Week 4B

The woollen and worsted industries after 1780

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http://open.conted.ox.ac.uk/series/manufactures-industrial-revolution
Week 3 and 4a takeaways

- Wool textile industries grew overall from 1700-1780, but experienced an intensification from variable export markets, changing tastes and competition from cotton.

- Growth of Yorkshire, stagnation of West Country woollens, decline of Norwich worsted industry after 1740-60.

- Became economic to mechanise cotton spinning by 1780s, due to rapidly-increasing demand for cotton cloth, higher weaver productivity with Kay’s fly shuttle, shortage of spinners, rising piece-rates.

- Other cotton manufacturing processes largely mechanised by 1800, except weaving.

- Relative lack of opposition to cotton mechanisation because of increased demand and opportunities in handloom weaving.
Outline

• Threat from cheap cotton

• Slower adoption of mechanization

• Impact of industry organization and industrial relations

• Continuation of artisan woollen production till 1850s to 1860s

• Changes to industry organization

• Reasons for Yorkshire supremacy, decline of West Country and Norwich
Discussion

How did developments in the cotton industry affect woollen and worsted manufacture?
Slower introduction of mechanisation

Kay’s fly shuttle:

- Improvements in worsted weaving and machine spinning went hand in hand
- Fly shuttle adopted by cotton weavers from 1760s, but less suitable for worsted due to frequent yarn breakages
- Adopted by Yorkshire broadcloth weavers
- Early machine-spun worsted yarn rougher than hand-spun, shuttle tended to get stuck in the shed
- Michael Greenwood of Halifax’s invention of a false slay
- Fly shuttle adopted when machine-spun yarn became smoother
- Worsted weaving productivity increased dramatically, increased demand for machine-spun yarn
Carding

- Wool courser than cotton, required stronger machine than cotton
- Process divided into scribbling and carding
- First process to be mechanized, from 1790s
- Scribbling and carding machinery often added to existing fulling mills
- Some horse-powered in 1790s Yorkshire, later converted to steam
- Corn mills converted, new mills built
Mechanized worsted spinning

- Long-staple wool less strong than cotton, harder to mechanize spinning
- First mill at Dolphinholme on the River Wyre, Lancashire, in 1784 using small water frames unsuccessful
- By 1800 spreading through Yorkshire and Lancashire
- Hand spinning continued for a while to produce warp – wages went down to 1/2d a pound spun
- Slubbing machine introduced to stretch the fibres before roving
- Machine-spinning took off from 1820s
Wool combing

- Woolcombers high-paid and militant
- Cartwright’s combing machine patented 1792, introduced by some manufacturers to subdue combers
- Petition to Parliament about potential loss of employment estimated there were around 50k woolcombers
- Further militancy in 1820s, Platt & Collier’s machine invented 1827, but first really efficient machine mid-19c
- Washing machine introduced mid-19c
Woollen finishing

- Gig mill automated raising nap
- Reduced time to dress one cloth from 100 hours for one man to 12 hours for one man and two boys
- Mechanization threatened craft status and employment
- Riots against introduction of gig mills
- Parliament abolished Tudor legislation in 1809
- Automated frames, then rotary perpetual shearing machines introduced after 1815
- 20x more productive than hand shearing, operated by boys
Improved hand-weaving technology

• Jacquard loom invented late 18th century in France
• Initially adopted in silk, ribbon and carpet-weaving
• Spread to Yorkshire worsted industry in 1830s
• Resulted in de-skilling weavers but enabled patterned worsted to reach a wider market
Power looms

- Power loom invented in 1780s, not developed sufficiently to use in cotton till 1820s
- Worsted weavers stuck 1825 for a higher share of trade’s profits, but masters objected on grounds power looms produced more cheaply
- Initially more cumbersome and slower than cotton power looms, but rapid improvements in technology in 1840s
Influence of proto-industry organisation on industrialization

Proto-industry theory:
Proto-industrial phase develops the entrepreneurial skill, capital, networks, and marketing needed for industrialization

- Yorkshire woollen proto-industry around Leeds organised on an artisan basis, often small farmers
- Yorkshire worsted industry grew around Halifax from 1700 on a putting-out basis

Industrialization:

- In woollen zone, landowners owned fulling mills, extended them as scribbling and carding mills
- Clothiers’ consortia built new carding mills, provided service on commission
- Investment often secured by mortgage on clothier’s farm
- In worsted districts, mills financed by large putting-out manufacturers
- Factory masters also came into worsted manufacture from outside, e.g. wool merchants and cotton masters
Continued viability of Yorkshire artisan system

- Company mills provided mechanised services on commission
- Allowed 2-3 months’ credit to clothier
- Clothiers also bought wool on credit
- Turnover on capital therefore fairly rapid
- Less fixed overheads than worsted manufacturers, family cohesion, web of credit and local ties made it easier to weather trade depressions
- Opportunity to supplement industrial earnings from farm, use of commons, carting etc.
- Artisan sector remained viable till 1850s
Changing organisation of Yorkshire worsted sector

Already dominated by large manufacturers – slow turnover, needed large circulating capital

Once scribbling and carding powered by steam, incentive to vertical integration and moving more processes into factory to avoid bottlenecks

Emergence of worsted yarn market, reduced need for circulating capital

Worsted sector grew faster than woollen – demand for light fabrics, Copied Norwich products, such as camblets and damask

Product innovation – dobbies, plainbacks
Decline of Norwich and West Country

Norwich:
• Riots and party politics delayed mechanization
• Lack of investment in mechanization led to more branches being taken over by Yorkshire
• Norwich bought machine-spun worsted yarn from Yorkshire
• Jacquard loom threatened Norwich’s niche market in high-end stuffs

West Country:
• Trade declined after 1825, reduced demand for broadcloth, increased demand for lighter-weight fabrics
• Worsted became more popular than light-weight woollens
• Unable to compete with Yorkshire on low-priced mass market woollens
• Competition from Scottish tweed
Summary

• Delays in mechanizing woollen cloth and worsted stuffs after cotton mechanized because wool less suitable for machinery, opposition from workers

• In Yorkshire and West Country, existing proto-industrial manufacturers often led industrialization, but also newcomers to worsted manufacture

• Gradual loss of spinning for women and skilled male jobs 1780-1850

• Survival of small artisan clothiers in Yorkshire till 1850s due to co-operative capitalism of company mills

• Eclipse of Norwich
Prep for Week 6, The leather industries

Discussion topics: Describe in no more than 5 minutes the main points of one of the following readings:

**Leather**


- Clarkson, L., 'The organization of the English leather industry in the late sixteenth and seventeenth centuries', *Economic History Review* 13 (1960). In class Google drive, one class copy.


**Shoemaking**


**Glovemaking**
