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**Economics 201Y1: The Economic History of Later Medieval and Early Modern Europe**

**Topic No. 18: On the Industrial ‘Origins’ of the Industrial Revolution: The Nef Thesis on Industrial Change in Tudor-Stuart England**

**Note:**

The focus of the Nef thesis is upon industrial change in mining, metallurgy, and coal-burning industries during the ‘Price-Revolution’ era, involving principally: (a) a late 16th and early 17th-century ‘energy crisis’ inducing changes in fuel technologies, which in turn brought about larger-scale forms of capitalistic industry; and (b) the birth, growth, and then stagnation of a modern capitalistic iron industry.

England's major manufacturing industry of this era, however, was textiles: with its woollen, worsted, and fustian branches. Readings on textiles are supplied in section D of this bibliography, but are also contained in the bibliography for the related topic no. 30, on ‘Proto-Industrialization,’ which also provides many other readings relevant to early-modern textile industries.

**READINGS:**

Within each section, readings are listed in the chronological order of original publication, when that can be ascertained, except for some collections of reprinted essays.

**A. Industry and Industrial Growth in Early-Modern Europe: General Studies:**

**i. Europe in General: Chiefly Continental Europe**

1. Herbert Kisch, ‘The Textile Industries in Silesia and the Rhineland: A Comparative Study in Industrialization,’ Journal of Economic History, 19 (1959), 541-64.
2. R. Ludloff, ‘Industrial Development in Sixteenth and Seventeenth-Century Germany,’ Past and Present, No. 12 (1961), 58-75.
3. Hermann Kellenbenz, ‘Industries rurales en Occident de la fin du moyen âge au XVIII siècle,’ Annales: Économies, sociétés, civilisations, 18 (1963), 833 - 82.
4. Herbert Kisch, ‘Growth Deterrants of a Medieval Heritage: The Aachen Area Woolen Trades Before 1790,’ Journal of Economic History, 24 (1964). Republished in Peter Kriedte, Hans Medick, Jürgen Schlumbohm, Industrialization before Industrialization: Rural Industry in the Genesis of Capitalism (Cambridge University Press, 1981), pp. 178-200, with a postscriptum (pp. 194-200).

5. Hermann Freudenberger and Fritz Redlich, 'The Industrial Development of Europe: Reality, Symbols, Images,' Kyklos, 17 (1964), 372-402.
6. François Crouzet, W.H. Chaloner, and W.M. Stern, eds., Essays in European Economic History, 1789-1914 (London, 1969).
  - (a) Jan Dhondt, 'The Cotton Industry at Ghent during the French Regime,' pp. 15-52. [Original French version published in Revue d'histoire moderne et contemporaine, 2 (Oct-Dec. 1955)].
  - (b) Gerhard Adelman, 'Structural Change in the Rhenish Linen and Cotton Trades at the Outset of Industrialization,' pp. 82-97. [Original German version published in Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte, 53 (July 1956)].
- \* 7. Hermann Kellenbenz, 'Rural Industries in the West from the End of the Middle Ages to the Eighteenth Century,' in Peter Earle, ed., Essays in European Economic History, 1500-1800 (Oxford, 1974), pp. 45-88. Translated and adapted from 'Industries rurales en Occident de la fin du moyen âge au XVIII siècle,' Annales: Économies, sociétés, civilisations, 18 (1963), 833 - 82. (translated by K.E. George).
- \* 8. Domenico Sella, 'European Industries, 1500-1700,' in Carlo Cipolla, ed., The Fontana Economic History of Europe, Vol. II: The Sixteenth and Seventeenth Centuries (London, 1974), pp. 354-426.
9. Aloys Klima, 'The Role of Rural Domestic Industry in Bohemia in the Eighteenth Century,' Economic History Review, 2nd ser. 17 (1974), 48-56.
10. W. Robert Lee, Population Growth, Economic Development, and Social Change in Bavaria, 1750-1850 (New York, 1977).
11. Peter Kriedte, Hans Medick, Jürgen Schlumbohm, Industrialisierung vor der Industrialisierung (Göttingen, 1977). Translated by Beate Schempp as: Industrialization before Industrialization: Rural Industry in the Genesis of Capitalism (Cambridge University Press, 1981).
12. Milan Mijska, 'Pre-Industrial Iron-Making in the Czech Lands: The Labour Force in Production Relations, ca. 1350-ca. 1840,' Past and Present, No. 82 (Feb. 1979), 44-72.
- \* 13. Myron P. Guttman, Toward the Modern Economy: Early Industry in Europe, 1500 - 1800 (Philadelphia, 1988).
14. Jordan Goodman and Katrina Honeyman, Gainful Pursuits: The Making of Industrial Europe, 1600 - 1914 (London, 1988).
- \*\* 15. Herman Van der Wee, ed., The Rise and Decline of Urban Industries in Italy and in the Low Countries: Late Middle Ages - Early Modern Times (Leuven: Leuven University

Press, 1988).

See especially chapter 15: Herman Van der Wee, 'Industrial Dynamics and the Process of Urbanization and De-Urbanization in the Low Countries from the Late Middle Ages to the Eighteenth Century: A Synthesis,' pp. 307 - 81.

16. Herbert Kisch, From Domestic Manufacture to Industrial Revolution: The Case of the Rhineland Textile Districts, London: Oxford University Press, 1989.
17. John Theibault, 'Town, Countryside, and Proto-Industrialization in Early Modern Europe,' Journal of Interdisciplinary History, 29:2 (Autumn 1998), 263-72. A review article based upon Terence McIntosh, *Urban Decline in Early Modern Germany: Schwäbisch Hall and Its Regions* (Chapel Hill, 1997) and Sheilagh Ogilvie, *State Corporation and Proto-Industry: the Württemberg Black Forest, 1580 - 1797* (Cambridge, 1997).

## ii. England

1. W.R. Scott, The Constitution and Finance of English, Scottish, and Irish Joint-Stock Companies to 1720, 3 vols. (Cambridge, 1910-12). An important study on business organization in the British Isles in the 16th, 17th, and early 18th centuries.
2. George Unwin, Industrial Organization in the Sixteenth and Seventeenth Centuries (London, 1914; reissued 1957).
3. A.P. Usher, The Industrial History of England (Boston, 1920).
4. Ephraim Lipson, The Economic History of England, Vols. II - III: The Age of Mercantilism (London, 1931; 6th edition, 1956; reprinted 1961). See in particular:
  - Vol. II, Chapter I, 'Industry,' pp. 1 - 183 (on textiles, coal and iron);
  - Vol. III, Chapter V: 'Control of Industry,' pp. 207-409.
5. J. D. Chambers, Nottinghamshire in the Eighteenth Century (London, 1932). A regional study of industrialization.
6. W.H.B. Court, The Rise of the Midland Industries, 1600-1800 (Oxford, 1938; reissued 1953, 1965).
7. John Nef, Industry and Government in France and England, 1540-1640 (1940): deals with industrial organization, government regulation, and taxation -- but not with the so-called 'Nef Thesis' listed below in Section C.
- \* 8. J.D. Chambers, The Vale of Trent, 1660-1800 (Cambridge, 1957). A classic study of economic development and industrial growth in one an English Midlands region.

9. Donald C. Coleman, 'Technology and Economic History, 1500-1750,' Economic History Review, 2nd ser. 11 (1959): a review of Charles Singer, et al., eds., A History of Technology, Vol. III: 1500-1750 (Oxford, 1953).
- \* 10. Joan Thirsk, 'Industries in the Countryside,' in F.J. Fisher, ed., Essays in the Economic and Social History of Tudor and Stuart England (Cambridge, 1961), pp. 70-88. A classic study.
- \* 11. Peter Ramsey, Tudor Economic Problems (London, 1965), Chapter III: 'Industry and the Towns,' pp. 82-112.
12. Charles Wilson, England's Apprenticeship, 1603-1763 (London, 1965), Chapters 4 and 9, pp. 66-88 and 185-205.
- \* 13. L.A. Clarkson, The Pre-Industrial Economy in England, 1500-1750 (London, 1971), Chapter 4: 'Industry,' pp. 75-116.
14. Walter E. Minchinton, ed., Wage Regulation in Pre-Industrial England (New York, 1972).
15. Penny Corfield, 'A Provincial Capital in the Late Seventeenth Century: the Case of Norwich,' in P. Clark and P. Slack, eds., Crisis and Order in English Towns, 1500 - 1700 (London, 1972). Concerns worsted textile-manufacturing.
16. D. Hey, The Rural Metalworkers of the Sheffield Region: A Study of Rural Industry Before the Industrial Revolution (London, 1972).
- \*\* 17. Donald C. Coleman, Industry in Tudor and Stuart England (London, 1975), pp. 11-51.
18. M. B. Rowlands, Masters and Men in the West Midland Metalwares Trades Before the Industrial Revolution (London, 1975).
19. Peter Clark and Paul Slack, English Towns in Transition, 1500-1700 (Oxford, 1976), especially Chapter 7.
- \* 20. Donald C. Coleman, The Economy of England, 1450-1750 (London, 1977). Chapter 5, 'Occupations and Industries, 1450 - 1650,' pp. 69 - 90; chapter 9, 'Industrial Change, 1650 - 1750,' pp. 151 - 72.
- \* 21. Sybil M. Jack, Trade and Industry in Tudor and Stuart England (Historical Problems series, Studies and Documents No. 27, London 1977).
22. J. Langton, 'Industry and Towns, 1500-1730,' in R.A. Dodgshon and R.A. Butlin, ed., An Historical Geography of England and Wales (London, 1978), pp. 173-98.
- \* 23. Christopher G. A. Clay, Economic Expansion and Social Change: England, 1500 - 1700, Vol. II: Industry, Trade, and Government (Cambridge, 1984), chapter 8, 'The Diversification of Economic Activity,' pp. 1 - 102.

24. Maxine Berg, The Age of Manufactures: Industry, Innovation, and Work in Britain, 1700-1820 (London, 1985).
25. John T. Swain, Industry Before the Industrial Revolution: North-East Lancashire, c. 1500 - 1640 (Manchester University Press, 1986).
26. Pat Hudson, ed., Regions and Industries: A Perspective on the Industrial Revolution in Britain (Cambridge University Press, 1990).
27. Ian Blanchard, 'Technological Diffusion in the International Mining and Metallurgical Industries: Introduction,' in Ian Blanchard, Anthony Goodman, and Jennifer Newman, eds., Industry and Finance in Early Modern History: Essays Presented to George Hammersley on the Occasion of his 74<sup>th</sup> Birthday, Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte, Beiheft series no. 98 (Franz Steiner Verlage: Stuttgart, 1992), pp. 143-60.
28. John Harris, Essays in Industry and Technology in the Eighteenth Century: England and France (Aldershot: Variorum, 1992).
29. T.M. Safley and L.N. Rosenbud, The Workplace Before the Factory Artisan and Proletarians, 1500 - 1800 (Ithac and London: Cornell University Press, 1993).
30. Akira Satoh, Building in Britain: The Origins of a Modern Industry (Aldershot: Scolar Press, 1995).
31. Donald Woodward, Men at Work: Labourers and Building Craftsmen in the Towns of Northern England, 1450 - 1750, Cambridge Studies in Population, Economy and Society in Past Time vol. 26 (Cambridge and New York: Cambridge University Press, 1995).
32. Kenneth L. Sokoloff and David Dollar, 'Agricultural Seasonality and the Organization of Manufacturing in Early Industrial Economies: The Contrasts Between England and the United States,' Journal of Economic History, 57:2 (June 1997), 288-321.

**B. The Nef Thesis: The 'Industrial Revolution of 1540-1640'**

1. John Nef, The Rise of the British Coal Industry, 2 vols. (London, 1923; reprinted 1966). In particular, Vol. I, Part ii, 'Coal and Industrialism,' pp. 133-264. Chapter 2 of this section is entitled: 'An Early Industrial Revolution.' (pp. 165-89)
- \*\* 2. John U. Nef, 'The Progress of Technology and the Growth of Large Scale Industry in Great Britain, 1540-1640,' Economic History Review, 1st ser. 5 (1934), reprinted in both:
  - (a) E.M. Carus-Wilson, ed., Essays in Economic History, Vol. I (London, 1954), pp. 88-107.

- (b) John Nef, Conquest of the Material World (Chicago, 1964), pp. 121-43.
3. John Nef, 'A Comparison of Industrial Growth in France and England, 1540-1640,' Journal of Political Economy, 44 (1936), reprinted in John Nef, Conquest of the Material World (1964), pp. 144-212.
- \* 4. John Nef, 'Prices and Industrial Capitalism in France and England, 1540-1640,' Economic History Review, 1st. 7 (1937), reprinted in both:
- (a) E.M. Carus-Wilson, ed., Essays in Economic History, Vol. I (1954), pp.108-34.
- (b) F.C. Lane and J.C. Riemersma, eds., Enterprise and Secular Change: Readings in Economic History (London, 1953), 292-321.
5. John Nef, War and Human Progress: An Essay on the Rise of Industrial Civilization (New York, 1950; reprinted 1963). See Part I (1494-1640), Chapter 4, 'Progress of Capitalist Industry,' pp. 65-88.
6. John Nef, The Conquest of the Material World: Collected Essays (Chicago, 1964).

**C. Coal, Iron, and othe Metallurgical Industries: Critics and Supporters of the Nef Thesis**

- \* 1. T. S. Ashton, Iron and Steel in the Industrial Revolution (Manchester, 1924; reprinted 1951), chapter 1, pp. 1-23. Puts forward the classic theory of the 'tyranny of wood and water,' which undoubtedly influenced Nef strongly.
2. T. S. Ashton and J. Sykes, The Coal Industry of the Eighteenth Century (Manchester, 1929; reprinted 1964).
3. B. L. C. Johnson, 'The Foley Partnerships: the Iron Industry at the End of the Charcoal Era,' Economic History Review, 2nd ser. 4 (1952).
- \* 4. Donald C. Coleman, 'Industrial Growth and Industrial Revolutions,' Economica, new ser. 23 (1956), reprinted in: E.M. Carus-Wilson, ed., Essays in Economic History, Vol. III (London, 1962), pp. 334-52.
5. H. R. Schubert, The History of the British Iron and Steel Industry from ca. 450 B.C. to A.D. 1775 (1957).
6. George Hammersley, 'The Crown Woods and their Exploitation in the Sixteenth and Seventeenth Centuries,' Bulletin of the Institute of Historical Research, University of London, 30 (1957), 154-59.
- \* 7. Michael Flinn, 'The Growth of the English Iron Industry, 1660-1760,' Economic History Review, 2nd ser. 11 (1958), 144-53.

8. Michael Flinn, 'Timber and the Advance of Technology: A Reconsideration,' Annals of Science, 15 (1959), 109-20.
- \* 9. D.W. Crossley, 'The Performance of the Glass Industry in Sixteenth-Century England,' Economic History Review, 2nd ser. 25 (1972), 421-33. Very important study.
10. J. L. Langton, 'Coal Output in South-West Lancashire, 1590-1799,' Economic History Review, 2nd ser. 25 (1972), 28-54.
- \*\* 11. George Hammersley, 'The Charcoal Iron Industry and its Fuel, 1540-1750,' Economic History Review, 2nd ser. 26 (1973), 593-613. The most effective challenge to Nef.
12. D.C. Coleman, Industry in Tudor and Stuart England (1975), pp. 35-49.
- \* 13. George Hammersley, 'The State and the English Iron Industry in the Sixteenth and Seventeenth Centuries,' in Donald Coleman and A. H. John, eds., Trade, Government, and Economy in Pre-Industrial England: Essays Presented to F. J. Fisher (London, 1976), pp. 166 - 86.
14. Philip Riden, 'The Output of the British Iron Industry Before 1870,' Economic History Review, 2nd ser. 30 (1977), 442-59.
- \*\* 15. Charles K. Hyde, Technological Change and the British Iron Industry, 1700-1870 (Princeton, 1977), especially chapter 1, pp. 7-22; also chapter 3, pp. 42-52. Modifies Ashton and Nef.
16. D.C. Coleman, The Economy of England, 1450-1750 (1977), pp. 82-90, 165-72.
- \* 17. Eric Kerridge, 'The Coal Industry in Tudor and Stuart England: A Comment,' and the reply: D.C. Coleman, 'The Coal Industry: A Rejoinder,' both in: Economic History Review, 2nd ser. 30 (1977), 340-45.
- \* 18. Sybil Jack, Trade and Industry in Tudor and Stuart England (London, 1977), especially chapter 2, pp. 66-121. The entire book is a concerted, most vigorous, and often overdone assault on Nef and all his works. Nothing is spared.
19. Ian Blanchard, 'Labour Productivity and Work Psychology in the English Mining Industry, 1400-1600,' Economic History Review, 2nd ser. 31 (1978), 1-24.
20. Sidney Pollard, 'A New Estimate of British Coal Production, 1750-1850,' Economic History Review, 2nd ser. 33 (1980), 212-35.
21. Wendy R. Childs, 'England's Iron Trade in the Fifteenth Century,' Economic History Review, 2nd ser. 34 (Feb. 1981), 25-47. Provides interesting background information.

22. Brian G. Awty, 'The Continental Origins of Wealden Ironworkers, 1451-1544,' Economic History Review, 2nd ser. 34 (Nov. 1981), 524-39.
- \* 23. Brinley Thomas, 'Escaping from Constraints: The Industrial Revolution in a Malthusian Context,' The Journal of Interdisciplinary History, 15 (Spring 1985), 729 - 54.
- \*\* 24. Brinley Thomas, 'Was There an Energy Crisis in Great Britain in the 17th Century?' Explorations in Economic History, 23 (April 1986), 124 - 52. An implicit defence of the Nef thesis.
25. J. R. Harris, The British Iron Industry, Studies in Economic and Social History series (London: Macmillan, 1988).
26. George Hammersley, 'The Effect of Technical Change in the British Copper Industry between the Sixteenth and Eighteenth Centuries,' Journal of European Economic History, 20 (1991), 155 - 74.
27. Ian Blanchard, 'Technological Diffusion in the International Mining and Metallurgical Industries: Introduction,' in Ian Blanchard, Anthony Goodman, and Jennifer Newman, eds., Industry and Finance in Early Modern History: Essays Presented to George Hammersley on the Occasion of his 74<sup>th</sup> Birthday, Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte, Beheft series no. 98 (Franz Steiner Verlage: Stuggart, 1992), pp. 143-60.
28. Carl-Gustraf Hildebrand, 'Swedish and Russian Iron in the Eighteenth Century,' in Ian Blanchard, Anthony Goodman, and Jennifer Newman, eds., Industry and Finance in Early Modern History: Essays Presented to George Hammersley on the Occasion of his 74<sup>th</sup> Birthday, Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte, Beheft series no. 98 (Franz Steiner Verlage: Stuggart, 1992), pp. 227-44.
- \* 29. John Hatcher, The History of the British Coal Industry, Vol. 1: Before 1700 (Oxford: Oxford University Press, 1993).
30. Michael Zell, Industry in the Countryside: Wealden Society in the Sixteenth Century (Cambridge: Cambridge University Press, 1993.)
31. Roger Burt, 'The Transformation of the Non-Ferrous Metals Industries in the Seventeenth and Eighteenth Centuries,' Economic History Review, 2nd ser., 48:1 (February 1995), 23-45.
32. Ian Blanchard, International Lead Production and Trade in the 'Age of the Saigerprozess,' 1460 - 1560, Zeitschrift für Unternehmensgeschichte-Behefte, Band 85 (Franz Steiner Verlag: Stuttgart, 1995).
33. Richard Unger, 'The Dutch Coal Trade in the Seventeenth and Eighteenth Centuries,' Mededelingen van de Nederlandse Vereniging voor Zeegeschiedenis, 43 (1981), 6-14; republished in Richard W. Unger, Ships and Shipping in the North Sea and



Atlantic, 1400 - 1800, Variorum Collected Series CS 601 (Aldershot and Brookfield, Vt., Ashgate, 1997).

**D. The Textile Industries in England and the Continent: the Old and New Draperies, the Early Cotton Industry, and other Textile Industries in Early-Modern Europe, 1500 - 1750**

1. George Unwin, 'The History of the Cloth Industry in Suffolk: (i) The Old Draperies; (ii) The New Draperies,' in William Page, ed., The Victoria History of the Counties of England: A History of the County of Suffolk, Vol. II (London, 1907), pp. 254 - 71; reprinted in Studies in Economic History: Collected Papers, ed. R.H. Tawney (London, 1927), pp. 262-301.
2. Maud Sellers, 'The Textile Industries,' in William Page, ed., The Victoria History of the Counties of England: A History of the County of York, 3 vols. (London: Constable, 1907 - 1913), Vol. II (1912), pp. 406 - 29.
3. A.P. Usher, The Industrial History of England (Boston, 1920), Chapter VIII: 'Woollen Industries, 1450-1750,' pp. 195-224.
4. Eileen Power, The Paycockes of Coggeshale (London, 1920).
5. Ephraim Lipson, The History of the English Woollen and Worsted Industries (London, 1921).
6. B. McClenaghan, The Springs of Laveham and the Suffolk Cloth Trade in the XV and XVI Centuries (Ipswich, 1924).
7. Astrid Friis, Alderman Cockayne's Project and the Cloth Trade (Copenhagen, 1927).
- \* 8. Julia de Lacy Mann and Alfred P. Wadsworth, The Cotton Trade and Industrial Lancashire, 1600-1780 (Manchester University Press, 1931; reprinted 1965). A classic study.
9. Ephraim Lipson, The Economic History of England, Vol. II: The Age of Mercantilism (London, 1931; 6th edn. 1956), Chapter 1, 'Industry,' pp. 10 - 112 (on textiles).
10. F. Consitt, The London Weavers' Company, Vol. I: From the Twelfth Century to the Close of the Sixteenth Century (1933).
11. George D. Ramsay, The Wiltshire Woollen Industry in the Sixteenth and Seventeenth Centuries (London, 1943; 2nd ed. 1965).
12. N.J. Williams, 'Two Documents Concerning the New Draperies,' Economic History Review, 2nd ser. 4 (1951-52), 353-58.
13. Ephraim Lipson, A Short History of Wool and its Manufacture (London, 1953), Chapters

1-3.

14. T.C. Mendenhall, The Shrewsbury Drapers and the Welsh Wool Trade in the XVIth and XVIIth Centuries (Oxford, 1953).
15. Peter J. Bowden, 'The Home Market in Wool, 1500-1700,' Yorkshire Bulletin of Economic and Social Research, 8 (1956).
16. Peter Bowden, 'The Wool Supply and the Woollen Industry,' Economic History Review, 2nd ser. 9 (1956-57), 44-58.
17. Kenneth G. Ponting, A History of the West of England Cloth Industry (1957).
18. W.B. Stephens, Seventeenth-Century Exeter (London, 1958). Has a considerable amount on the textile industry.
19. Kevin H. Burley, 'An Essex Clothier of the Eighteenth Century,' Economic History Review, 2nd ser. 11 (1958), 289 - 301.
20. Elizabeth Critall, ed., The Victoria History of the Counties of England: A History of Wiltshire, Vol. IV (London, 1959):
  - (a) Eleanora Carus-Wilson, 'The Woollen Industry Before 1500,' pp. 115-47.
  - (b) Julia de Lacy Mann, 'Textile Industries since 1550,' pp. 148-82.
- \* 21. John E. Pilgrim, 'The Rise of the 'New Draperies' in Essex,' University of Birmingham Historical Journal, 7 (1959-60), 36 - 59.
- \* 22. Charles Wilson, 'Cloth Production and International Competition in the Seventeenth Century,' Economic History Review, 2nd ser. 12 (1960), reprinted in Charles Wilson, Economic History and the Historian: Collected Essays (London, 1969), pp. 94-113.
23. Julia de Lacy Mann, 'Clothiers and Weavers in Wiltshire during the Eighteenth Century,' in L.S. Pressnell, ed., Studies in the Industrial Revolution Presented to T. S. Ashton (London, 1960).
24. K.J. Allison, 'The Norfolk Worsted Industry in the Sixteenth and Seventeenth Centuries, I: The Traditional Industry,' Yorkshire Bulletin of Economic and Social Research, 12 (1960), 73-83.
25. K.J. Allison, 'The Norfolk Worsted Industry in the Sixteenth and Seventeenth Centuries, II: The New Draperies,' Yorkshire Bulletin of Economic and Social Research, 13 (1961), 61-77.
- \* 26. Peter Bowden, The Wool Trade in Tudor and Stuart England (London, 1962), pp. 1-76.

27. Pierre Deyon, 'Variations de la production textile au XVIe et XVIIIe siècles,' Annales: E.S.C., 18 (1963), 39-55.
- \* 28. Barry Supple, Commercial Crisis and Change: England, 1600-1642 (Cambridge, 1964), Chapters 2, 3, 5, and 7: on the cloth trades, the Old and New Draperies.
- \* 29. Herbert Heaton, The Yorkshire Woollen and Worsted Industries from the Earliest Times to the Industrial Revolution, 2nd edn. (Oxford, 1965), Chapters 1-3. [The first edition was published in 1920; but this edition has so substantially revised the original that there is no point citing it.]
30. Jennifer Tann, Gloucestershire Woollen Mills (London, 1967).
31. Michael M. Edwards, The Growth of the British Cotton Trade, 1780 - 1815 (Manchester and New York, 1967).
- \* 32. Donald C. Coleman, 'An Innovation and its Diffusion: The 'New Draperies',' Economic History Review, 2nd ser. 12 (1969), 417-29. An important, provocative, interesting, but rather misleading article in many places.
33. Julia de Lacy Mann, The Cloth Industry in the West of England from 1640 to 1880 (Oxford, 1971).
34. Kenneth G. Ponting, The Woollen Industry of South-West England (Bath, 1971).
35. D.W. Jones, 'The 'Hallage' Receipts of the London Cloth Markets, 1562 - ca. 1720,' Economic History Review, 2nd ser. 25 (1972), 567-87.
36. Stanley D. Chapman, 'The Genesis of the British Hosiery Industry, 1600-1750,' Textile History, 3 (1972), 7-50.
37. Penny Corfield, 'A Provincial Capital in the Late Seventeenth Century: the Case of Norwich,' in P. Clark and P. Slack, eds., Crisis and Order in English Towns, 1500 - 1700 (London, 1972). Concerns worsted textile-manufacturing.
38. N. Lowe, The Lancashire Textile Industry in the Sixteenth Century (London, 1972).
- \* 39. J. Geraint Jenkins, ed., The Wool Textile Industry in Great Britain (London, 1972). See in particular:
- \* a) Eric Kerridge, 'Wool Growing and Wool Textiles in Medieval and Early Modern Times,' pp. 19 - 33.
- b) David Seward, 'The Wool Textile Industry, 1750 - 1960,' pp. 34 - 50.
- c) M. T. Wild, 'The Yorkshire Wool Textile Industry,' pp. 185-234.

- d) K. G. Ponting, 'The West of England Cloth Industry,' pp. 252 - 68.
- \* e) John E. Pilgrim, 'The Cloth Industry in East Anglia,' pp. 269 - 80.
40. N.B. Harte and K.G. Ponting, eds., Textile History and Economic History: Essays in Honour of Miss Julia de Lacy Mann (Manchester University Press, 1973). In particular:
- (a) D.C. Coleman, 'Textile Growth,' pp. 1-21.
- (b) Joan Thirsk, 'The Fantastical Folly of Fashion: The English Stocking Knitting Industry, 1500-1700,' pp. 50-73.
- (c) N.B. Harte, 'The Rise of Protection and the English Linen Trade, 1690-1790,' pp. 74-112.
- (d) S.D. Chapman, 'Industrial Capital Before the Industrial Revolution: An Analysis of the Assets of a Thousand Textile Entrepreneurs, c. 1730-1750,' pp. 113-37.
- (e) R.G. Wilson, 'The Supremacy of the Yorkshire Cloth Industry in the Eighteenth Century,' pp. 225-46.
- \* (f) R.M. Hartwell, 'A Revolution in the Character and Destiny of English Wool,' pp. 320-38.
41. Walter Endrei, 'English Kerseys in Eastern Europe with Special Reference to Hungary,' Textile History, 5 (1974), 90-99.
42. Jennifer Tann, 'The Textile Millwright in the Early Industrial Revolution,' Textile History, 5 (1974), 80 - 89.
43. Kenneth G. Ponting, Wool and Water: Bradford-on-Avon and the River Frame (London, 1975).
44. A.J. Durie, 'The Fine Linen Industry in Scotland, 1707-1822,' Textile History, 7 (1976), 173-85.
45. Joan Thirsk, Economic Policy and Projects (Oxford, 1978). Contains a discussion of the New Draperies and of the relationship of textiles to agriculture in the seventeenth century.
46. Paul Richards, 'The State and Early Industrial Capitalism: The Case of the Handloom Weavers,' Past and Present, no. 83 (May 1979), 91 - 115.
47. D.J. Dickerson, 'Fulling in the West Riding Woollen Cloth Industry, 1689-1770,' Textile History, 10 (1979), 127-41.

48. T.S. Willan, 'Manchester Clothiers in the Early Seventeenth Century,' Textile History, 10 (1979), 175-83.
49. Alan Rogers, 'Rural Industries and Social Structure: the Framework Knitting Industry of South Nottinghamshire, 1670-1840,' Textile History, 12 (1981), 7-36.
50. Dennis R. Mills, 'Rural Industries and Social Structure: Framework Knitters in Leicestershire, 1670-1851,' Textile History, 13 (Autumn 1982), 183-204.
51. A. R. Bridbury, Medieval English Clothmaking: An Economic Survey (London, 1982). Provides a good, concise up to date background.
- \*\* 52. George D. Ramsay, The English Woollen Industry, 1500 - 1750, Studies in Economic and Social History (London, 1982).
53. C. Gulvin, 'The Origins of Framework Knitting in Scotland,' Textile History, 14 (Spring 1983), 57-66.
54. Margaret Spufford, The Great Reclotting of Rural England: Petty Chapmen and Their Wares in the Seventeenth Century (London, 1984).
- \* 55. Eric Kerridge, Textile Manufactures in Early Modern England (Manchester, 1985).
- \* 56. John Munro, 'Textile Technology,' and 'Textile Workers,' in Joseph R. Strayer, et al, eds., Dictionary of the Middle Ages, Vol. XI (New York: MacMillan, 1988), pp. 693 - 715.
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**QUESTIONS:**

1. What constituted John Nef's view of an 'industrial revolution' in the century 1540-1640; or the 'progress towards larger-scale forms of industrial capitalism'? To what extent is he justified in his use of terms for this period? To what extent were the industrial forms and structures of England changed in this period? To what extent did the industrial changes of this era alter the general economic structure of England?
2. Relate the industrial changes that did occur to the following: (a) the Price Revolution, in its monetary aspects; (b) the demographic aspects of the Price Revolution era; (c) Enclosure and the 'Rise of the Gentry'; (d) government policies; (e) expansion in England's overseas trade.
3. How and why did coal come to be substituted as a fuel for wood? What was the economic significance of substituting coal fuels for wood fuels, in terms of: relative fuel cost, technological changes, industrial scale, industrial location, capitalization of industry.
4. What were the technical problems involved in using coal as a fuel; what industries succeeded in using coal, and which ones did not in this era? What happened to the former and to the latter?
5. What changes occurred in the mining and metallurgical industries in this era? In particular, what factors facilitated the growth of the iron industry in the 16th century? What was the significance of the introduction of the blast furnace, and of the 'indirect process' in iron-making? Explain the processes involved in making cast or pig-iron and wrought (malleable iron). How was the two-stage iron industry organized? Where was it located, and why?
6. Did the iron industry stagnate in the course of the later 17th and early 18th century? Were charcoal fuels in this era uneconomic? What changes nevertheless occurred in the iron industry of this period?
7. What other factors promoted the growth of larger-scale forms of industry in the Tudor-Stuart era? Did these mean the development of truly 'capitalist' forms of manufacturing industry?
8. What new industries were successfully introduced into England in this period? What older industries came to flourish for the first time in this era?
9. What factors determined an urban or rural location of industry in the Tudor-Stuart era? What were the relative advantages and disadvantages of each type of location (or of mixed urban-rural locations): iron and metal-working, glass-making, brick-making, textiles, pottery, leather-working, etc.
10. What were the aims and objectives of government regulation of industry in the Tudor-Stuart era? What influence did such legislation have upon English industrial development--and how effectively was such legislation enforced? How, according to Nef, do the results of English and French state regulation of industry differ in this era?

**Table 1:**

**Price-Relatives of Charcoal, Timber, Industrial Products,  
Grains, and the Phelps-Brown & Hopkins 'Basket of  
Consumables,' in Decennial Averages, 1530-9 to 1640-9**

**Mean value of 1530-9 = base 100**

<b>Decade</b>	<b>Charcoal sumables (Cambridge)</b>	<b>Timber (National)</b>	<b>Industrial Products (Average)</b>	<b>Grains: Wheat, Rye Oats, and Barley</b>	<b>Basket of Con- sumables Index</b>
1530-9	100	100	100	100	100
1540-9	122	115	115	116	124
1550-9	203	174	169	216	186
1560-9	217	178	198	196	180
1570-9	230	206	203	230	203
1580-9	270	247	209	282	230
1590-9	287	289	216	366	305
1600-9	320	335	233	348	306
1610-9	359	397	249	407	341
1620-9	345	450	240	399	333
1630-9	378	475	255	491	397
1640-9	535	524	278	488	398

Sources:

- (a) charcoal: J.E. Thorold Rogers, History of Agriculture and Prices in England, I V (1401-1582), 383-7; V (1583-1702), 398-402.
- (b) timber, industrial products, grains: Peter Bowden, 'Agricultural Prices: Statistical Appendix,' in Joan Thirsk, ed., Agrarian History of England and Wales, IV: 1500-1640 (1967), Table XIII, p. 862.
- (c) 'Basket of Consumables': E.H. Phelps Brown and Sheila Hopkins, 'Seven Centuries of the Prices of Consumables,' in E.M. Carus-Wilson, ed., Essays in Economic History, II, pp. 194-95.

**Table 2:**

**Prices and Price-Relatives of Wood-Charcoal and Coal  
at Cambridge, and the Phelps-Brown & Hopkins 'Basket  
of Consumables' Price Index, 1580-9 to 1690-9**

**Index Base: Average of 1580-9 = 100**

<b>Decade</b>	<b>Charcoal: Shillings per Load</b>	<b>Index</b>	<b>Coal: Shillings per Chaldron of 36 bushels</b>	<b>Index</b>	<b>Basket of Con- sumables Index</b>
1580-9	19.52s.	100.0	13.22s.	100.0	100.0
1590-9	20.79	106.5	13.41	101.4	132.2
1600-9	23.18	118.8	15.19	114.9	133.0
1610-9	25.96	133.0	13.88	105.0	148.0
1620-9	24.97	127.9	15.82	119.7	144.5
1630-9	27.38	140.3	16.78	126.9	172.5
1640-9	38.70	198.3	23.71	179.3	172.9
1650-9	38.40	196.7	20.76	157.0	178.2
1660-9	38.64	198.0	19.65	148.6	181.1
1670-9	43.50	222.8	21.48	162.5	172.2
1680-9	n.a.	--	19.28	145.8	161.6
1690-9	n.a.	--	24.07	182.1	181.2

**Sources:** Calculated from James E. Thorold Rogers, History of Agriculture and Prices in England, Vol. IV, pp. 385-7; Vol. V, pp. 398-402; and E.H. Phelps-Brown and Sheila Hopkins, 'Seven Centuries of the Prices of Consumables, Compared with Builders' Wage-Rates,' in E.M. Carus-Wilson, ed., Essays in Economic History, Vol.

II (London, 1962), p. 195.

**Table 3:****The Early Modern English Iron Industry:****Charcoal Prices, Pig Iron Output, and Bar Iron Imports****Selected Decades, 1580 - 1740**

<b>DECADE</b>	<b>CHARCOAL PRICE at</b>	<b>PIG IRON OUTPUTS Westminster</b>	<b>BAR IRON IMPORTS in HOPKINS tons</b>	<b>PHELPS i n PRICE INDEX</b>
<b>BROWN</b>	<b>£ per load</b>	<b>tons</b>		
<b>1451-75</b>				<b>= 100</b>
1580-9	£1.00	15,200	1,700	357
1630-9	£1.40	20,000	3,700	616
1680-9	£2.60	21,000	23,000	577
1730-9	£3.00	27,500	34,600	553

**Source:**

Brinley Thomas, 'Was There an Energy Crisis in Great Britain in the 17th Century?' Explorations in Economic History, 23 (April 1986), 124 - 52.

**Table 4:****English Pig Iron Production, 1530-1750****Occupied Blast Smelters, Average Output per Furnace, and Estimated Annual Average Output in Tons, per Decade, 1530-9 to 1740-9**

<b>DECADE</b>	<b>Occupied Blast Smelters</b>	<b>Average Output per Smelter in tons</b>	<b>Average Annual IRON OUTPUT in tons</b>
1530-9	6	200	1,200
1540-9	22	200	4,400
1550-9	26	200	5,200
1560-9	44	200	8,800
1570-9	67	200	13,400
1580-9	76	200	15,200
1590-9	82	200	16,400
1600-9	89	200	17,800
1610-9	79	215	17,000
1620-9	82	230	19,000
1630-9	79	250	20,000
1640-9	82	260	21,000
1650-9	86	270	23,000
1660-9	81	270	22,000
1670-9	71	270	19,000
1680-9	68	300	21,000



1690-9	78	300	23,000
1700-9	76	315	24,000
1710-9	74	340	25,000
1720-9	80	350	28,000
1730-9	75	365	27,500
1740-9	71	375	26,500

Sources: George Hammersley, 'The Charcoal Iron Industry and its Fuel, 1540-1750,' Economic History Review, 2nd ser. 26 (1973), 595; Charles Hyde, Technological Change and the British Iron Industry, 1700-1870 (Princeton, 1977); Philip Riden, 'The Output of the British Iron Industry before 1870,' Economic History Review, 2nd ser. 30 (1977), 443, 448.

**Table 5****Charcoal-Smelted Pig Iron: Production Costs ca. 1720-21****To Produce 360 Tons of Pig Iron per year**

<b>Production Input</b>	<b>Total Costs per year</b>	<b>Percentage of Total Cost</b>
(1) Charcoal	£1,459	71.0%
(2) Iron Ore	313	15.2%
(3) Furnace Labour	61	3.0%
(4) Clerical salaries	40	1.9%
(5) Rent	40	1.9%
(6) Repairs and Maintenance	63	3.1%
(7) Other Costs	78	3.8%
	—	—
<b>TOTAL COSTS</b>	<b>£2,054</b>	<b>100.0%</b>

Cost per ton of pig iron

= £5.70

**Table 6:****English Iron Production and Imports: Average Annual Estimates per****Decade of Imports and Production of Bar Iron, 1720-9 to 1740-9**

<b>Decade</b>	<b>Bar Iron IMPORTS in tons</b>	<b>Bar Iron Domestic PRODUCTION in tons</b>	<b>Imports as Percentage of Total Consumption</b>
1720-9	19,650	19,700	50%
1730-9	25,650	19,350	57%
1740-9	22,500	18,650	55%

Note: 1 ton of bar (wrought) iron requires about 1.35 tons of pig iron; and about 5% of pig iron production was reserved for castings. Therefore bar production in England has been estimated as:  
 $0.95/1.35 = 0.7037$  tons of pig iron per ton of bar iron.

**Duties Paid on a Ton of Swedish Bar Iron (Fully Refined Wrought Iron)**

a) Swedish exports duties:	£3.45 per ton
b) English import duties:	<u>£2.05</u> per ton
<b>TOTAL DUTIES</b>	<b>£5.50 per ton</b>

**Source:** Charles Hyde, The British Iron Industry (1977).

N.B. Brinley Thomas (1986), in Table 3, provides even larger estimates of bar iron imports for the decade 1730-9: in absolute amounts, and as a proportion of total consumption.

**Table 7**  
**Geographical Distribution of Early**  
**Eighteenth-Century Ironworks**

<b>Region</b>	<b>Number</b>	<b>Tons of Output</b>	<b>Share of National Output (%)</b>	<b>Tons Output Per Furnace</b>
<b>A. <u>Furnaces (1720)</u></b>				
1. The Weald	15	2,000	11.5%	133
2. Forest of Dean	9	4,250	24.4%	472
3. South Wales	6	1,500	8.6%	250
4. North Wales-Cheshire	5	2,250	12.9%	450
5. Shropshire	7	2,550	14.6%	364
6. Staff.-Worcestershire	6	2,400	13.8%	400
7. S. Yorkshire-Derby	11	2,400	13.8%	218
8. Lancs.-Cumberland	-	-	-	-
<b>Total/Average</b>	<b>59</b>	<b>17,350</b>		<b>297</b>
<b>B. <u>Forges (1717)</u></b>				
1. The Weald	15	920	6.9%	61
2. Forest of Dean	20	1,840	13.8%	92
3. South Wales	13	1,750	13.1%	134
4. North Wales-Cheshire	8	880	6.6%	110
5. Shropshire	14	2,010	15.0%	143
6. Staff.-Worcester.	28	3,920	29.4%	140
7. South Yorkshire-Derby	16	1,690	12.6%	105
8. Lanc.-Cumberland	2	320	2.4%	160
<b>Average or Total</b>	<b>116</b>	<b>13,330</b>		<b>115</b>

**Source:** Hyde, *The British Iron Industry* (1977). **Note:**

