

## Quaker Contributions to Industrial Capitalism

Wool & cloth	<p>Yeoman Quaker farmers in the Northwest (Fox country), already in the sheep economy, forced into the wool trade by distraintment</p> <p>Gurneys in wool for a century.</p> <p>Lending to worsted spinners led to the Norwich Bank, largest bank in England after the Bank of England.</p>	17 <sup>th</sup> C
Iron	<p>50% - 75% of iron industry in Quaker hands between 1700 &amp; 1750</p> <p>Quaker family groups cooperating in several ways and very inter-married, develop the <i>metal infrastructure</i> of the English industrial revolution.</p> <p>British iron industry had languished, mostly from lack of fuel</p> <p>Solve fuel problem by developing rotated crop coppice farming, rather than using virgin timber (Eng denuded)</p> <p>Then develop the <i>coke smelting</i> techniques which produced bar iron from pig iron, unsuitable for forges, but perfect for <i>casting</i>: leads to a huge cast iron consumer product market, esp pots &amp; pans; then to steam engine parts.</p> <p>Had already patented the casting process</p> <p>Made <i>machinery</i> possible; therefore, the industrial revolution, esp replacing brass for steam engines; Darby supplying Newcomen, the inventor of the steam engine</p> <p>Also designed <i>slitting mills</i> for rod &amp; bar and improved wire drawing.</p> <p>Four different family groups together represent all transition stages between isolated bloomeries on the old monastic model to full-blown blast furnace-foundry plants.</p>	~1710 1707 1724
Steel	<p>Benjamin Huntsman first to develop <i>cast</i> steel; extremely high quality.</p> <p>This literally makes the industrial revolution possible, because of the availability of quality, enduring machinery parts.</p> <p>Leads to English cutlery industry.</p> <p>Refuses election as a Fellow of the Royal Society for his accomplishment, and never takes a patent.</p>	1740s
Farm implements	<p>Robt Ransome develops first tempered cast iron plowshare;</p> <p>then an improved cooling method for better sharpness maintenance.</p> <p>Then the interchangeable parts plow—the very beginning of mass industrialization</p>	1720s

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Brass	<p>Champion family develops patents that were vital to the industry's development</p> <p>First to make zinc in England.</p> <p>Pioneered worker community development.</p>	1750s
Mining	<p>2 Quaker families acquire failing firms; soon merge to become the Quaker Lead Company.</p> <p>Controlled all lead in Br. Isles; largest mining firm in England until 1896.</p> <p>Major advances in worker relations and conditions.</p>	1690s
Silver	<p>Quaker Lead Company develops a superior furnace design and smelting process for drawing silver from lead ore.</p> <p>Becomes sole supplier of silver for the national Mint.</p>	
Transport	<p>Leeds &amp; Liverpool Canal—John Hustler</p> <p>Hustler both organized it and provided much of the funding</p> <p>Water communication across Eng through the growing industrial regions</p> <p>Later forms the Assoc of Worsted Mfrs</p>	1764
	<p>Railroad</p> <p>Abraham Darby II (one of the iron families) first to put wooden sleepers on the road for wagons and phlanged iron wheels on the wagons—to save the horses, who were carrying ore directly</p>	1752
	<p>Richard Reynolds (Darby's son-in-law) used iron rails to give his workers employment during period of low demand: first iron rails for roads</p> <p>Set a pattern for collieries having wagon rail-ways to the staithes on the nearby river</p>	1768
	<p>Darby III builds the famous Iron Bridge at Coalbrookdale</p> <p>Avoids ferry over Coalbrookdale R.</p> <p>Revolutionary design, single span 100', cast iron, still there</p>	1779
	<p>Pease and Backhouse families organize financing, largely among Quakers and others who trusted Quaker venture sense, for the first railroad in England; known as the 'Quaker Line'</p>	1825
	<p>The Stockton and Darlington Railway ushers in the railway era in England; also finance the Manchester-Liverpool line</p>	Early 1820s
	<p>Pease conceives the first passenger train; also begins using steam locomotion for the whole run, not just steep grades</p>	1830s
Pottery	<p>William Cookworthy discovers the Cornish deposits of China clay.</p> <p>Founds the English porcelain industry.</p>	1755

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Watchmaking	<p>Important for the industrial revolution because of both the materials and engineering advances, plus maritime navigation</p> <p>The most famous clock &amp; watch makers in this period were Quakers</p> <p>Thomas Tompion—“father of English watchmaking”</p> <p>Edward East—clockmaker for Charles II</p> <p>Daniel Quare—clockmaker for William III and George I; the greatest clockmaker of his time</p> <p>George Graham—known for the extreme beauty and accuracy of his scientific instruments; builds the original orrery for Lord Orrery; many important advances</p> <p>Benjamin Hunstman—seeking better springs for watches, his experiments in steel casting and his discoveries lay the foundation for the steel industry in Sheffield</p>	<p>1670s</p> <p>1660s</p> <p>1708</p> <p>1720s</p>
Soap	<p>Joseph Fry and partners start a soap business that becomes Lever Brothers.</p>	<p>1770</p>
On-board seawater still	<p>Cookworthy develops first successful process for distilling drinking water from seawater. Still used today.</p>	<p>1760s</p>
Energy	<p>William Cubitt and Robert Ransome develop the first gas works for gas lighting.</p> <p>William Cubitt designs the first wind-regulated vanes for windmills.</p> <p>Arthur Albright the first to use phosphorus in matches, creating the ‘safety match.’</p> <p>Quaker firm of Bryant &amp; May develops a production line, contributing to the organizational dimension of the industrial revolution; becomes one of the leading match companies in Europe. Invents “strike only on the box.”</p>	<p>1817</p> <p>1844</p> <p>1861</p>
Retail	<p>The price tag—Though already a theoretical debate, Friends are the first to publicly display a fixed price for goods, out of a religious concern for truth—there is but one true price for a good: its cost plus a modest, reliable profit. The price should not depend on the bargaining skills of the merchant or the customer. And haggling meant too much talking.</p> <p>Strawbridge &amp; Clothier in Philadelphia and Macy’s in New York help to redefine retail with very early versions of the department store—one store with a wide range of dry goods.</p>	<p>late 17<sup>th</sup> C</p> <p>1868</p>
Chocolate	<p>Three great Quaker chocolate families: Fry, Rountree &amp; Cadbury</p> <p>Joseph Fry (apothecary) founds the British cocoa and chocolate</p>	<p>1753</p>

	industry.	
	Cadburys the first to develop pure chocolate, having developed a technique for pressing out the fats: cocoa butter.	1866
	Frys & Cadburys become British Cocoa & Chocolate Co.	1919
	Rountree the first to conduct organized industrial espionage.	
	Cadbury and Fry early innovators in advertising.	
	All three firms become leaders in benign industrial relations and labor benefits.	
Banking	Banking grows out of 2 functions:	
	provide large personal loans, usually to customers	1700
	accepting custody of valuables for safekeeping, usually from employees	
	Two branches of origin:	
	1. Earlier & smaller banks start with goldsmiths	
	Eg: Freame founds what will become Barclay— financed London Lead & handled silver supply to the national Mint	1698
	2. Larger number of banks built as adjuncts for the convenience of smaller domestic industries ~ 18 <sup>th</sup> C — consolidated in 19 <sup>th</sup> C	
	Lloyds develops from the iron industry	1765
	Norwich Bank (Gurneys) from woolen manufacture	1775
	Legal constraints aid the Quakers:	
	Bank of Eng makes banking illegal, tho goldsmiths not prevented from writing promissory notes	1694
	law prohibits banking partnerships larger than 6 partners ⇒ fostered many local family (Quaker) banks	1707
Associations	Assoc of Worsted Mfrs—John Hustler	1764
	Midland Assoc of Ironmasters	~1700
	United Chamber of the Mfrs of Great Britain	1785
Industrial Organization	London Lead, esp, introduces a new business structure for the large association of many small business units—the conglomerate	
	Instead of the single family, single site business	

Industrial Welfare	Richard Reynolds buys the woods of Manor Madely and has walks laid out for his workers; provides a plot with housing for gardening at very reasonable rate builds schools & provides scholarships London Lead provides health plans, pension plans, year-round production/employment schedule Many firms provide housing, schooling and other benefits far ahead of wider industry developments Though they are slow to give up the paternalist model of employee management and they resist the rising labor movement in the late 19 <sup>th</sup> C
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