weavers was greater than the number of power-loom weavers as late as 1875, although the output of power-looms was far greater. Directories of Counties Armagh and Down in 1888 estimated that 15,000 to 20,000 hand-loom weavers were employed in County Antrim alone — and thousands more in Down and Armagh. Other evidence of wages in the trade points to an extensive hand-loom workforce in the 1880s and early 1890s: as late as 1893, for instance, £220,000 was paid out in wages to hand-loom weavers. Evidence of decline by the first decades of the twentieth century is equally stark: in 1898 Clara Collet estimated that only 2,500 hand-loom weavers remained in Ulster and wages had fallen to £55,000 by the beginning of the second decade of the twentieth century. By 1912, representatives of the Hand-loom Weavers’ Association claimed that their membership of 800 heads of weaving families accounted for most of Ireland’s weaving households, with another 300 heads not included on the Association rolls. They estimated the size of the combined cambric and damask hand-loom weaving labour force in Ireland to be around 3,000. Clearly, thousands of workers remained at the loom in the 1850s through the 1880s. The composition of the hand-loom workforces, and the stability of their branches, varied markedly, however. In the 1890s, when the Ballymena shirting trade contracted and the fine cambric trade fluctuated, finest damask handloom cloth retained its ‘special channels of consumption’, linked to its luxury tableware market, and weathered the down-turn. Indeed, the Irish Textile Journal declared in August 1902 that hundreds of looms were at work, the trade having ‘nothing to fear for a long time to come’.
While the number of power-loom continued to grow after the 1860s, the greatest period of prosperity in the Ulster linen trade had drawn to a close after a period of uneven mechanization and incomplete displacement of hand power. Alexander Knox, Medical Poor Law Inspector, noted in 1870 that the post-war conditions in the linen sector had depressed manufacturing in parts of Ulster, but still remarked that hand-loom weaving was ‘pretty general, in different parts, but especially in the districts adjoining Belfast, Newtownards, Lisburn, Banbridge and Ballymena’. Conditions in these districts changed as mechanized production improved and was adopted in many branches, while others remained outside the orbit of the power-loom for decades. Indeed, in 1912 manufacturers in Portadown were still arguing that damasks and cambrics of the highest set could be more profitably produced by the hand-loom than by the power-loom — provided the weavers were not insured.

CONCLUSION

This article has explored the Irish linen trade in the 1850s and 1860s, and has examined developments that enabled hand production — especially the differentiated demand for coarse and fine linen during the 1860s, and the technical limits of power-loom technology. Even in the prosperous 1860s, mechanization was concentrated in coarser branches of the Irish linen trade. The subsequent post-war period saw much more challenging trading conditions. These were important developments, since they interacted with technological limitations that also privileged mechanization in coarse branches. Clearly, hand-loom production merits a more prominent place in analyses of the linen industry in the second-half of the century. The resilience of the hand-loom undermines any interpretation of the sector’s development which is premised on the homogenization of production systems, and focuses our attention on diverse structures and experiences of work within Ulster’s heterogeneous linen trade.

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4 Gill, p. 40.


6 James Haughton, 'The Application of Machinery to Manufacture, Beneficial to the Working Classes', Transactions of the Dublin Statistical Society (1851), p. 11. This analysis was coupled with a commentary on manufacture in urban centres, where, in contrast to rural districts, Haughton believed that a 'much higher standard of intelligence, and a much stronger appreciation of the blessings of freedom were to be found (p. 7). See also John Sproule, The Resources and Manufacturing Industry in Ireland, as Illustrated by the Exhibition of 1853 (Dublin: John Sproule, 1854), p. 288; John Burke, Outlines of the Industrial History of Ireland (Dublin: Browne and Nolan, 1928), p. 330.

7 C. F. Bastable, 'Economic Conditions of Industrial Development, with Special Reference to the Case of Ireland', Journal of the Statistical and Social Inquiry Society of Ireland, LXII (July 1884), pp. 461–73; this quotation appears on p. 466.


9 H. J. Habakkuk, American and British Technology in the Nineteenth Century; The Search for Labour-Saving Inventions (Cambridge: Cambridge University Press, 1962). Others argue that specific local economic and social structures enabled households to deploy members to the loom — especially those whose age and sexual status militated against more remunerative employment — while other household members found work in other sectors of the local economy (Lyons, op. cit.).


12 See note 6.
13 Linen Trade Circular, 29 October 1852.
16 The cost of introducing power-looms was reckoned in 1862 to be around £14, which amounted, when calculated alongside the costs of motive power and related factory infrastructure, to £42 per loom. See William Charley, Flax and its Products in Ireland (London: Bell and Daldy, 1862), p. 92. These were fixed investments — whether or not the looms were engaged, and required a promise of stable demand and profitable returns. By contrast, the cost of a hand-loom, usually borne by the weaver, amounted to 30s, with an equal amount for healties and reeds.
17 Smith, p. 94.
19 For a discussion of the state of domestic and foreign Flax supply, see Boyle, pp. 129–42.
20 Linen Trade Circular, 29 January 1857.
21 Smith, p. 97.
22 Linen Trade Circular, 18 January 1856.
25 Ure, p. 590.
27 The payment system in mechanized weaving, which was based on piecework, preserved elements of the ‘craft’ tradition in the factory milieu. For women’s participation in mechanized weaving, see Gill, p. 333 and Cohen, pp. 182–84.
28 Gill, p. 333.
29 Linen Trade Circular, 19 January 1857.
32 Linen Trade Circular, 23 November 1857. A package of linen contained about 1,000 yards of cloth. The author is grateful to Dr Peter Solar for information on weights and measures of linen exports.
33 Linen Trade Circular, 4 January 1858.
34 Ure, The Philosophy of Manufactures, p. 84.
35 Smith, p. 99.
36 Linen Trade Circular, 2 January 1860.
37 In Ure, The Philosophy of Manufactures, p. 590.
38 Boyle, pp. 80–81.
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40 Boyle, p. 85.
41 Linen Trade Circular, 7 January 1861.
42 Linen Trade Circular, 12 January 1863.
43 Boyle, p. 185; see also Ollerenshaw, Banking in Nineteenth Century Ireland, pp. 105–14.
44 Patterson, p. 130.
45 Emily Boyle has estimated that the rate of return for one company, Richardson Sons and Owden of Bessbrook, grew from 6.4 per cent in 1862 to 27.1 per cent in 1864 (Boyle, p. 90).
48 Linen Trade Circular, 11 January 1864. Political uncertainties which attended the American conflict also impacted on the commercial underpinnings of the trade. The small number of agents acting on behalf of Ulster concerns and houses increased, with the system of settlement by notes at six and eight months was replaced by cash payments in ten days, with a 6 per cent trade discount, or in one month, with a 5 per cent discount (Irish Textile Journal, 15 May 1887, p. 55).
49 Linen Trade Circular, 9 January 1865.
50 I am grateful to Dr Peter Solar for providing data, soon to be published, on linen exports for this period which promise to offer new foundations for investigations into the state of the trade in the 1850s and 1860s.
51 Greeves, pp. 95–104.
52 Ibid., p. 100.
53 Ibid., p. 105.
54 Royal Commission on the Employment of Children in Trades and Manufactories not Regulated by Law [3414], HC 1864, XXIV, Evidence upon the Hand-loom Weaving and Hosiery Manufactures in Ireland and Scotland, testimony of Mr Henry Cinnamon q. 3. When they graduated to weaving, household children earned 2s 6d to 3s weekly, with adults earning 6 to 7s a week — and 10s for the finest class of work.
55 Charley, p. 89. For a discussion of measurements, see the note below Table 2. A detailed discussion of linen web measurements may be found in Alfred S. Moore, Linen From the Raw Material to the Finished Product (London: Pitman, 1914), pp. 104–06.
57 Ure, Dictionary of Arts, p. 123.
58 Board of Trade Report by Miss Collet on Changes in the Employment of Women and Girls in Industrial Centres, Part I, Flax and Jute Centres [C.8794], HC 1898, LXXXVIII, p. 53. Among features of the sexual division of labour was the designation of potato-harvesting as female work. As well, at harvest time, many members of local households engaged in waged lournal labour. See Jonathan Bell, ‘Hiring Fairs in Ulster’, Ulster Folklife, 25 (1979), pp. 67–78.
59 Board of Trade Report by Miss Collet.
61 The number of hand-loom weavers in Ulster 'directed by' manufacturers and merchants in the Lurgan district alone was said to be as high as 18,000. See George Henry Bassett, County Armagh 100 years ago: A Guide and Directory 1888 (Belfast: Friar’s Bush Press, 1889), p. 359.
62 Crawford, Irish Linen, p. 13; Moore, p. 82.
63 Board of Trade Report by Miss Collet.
64 Report of the Committee Appointed to Consider and Advise with regard to the Application of the National Insurance Act to Outworkers in Ireland, II, Evidence and Appendices [Cd. 7686], HC 1914–16, XXXI [hereafter referred to as ‘Outworkers in Ireland’], testimony of representatives of the Hand-loom Weavers’ Association, q. 404–409.
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Irish Textile Journal, 15 August 1902, p. 102.

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Outworkers in Ireland, testimony of Mr Ireland, q. 1372, 1372.