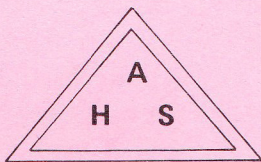


ABERTAY HISTORICAL SOCIETY PUBLICATION: No. 2 (1954)

**The Textile Industry of  
Arbroath  
since the Early 18th Century**

**W.H.K. Turner, M.A.**





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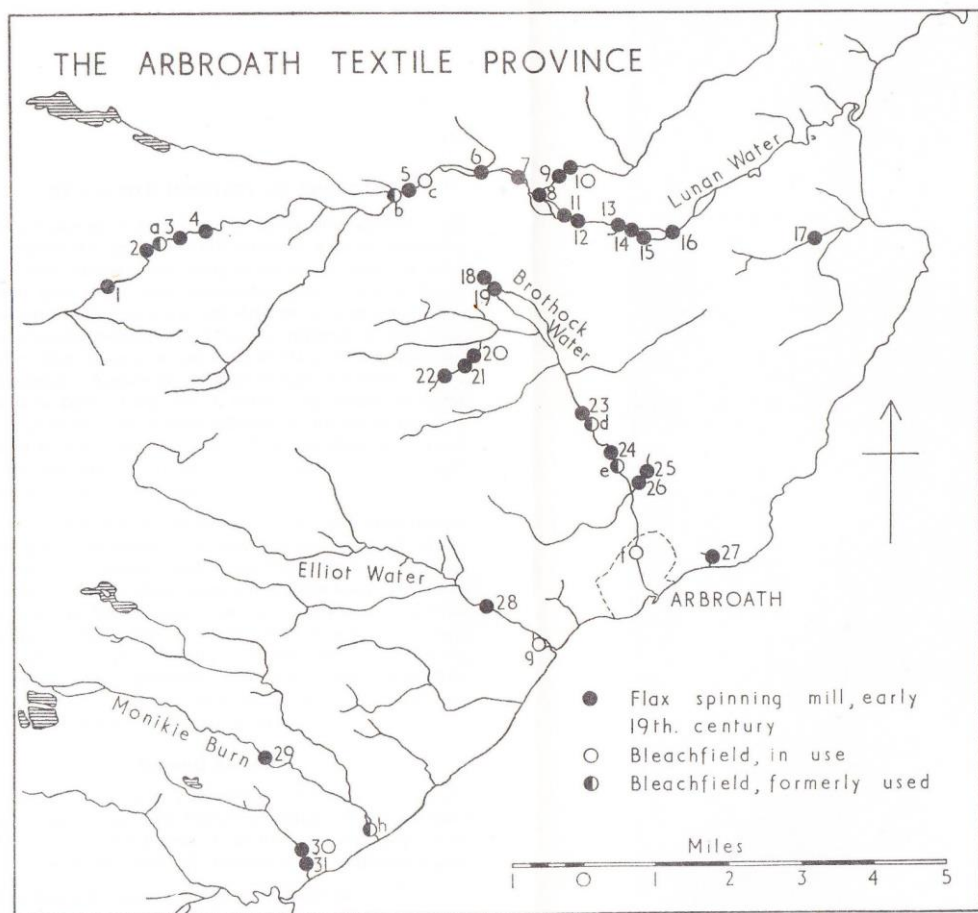


Figure 1—The Arbroath textile province.

BLEACHFIELDS:—a Vinney Den, b Pilmures, c Friockheim, d Waukmills, e Letham, f Wardmill, g Elliot, h Parbride,

SPINNING MILLS:—1 Curden, 2 Vinney Den, 3 West Idvies, 4 East Idvies, 5 Friockheim, 6 Kinnell, 7 Haxton, 8 Haxton Den, 9 Lower Gighty, 10 Upper Gighty, 11 Upper Boysack, 12 Lower Boysack, 13 Waukmill, 14 Millfield, 15 Lawton, 16 Balmulie, 17 Anniston, 18 Leysmill, 19 South Mill, 20, 21, 22 Colliston, 23 Waukmills, 24 Letham, 25 Upper Tarry, 26 Lower Tarry, 27 Season Den, 28 Kelly Den, 29 Baxteden, 30 Upper Lochy, 31 Lower Lochy.

## **THE TEXTILE INDUSTRY OF ARBROATH**

**T**HE processes of industrial change in this country in the eighteenth and nineteenth centuries were so continuous and of such intensity that many of the transformations which resulted from them went unrecorded, particularly in textile manufacturing regions where industrial progression simply gave a heightened significance to economic features of such longstanding that change, so far from inviting record, remained unchronicled. Nineteenth century change especially is most difficult to trace in any detail, particularly where, as in the case of Arbroath, the leading industry of the period has since declined to the extent that it is residual, its elements so much reduced that the few survivals have little value in any assessment of the extent of earlier growth.

Arbroath first acquired significance in the twelfth century as an Abbey settlement. It grew on the left bank of the Brothock, and it developed along the High Street, which linked the Abbey with the shore when the Abbots founded the first harbour in the late fourteenth century. After the Abbey was despoiled in the Reformation, the town, as one of the royal burghs of Angus, grew slowly,<sup>1</sup> providing the nucleus for the transformation the eighteenth century was to bring, after which Arbroath became in the nineteenth century the second most important linen textile town in Scotland.

### **Regional Association**

Already possessing important elements of textile manufacture,<sup>2</sup> in the early eighteenth century Arbroath shared in the regional development of the linen industry inspired by the policies of the Board of Trustees for Manufactures after 1727.

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<sup>1</sup> G. HAY, *History of Arbroath* (1876), 33, 56-57, 104-105, 135-137.

<sup>2</sup> *Ibid.*, 295. See also Town Council document quoted in *The Arbroath Guide*, 6 Jan. 23.

It became a minor textile town whose productions of coarse linen conformed in character to those of the region where the outstanding centre was Dundee. Growing thus in regional association, dependent no longer on local stimulus and privilege, its development was in sharp contrast to what had gone before. The Abbey House became a thread factory, controlled by Wallace, Gardyne and Company, who, about 1738, were the first to make osnaburgs in Scotland, initiating a manufacture which became the staple of the region.<sup>1</sup>

In 1742 Mudie, the Town Clerk, wrote, "The weavers are as numerous as all the other trades put together. The greatest manufacture is coarse linen, which is commonly sold green." By 1772 sailcloth was made in addition to osnaburgs; and the town was directly exporting its made textile goods to London, and importing from the Baltic flax and hemp, and also flax seed for sowing in areas of local flax cultivation.<sup>2</sup> These developing external relationships, based on the duality of coasting and North Sea trade, were typical of the minor coastal centres of the eastern linen region; and Arbroath acquired, with Montrose, much local importance as a supply port for eastern Strathmore.<sup>3</sup> Internally, there was the remarkable growth of textile trade societies, such as the Flax-Dresser Society, and the St. Vigeans, United, and Abbey Weaver societies.<sup>4</sup> Developing thus, by about 1790 Arbroath's production of coarse linens was about one-quarter that of Dundee, and the town was already the principal producer of sailcloth in Scotland.<sup>5</sup>

The turn of the century was a point of departure, and new elements of change were contributed which stimulated industrial growth while emphasizing regional ties. In 1793 the first local flax-spinning mill was built at Letham, to the north of the town, powered by the Brothock where its flow is entrenched in a den that had in an earlier period invited the establishment of

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<sup>1</sup> Old Statistical Account, 12 (15), 176-177.

<sup>2</sup> Thomas Pennant, *A Tour in Scotland* (1776), 132. Flax was grown at this time in St. Vigeans, Arbirlot, Craig, Dunnichen, Farnell, Guthrie, Kinnell, Lunan, and Monikie parishes; See O.S.A.

<sup>3</sup> O.S.A., 7(34), 342.

<sup>4</sup> *The Angus-shire Register for 1799*, 83-86.

<sup>5</sup> In Arbroath in 1792 1,055,303 yards were stamped, and the unstamped production of sailcloth valued at £39,000. Comparative figures for Dundee in 1789 are 4,242,653 yards, and £32,000. O.S.A., 7(34), 342 ; 8(11), 216.

numerous grain mills and of yarn-washing and cloth-fulling.<sup>1</sup> It was near here in 1714 that the townspeople had been thirled to the "Walkmilne of Aberbrothock."<sup>2</sup>

From this area of interest, in response to regional influence, a scatter of mills quickly emerged along accessible stream courses, their distribution reflecting the degree of power available and confirming the importance of a rural supply of yarn for the weavers of the town. Most of the mills shown in Figure 1 existed by 1822, though even then some were being built.<sup>3</sup> The Lunan distribution was outstanding, particularly along the river from Friockheim to Balmullie. Of the lesser streams, the Brothock, draining with the Elliot from the levels of Carmyllie, was the only one of significance; there were but few mills along the other streams flowing to the coast.

Dispersed thus, many of these flax mills were closely linked with Arbroath and represented extensions of town influence. Letham, Colliston, Leysmill, Friock, and the upper and lower Boysack mills were among those controlled wholly or in part by manufacturers in Arbroath.<sup>4</sup> This combination of town influence and rural resource continued without check until twelve years after the building of Letham mill. Then mill-spinning began in Arbroath, using steam-power, initiating another phase of growth whose consequences were at once more local and more profound, but whose chronology overlapped that of water-power spinning until the 1820s.

### **Steam-power and Town**

In the monastic period of town growth there had been conferred certain elements which acquired a new significance in the changing contexts of the eighteenth and early nineteenth centuries and influenced profoundly early

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<sup>1</sup> *New Statistical Account*, 11, 510; O.S.A., 12(15), 170.

<sup>2</sup> Town Council document dated 2 July 1714.

<sup>3</sup> At Colliston in 1822 there were two mills, a third was being built, and a site for another advertised to let. *The Montrose Review*, 4 April 1822.

<sup>4</sup> *The Montrose, Arbroath, and Brechin Review; and Forfar and Kincardine Shires Advertiser*, 23 June 1820, 31 March 1820, 21 May 1830, 3 March 1826, 10 April 1818.



spinning-mill siting within Arbroath. The Brothock formed the western boundary of the early town—in the mid-eighteenth century only Millgate stood west of it—and had been dammed above Brothock Bridge to form the Mawkin Pool.<sup>1</sup> From this ran a lade to power the original Burgh corn mill, Nether Mill. Another corn mill, originally the property of the Abbey, lay beyond North Port, where a lade from the Brothock was impounded to power Ward Mill, the tail race bifurcating, a minor branch joining the Brothock above Stobcross Bridge, the other at the head of the Pool (Figure 2).

These water-lines invited the location of yarn-washing mills and bleachfields. Along the lade from Mawkin Pool about 1740 a plash mill took the place of Nether Mill. In 1747 John Gardiner, a partner in the firm of Wallace, Gardyne and Company, built a plash mill, "close by the dam at the corner of his bleaching field," which occupied the Lordburn Braes and took its water by sluice from the Pool<sup>2</sup>. It was clearly just above and below Brothock Bridge that early industrial interests dependent on water first fastened, near the centre of town, which, then as now, extended from the top of Marketgate to the foot of the High Street slope (Figure 2).

Confirming the significance of prior use, it was within this area that Bell Mill, later to be called Brothock Mill, was built in 1806 by the brothers Renny, partners of William Fitchet and Sons, the principal firm in the town at this time. It was sited along the lade to Nether Mill. Nearby, the Balfours' Burnside Mill was next to be built, along the river by Brothock Bridge<sup>3</sup>. Upstream, Inch Mill served as both corn and flax mill from 1808 to 1811, and then Robertson and Souter built here a spinning mill, "lying at townhead of Arbroath . . . in the immediate vicinity of the town."<sup>4</sup> The new Inch Mill, with which were associated yarn-beating

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<sup>1</sup> This name occurs in the Abbey Registers in 1457.

<sup>2</sup> P.C. Carrigher, *Arbroath* (1909), 29; Hay op. cit., 333.

<sup>3</sup> J.M. McBain, *Arbroath: Past and Present* (1887), 117.

<sup>4</sup> *Montrose Review*, 3 July 1812; N.S.A., 11, 501

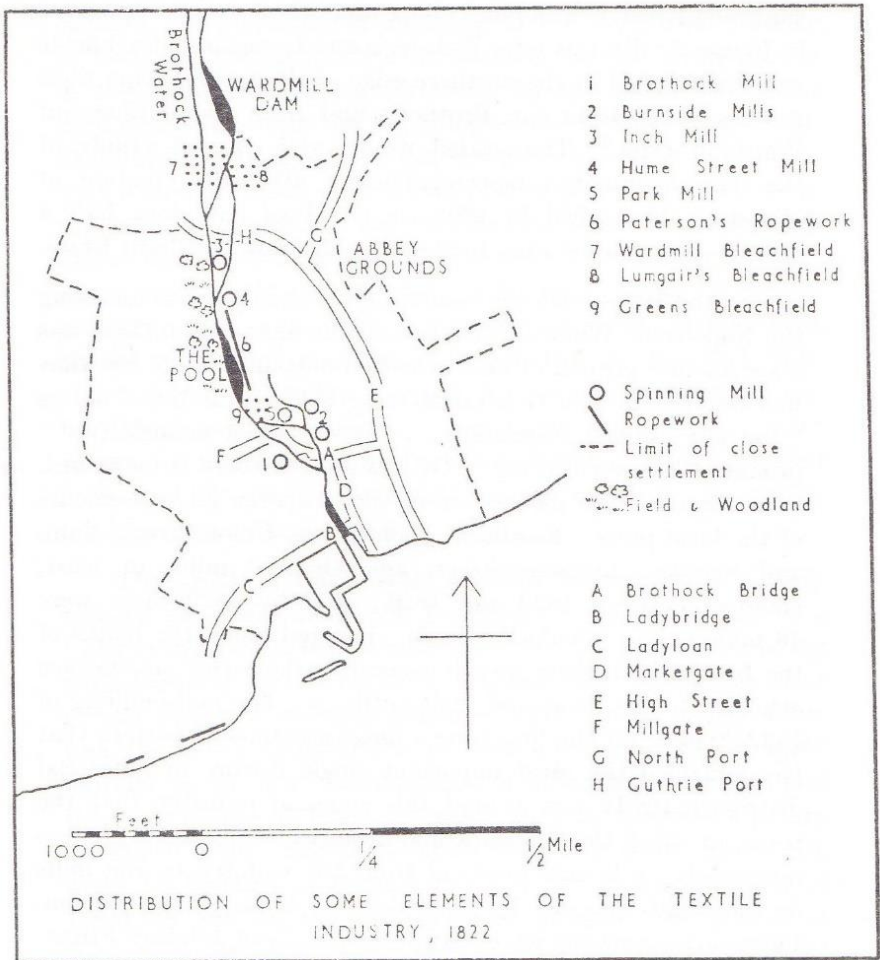


Figure 2.—Distribution of some elements of the textile industry, 1822.

and washing mills,<sup>1</sup> was sited near the entry into the Brothock of the lower lade from Wardmill Dam. Park and Hume Street mills and another Burnside mill emerged along stream and lade by 1822, giving the two distinctive groupings above and below the Pool apparent in Figure 2. By this time Webster's and Lumgair's bleachfields were established at the northern edge of the town, taking their process water from the Brothock and from the outflows of Wardmill Dam.<sup>2</sup> The settled waters and ensured supply of the dam acquired a new significance after the creation of Webster's bleachfield in 1802, as the Pool had done half a century before in relation to the bleachfield at Lordburn Braes.

In the 1820s, with the resumption of normal trade following the Napoleonic Wars, as elsewhere in the linen region there was a spectacular growth of mills, checked only in 1825-26 by what was referred to in a General Meeting held on 29 May 1826 as " the unexampled stagnation . . . in the linen manufacture " produced by over-trading.<sup>3</sup> Of this growth there is no record, save what can be gleaned from the property advertisements of the local press. Kastburn, Pool, Low's, Union Street, Mann and Shanks', Lindsay Street, and Orchard mills, at least, emerged between 1822 and 1826 ; and by 1829 there were 16 mills in the town<sup>4</sup> (Figure 3), clustered along the banks of the Brothock, in their growth concealing the earlier significance attached to the dams and their outflows. The mill-building of 1822-29 gave for the first time a lineal stream-side pattern that has remained the most important single feature of industrial distribution. It was around this spine of industry that the town, to which the Brothock had hitherto been a limit, grew so intensively as labour marched from the country to the mills in the 1820s (Figure 5). On the left bank of the stream, Paterson's ropework gave way to the mills of Lindsay Street.

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<sup>1</sup> Brothock Mill similarly developed as a complex unit, with plash and beating mills and a Bleaching work. See *Montrose Review*, 24 Aug. 1827

<sup>2</sup> See Map of Arbroath by John Wood, 1822.

<sup>3</sup> *Montrose Review*, 2 June 1826.

<sup>4</sup> *Ibid.*, 26 Dec. 1828; 29 Feb. 1828; 26 Jan. 1827; 3 April 1829; 10 Nov. 1926; 22 Dec. 1826; 1 Sept. 1826 27 Nov. 1829.

On the right bank, the field and woodland from Wellgate to below the Pool, shown on Wood's map, was taken up by the mills of evolving Orchard Street. 1820-26, "the halcyon era," saw mills and suburb grow in Almerieclose.<sup>1</sup> Sensitive to these changes, the centuries-old approach to the town from Dundee by Ladyloan and Ladybridge declined, and yielded in importance to the Millgate-West Port-Brothock Bridge access which had been developing from the beginning of the century (Figure 2). From 1829 to 1842 growth was slower: only three more mills were added, of which only Greens Mill at Wardmill Croft, along the lade by Lumgair's old bleachwork, was away from the Stobcross-Brothock Bridge mill cluster.<sup>2</sup> By this time regional engineering developments were helping to serve a textile industry which at the beginning had been completely dependent on the engineering resources of the south. At Brothock Mill, alongside the earlier Boulton and Watt engine, was placed one by Carmichael of Dundee; and Carmichael engines were commonly installed elsewhere, as in Leysmill and Batiesden mills and Wardmill Bleachfield, while most of the textile machinery came from Leeds.<sup>3</sup>

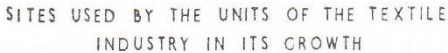
The great urban growth of mills in the 1820s, clearly marked as it was along the Brothock, was inspirational to a wider growth of the textile industry within the town, stimulating hand-heckling and hand-loom weaving and promoting their greater dispersal wherever labour existed. In particular, there was the rapid construction of weaving factories, prompted initially by the first developments of urban mill-spinning, and then proceeding at much the same pace as the contemporary growth of mills. Beginning on an important scale about 1815, with the building of Samuel Kenny's factories at the foot of Lordburn and on the north side of Millgate, the growth of these early hand-loom factories reached its climax between 1828 and 1826 when most of the factories existing by 1829 were built.

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<sup>1</sup> Ibid., 5 June 1823; N.S.A., 11, 561-502

<sup>2</sup> See John Jarron's revision of J. Wood's Map, 1842.

<sup>3</sup> *The Arbroath Guide and County of Forfar Advertiser*, 3 July 1812, 14 Aug. 1869; *Montrose Review*, 30 March 1827, 31 Aug. 1832.



(Where the same site has been used more than once for different purposes, its most recent use has been shown.)



Typically three-storey structures, they displayed, like the mills of the time, common features; giving to the town a legacy of period uniformity which in some cases still remains. There were factories at Lordburn, Helen Street, Brothock Bank, Millgate Bank, Mary Street, the Abbey Streets, Grimsby, and Millgate (Figure 3). <sup>1</sup> Probably the largest was that at Grimsby, belonging to Fitchet and Sons, near their Brothock Mill; it had 30 looms in 1826. <sup>2</sup> Other industrial units emerging at this time were the chemical bleachfields, of which six existed by 1824, three having been set up in that year alone. <sup>3</sup> In addition, flax-heckling and warehouses increased in number to add to the growing dispersal of industry. Half the factories in town were engaged in making duck, osnaburgs, and dowlas at this time, carrying forward some of the eighteenth century tradition of textile working; but Kenny, Corsar, Esplin, Stirling, Lumgair, and Pitchet, among the then most important textile families, were making canvas and sailcloth, to which manufacture Arbroath was soon to become almost exclusively devoted.

This eruption of town industry in the 1820s stemmed directly from the growth of steam-powered mills. By its nature it signalled the eventual decline of rural mills, some of which, however, responsive to the same regional stimulus to growth, became more important in this period. Re-equipment took place, for example, at Leysmill and Letham Mill, and there was mill construction at Colliston.<sup>4</sup> Nor had the acceptance of steam-power been confined to the town, for by 1832 small engines to supplement water-power had been installed in Batiesden, North Tarry, Seaton Den, Leysmill, Letham, Hatton East, and Collision West mills, at least.<sup>5</sup> After the depression of 1826,

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<sup>1</sup> Bowman's duck factory on the west side of Helen Street, built in 1824, had its looms on the ground floor, wareroom on the second floor, starching and drying room on the third floor. *Montrose Review*, 25 Dec. 1818, 11 Jan. 1828, 14 April 1826, 20 April 1827, 7 Dec. 1832, 9 Jan. 1818; *Arbroath Guide*, 23 March 1844.

<sup>2</sup> *Montrose Review*, 15 Sept. 1826.

<sup>3</sup> *Ibid.*, 29 Jan., 5 Feb., 22 July, 23 Dec., 1824.

<sup>4</sup> *Ibid.*, 30 March 1827, 28 March 1828, 4 April 1822.

<sup>5</sup> *Ibid.*, 31 Aug. 1832, 3 April 1829, 10 Nov. 1826, 30 March 1827, 28 March 1828, 22 Dec. 1826, 19 Jan. 1827.

however, decline began. In 1826 the machinery Seaton Den Mill, in 1827 West Mill of Collision and Leysmill and in 1832 Letham Mill were sold.<sup>1</sup> Fifty years later only two of the mills whose distribution is shown in Figure 1 were still in operation.

### **The Climax of Growth**

Growth was decelerated from 1826 to 1833, when the end of a phase is apparent, and then from about 1833 to 1847 industry was generally depressed.<sup>2</sup> In 1842 there was reported "a sad lack of employment." From 1836 to 1841 the price canvas-weaving fell 20 per cent., the wages of mill-spinners fell 18 per cent, and of flax-dressers 20 per cent. Factories were idle or only partially occupied.<sup>3</sup> Mill-building was slow and some of the mills built in the 1820s remained with their productive capacities little changed.<sup>4</sup> It was a period reaction from the earlier growth.

The second phase of nineteenth century growth, like the first, had as its stimulus technological progress, and was relate to the acceptance of power-weaving. In 1847 two of Parker patent looms were introduced by Kenny, Sons and Company to their Park Mill. This was followed in 1849 by the construction of David Corsar's Spring Garden Works, the first power-loom factory in town.<sup>5</sup> Other factories soon followed; Applegate and Wellgate (c.1850), Baltic (c.1854), Alma (1856), Dens (by 1857), Erin (c.1858) works, and at Brothock Mill (by 1859).<sup>6</sup> In 1859, when the industry was still expanding, there were apart from the hand-loom weaving shops. 10 mills, 7 spinning and weaving works, and 7 canvas factories<sup>7</sup> (Figure 4). By

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<sup>1</sup> Ibid., 10 Nov. 1826, 19 Jan. 1827, 30 March 1827, 20 April 1832.

<sup>2</sup> N.S.A., 11, 506-508, 512.

<sup>3</sup> Town Council Committee Report, cited in Hay, op. cit., 407-408.

<sup>4</sup> For example, 1826-45 Lindsay Street Mill increased its spindleage from 18 only to 20 frames; 1828-45 East Burn Mill's spindleage was unchanged at 12 frames. *Montrose Review*, 22 Dec. 1826, 26 Dec. 1828; Arbroath Guide, 26 April 1845, 3 Jan. 1846.

<sup>5</sup> J.M. McBain, op. cit., 120-121.

<sup>6</sup> *Arbroath Guide*, 11 Jan. 1930, 30 Jan. 1932, 28 Feb. 1857, 17 Oct. 1857, 13 Sept. 1862, 30 April 1859.

<sup>7</sup> Ordinance Survey 1/500 plans, surveyed 1859, published 1864.

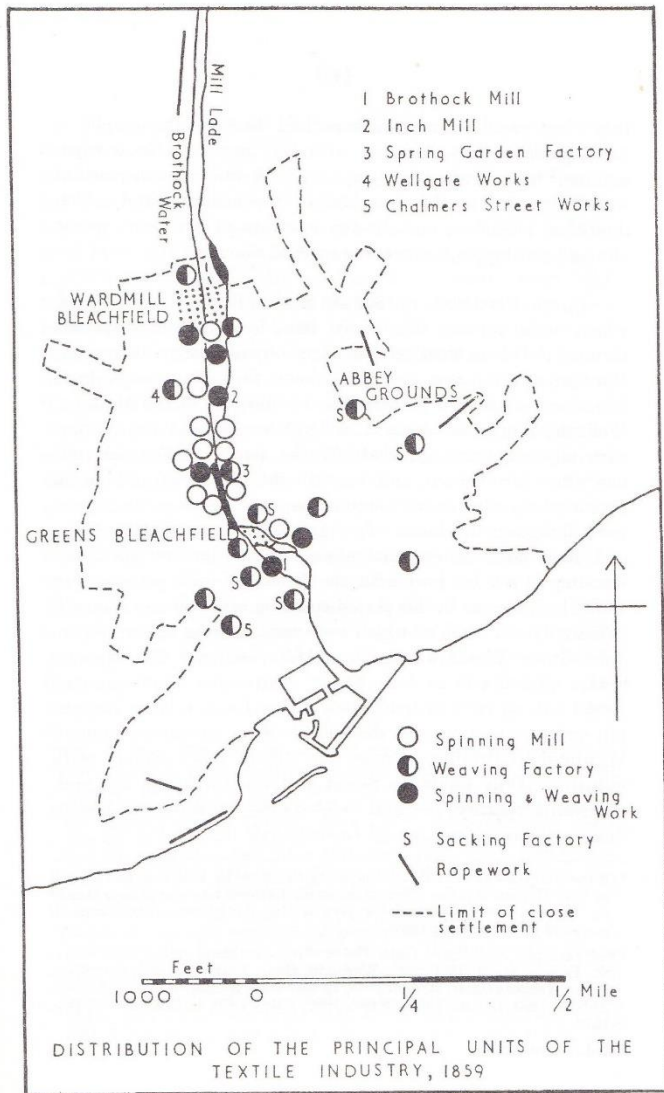


Figure 4—Distribution of the principal units of the textile industry, 1859.

this time sailcloth manufacture had become the staple, a development which, together with the growth of local rope-making,<sup>1</sup> had occurred in sympathy with the great increase in world shipping in the first half of the century, and which doubtless helped to sustain the interests of the port, whose climax as a shipping centre was reached about 1850.

On the 1/500 plans of 1859 are marked five sacking factories, which were among the many hand-loom works dispersed through the town, most being engaged on sailcloth manufacture.<sup>2</sup> Only in a few cases did power-loom factories emerge from hand-loom origins to preserve the significance of initial siting. Wellgate Works, established in 1832 by Douglas Fraser, was such an exception, Applegate Works another. For the rest, new sites were chosen, and, as with the growth of mills in an earlier phase, due to the requirements of steam-raising, most were along the Brothock. Spring Garden, Dens, Baltic. Alma, and Erin factories emerged along the stream and its lades, standing cheek by jowl with the Brothock mills, so many of which had become in this period spinning and weaving concerns (Figure 4) and some of which were new. Along the Brothock, John Street Works was built in 1850; in 1858 Ramsay and Smart built a mill in John Street, "after the most approved model . . . so constructed that a Power-Loom factory may be put up in connection with the mill."<sup>3</sup> "From the ancient dam of Wardmill to Brothock Bridge the stream was crammed with industry. Only Chalmers Street Mill stood apart in the mid-nineteenth century, the mill well tapping the supply of springs draining from higher ground to the north.

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<sup>1</sup> Of the 5 ropeworks in 1859, the one along the shore by Ladyloan had existed in 1822 (Figure 2); the others were in Kyd Street, Leonard Street, Den of St. Vigeans, and on part of the present Gas Works site. They were all marginal to the growing town.

<sup>2</sup> For example, at Millgate Loan, Helen Street, Dishland Street, Hill Street, St. Thomas Street, Hill Place, Wardmill, Hays, North Grimsby, and North Port. *Arbroath Guide*, 10 Jan. 1863, 19 May 1860, 31 Mar. 1860, 4 Feb. 1860, 21 Nov. 1863, 13 Aug. 1859, 18 Oct. 1862, 7 May 1870, 12 Jan. 1861, 27 Dec. 1879.

<sup>3</sup> *Ibid.*, 7 Jan. 1860

Further stimulus to growth was given by the American Civil War and the expanded markets of the period. "Wherever the linen trade is prosecuted," it was reported, "the prosperity has been without parallel."<sup>1</sup> Trading conditions remained good to prosperous, after a post-war depression from mid-1866 to 1870, until 1875, when the end of the second phase of growth, begun in 1847, was reached. The expansion of industry from 1847 to about 1875 was continuous (Figure 3). Six new power-loom factories and eight new mills were built 1860-1876,<sup>2</sup> and of these works eight were along the Brothock or its lades, where industry was now so congested that there was no longer space for growth except in place of earlier works, as in the cases of Victoria, St. Rollox, and Millgate factories, and the expansion of Spring Garden factory about 1862.<sup>3</sup> Of the rest, a mill and factory at Lordburn Tanworks, Abbot, and Stanley works emerged along the Lordburn, a rivulet rising from the springs at Hays; while Abbey Mill and Lochland Works marked the eastern and western limits of dispersal and were away from the streams altogether. This intensification of growth along the Brothock and its enforced dispersal elsewhere was accompanied by the decline of hand-loom weaving, and from 1860 to 1881 numerous old factories were sold, some becoming flax warehouses or heckling houses, while others were acquired by other forms of industry expanding in this period.<sup>4</sup> By the time Arbroath reached its peak of importance as a textile

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<sup>1</sup> Ibid., 26 Doc. 1863. See annual trade reports, *Arbroath Guide*, 1863-75.

<sup>2</sup> Victoria Works (c.1860), a factory at Lordburn Tanworks (1864), Abbot (1865), Millgate (c.1870), St. Rollox (c.1871), and Wardmill (1875) works; Nos. 2, 3 Inch Mills (1863-66), Albert (c.1865), Abbey (1865), Tanwork Mill (c.1866), Stanley (c.1870), Alma (1872), Lochland (1876) works. *Arbroath Guide*, 1 Oct. 1921, 13 Sept. 1862, 11 Oct. 1862, 6 Dec. 1862, 23 April 1864, 24 July 1869, 2 Jan. 1875, 1 May 1875; 3 Jan. 1863, 22 Sept. 1928, 7 Mar. 1896, 5 May 1866, 6 Jan. 1866, 28 Dec. 1872, 1 Sept. 1883.

<sup>3</sup> These replaced an alkali works, Brothock foundry, a hand-loom factory, and Bank Mill respectively.

<sup>4</sup> The following factories were sold:—Anderson's in Dishland Street, Paterson's in East Grimsby, Nicol's at Wardmill, Kay's in Millgate Loan, St. Thomas Street factory, Duncan's in Helen Street, Hay's factory, Rorie's at Hill Place, Bell's in Keptie Street. North Port factory, Wilson and Anderson's in Hill Street, and Garland's in Bank Street. *Arbroath Guide*., 31 Mar. 1860, 14 Dec. 1861, 5 Mar. 1864, 18 Oct. 1862, 10 Jan. 1863, 21 Nov. 1863, 14 May 1864, 7 May 1870, 8 April 1871, 12 Aug. 1870, 27 Dec. 1879, 6 Nov. 1880, 7 May 1881.



centre, hand-loom weaving had virtually ceased. In 1887 there were only 13 hand-loom in the town.<sup>1</sup>

The growth of industry from 1847 came to a climax about 1876, and, if the quantities of flax directly imported are any guide, this position was sustained until about 1883, when the industry began seriously to decline. By 1864 there were 30,342 spindles and 836 power-loom in the town, and Arbroath ranked as the second most important linen textile centre in Scotland.<sup>2</sup> By 1876 there were 34 mills and factories, 40,000 spindles, and 1,100 power-loom, engaged almost exclusively in making sailcloth; and there were 7 bleachfields nearby,<sup>3</sup> mainly serving the town, their dispersed distribution serving to re-define those regional associations first made clear during the spread of water-power spinning, and marking out effectively the limits of the textile province of Arbroath (Figure 1).

### **Flax Supply and the Introduction of Jute.**

The growth whose chronology has been outlined was one which, from an early stage, was sustained almost completely by a mounting import of flax, tow, and hemp from North Russia. The contribution made by local flax cultivation to the demands exercised by Arbroath probably ceased to have importance with the great growth of mill-spinning in the 1820s, though flax continued to be grown locally until 1888 at least.<sup>4</sup> It is difficult, however, to demonstrate the degree to which industrial expansion stimulated textile imports, because, not only are the port records of imports incomplete, but after 1838, when Arbroath was linked by rail with Dundee, rail supplies of flax assumed an increasing importance.<sup>5</sup>

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<sup>1</sup> J.M. McBain, op. cit., 121.

<sup>2</sup> A. J. WARDEN, *The Linen Trade, Ancient and Modern* (1864), 654, 655.

<sup>3</sup> These were Panbride, Elliot, Letham, Pitmuies, Friockheim, Waukmills, and Wardmill. HAY, op. cit., 408.

<sup>4</sup> *Arbroath Guide*, 14 Jan. 1888; flax was then grown at Turin, Middleton, Woodside, Fithie, and Hilton of Arbikie.

<sup>5</sup> Harbour records do not exist for before 1889, and those existing are in part unreliable. *The Arbroath Guide* gives harbour imports for 1869-70, 18715-83; WARDEN, op. cit., gives harbour imports 1848-63, and rail supplies 1859-63.

In 1798, before mill-spinning came to the town, the import of flax, hemp, and flax seed into Arbroath was about 1,000 tons.<sup>1</sup> On 17th June 1824, when mill growth in town and country was in full swing, it was reported, "Upwards of 1,000 tons of flax have arrived . . . within the last ten days; and several more vessels are daily expected from Riga." Under the stimulus of increased trade, the port was improved: the New Harbour was begun in 1839, extending the limited facilities then offered by the Old Harbour, whose construction in 1725 had furthered the commercial development of the town in the eighteenth century.

To what extent direct imports of flax were sent from Arbroath to Forfar after they were linked by rail in 1839, and to what extent rail supplies from Dundee were sent beyond Arbroath after the Arbroath-Montrose line was opened in 1848, one cannot say. The Arbroath and Forfar Railway minute books for 1840-42 possess scattered references which indicate the movement of substantial quantities of flax yarn inland from Arbroath, but give no sure indication that flax fibre was transported on a significant scale. Certainly in 1848 and 1849, of the Scottish flax-importing ports, Arbroath came second to Dundee; but thereafter lost some of this importance as rail supplies grew.<sup>2</sup> For the period 1851-54 the average annual import of textile fibres by rail and sea was 11,091 tons, of which an average of 68 per cent, came annually from Dundee by rail: for the period 1859-63 the corresponding figures are 14,375 tons and 68 per cent., showing clearly the influence of industrial expansion in the mid-nineteenth century and the constancy of the considerable dependence upon Dundee for supplies. Direct imports increased from 6,636 tons in 1863 to 11,420 tons in 1873, remaining fairly steady until 1882 when the peak import of 12,231 tons was reached.<sup>3</sup> 1873-82 was the climax period so far as direct imports were concerned.

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<sup>1</sup> Hay, op. cit., 405.

<sup>2</sup> Warden, op. cit., table 638.

<sup>3</sup> In 1882 out of 84 cargo vessels calling from overseas 72 brought flax. *Arbroath Guide*, 6 Jan. 1883.

Nearness to Dundee affected also the nature of textile -working, and when Dundee changed its staple from flax to jute in 1855-57 jute-working spread to Arbroath. By 1859, Spink Street, Lindsay Street, Brothock and Inch mills were spinning jute in addition to flax and tow, and it was no doubt used in the sacking factories of the period. The only record of jute import into Arbroath harbour is for 1861, when 149 tons were imported, three times the tow or hemp import, but only a thirtieth of the total fibre import for that year.<sup>1</sup> Rail supplies from Dundee became normal after 1863, when Dundee developed as a direct importer of jute.

The use of jute spread in Arbroath, in most cases tow-spinning machinery being adapted for this, as in Orchard Mill by 1870. In 1875, however, John Street Works was re-equipped with new machinery designed for jute and tow-spinning; and about this time too Albert Works became a jute mill.<sup>2</sup> There were other works in which jute came to be used,<sup>3</sup> but at the time of greatest expansion sailcloth manufacture remained outstanding in importance, a fact which goes far to explain much of the subsequent decline of the textile industry of the town.

### Decline

Figure 3, its details derived from property advertisements in the local press, records all that can be traced of the various sites used at one time or another by the textile industry; and it shows the extent to which the industry in its growth came to dominate the town. Compare these past distributions with that of to-day, and the full measure of the decline that has taken place is at once apparent (Figure 6).

The reasons for decline were various. The large-scale changeover from sail to steam vessels in the 1880s, the changing balance of world trade,<sup>4</sup> the general decline of the British linen industry due to the increased use of

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<sup>1</sup> Ibid., 4 Jan. 1862.

<sup>2</sup> Ibid., 23 June 1870, 13 Nov. 1875, 5 Feb. 1887.

<sup>3</sup> These included Pool Mill, Netherward, Baltic, Stanley, Erin, and Wellgate works.

<sup>4</sup> From 1876 to 1909 there were only seven good years out of thirty-four: these were 1882, 1890, 1896-1900. See *Arbroath Guide*, annual trade reports.

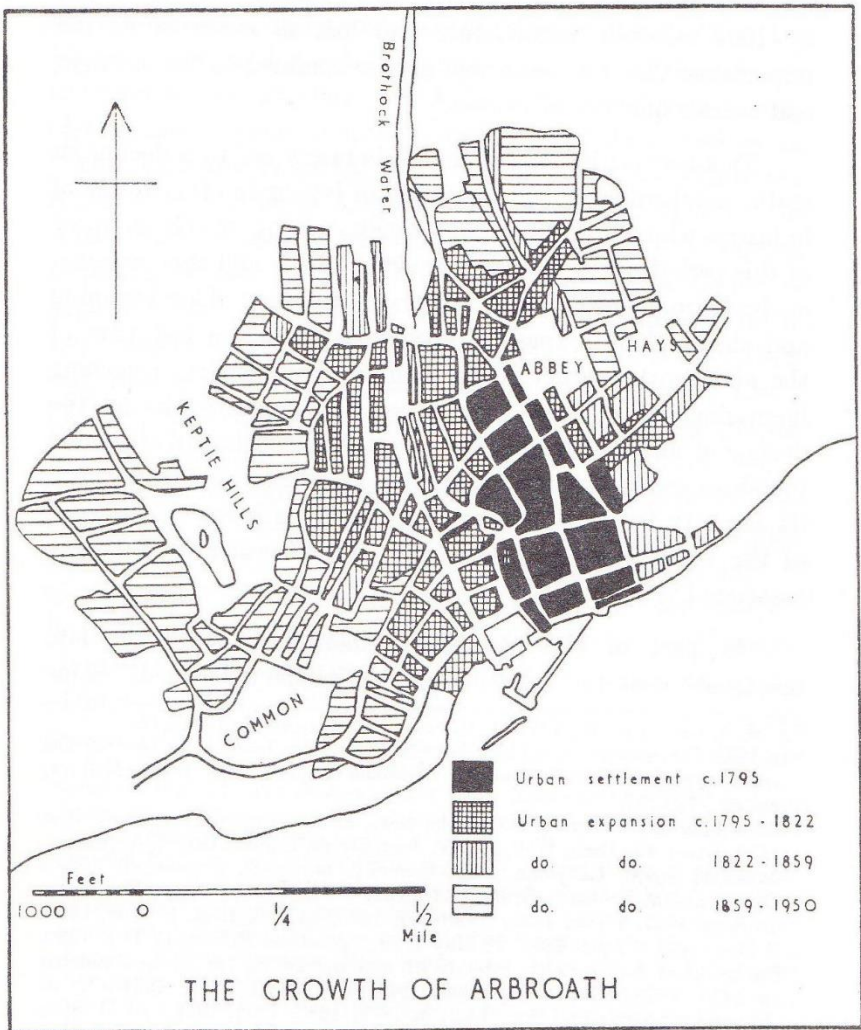


Figure 5—The growth of Arbroath.

cotton and the growth of textile industries in other countries, interacted to produce a general loss of markets, and Arbroath's staple industry was forced to contract. By 1887 depression was severely felt; and by 1904 sailcloth manufacture had lost so much of its old importance that the trade was mostly confined to the stronger and coarser qualities of canvas.<sup>1</sup>

This contraction of the textile industry led to a decline in status accelerated by the attraction of labour to other forms of industry whose expansion was facilitated by trends in most of this period which favoured growth. Boot- and shoe-making, evolving from an eighteenth century background of local tanning and shoe-making, expanded spectacularly in the last part of the nineteenth century.<sup>2</sup> The engineering industry, becoming increasingly concentrated in fewer but larger works as the decline of mill and factory life speeded the decline of the small foundries and workshops,<sup>3</sup> similarly expanded from about 1872,<sup>4</sup> its capacity for growth indicating clearly its independence now of the local textile industry, with which earlier it had been associated.<sup>5</sup>

As part of this changing industrial scene of the late nineteenth century, Arbroath's staple industry declined. Some mills went out of use while mill and

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<sup>1</sup> J.M. McBain, op. cit., 121; J. Brodie, *About Arbroath* (1904), 12.

<sup>2</sup> In 1882, for example, three new boot factories were built; and by 1887 the trade employed about 700 people. *Arbroath Guide*, 30 Dec. 1882; McBain, op. cit., 129-131.

<sup>3</sup> These existed in many parts of the town in the nineteenth century:—in High Street, the Dens, Wellgate, W. John Street, Lindsay Street, Applegate, Dickfield Street, Ladyloan, West Grimsby, Lordburn, Gravesend, Lillie's Wynd, and at Brothock Bridge. *Arbroath Guide*, 7 Mar. 1863, 6 Mar. 1886, 18 Sept. 1897, 4 Dec. 1880, 7 October. 1893, 15 Feb. 1868. 10 Nov. 1866. 8 Feb. 1868, 2 April 1898, 18 May 1929; *Montrose Review*, 17 Dec. 1830.

<sup>4</sup> The works of James Keith, later Keith and Blackmam, Ltd., were extended in 1872, 1875, 1880, 1882, 1903, 1911-13, 1928-29, 1931, 1934-35; of Alexander Shanks and Son, Ltd., in 1872, 1882, 1903, 1911; of Douglas Fraser and Sons, Ltd., in 1896, 1903, 1920-21, 1922-24, 1931. Information derived from *Arbroath Guide*.

<sup>5</sup> In 1842 there were, apart from the machine shops, two works making textile machinery. In the 1860s there was a hackle-making works at Gravesend, and power-looms and other textile machinery were made at Lordburn Works and Victoria Works. None of these works survived after about 1891. See N.8.A., 11, 511; *Arbroath Guide*, 10 Nov. 1806, 15 Feb. 1868, 2 April 1870; *Census of Scotland*, 1891.



factory growth elsewhere continued.<sup>1</sup> but it was not until 1880 that decline seriously began. Then property tumbled to the market. Between 1878 and 1908 four mills, three factories, six carding and waste works, three rope works, and three flax warehouses were sold<sup>2</sup>; the Hemp, Yarn, and Cordage Company, Ltd., was liquidated; the eight works owned by Andrew Lowson were offered for sale, and the firm became a limited company; and the site of Greens "Yarn Cleaning Premises" surviving from the mid-eighteenth century bleachfield of Lordburn Braes, became that of the cattle mart of today.<sup>3</sup> Illustrating contemporary difficulties, Lochland Works, built in 1876 at the end of the period of expansion, was not equipped until 1883, ceased to operate in 1900 was offered for sale in 1903 and eventually sold in 1912, and then remained a textile mill for only a short time.<sup>4</sup> Property advertisements show clearly the explicit recognition that only other forms of industry had virility enough to acquire sites which, through economic stress, the staple industry "was being forced to discard. Brechin Road carding works became a boot factory; Chalmers Street Mill, having ceased to operate as a spinning mill by 189], was advertised as "Suitable for Boot Manufactory," Ogilvy Place flax warehouse as "readily adapted for other purposes."<sup>5</sup> Probably the most intriguing adaptation in this period of change was that made by Douglas Fraser and Sons, by 1864 the second largest employer of textile

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<sup>1</sup> Spink Street and Bankmills went out in 1862; Abbey and Park Mills in 1868, at a time of post war recession. Arbroath Guide, 8 Feb. 1862, 13 Sept. 1862, 21 Mar. 1868, 22 Feb. 1868.

<sup>2</sup> Tanwork Mill (sold in 1880), Erin Works (1883), Albert Works (1888), Hume Street Mill (1897), Millgate Works (1899), Union Street Mill (1901), Abbot Works (1905); Lindsay Street, Ogilvy Place, and Victoria flax warehouses (1880-1901); carding and waste works in Brechin Road, St. Thomas Street, Boglane, Garden Street, St. Mary Street, and North Grimsby (1878-1908); Gardiner's, Arbroath, and Ladyloan ropeworks (1882-1901). Ibid., 24 July 1880, 10 Mar. 1883, 12 May 1888, 9 Jan. 1897, 21 Jan. 1899, 30 Mar. 1901, 25 Nov. 1905; 18 Dec. 1880, 30 Mar. 1901, 2 Mar. 1889, 2 Jan. 1892; 27 Jan. 1878, 5 Aug. 1882, 15 Mar. 1890, 12 Mar. 1892, 28 Sept. 1895, 11 April 1908; 15 July 1882, 22 Sept. 1883, 9 Mar. 1901.

<sup>3</sup> Ibid., 1 May 1897; 5 Feb. 1898, 10 Dec. 1898; 12 April 1902. Lowson's works included Greens, Lindsay Street. John Street, Nos. 1, 2, 3 Inch mills, Baltic and St. Rollox works.

<sup>4</sup> Ibid., 1 Sept. 1883, 18 Aug. 1900, 7 Mar 1903, 3 Aug. 1912, 4 Jan. 1913.

<sup>5</sup> Ibid., 5 Jan. 1889, 28 Jan. 1882, 2 May 1891.

labour,<sup>1</sup> who added shoe-making and engineering to textile working, and are now principally important for the manufacture of textile machinery. Beginning with a hand-loom factory at Wellgate in 1832, replacing this with a power-loom works, acquiring Westburn Mill, and later (1869) Friockheim Bleachfield, the firm invented a plaiting machine, began making jute-soled shoes and the special machinery necessary, expanded from the machine shop of the mill to create Westburn Foundry, and finally made general engineering and textile machinery, while continuing to operate the textile works at Wellgate and the bleachfield at Friockheim. That this development should have been prompted by the decline of the staple industry, and that it has grown to support textile manufacture not locally but elsewhere, provides the most fitting comment on the changing status of industry in the town in the last part of the nineteenth century.

The contraction of the textile industry within the town, caused by the closing down of so many works following the earlier loss of hand-loom factories, was considerable, though some units continued to be used for textile purposes<sup>2</sup> (Figure 6). Industrial distribution also contracted beyond the town to reduce still further the degree of association between town and region. By 1883 Vinney Den Bleachfield, and by 1905 Panbride Bleachfield, had ceased to operate. In 1882 the building of a newly-erected spinning mill at Letham, and in 1889 the plant at Leysmill plash mill, were sold. Finally, in 1893, Hatton Mills, the last of the rural, water-powered mills, were sold, completing the decline of the country mills which had been initiated over sixty years before.<sup>3</sup>

Smaller and changed in character, the industry, adapting itself to a lower level of production, from 1910 to 1918 found trading conditions good; particularly in the war years, when,

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<sup>1</sup> A.J. Warden, op. cit., table 654; *Arbroath Guide*, 30 Jan. 1932.

<sup>2</sup> Erin Works for example, became a yarn warehouse for Wardmill Bleachfield. Ibid. 24 Aug. 1889.

<sup>3</sup> Ibid., 18 Aug. 1883; 13 Jan. 1883, 7 Feb. 1889, 14 Oct. 1893; *Arbroath Year Book and Eastern Forfarshire Directory* for 1905.

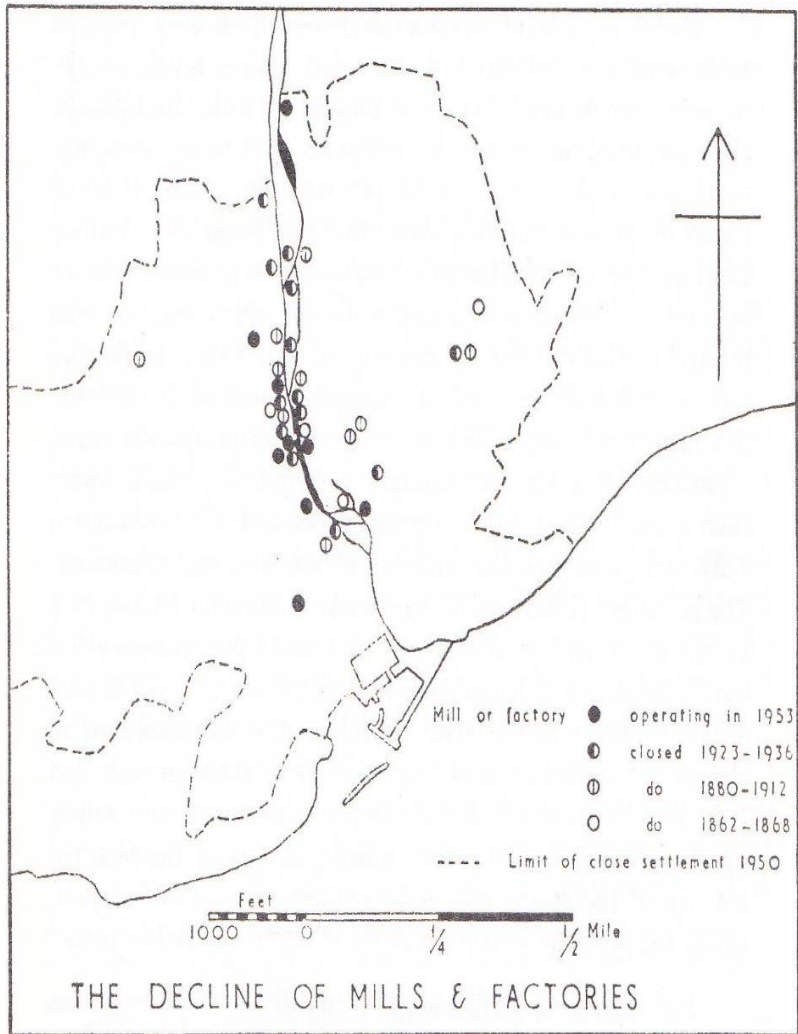


Figure 6—The decline of mills and factories.

in response to the security of Government orders, some works were extended and improved.<sup>1</sup> But in the post-war years of intense depression decline continued, touched off by the cessation of flax supplies from North Russia with the Russian Revolution of 1917.

Direct imports of flax had decreased from their peak in 1882, implying industrial decline, but owing much to the cheaper movement of flax from Dundee by rail. In 1883 the Harbour, burdened with debt, raised its rates to the statutory maximum, making charges 75 per cent, in excess of those levied by Dundee and 661 above those of Montrose. Andrew Lowson, one of the Harbour Trustees and principal spinner in the town, who imported flax in his own ships, was one who reacted to this decision by deciding now to bring his flax by way of Dundee.<sup>2</sup> In 1887 the complaint was made that the flax import was only about one-sixth that of prosperous years, "but much flax has been brought . . . by rail, probably more than ever."<sup>3</sup> By 1911 the direct import had been reduced to 1,206 tons, and with the outbreak of war it ceased altogether. The last cargo of flax was brought to Arbroath on 5 August 1914 by the S/S *Orient* from Pernau; and on 19 November 1915 a coastal shipment of hemp from Hull was the last direct import of textile fibre to be received.<sup>4</sup> This loss of so old-established an element of its Baltic trade left the port, whose growth had been largely prompted by it, simply with its present minor significance as a fishing centre, missing altogether the seasonal activity of the spring and early summer months of the past, which followed the yearly break-up of ice in the Baltic ports.<sup>5</sup>

The cutting-off of flax supplies in 1917 involved a serious readjustment on the part of manufacturers who had been accustomed wholly to the use of Russian flax, though it was not until 1919, when national stocks were exhausted, that

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<sup>1</sup> For example, Alma and Burnside works. *Arbroath Guide*, 4 Jan. 1913, 3 Jan. 1914, 1 Jan. 1916; see Trade reports, 1910-1918.

<sup>2</sup> *Ibid.*, 30 Dec. 1882.

<sup>3</sup> *Ibid.*, 1 Jan 1887.

<sup>4</sup> Harbour Records.

<sup>5</sup> In 1890 for instance, 86 per cent of the textile imports were received from 27 March to 12 June. See Harbour Records.

the position was felt acutely.<sup>1</sup> High flax prices, due to scarcity,<sup>2</sup> together with the effects of depression, reduced the textile trade to "a parlous position, in danger of losing its status as the staple industry of the town."<sup>3</sup> In 1924 the Chamber of Commerce reported, "Every firm has looms and spindles silent . . . and the competition in canvas from France, Belgium, Russia, and Czechoslovakia is greater than ever before. These countries are in a position to undersell us, and so secure what business there is going."<sup>4</sup>

Trade revived from 1933 to 1952,<sup>5</sup> particularly in the war and immediate post-war years, but by this time the industry, smaller how than in 1910-18, was set in a town whose character had altered greatly. Boot and shoe-making declined after 1913 and by 1935 was defunct.<sup>6</sup> Emigration from the town and its development as a seaside resort, both of which were features of the late nineteenth century, quickened in the depression years.<sup>7</sup> Following the example of Dunfermline, the attempt was made to broaden industrial life by inviting the establishment of the silk industry, but it was abortive.<sup>8</sup> The main element of change continued to be the growth of engineering, referred to in 1929 as "the salvation of Arbroath." It was in the war and immediate post-war period, for instance, that Fraser and Sons, Ltd., became more important as an engineering than as a textile firm, its expansion in 1920 related to the making of textile machinery for the great post-war growth of the jute industry in Calcutta.<sup>9</sup> Meantime, the textile industry contracted to produce the

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<sup>1</sup> *Arbroath Guide*, 4 Jan. 1910, 3 Jan. 1920; *Arbroath Year Book for 1920*, 25, 47.

<sup>2</sup> In 1920 Max cost c. £400 per ton, as compared with £26-£32 per ton prior to 1914. Flax acreage in Russia in 1920 was only 10 per cent, of the pre-war average. *Arbroath Guide*, 22 May, 21 Aug., 10 Oct., 4 Dec. 1920.

<sup>3</sup> *Ibid.*, 3 Nov. 1923.

<sup>4</sup> *Ibid.*, 1 Nov. 1924.

<sup>5</sup> In 1933, after 15 years of restricted working, a few works were able to run full-time for occasional periods. *Ibid.*, 6 Jan. 1934.

<sup>6</sup> *Ibid.*, 9 May 1931, 23 Sept. 1933, 2 Nov. 1935.

<sup>7</sup> *Ibid.*, 28 Dec. 1901, 3 Nov. 1923, 5 Jan. 1924, 5 Jan. 1907, 26 Mar. 1921.

<sup>8</sup> *Ibid.*, 25 July 1925.

<sup>9</sup> *Arbroath Year Book for 1929-30*; *Arbroath Guide*, 24 Jan. 1920. See footnote No.4, page 20.

distribution of to-day<sup>1</sup> (Figure 6). Between 1923 and 1936 one bleachfield and thirteen textile works ceased to operate,<sup>2</sup> six of them controlled by Andrew Lowson, Ltd., the largest textile manufacturing firm the town had known.<sup>3</sup> Among the last to be closed was Brothock Mill, sold in 1936, to which James Watt had come to grace the beginning of steam-power spinning in Arbroath 130 years before.

In 1876 there were 34 mills and factories; now there are 9.<sup>4</sup> Of the seven bleachfields in use in 1876, only Elliot, Friockheim, and Wardmill survive (Figure 1). Whereas in 1895 there were five flax-merchants in the town, now there are none; rope and twine-making has ceased; and of the three sail-making firms in 1895 only one remains, and that gave up sail-making about 25 years ago for more varied sewn canvas products.<sup>5</sup> Of the old textile families of Arbroath, there are now only Corsar and Webster, the principal manufacturers to-day. Since sailcloth manufacture lost its exclusive importance towards the end of last century, the further decline of the industry seems not to have altered its character greatly, and the emphasis is still on medium and heavy canvases.<sup>6</sup> Despite the close links with Dundee, notably in the supply by road and rail of flax which comes ultimately from Belgium, Holland, and Commonwealth sources and no longer from Russia, the influence of the town has not been such as to lead to any significant

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<sup>1</sup> The only addition was Ladyloan Carpet works, which started in 1919, but lasted only a short time. *Arbroath Year Book* for 1920, 51.

<sup>2</sup> Spring Garden Factory (ceased in 1923), Applegate Works (1925), Dons Factory (1928), Waukmills Bleachfield (1930), Greens, Inch, Pool, and Lindsay Street mills, John Street and Baltic works (1932), Nursery Mill, Stanley, and Netherward works (1933), Brothock Mill (1930). *Arbroath Guide*, 25 June 1932, 17 Jan. 1925, 12 Aug. 1933, 30 Sept. 1933, 4 Feb. 1933, 14 Mar. 1936; *Arbroath Year Book* for 1929, 23.

<sup>3</sup> Andrew Lowson came to Arbroath from Forfar in 1836, built Greens Mill in 1837, bought Lindsay Street Mill in 1848, built Baltic Works c. 1854, bought John Street Works, and Nos. 1, 2 Inch Mills in 1863, built No. 3 Inch Mill in 1866, and bought Pool Mill c. 1910.

<sup>4</sup> Almerieclose, Orchard, Burnside, and Wellgate mills; Alma, Wardmill, Victoria, St. Hollox, and Chalmers Street factories. This takes into account the 1953 reorganization by Francis Webster and Sons, Ltd., who are transferring all spinning to Burnside Mill.

<sup>5</sup> *Arbroath Year Book* for 1895.

<sup>6</sup> The main productions are sailcloth, tarpaulin canvas, canvas covers and bags.

development of jute manufacture, though most of the works use some jute.<sup>1</sup> Indeed, cotton weaving, its acceptance a measure of the competition provided by the growing production of cotton canvas, has probably more importance as a secondary feature of textile working.

By chance, decline, in ridding the town of so many of the old features of industrial dispersal, re-conferred on the distribution of textile works along the Brothock much of the clear-cut significance first acquired with the growth of power industry in the early nineteenth century; only Wellgate and Chalmers Street works are away from the stream and its lades (Figure 6). These features of location are, however, largely residual. Electricity from 1909, and diesel power from 1929,<sup>2</sup> have taken the place of steam-power; and the Brothock has ceased to have importance as an agent of localization, save with regard to the supply of process water for Wardmill Bleachfield.

Though the stream and lades have little functional significance now, the continuing payments for water rights by most of the existing firms points clearly not only to the nature of past growth, but also to some of the elements that influenced it. All the works lining the Pool<sup>3</sup> continue to pay annually for water rights controlled by the successors to Greens Bleachfield, which, over 200 years ago when it was more extensive, first acquired the right to take water from the Pool. The Wardmill Dam and its outflows have a similar significance, works along the Brothock having to pay "for regulating the water," when the lades from the dam are cleared each year. These survivals, like the location of the works themselves, are the residue of past growth, and are reminders of the significance the old town dams and water-lines assumed when the textile industry grew to importance in the eighteenth and early nineteenth centuries.

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<sup>1</sup> Wellgate Works is the only one in which flax and linen working have been given up; it manufactures jute and fibro yarns.

<sup>2</sup> *Arbroath Year Book for 1910*, 49-51; *Arbroath Guide*, 30 Jan. 1932, 13 April 1929.

<sup>3</sup> On both banks from Panmure Street Bridge to Hume Street Bridge.

It is clear that the decline of Arbroath as a textile centre has been as spectacular as its growth ; but whereas expansion created only opportunity for a largely immigrant and fast multiplying people, contraction forced labour to move out or find alternative employment in other forms of industry. Responsive to these changes, the peak population of 22,821 was reached in 1891, not long after the textile industry reached its climax of growth; this was housed in a town smaller than that of to-day, mostly in the early nineteenth century area, where the highest population densities are still to be found. The population subsequently decreased, and in 1931 stood at 17,635, nearly the same as that in 1861. The increase to 19,511 in 1951, after nearly half a century of continuous decline, is a measure of the degree to which the structure of industry has broadened in a town which combines also the functions of tourist and fishing centre. Old mill and factory sites are now used for a variety of purposes, many of them having been acquired by the engineering industry in its growth,<sup>1</sup> reversing the conditions of earlier years when foundries gave way to textile works.

In conclusion, it may be stated that the changing character of what was once an Abbey town demonstrates the capacity for adaptation inherent in most settlement units, so placed and of sufficient size as to be sensitive to the changing economic circumstances of region and nation. The growth and decline of the textile industry of Arbroath, inspirational as it has been to the changing character of the town, has no meaning apart from the wider contexts in which it is set. The town has simply reacted to stimuli from elsewhere, its growth and decline part of the wider changes of circumstance associated with the textile region of east central Scotland, but possessing special elements in view of the remarkable growth of sailcloth manufacture which made it especially vulnerable as the character of shipping changed in the late nineteenth century. Further, its growth, in forming simply a small part of the wholesale transformation of industry in this country in the late eighteenth and in the nineteenth centuries, is indicative of

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<sup>1</sup> In 1881 there were 256 occupied in engineering, 133 on foundry work, and 4,351 on textile fabrics (see *Census of Scotland*, 1881); in July 1952 there were 1,842 occupied in engineering and 1,266 on textiles.



the extent to which the location of power industry became in the first instance and for a long period after clearly associated with natural features which were attractive where industry depended on the easy fulfilment of certain simple, physical needs. The demands for water by steam-powered mills and factories led, while neither inevitably nor invariably, to so close an association between industrial siting and easily available water resources as to give a firm measure of physical control over the early distribution of industry. In Arbroath the degree of this association was sufficiently marked to give to the town for a period a direction of growth to both industrial and general urban development, along and about the Brothock; and growth itself was so intense as to promote the obscuring of these features at a later period, when industrial and urban congestion forced further development outwards.

The decline of the industry has inevitably led to the survival of elements whose distribution is a chance affair; and that this distribution is still largely a stream-side one is almost completely fortuitous in view of the changes in power supply which have taken place to make steam-power obsolescent. The inflexibility of a town which has matured about the industry which prompted its modern growth, combined with the lack of economic conditions favourable to the further spread of an industry no longer dependent on the fulfilment of basic physical requirements, make the industrial survivals of to-day examples of inert localization, their distribution interpretable therefore only in depth and lacking all meaning apart from the historic processes which have worked upon them.

The siting, character, and status of an urban industry are as mutable or immutable as the reactions of its town to economic change make them, within the limits set by the degree of industrial association between town and region and by the extent of wider technical advancement. It is from such local reactions to economic stimuli that the broader conclusions to be drawn from regional studies of industry will derive their ultimate value and validity, and make apparent not only the degree to which the present is the outcome of the past, but also the extent to which the rejection of past elements has taken place.

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