SUMMARIES OF LECTURES in ECO 303Y1:

the Economic History of Modern Europe, to 1914

for the Academic Year: 2012 - 2013

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Updated: Tuesday, 2 April 2013

Please read these lecture summaries **now, after (or before) each lecture:** and not, for the first time, the night before the final examination.

FIRST TERM: SEPTEMBER TO DECEMBER 2012:

Ia. Week no. 1: Lecture no. 1: on 12 September 2012:

The Economy of the Netherlands: Dutch Economic Hegemony in the European Economy during the 17th and 18th centuries

- since this topic was not given in class, as a set of oral lectures, but has instead been presented in full on-line, there is no summary to be given for this set of lectures. Read the online lecture.

Ib. Week no. 1: Lecture no. 2: on 12 September 2012:

Great Britain as the Homeland of the Industrial Revolution

(1) **The focus of this course is on the industrialization of modern Europe, especially urban industrialization:**

a) in the first term, beginning with the British Industrial Revolution (1760 - 1830); and,
b) in the second term, the spread of the Industrial Revolution to the continent: with a comparative study of the industrialization of France, Germany, and Russia, in that order during the 19th century (1789 - 1914).
c) We will then return to examine the British economy from 1870 to 1914, to see how it fared with the end of the British economic hegemony, in facing new international competition, especially from Germany and the U.S.

(2) **Despite the focus on industrialization, we will necessarily examine all four sectors of the economy,** noting how changes in one sector influenced changes in the other: agriculture; commerce (domestic and foreign trade); banking and finance; and manufacturing industries

(3) **The importance of the Kuznets U-curve:** on the social consequences of industrial changes:

a) Kuznets (Nobel Prize in Economics, 1971) contended that economic development and industrialization underwent two phases in terms of its impact of income distribution and living standards, following the downward and upward slopes of a U-curve

- in the initial phase, economic growth necessarily transferred wealth, resources, and real incomes from the lower to upper economic strata of society, especially to the entrepreneurs in commerce, finance, and industry, thereby more highly skewing income distributions, and

reducing the real incomes of the lower strata (working classes, urban and rural)

- but in the second phase, the fruits of both enterprise and investments, with technological changes, bore the fruits of higher productivity and overall economic growth, increasing the real incomes and living standards of most of society, especially benefitting the lower strata

b) The economic significance of the Kuznets U-curve can best be seen in the popular debate topic about living standards of the working classes during the Industrial Revolution era, from the 1770s to the 1820s: did they decline; and if so, why?

c) We do not, yet, however find this debate about the 19th-century industrialization of France, Germany, and Russia. Perhaps we have to wait for another generation of scholars to investigate this intriguing problem.

(4) **For these reasons, we most focus in the first term, on the origins and development of the modern Industrial Revolution, in Great Britain; and ask these five questions:**

- Why was Great Britain the homeland of the modern industrial revolution: why did it not occur first in, say, the Netherlands or France, who were equally wealthy in the 18th century?
- Why did it begin, in Britain, from the 1760s? Why was the period from c. 1760 to c. 1820 the crucial initial phase of the Industrial Revolution?
- Why did it begin in three specific industries: steam engineering (with coal-fired steam power); metallurgy: iron manufacturing (with coal); and textiles using steam power: in cotton textiles especially.
- Why and How did technological innovations play such a crucial role in this Revolution?
- How and why was the Industrial Revolution accompanied by an equally significant demographic revolution: during which British population doubled from 1760 to 1810, and then tripled to 1910?

(5) **Is the term 'Industrial Revolution' justified?** I gave three reasons why it is fully justified, in marking a very distinct and fundamental 'water-shed' or dividing point in human history: even if it did not occur in as a dramatic, short-term, cataclysmic phenomenon.

- The Industrial Revolution marked the first time in human history that mankind escaped the 'Malthusian Trap': of suffering economic crises and impoverishment with unchecked population growth: the very first time that the economy, thanks to technological changes, permitted a continuous self-sustaining growth in both population and per capita output (or living standards) - with evidence presented in the text

- It also marked the first time that the industrial sector, always in the past, the weakest of the four sectors, leap-frogged ahead for fourth to first place, in becoming the most dynamic sector, governing changes in all of the other three sectors, in promoting economic growth (in Britain, though its impact on foreign trade)

- It also marked the first time that a proletariat, both urban and rural, developed as a distinct socio-economic class: composed of those who sold only their labour power, for money wages, and were no longer, as in the past, able to produce their own food, clothing, and shelter (or much of it). In the past few people worked for money wages along, and most of those in the 'working classes', as both artisans and labourers, also had other gainful

employments.

(6) **Technological innovations:** are the key to understanding the dynamics of the Industrial Revolution and of economic growth in general: and that will be a key topic of the next set of lectures.

(7) **Natural Resource endowment: the question of coal**

- we will see, in terms of the technological changes that produced the Industrial Revolution, the overwhelming importance of coal
- coal: coal in the form of coke for producing iron (and then steel); for coal-fired steam power for the machinery used in producing iron and textiles; coal-fired steam power for the transportation revolution in trains (locomotives) and shipping; coal-fired steam turbines to produce electrical power, in the so-called Second Industrial Revolution, after 1860
- An industrial map of Europe in the 19th century was essentially a map of its coal-fields: industries gathered around coal because of relative transportation costs
- Britain's enormous advantage: that it had a two-centuries' head start over the rest of the world in utilizing coal as the key industrial fuel.
- the curse of coal-fired modern industrialization: Global Warming (carbon dioxide emissions).

Read the rest of the full lecture online.

II. Week no. 2: Lecture no. 3: on 19 September 2012:

Technology, the 'Scientific Revolution', Religion, Education, and Social Attitudes during the British Industrial Revolution (1760 - 1830)

(1) **Technological innovations are the key and essence of the modern Industrial Revolution:** not that such innovations were not found in the past, but that they occurred with a rapidity and interconnectedness – so that one innovation necessitated another – that the vastly increased profitable productivity at an unprecedented rate.

a) **entrepreneurship:** note the importance distinction between invention and innovations: their profitable application in the economy

b) **innovations did not consist merely of labour saving machines,** but of changes in the organization of production, in agriculture, commerce, and finance, as well as in industry, that achieved these goals

c) **the crucial role of population growth and a consequent Malthusian threat:** that forced or inspired innovations to economy on land and resources, as well as labour.

d) **the nature of innovation:** was it merely a 'random walk', of chance, of stochastic processes, depending on certain successful inventors, innovators, and entrepreneurs: or was the Industrial Revolution a case of Toynbee's thesis of 'challenge and response', as in the cases of responses to growing population pressures on land and resources? But challenges do not always elicit the proper responses – forcing us to ask why 18th century Britain was more successful in responding to such challenges than other countries

2) **The 'Scientific Revolution', of ca. 1660 - 1760, leading into the Industrial Revolution:** the era of Isaac Newton and Robert Boyle (see the lecture notes)

a) **Royal Society, founded in 1660:** with the explicit objective of applying science and scientific experimentation to industry and the material progress of society: no other similar academy of sciences to be found elsewhere in 17th century Europe

b) **the debate about whether the Industrial Revolution in fact depended upon scientific knowledge:** the modern consensus is that it did, especially knowledge of physics and chemistry

c) **If the Royal Society ultimately did not produce many such concrete results,** it at least inculcated the social attitudes that scientific experimentation could lead to material progress and industrial growth; and 18th century England did have a society with better and more practical scientific knowledge than other European societies.

d) **The Lunar Society of Birmingham:** founded in 1764, at the outset of the Industrial Revolution: set up to revivify and achieve the former objectives of the Royal Society. Among its many members are to found most of the leading scientists and industrial entrepreneur of the Industrial Revolution: including James Watt and Matthew Boulton.

3) **Religion and Society in the Industrial Revolution:** the peculiar role of the Dissenters:

a) **Protestant Sects who refused to 'conform' to the established Church of England (Anglican Protestant),** who thus 'dissented' from the state church, many of whom were Calvinists: Independents or Congregationalist, Presbyterian (adherents of the Calvinist Church of Scotland), Baptists, Unitarians; and later the Quakers (1667) and Methodists (1795).

b) **The earlier Calvinists had played a major role in the English Civil War (1642 - 1651):** between Parliament and the Crown, between 'Puritans' and the established church, and gained the upper hand in the republic that Cromwell established (the Commonwealth and Protectorate, 1649 - 1659).

c) **Restoration of the Monarchy in 1660 (after Cromwell's death in 1658, and overthrow of his son Richard):**

i) **Charles II and the monarchist majority:** set about to remove all Republicans and Calvinist from local and national power, in any form
ii) **Corporation (1661) and Test Acts (1673):** excluded all Dissenters and Catholics from any form of local municipal or national office, from any branch of government and the armed forces, any royal offices, etc. ; i.e., total exclusion of anyone who refused to take oaths and sign pledges to conform with the Established Church of England (upholding its 39 Articles, taking communion, etc), and renounce Catholicism.
iii) **That included not only all Protestant Dissenters but also Roman Catholics:** (to 1829)
iv) **Glorious Revolution of 1688-89:** overthrown of James II (younger brother of James II), replaced by James' daughter Mary and her husband, the Dutch Calvinist prince William of Orange
v) **Edict of Toleration of 1689:** at William's insistence (as a Calvinist): to permit Dissenters (but not Unitarians and Catholics) full freedom of religion, though they all remained subject to the Corporation & Test Acts: thus a half-way status between toleration and discrimination.

d) **Social and Economic Significance of the Dissenters:** though they comprised only about 5% - 7% of the

population of England and Wales, they accounted for over half of the known entrepreneurs and scientists of the Industrial Revolution era (to the 1830s)

e) **Explanations for the social and economic significance of Dissenters:**

i) **Their minority status:** exclusion from normal avenues of wealth, power and prestige forced them to devote their talents and energies in the world of business or commercial agriculture: and to excel, to prove their worth to themselves and to society

ii) **The Weber-Tawny Thesis on Protestantism (Calvinism) and Capitalism:**
(1) Predestination and 'election':

- that God is omnipotent, and human beings are utterly helpless in achieving salvation without God's 'election':
- that, ultimately, success became the sign or symbol of God's favour, of his 'election' to Paradise, as explained in the second feature

(2) The Calling: that everyone's duty to glorify God is achieved by excelling in one's 'Calling' – any honorable way of life, including business. The sign of business success is profit maximization, which came to serve as the sign or indication of one's 'election' to eternal Salvation with God: profits as the 'bottom line'
(3) 'Worldly Asceticism': i.e.. to live almost like monks, but in the real world.

- that one should always live simply and frugally without ever manifesting the fruits of business success
- that profits, instead of being consumed ('conspicuous consumption') should be reinvested in the business enterprise (including agriculture), to expand and increase the profitability of that enterprise, further to glorify God (see: Predestination

iii) **Education:** the successful role of the Dissenting Academies and Scottish Presbyterian universities

- Dissenters were denied all access to established schools and universities, all run or dominated by the Church: and hence were forced to set up their own schools
- Dissenting Academies: emphasized mathematics, physical sciences, accounting, engineering, English, etc. at the expense of theology, Latin and Greek (Classics), philosophy, which were the foundations of traditional English education
- that business-oriented curriculum may reflect the interests of the urban middle classes who predominated amongst the Dissenters; but also clearly provided an education better designed to ensure success in the business world.

But you will gain more by reading the lecture in full, in PDF or Word.

III. Week no. 3: Lecture no. 4: on 26 September 2012

The Demographic and Industrial Revolutions: Expansion of the Market

(1) **The Demographic and Industrial Revolutions: was population growth the cause or the consequence of the Industrial Revolution? The answer is both:**

a) **the onset of population growth preceded the Industrial Revolution by about twenty years:** and certainly population growth provided changes in both aggregate demand (markets) and aggregate supply

(problems that required technological solutions).

b) **at the same time,** the forces of economic growth and especially urban industrialization both spurred on and permitted a much more rapid population growth (as will be seen in later lectures) – the greatest extent of population growth occurred after the onset of industrialization

c) **population statistics:**

i) population of England and Wales doubled from about 6 to 12 million, from c. 1760 to 1820, and then tripled again, from 12 to 36 million, by 1910.
ii) that provided the major force in the growth of the domestic market, which was by far the more important market for the Industrial Revolution, up to about 1815
iii) From 1815, the foreign markets became decisive: but without a vast increase in foreign trade, from the economic forces of the Industrial Revolution, Great Britain could never – without food imports (83% of the total consumption by the 1890s) – have a population that tripled from 1810 to 1910.

d) **Major question:** was the Industrial Revolution principally a demand-induced or a supply-induced phenomenon?

i) Note: most historians are and have been demand-oriented, while most economists are supply oriented.
ii) I will supply no definitive answer to this question, though I will not hesitate to place such a question of the mid-year test or final examination.

(2) Population Growth and the English Industrial Revolution:

a) **Note that in the century preceding the Demographic and Industrial Revolutions, England & Wales had experienced both demographic decline and stagnation:** from the 1650s to the 1740s, during the so-called '17th Century General Crisis' era; and that decline was possibly a Malthusian response to excessive population growth in the 16th and early 17th centuries.

b) **But the combined Demographic and Industrial Revolutions banished forever any threat of a Malthusian Trap,** during which population growth curbed economic growth and led to subsequent decline: for Great Britain, for the first time in human history, achieved a continuously sustained growth in population, output, and per capita incomes (rising living standards, from at least the 1840s).

c) **Great Britain was not alone in enjoying population growth after 1760:** so did most of Europe, the Americas, and Asia. But British population grew by far the fastest (in Europe): expanding by 133% from 1680 to 1820, while France's population grew by only 39% and the Netherlands, by only 8%.

d) **What factors or variables are involved in population growth?**
- falling death (mortality) rates
- rising birth (fertility) rates
- increased immigration – which we will ignore here, as relatively unimportant.

e) **The debate about the role of death and birth rates:**

i) **in the past, most historians placed greater importance on death rates,** if only because death rates fluctuated far more widely than did birth rates: i.e., a DR rate from 30/1000 to 500/1000 (with the Black

Death), while the BR had a biological maximum of 40/1000.
ii) **The Black Death (whose nature remains a mystery) and subsequent bubonic and pneumonic plagues:** had, in a wide variety if diseases, been the major destroyer of European populations, from 1348 to the 18th century
iii) **The Plague came to an end in England (London) in 1665:** in France, in 1720 (Marseilles); in Italy Messina, Sicily), in 1733
iv) **but plague remained endemic:** in the Russian and Ottoman Turkish empires to the 1840s
v) **Helleiner (1963) and others:** maintained the primary of the death rate in demographic changes
vi) **Deane and Cole (1968):** gave almost equal weight to changes in both the DR and BR
vii) **Wrigley, Schofield, and the Cambridge School of Population studies:** argued for the primary of the birth rate, contending that in the Demographic Revolution (from end of the 17th century), a rise in the birth rate accounted for about 70% of total population growth, based on the following suppositions.

3. **John Hajnal's European Marriage Pattern and the Demographic Revolution:** pertaining only to western Europe (from a line west of one drawn from St. Petersburg, in Russia, to Trieste, in Italy); and only from early-modern times

a) **The EMP: its primary components**

- Nuptiality: a high average age of first marriage for women: in the high 20s or even 30
- Celibacy: consequently, a significant proportion of women who end up never marrying (if only because women tended to marry older men, not many of whom were available when they themselves reached the age of 30)
- nuclear or single-family households: i.e., father, mother, and their own children only
- the role of real incomes and real wealth in determining both Nuptiality and Celibacy (as above): in particular the average of first marriage
- service in husbandry: a socio-economic institution from later medieval times to provide supplementary household labour

b) **The Universal Marriage Pattern:** which prevailed in eastern Europe, Asia, Africa, Latin America – also in western Europe before the 16th century. Its primary components were the mirror opposite
- Nuptiality: average age of first marriage for women in the late teens or early 20s
- Celibacy: almost non existent (except for nuns): virtually all women married (by late teens)
- extended family households, with ample labour supplies: grandparents, father and mother, their children, and other children (cousins: children of aunts, etc).

c) **The role of servants in the EMP:**

- Chiefly young women, hired on annual contracts, from poorer families: agreed to work in a household, usually rural (but some urban) as supplementary labour (that supplied in an extended family system), for room, board and clothing, and an annual cash payment (which could be saved)
- lived as though they were members of the family, performing household and agricultural labour functions
- conditions: that they not marry, nor produce (bastard) children while employed a servants
- consequence: delayed the average age of first marriage for such women, until later 20s, while providing them with a cash dowry that made them attractive marriage partners when leaving service
- with both the Agricultural and Industrial Revolutions, offering far more and better paid employment, many young women left service-in-husbandry earlier, or no longer entered such service ==>

- thereby lowering the average age of first marriage for women

d) **European Demographic Systems:**

i) **Low Pressure Demographic Systems:** the European Marriage Pattern

- with low birth rates and even lower death rates (with better health and nutrition)
- birth rates were now the more flexible, and became the prime determinant of demographic changes
- thus, if rising real incomes promoted earlier marriages (at least for women), while reducing celibacy, fertility and average family sizes would also rise.

ii) **High Pressure Demographic Systems:** the Universal Marriage Pattern in the rest of the world: eastern Europe, Asia, Africa, Latin America (and ancient + medieval Europe)

- both birth rates and death rates were at or near their biological maximums
- high birth rates contributed to high death rates (including especially infant mortality), because of reduced nutrition and living standards
- death rates were the prime determinants of demographic change, since birth rates were stable near the biological maximum
- note evidence (from lecture notes) that the Universal Marriage Pattern is now (early 21st century) disintegrating in many parts of East Asia: especially Japan, Korea (south), Taiwan, some large coastal cities in PR China, and Thailand (Bangkok): as well educated financially independent young women refuse to marry before turning 30 – or do not marry at all ==> downswings in birth rates

iii) **Relationship between the EMP, age of marriage, and fertility:**

- since women are at the most fecund (fertile) in their late teens and very early 20s, a delay in first marriages for women to the late 20s (or early 30s), meant a drastic reduction in marital fertility
- also: women in the early 30s are twice as likely to suffer miscarriages as women in their late teens and early 20s
- furthermore: with relatively low life expectancies, marrying older reduced the time available for procreation (though a lesser factor).
- more important: older women found it very difficult to get older men as husbands, who preferred to marry younger women who would obviously be more likely to bear children ==> hence such women were likely to remain unmarried, thus explaining while celibacy rates were so high
- also: since men died at earlier age, and since most surviving older men were already married, the supply of such men eligible to marry was correspondingly small
- consequences: much smaller completed family sizes ==> necessarily meant that there were fewer women in the next generation available for subsequent procreation: a vicious circle
- Note: there is absolutely no evidence that a later age of first marriage for women had any impact on illegitimacy, either pre-marital or extra-marital – thus to refute the contention that fertility is independent of marriage.

iv) **Importance of the EMP for the early-modern and modern eras of European society:**

- the self regulating mechanism of marital fertility ended the threat of a Malthusian Trap of overpopulation and impoverishment
- the EMP almost fully explains how the Demographic Revolution took place: by a reduction in both the average age of first marriage (nuptiality) and in celibacy (proportion unmarried) to produce a

rapid rise in the birth rate, more rapid and extensive than the fall in the death rate
- note again: that the EMP is peculiar to and localised in western Europe, only, and strongest in north-west Europe, from early-modern times (with an unknown origin)
- note also that the Demographic Revolution followed from a period of demographic decline and stagnation (for which the EMP was either a factor or a reflection): so that birth rates had been very low and were capable of a major rise.

e) **Malthus and the EMP:** as Hajnal clearly noted, Malthus himself virtually indicated how the EMP operated (though he did not know that it was peculiar to early modern western Europe).

i) **For Malthus, there were two sets of factors that limited an exponential increase in population, of which, for Malthus, the second set was by far the more important:**

- Providential or Preventative measures: war, famines, plagues, etc.
- Prudential checks: in the form of sexual abstinence, principally though delayed marriages; and thus he implicitly meant the European Marriage Pattern

ii) **Contraception, Malthus, and the EMP??**

(1) **Note that Malthus, as a Protestant clergyman,** was opposed to any form of contraception, in an era when Protestant and Catholic views were the same.

(2) **But we do know that various methods of contraception had been practised from medieval times:**
- coitus interruptus: i.e., withdrawal (known as Onanism – see the notes): a method that priests and clergymen grudgingly accepted
- anal intercourse: also known as sodomy or 'buggery' (see the lecture notes)
- condoms (made from sheep membranes): only for the wealth
- various herbs used as abortifacient: to induce abortions
- infanticide: suffocating infants on birth

f) **Mortality, the EMP, and the Demographic Revolution?**

i) **Peter Razzell:** has been the chief opponent of Wrigley and the Cambridge School of Population Studies

(1) He begins by attacking their methodology and facts: judge for yourselves
(2) His article on the morality, and its supremacy over fertility as the most dynamic variable, is in the collection of studies for the A-List topic on Population and the Industrial Revolution
(3) I do not find his arguments on improved sanitation in the later 17th and early 18th centuries at all convincing, since his evidence is only urban (whereas most of the population was still rural), largely London-based, and anecdotal. But read it for yourself

ii) **Wrigley on mortality:** he did respond to give more attention to morality factors, especially to the issue of maternal mortality (during childbirth), while still contending that the nuptiality and the birth rate were paramount

(1) Key points: sharp decline in the incidence of still-births: so that a fall in still-births reduced the birth-intervals, leading to increased rates of effective birth rates
(2) decline also in the incidence of maternal mortality: far fewer women died in childbirth, from the later 17th to the early/mid 19th century. See the tables in the lecture notes.

iii) **Robert Koch (1843-1910), and Louis Pasteur (1822 - 1895):** biochemists who discovered the bacterial origin of (many, but not all) diseases

- their discoveries proving the bacterial transmission of diseases proved to be the most decisive factor leading to a sharp decline in European and North American mortalities, from the 1880s – ending the centuries long belief in the 'miasma' theory: that diseases were caused by poisonous vapours carried by the winds.
- consequence: the realization that most bacterial diseases were water-borne led to massive capital investments, in the later 19th and early 20th centuries, in water-purification systems and sewage controls, to prevent water contamination
- the discovery that other diseases were caused by viruses had to wait until the 1920s

g) **The Demographic Transition:** the subsequent fall in fertility rates, in Great Britain, only from the 1870s: read the speculative reasons offered in the lecture notes.

h) **The Relationship between population growth and industrialization:**

- relieving severe labour scarcities, with the previous demographic downturns (1650-1730)
- increasing aggregate demand (provided that all such extra consumers had monetized demand)
- disproportionate urbanization with population growth from the 16th but especially from the 18th century ==> more efficient markets, with lower transaction costs
- growing population pressures on scarce inelastic resources ==> chief spur to technological changes in both agriculture and industries

read the lecture notes, and those for subsequent lectures.

IV. Week no. 4: Lecture No. 5: on 3 October 2012

The Market and Trade: Domestic and Foreign Trade

Prologue and Précis: England (then Great Britain) enjoyed two major market advantages over its continental arrivals, that also help to explain whey Great Britain was the Homeland of the modern Industrial Revolution:

(1) **A domestic market:** that was (from 1707 Act of Union) the largest single unified market in Europe, and also the fastest growing market (doubling from 6 to 12 million), with high living standards, and one that became fully integrated, physically, with the transport revolution in canals (1760-1800

(2) **Foreign markets:** which became the more decisive markets for growth, after 1815, based upon the creation of Europe's most viable and profitable Overseas Commercial Empire – one that proved to be far more conductive to modern industrialization than any other such Empire; and one that profitably practised the economics of New Colonialism (as opposed to the previous, self-defeating Old Colonialism) and the protectionist micro- and macro-economics of Mercantilism, so closely related.

A. The Domestic Market: the more important to 1815

(1) **Importance of the domestic market:** played a more powerful role than the foreign market in the first crucial phase of the Industrial Revolution, from ca. 1760 to ca. 1810

I) in 1770, the domestic market consumed 77% of total English manufacturing output, and still 69% as late as 1810

ii) Table on foreign trade: shows that exports, having expanded 2.5 fold from 1700, reached a plateau in the 1760s, and did not increase at all until the early 1790s

iii) After the Napoleonic Wars (ending in 1815), however, foreign trade became the more decisive market variable affecting British economic growth

iv) Britain's population could not have tripled from 1810 to 1910 – from 12 to 36 million – without the agency of foreign trade: i.e. to supply the requisite foodstuffs and industrial raw materials

(2) **Factors promoting aggregate growth of the domestic market, 1760 - 1810:**

I) **population growth:** doubling from 6 to 12 million. Note that no European country experienced such a dramatic growth in population during this period

ii) **Market Unification and Market Size:** with the Act of Union of 1707, by which Scotland joined England and Wales (form Grear Britain), and then with the union of Ireland, to form the United Kingdom in 1805, Britain or the United Kingdom became the largest single, unified market in Europe. All other nation states (Netherlands, France, Germany, Italy, Spain, etc.) were not unified – divided by internal barriers – until much later.

iii) **Urbanization:** especially in the growth of London, from 50,000 in 1500 to 550,000 in 1750 – to become Europe's largest city, growing to 2.491million by 1851, when England had become 49% urbanized, whereas France was only19% urbanized.

iv) **Say's Law:** the supply creates in own demand. The Industrial Revolution did so, principally, through:

- technological change: reducing costs and thereby (by market competition) and prices to create mass-consumption goods with both broad and deep markets.
- It did so also by expanding the number and size of urban markets: concentrated markets with low transaction costs.

(3) **The question of real wages and income distribution:**

I) note that an increase in population will not proportionally increase aggregate demand, until that increased population is gainfully employed, without reductions in real incomes (i.e., from the Malthusian Trap)

ii) **general agreement that real wages, and nationally real incomes in general, were steadily rising from the 1690s to the 1770s:** RWI = NWI/CPI (with a specified base period = 100). The Real Wage Index is the Nominal Wage Index divided by the Consumer Price Index.

iii) **The Standard of Living Debate:** the course of real wages for artisans and labourers from the 1780s to the 1820s: a much disputed question, disputed in particular between Pessimists (Marxists) and Optimists (Conservative), though a majority view today favours the Pessimist case.

iv) **Argument for the Pessimists' Case:** on the decline of real wages from the 1780s to the 1820s:

- **Marxist views:** increased exploitation of labour to finance the Industrial Revolution: reduce consumption to increase capital investment
- **Kuznets U-Shaped Curve:** that the initial phases of economic development and modern industrialization requires a shift of wealth, resources, income from the lower to upper economic strata of society, again to shift national income shares from consumption to increased investment, whose subsequent fruits lead to rising real incomes throughout society
- **The Malthusian Trap:** that increased population pressures led to diminishing returns and fall labour productivity and thus to declining real wages: OK in agriculture, but why in urban industry. Note the previous assertion: that the Industrial Revolution, through productivity-enhancing technological changes, broke forever the Malthusian constraints, to permit the simultaneous growth of population, the economy, and real incomes – but not until the 1850s
- **The Negative Effects of Warfare, 1792 - 1815:** the French Revolutionary and Napoleonic Wars: from the disruptions to international trade and the wasteful diversion of resources and manpower into warfare.
- **The Financial Costs of Warfare:** in particular, hurting the lower classes
  - Increased taxation, especially in the form of highly regressive excise taxes on consumption, afflicting the lower classes far more than the upper classes
  - Inflation: financing warfare by excessive increases in the money supply, to purchase increased public debt issues. In Banking and Finance, see the lecture on the 'Paper Pound'.
  - clear evidence that consumer prices soared well above any rise in money wages: as in RWI = NWI/CPI

v) **How Was Aggregate Demand Retained or Augmented under these adverse conditions?**

- Remember that only a minority proportion of society was dependent solely on money wages
- many wage earners who suffered a decline in daily real wages compensated by increasing the number of days worked in the course of the year (when the early
- In the large agricultural sector: producers who sold grains and other agricultural commodities gained in real terms, as prices for their products rose more than did the CPI: i.e., market demand maintained as the barter-terms of trade favoured the large agricultural sector
- Incomes in terms of rents, profits, and interest rose with commercial, financial, and industrial expansion, even if aggregate wages decline in real terms (but that decline is far from being proven).
- **the renewed importance of the foreign-trade sector from the 1790s: see the table**

(4) **Integration of the National Domestic Market:** Canals, as the firs of three Transportation Revolutions

I) **Great Britain's disadvantages and advantages:**

- road networks were very bad, in terrible disrepair, compared to much of continental western Europe
- but no significant location in Britain (England especially) was more than 100 km from some form of water transport: as a compact island cris-crossed by rivers

ii) **1670s to 1770s:** large investments in making English rivers navigable, greatly expanding feasible water transport with boats and barges

iii) **origins of the canals:** population growth and urbanization:

- cheaper water transport to required for supplying larger towns with foodstuffs and fuels (wood and

coal), as population pressures drove up their prices
- Industrial Revolution in cottons: required cheap transport of American raw cotton, in large bulk lots, from port towns (Liverpool) to industrial towns (Manchester)

iv) **The era of canal building: the creation of the Cross Scheme:** 1760s to 1790s, NE towns with SW towns, NW towns with SE towns (London), intersecting at Birmingham in the industrial Midlands

v) cut the costs of shipping grain, coal, iron ore, raw cotton, etc. by 50% to 75%:
- brought all areas of England within an effective market economy
- cost cutting => price cutting, to bring many more commodities (but more industrial than agricultural) within the purchasing power range of the masses

v) **Problems and solutions:**

- canals were necessarily Parliament-sanctioned monopolies (with monopoly rights of way),
- and as such, they were rent-seeking and prone to inefficiencies, as well as high costs
- but that provided the incentive for the Second Revolution in Transportation: steam powered locomotives (the railway), from the 1820s

B. **Foreign Trade:**

(1) **Importance of Foreign Trade for British Economic Development:**

- came to the fore, as the more decisive market sector, after the Napoleonic Wars (1815): when Britain literally had to 'export or die',
- for reasons already stressed: for imports of foodstuffs and industrial raw materials as for export earnings (both completely related).
- As the Classical School Economists argued: a nation exports principally in order to import goods more cheaply than producing them at hom**e**
- The purpose of this lecture is to explain the evolution and development of England's foreign trade sector from the 1660s to the French Revolutionary & Napoleonic Wars (1792 - 1815): developments in foreign trade from 1815 will be dealt with in a subsequent lecture (the last in this term).

(2) **The 1660s as a crucial turning point leading to the Industrial Revolution era:**

a) **Two complementary theses on this turning point:**

I) **Ralph Davis: the Commercial Revolution of 1660 - 1760:** broke England's three-fold commercial dependence that had prevailed for previous four centuries

- dependence on the nearby continent of western Europe
- dependence in particular on the Low Countries'
- dependence on one export commodity: first wool, and then woollen cloth
- while attempts at overseas trade diversification, in both regions and commodities, had begun in the mid-16th century, they proved successful only from the 1660s, in establishing a viable overseas commercial Empire, i.e.. British Imperialism
- principal regions: Asia, the Caribbean region, and North American (Africa: only much later)

ii) **Hobsbawm: the 'General Crisis of the 17th Century' and the New Colonialism:**

- as part of his thesis, a Marxist model to explain the transition from a 'feudal' economy to a modern 'capitalist economy', beginning with the British Industrial Revolution, Hobsbawm portrayed a crisis of 'Old Colonialism' giving way to a 'New Colonialism'
- 'Old Colonialism' based on the key medieval profit or rent-seeking motives: the lust for overseas precious metals (gold and silver) and spices (from the East Indies, principally), both of which are luxury commodities that do not promote economic growth
- ultimately international competition drove down the rents and led to soaring costs in miliary measures that literally 'bankrupted' Old Colonialism
- forcing a switch to a 'New Colonialism:' one based on mass-produced and much cheaper mass-consumption colonial markets, but also the development of colonial markets (principally in the Western Hemisphere).
- Great Britain, of all the European powers, most successfully and most profitably achieved this transition from Old to New Colonialism.

iii) **Mercantilism:** as the prevailing philosophy of Political Economy in early-modern Western Europe, to the mid 19th century, in a state-influenced new structures of foreign trade and economic nationalism: can be seen as the product of both the Commercial Revolution and New Colonialism

(3) **The Commercial Depressions of the 17th century and their aftermath:**

a) **nature of the commercial depression:** – especially for England: 1620s to the 1660s

- negative effects of the Thirty Years' War (1618-48) on English trade: especially on the cloth trade: end of the era of the 'Old Draperies' (luxury quality woollen cloths)
- demographic stagnation and decline
- an agrarian depression, in part a product of the demographic decline
- monetary contraction and deflation: partly a product of changes in global commerce, as exports of precious metals to the Baltic and Asia exceeded the declining influx from the Americas
- The continued Dutch supremacy in international trade, shipping, and shipbuilding
- chief significance: to spur on overseas commercial diversification, especially for the English

b) **Successful English/British overseas commercial diversification form the 1660s:**

- **Asia:** especially the British East India Company in India, ultimately undermining Dutch supremacy in the Indian Ocean - East Indies trade (though East Indies remained a Dutch monopoly)
- **the Caribbean:** especially the sugar plantations on Barbados, Jamaica, the Windward and Leeward Islands (and later Trinidad). Here the British succeeded where the Dutch failed.
- **North America:** especially the Thirteen Colonies, which prospered economically, while the single Dutch colony of New Netherlands, based on the fur trade, failed
- In general, the British succeeded by pursuing the gains of New Colonialism, while the Dutch and French remained too wedded to Old Colonialism (especially in the fur trade)
- And thus the British succeeded in creating a viable, profitable overseas Commercial Empire that was more conducive to modern industrialization than was the Dutch or French Empires (or Spanish and Portuguese empires – not considered here).

(4) **The Era of New Colonialism and the Commercial Revolution:**

a) **the Re-Export trade in colonial products:**

I) **chief commodities:**

- sugar (Caribbean)
- tobacco (Virginia)
- Indian cotton textiles: calicoes and muslins
- tea: from India, Ceylon (Sri Lanka), China
- others: coffee, silks, pepper, dyestuffs, hemp (from Asia); and codfish, furs, lumber (North America)

ii) **the slave trade and triangular trades:** a product of New Colonialism:

- slaves purchased from West Africa, with European manufactures, and sold as labour for the sugar plantations in the Caribbean and Latin America; and for tobacco plantations in Virginia
- Caribbean sugar, rum, molasses exported to England
- New England: provided another set of triangular trades in exporting lumber, grain, fish, etc to the Caribbean and also shipping sugar, rum, molasses both to England and New England

iii) **importance:** colonial re-exports were responsible, by the later 17th century, and throughout the 18th century, for about one-third of the value of total British exports to the rest of the world

- promoted vast expansion in English/British overseas trade, shipbuilding, shipping, commercial and financial networks, insurance
- key factor in the pre-industrial growth of London and other major port towns
- major source of commercial wealth and capital accumulation

iv) **the micro-economics of the economic transformations:** mass-production (plantations) and mass distributions – mass marketing of mass consumption products – converted luxury commodities, as sugar, tea, and tobacco had once been, led to drastic cost and price reductions to reach the lower income strata of English, European, and North American societies.

b) **The Development of Colonial Export Markets:**

I) another major consequence was the development of new, non-European markets that proved vital for the British Industrial Revolution, from the 1790s

- in 1700, despite overseas diversification, Europe still accounted for 85% of total British exports, while all other markets thus accounted for only 15% of exports
- by 1798, the situation was almost reversed: continental Europe now accounted for only 30% of total exports, while other markets, chiefly those created by New Colonialism, accounted for 70%
- North America accounted for almost a third, and the Caribbean region for a quarter

ii) **The French and European markets:**

- European markets were, to be sure, much less accessible because of wars with French (the Napoleonic blockade came afer 1798, the year of the table concerned in the lecture
- but consider that the value of British exports was four times greater in 1798 than it had been in 1700, suggesting that thanks to the Industrial Revolution and related developments, especially in foreign trade, that Britain was able to finance both ‘guns and butter’.

iii) **Population and economic growth in British North America:**

- the importance of American markets in particular was made possible by the spectacular growth in the population and economies of the Thirteen Colonies, which already, by 1700, had a population of almost 300,000, compared to England's population of 5.21 million
- adding 121,000, from the Caribbean, the combined western market came to 418,000
- those markets grew over 2.2 million by the eve of the Industrial Revolution (when England's population was 6.913 million
- And the population of the new Republic of the US grew to 20 million by the 1840s.

C. **The Economics of Mercantilism and New Colonialism:**

(1) **'Mercantilism':**

I) **a term that Adam Smith (*Wealth of Nations,* 1776)** introduced into English, from the French Physiocrats' derogatory term *mercantilisme*, directed at those (a majority of French society) who believed – wrongly, in their view – that international trade was the source of all wealth, in the form of precious metals (instead of land and natural resources)

ii) **basic principles:** in essence, of what was never a coherently organized body of economic thought:
- all those laws, administrative measures, state and private mercantile policies whose goals were to maximize both national power and national wealth, principally through state intervention
- that wealth was necessary to acquire and maintain power; and that national power was equally necessary to acquire and protect national wealth

iii) **national wealth:** according to the core monetary belief: that precious metals (gold and silver) were either the sole forms of wealth, or the best means of acquiring both wealth and power.

iv) **the acquisition of precious metals:** when most nationals lacked gold and silver mines – by ensuring a 'favourable balance of trade': to ensure (by state intervention) that the aggregate value of export earnings, from goods and services (shipping, banking, insurance, etc), always exceeded aggregate national expenditures on imports of both goods and services.

v) **The See-Saw Theorem:** that since the international supply of 'wealth' was fixed, one nation could gain wealth only at the expense of other nations, who were expected to retaliate.

vi) **Mercantilism thus meant intense international competition and continual warfare**: hence the need always to augment and maintain national power.

vii) **protectionism:** to curb manufactured imports (but encourage raw material imports), and promote exports, in order to achieve a 'favourable balance of trade' – and also to reap the 'value-added gains' from exporting fully finished goods, rather than unfinished goods or raw materials.

viii) **the importance of colonies:** as potential sources of precious metals, as sources of industrial raw materials, especially for military purposes, and as captive markets for the Home Country.

ix) **While Mercantilism has many medieval roots- both Bullionism and Protectionism – going back to**

the later Middle Ages (14th century), it became the pre-eminent form of political economy and economic thought with the rise of national, militarized states in the 16th century and the international competition for overseas colonies in the 17th century – i.e., in the era of 'New Colonialism.

(2) **Why Mercantilists pursued the acquisition of precious metals:**

I) **almost underseal belief that precious metals were the sole or primary form of wealth:** and one that ensured national power

ii) **in order to finance both defence and warfare:** though in fact they were primarily financed by state borrowing

iii) **concept that money is capital:** a view that Keynes applauded, arguing that increasing the money supply (with constant Liquidity Preference) would lower interest rates, and augment capital accumulation

iv) **inflationary stimulus of increased money supplies:** in an era of monetary contraction and deflation: harm of deflation in increasing the real burden of factor costs of production

v) **the need for precious metals to finance trade with chronically 'deficit' areas:** especially Asia and the Baltic, to which areas Europe could never export sufficient material goods (other than silver).

(3) **The English Navigation Laws:** of 1651 (Cromwell), 1660, 1663, and 1673 (all Charles II)

i) **chief purposes:** to augment English shipbuilding and shipping, while removing the Dutch from English carrying trades

ii) **chief features:**

- all exports had to be shipped in English ships
- all imports had to be shipped by either English or English colonial ships, with one exception: that ships coming from the national origin of the goods (e.g., Spanish wines) could be imported by those ships (but with higher tariffs)
- all trade between the colonies and England had to be conducted only by English or English colonial ships: and colonists were forbidden to trade directly with other countries or their colonies
- Staple provisions: specific colonial goods (sugar, tobacco, calicoes, tea, coffee, lumber, etc) had to be shipped directly to specified English ports for English consumption or re-export

iii) **Navigation Laws:** the results:

- did have some success in promoting and expanding English shipbuilding and shipping, at the expense of the Dutch and the French
- but the chief beneficiary was not England but rather New England (Massachusetts, Maine, Vermont, New Hampshire, Connecticut, etc): based comparative advantages in natural resources
- Nevertheless: these laws restricting colonial shipping and trades, and other measures (Molasses Act, 1733; Sugar Act, 1765), and British taxation (to finance defence of North America) proved to be severe irritants that culminated in the American Revolution of 1776
- that Revolution brought an effective end to the Navigation Laws, though they remained on the British statutes books until the enactment of Free Trade in 1846-49 (last lecture this term).

iv) **Read the lecture notes:**

especially Landes and Diamond on Europe vs. China, in the context of national states and Mercantilism.

Also read the appendix: Keynes on Mercantilism

V. Week no. 5: Lecture no. 6a: on 10 October 2012

The Agrarian Sector of England and Wales: the origins and consequences of the Agricultural Revolution, part 1 (part 2 will be presented on 17 October 2012)

A. Introduction

(1) Précis: We now turn to the second, and largest sector of the pre-modern economy: agriculture, in order to examine the origins and consequences of the Agricultural Revolution. In my view, no major country has succeeded in achieving modern urban industrialization and sustained economic growth, without a radical transformation of its agrarian sector: in order to release land, capital, and especially labour to be employed more productively in other sectors of the economy. Most important was supplying labour, but also foodstuffs and raw materials, for urban industrialization.

(2) Note that in both England and France, at the dawn of the modern era, about 75% of their populations were engaged in agriculture and related agrarian activities; and as much as 85% of the population in eastern Europe, until the 19th century. In the early 20th century, only 7% of England's population remained in agriculture, compared to 43% of France's population, despite the progress in industrial development achieved there since the 1820s. Clearly the final goal and chief role of agrarian change in modern economic development is the shrinkage of the agricultural sector: i.e., in releasing resources to other sectors.

(3) The fundamental issue for agrarian change is that of property rights: the replacement of a centuries old system of communal farming (a product of medieval feudal manorialism) in many and chiefly the most populous regions of England with private-property systems, chiefly under what is known as Enclosures. The basic question: Were enclosures necessary both to permit the application of new agricultural techniques and to promote more profit oriented and efficient farms of commercial agriculture, which in turn promoted industrialization?

(4) In the second term, we find these very same questions highly relevant to understanding continental industrialization, from the French Revolution (1789), and to understanding the marked differences in French, German, and Russian industrialization -- based on what happened to their agrarian sectors, particularly in replacing communal (and servile) forms of agricultural with market-oriented, profit-seeking private property agrarian structures.

B. Summary of the Lecture:

(1) **The Barriers to Agrarian Change and Growth: the Open or Common Field Systems**

a) **The medieval & early modern agrarian system of Open Fields:** (without internal divisions and fences) or Common Fields (largely worked communally by dependent manorial peasant tenants): was the product of medieval feudal manorialism.

b) **In England, such an agrarian regime was found principally in the Midlands zone:** the area of the best agricultural lands, and the one most thoroughly subjected to medieval feudalism

c) **Medieval lordships:** combination of Feudalism = militaristic system of local government based on service: Manorialism = the landed estate given to a feudal vassal (knight) as a reward and means of support for that service; Serfdom = dependent peasant tenants who work the lords' lands for his benefits.

d) **The arable or crop-producing lands of a medieval peasant village:** were usually cast in the form of three great open fields (or some combination divisible by three):

- for Winter crops (Fall sewn) – wheat & rye;
- for Summer Crops (Spring sewn): barley, oats, legumes: the legumes were nitrogen fixing crops (peas and beans) that helped to fertilize the soil;
- the Fallow: lying at rest, uncultivated, to allow the natural restoration of fertility

e) **the importance of livestock:** cattle (cows, bulls, and oxen: castrated bulls), sheep, horses, donkeys, goats, pigs.

i) **chief contributions that Mixed Husbandry (with livestock) made to the northern agrarian economy: of Mixed Husbandry:** with a symbiotic relationship between arable and pasture lands:

- provided power, especially to pull the heavy wheeled northern ploughs: with either eight oxen or two horses (more capital costly and more costly to feed)
- provided fertilizer: especially 'folding' on post harvest arable and the fallow lands at night, while feeding on pastures during the day
- provided food: meat and dairy products (milk, cheese, butter)
- provided industrial raw materials: especially wool (textiles) and hides (leather); but also bone

ii) **Jared Diamond:** *Guns, Germs, and Steel*: a non-biological explanation of Europe's ultimate supremacy

- that Europe's chief advantage over the rest of the world came to be in having a large and varied supply of such useful livestock. compared to the rest of the world
- but similarly northern Europe had a decisive advantage over most of southern Europe in having so much more capital invested in livestock, and in a symbiotic agrarian relationship, whereas Mediterranean Europe kept the arable and livestock sectors largely separate.
- Note that southern Europe (and much of the rest of the world) did not use heavy wheeled ploughs that required such a large livestock complement (i.e., 8 oxen or 2 horses).

f) **The Components of Communal Open Field Farming (with this symbiotic relationship):**

i) **communal grazing of the village livestock (cattle and sheep) on both pasture and arable lands**

- i.e., livestock, fed on pastures during the day, were brought into the open fallow lands, and also the arable lands after harvest-times to feed on the stubble and grasses
- thereby depositing manure, the chief fertilizer (nitrogen)

ii) **unfenced open fields:** with fences only at the external frontiers of the fields, for this reason

iii) **peasant tenancy holdings in the form of plough strips,** interspersed between and among their

neigbhour's strips in each of the three fields

- McCloskey thesis: interspersed scattered holding as risk aversion: to provide as much diversification of land types, reducing risks of damages from snow, hail, floods, insects, animal vermin, etc.. Note that many peasant villages were engaged in subsistence farming, at the thin edge of survival (constant threats of famine)
- Dahlman thesis: interspersed strips to protect communal grazing; i.e., to prevent richer peasants from accumulating and consolidating ('engrossing') lands and to prevent those so successful in doing so from withdrawing engrossed lands from the Common Fields

iv) **communal ploughing:** because the northern wheeled plough (with coulter & moldboard) was such an expensive piece of capital equipment that it required communal ownership and communal provision of the oxen or horses to pull it

v) **communally determined crop rotations:** to ensure that each field grew only the same seasonal crops and thus was harvested at the same time, thus to permit the entry of livestock to feed on the post-harvest stubble and on the fallow lands.

vi) **but private elements still remained:**

(1) each peasant family maintained its own holdings and retained the residue of crops from its own strips, after church tithes (10%), rents, and taxes were paid, along with the right to market their own share of the crops.
(2) That provided some of the seeds of the ultimate destruction of communal farming.
- See the Dahlman thesis above,
- and the subsequent section on enclosures

f) **Inefficiencies of Open Field peasant farming:** why it was a barrier to growth

i) **communal resistance to change:** any changes in crops, rotations, techniques, land-layouts, etc. required consensus of at least the leading village families, who were all conditioned to risk aversion.

ii) **Neigbhourhood effect:** that careless and lazy farmers, in not controlling their strips for weeds, vermin and pests, and not providing proper drainage, threatened the welfare of their neighbours

iii) **wastage of land and labour:** in marking off scattered holdings; and attending and working far scattered strips, over vast fields. Note: a plough strip was the length ploughed in one full day

iv) **labour immobility and disguised unemployment:**

- in part from the servile nature of so much of the peasantry: unfreed, bound to the estates
- communal: that the system was designed to accommodate and support all families, reducing incentive to leave for better opportunities.

(2) **Enclosures: the mechanism for destroying manorial communal agriculture**

a) **in essence: enclosures involved a radical transformation of land-holding:** designed to destroy all aspect of communal village farming and replacing communal farming with private property arrangements:

- by placing the exclusive use of the land in the hand of one person, whether the landlord or the tenant to whom the landlord leased that land (as a consolidated block)
- by allowing the landlord or tenant to make decisions on land use, division between arable and pasture, crop rotations, agricultural techniques, application of capital, etc.
- by allowing the landlord to lease, sell, trade, or bequeath lands with no reference to village rights
- by allowing the landlord or his tenant to mortgage the land: to borrow capital using the land as the collateral for the loan – impossible to do under communal forms of agriculture (all the more so since the manorial lord or his overload was the technical owner of the lands)

b) **forms of enclosures:** in approximate historical sequence, during the first major phase of Enclosures: in the Tudor and early Stuart era (1485-1620):

i) **enclosing the village commons:** the outlying pasture and forest lands and meadows (hay), reserving their exclusive use to one person (landlord or tenant)

ii) **engrossing the scattered tenancy strips of the Open Fields:** i.e., consolidating holdings into separate blocks on land, which were usually then fenced off and withdrawn from communal rotations

iii) **land reclamations:** clearing and developing waste lands, or forest lands; draining swamps.

c) **Chief factors explaining the Tudor-Stuart Enclosures:** (more for my ECO 301Y course)

i) **the English cloth-export boom:** from the 1460s to the 1540s: more tripling cloth exports

ii) **Henry VIII's Reformation and the confiscation of monastic & church lands:** about one-third of the total arable area of England: in 1536-40

iii) **the 'Rise of the Gentry' (Tawney's term), from 1540 to 1640 (eve of the Civil War):** wealthy but non-noble landowners (knights: sat in House of Commons):

- acquired 90% of monastic lands, and much other land from the crown & aristocrats
- share of landed wealth rose from 25% in 1436 to 45% in 1690
- chief beneficiaries of the inflationary Price Revolution (1520-1650), which injured aristocracy and crown who had to finance rising expenditures by land sales (to the gentry)

iv) **landlord reaction to rising agricultural prices (Price Revolution era):** to resume or increase commercialized agriculture on the demesne:

- by taking back or confiscating peasant lands
- when remaining demesne holdings had been intermixed with tenancy strips in Open Fields, only solution was to engross and enclose those fields (evicting tenants):
- note: from the 1540s, rising population (demographic pressures) led to an increase in the relative prices of agricultural products, but especially grains (rose more than did the CPI).

d) **Features of the Tudor-Stuart Enclosures:** to the 1640s

i) initial phase: to 1540s: the conversion of arable – often depopulated, vacated arable – into pasture

ii) second phase, from 1540s: more for the production of arable crops, especially grains

iii) chief areas of Tudor-Stuart Enclosures: the Open Field areas of the English Midlands (see above)

iv) **What delayed landlord enclosures: so that 30% remained to be enclosed in 1750?**
(1) deeply entrenched property rights of numerous freeholders and some customary tenants (copyholders)
(2) But copyholders for 'lives' could be evicted: three 'lives' came to equal 21 years: or evicted after first 'life' by raising inheritance duties (called 'entry fines')
(3) copyholders at will and cottars (cottagers): could be easily evicted by landlords
(4) leasehold tenants: could be removed by not renewing the lease (though many ran for 20, 40, 60 years): but many leasehold tenants became the landlord's agents for enclosure, agreeing to pay higher rents

v) **Tudor-Stuart enclosures offered only the opportunity to landlords or their primary tenants:** to orient agricultural production by more efficient methods towards the market, and did not guarantee success

3) **The Agrarian Recession 1660-1740: the beginnings of the Agricultural Revolution**

a) **basic thesis:** that this recession, with falling prices, rising costs, and thus another price-cost squeeze forced both tenants and landlords, but especially, those who had enclosed their lands, to adopt more advanced, cost-cutting, productivity-enhancing methods to survive and prosper

b) **character of the agrarian recession, in terms of prices:**

i) **monetary deflation:** (as exports of bullion to the East surpassed bullion influxes from the Americas): provided a major cost in terms of factor-price 'stickiness': that wages remained stable, while prices fell, and that real interest rates (on capital) actually rose

ii) **behaviour of relative prices:** that grains prices fell more than livestock prices, thus making livestock production relatively more favourable, forcing a shift from grains into livestock and also industrial crops

- aggregate European supply of grains on the market increased (especially with new English exports – fruits of Tudor-Stuart enclosures) after the market ceased to grow or contract (demographic slumps or stagnation)
- new competing carbohydrate products: potatoes and maize (corn); rice

c) **consequences:**

i) **much greater diffusion of the New Husbandry:** more advanced farming techniques that had been introduced from the Low Countries, from the 1560s, but which had been slow to spread
ii) other new techniques: e.g. 'floating meadows' [next lecture]
iii) land consolidation: in larger more efficient estates, at expense of small farmers [next lecture]

4) **The New Technology of the Agricultural Revolution: Convertible Husbandry and the Norfolk Systems**

a) **Convertible Husbandry or 'Up and Down' Farming:**

i) **a radical change from Open Field Three-Course crop rotations:** involving the *alternation* in the use of land between arable (crops) and pasture (livestock) over a ten-year period
(1) First cycle: all of the arable lands are put down to grass for pasture (livestock), while the former pasture lands are ploughed up to become the new arable fields (to grown crops): for about five years
(2) Second cycle: these converted arable lands are again put down to grass, and the temporary pastures are again plough up to become arable lands

ii) **consequence:** the ploughed up pasture lands release enormous amounts of nitrogen, while conversion of arable to pasture allows these lands to recuperate and build up nitrogen

iii) **new crop rotations to eliminate all of the fallow:** reducing the relative amount of grains sewn while increasing the cultivation of industrial crops and legumes

iv) **new legumes:** clover, sainfoin, alfalfa (lucerne grasses), which were up to 8 times more powerful in fixing nitrogen than pulses (peas + beans), while also serving as high-protein fodder crops for livestock

v) **livestock:** far better fed (and managed) on the richer grasslands of the pastures (also supplying manure for 'night folding') on the post-harvest arable

vi) **By far the more efficient and productive form of agriculture:** before the introduction of chemical (synthetic) fertilizers from the 1870s (in Germany – second term)

vii) **Enclosures were absolutely necessary for Convertible Husbandry:**
- because this system totally destroyed the lay-out of peasant tenancies in Open Fields; and they could not possibly have been reconstructed when pastures were converted to arable
- because this new system required vast increases in capital: which could be obtained only by mortgaging enclosed lands (see above) – or from profits of rich farmers

b) **Norfolk Four-Course Rotations:** introduced by Lord Townshend

i) **also a radical or even more radical change:** in its full form, it eliminated not only the fallow lands but also pasture lands:
(1) half of the land (enclosed) devoted to growing grains, and the other half to legumes and turnips
(2) turnips: a major feature of this system: highly effective fodder crop, whose cultivation also improved the soil, but without adding nitrogen (not a legume)
(3) livestock: were now stall-fed from both turnips and legumes, without pasture

ii) **I doubt, however, that this system was ever widespread, or used outside its homeland in East Anglia (Norfolk & Suffolk):** I doubt that many farmers totally dispensed with pastures and meadows.

iii) See the full lecture notes and the tables (when posted online)

VI. Week no. 6: Lecture no. 6b: on 17 October 2012

The English 'Agricultural Revolution': Part II (conclusion)

c) **The Economic Advantages of the New Husbandry, with Enclosures: 1660 - 1740**

i) greater income stability for farmers – with greater crop + livestock diversification
ii) better, year-round feeding of livestock: stall-feeding from fodder crops
iii) better livestock management + selective breeding
iv) End of periodic famines – with better nutrition (unlike France)
v) much increased agricultural productivity (per acre land, per unit manpower) allowing farmers to cope better with the price-cost squeeze of the Agrarian Recession (1660-1740)

vi) but not all farmers were able to engage in the New Husbandry: especially the yeomanry
- lacked sufficient capital
- had not enclosed their lands or acquired enclosed farms from landlords

d) **The Plight of the Small Yeomen Grain farmers during the agrarian recession, 1660 - 1740:**

i) **suffered from a severe and growing price-cost squeeze:**
(1) grain prices were falling, often steeply, as already shown
(2) but real factor prices were either constant or generally rising

ii) **deflation:** almost always raises input or factor costs, because of factor-price stickiness:
(1) thus wages (labour), rents (land), and interest (on borrowed capital) do not fall – often because they have fixed by long-term contracts
(2) if commodity prices fall – output prices for farmers, and factor prices do not, then the real cost of inputs would be rising

iii) **lack of access to capital for small yeomen farms:**
(1) capital needed to engage in Convertible Husbandry and Norfolk Four-Course rotations, which were demonstrated to be the effective solution for the price-cost squeezes during the agrarian recession,
(2) But the New Husbandry, especially with so much more added livestock, was far more capital intensive than were traditional forms of agriculture

iv) **logical yeomen response to the price-cost squeeze, with inadequate capitals:** sell their farms

5) **Changes in English Landholding: in response to the Agrarian Recession, 1660-1740**s

a) **resurgence of the great landowners (aristocratic) at the expense of the yeomen, free-holders**

i) From 1690 to 1790, the aristocracy (peerage) increased its share of lands held from 18% to 25%
– many of the post-1660 aristocrats were gentry elevated to the nobility – purchase of peerage
ii) gentry: continued their expansion in holdings: from 25% to 50%
iii) Yeomen freeholders (substantial free peasants): suffered a decline in their share of land holdings from 27% to just 15%: era of most severe contraction of the English yeomanry

b) **importance of legal innovations for the aristocracy:** laws of entail and 'equity of redemption':

i) **entail settlements:** to ensure that aristocratic estates (tied to title of nobility) passed intact to the eldest song, without any sales or transfers of the 'patrimony':
- made the entailed estate are for more secure, risk free collateral for mortgages
- allowed aristocrats to borrow capital far more cheaply than those without entailed estates

ii) **equity of redemption:** permitted mortgage holders (lenders) to sell or transfer their mortgages to third parties,
- thus allowing them to regain their capital (since few mortgages were ever redeemed)
- and thus increasingly the willingness of lenders to provide mortgages
- chiefly true for entailed estates.

c) **ability of landholders to cope with Agrarian Recession and profit from the New Husbandry:** chiefly

depended on access to cheap capital

6) **Resumption and Completion of the Enclosure Movements, 1760 - 1830:**

a) **chief factor:** rising prices, both nominal and real, 1760 - 1815

i) **Inflation:** the rise in nominal prices, chiefly monetary
- influxes of gold (Brazil) and silver (Mexico), peaking ca. 1800
- proliferation of note-issuing banks (next day) from 1760s
- era of the 'Paper Pound': 1797 - 1820: unrestricted issue of bank notes and gov't deficit financing of warfare

ii) **Rise in real prices of grain (in relation to livestock and industrial prices):**
- population growth: doubling from 6 to 12 million, so that England became a net importer from 1770s
- warfare and Napoleonic blockades: cut off or reduced European grain imports
- bad weather in the 1790s (i.e.., poor harvests)

b) **Importance of the Price Changes:** nominal and real

i) **inflation:** reduced real interest rate and the real costs of borrowing capital, so important for Enclosures
ii) **steady sharp rise in real grain prices:**
- meant, in terms of Ricardo's theorem, rising economic rents on existing arable lands, all the more so as costs were reduced
- thus the landlord incentive: to enclose Open Field customary lands in order to capture the rising economic rents on those lands
- otherwise the customary tenants, with fixed rents (in nominal terms) would capture those rents

c) **Parliamentary enclosures:** the legal mechanism for landlords to enclose

i) **To exercise 'eminent domain':** the power of the government to expropriate land 'for the public good': required private Acts of Parliament, with government surveys and compensation
ii) allowed landlords to override the remaining and often deeply entrenched property rights of both yeomen freeholders and many customary tenants with strong inheritance rights
iii) charts & tables showing that Parliamentary enclosures were sensitive to both real interest rates and real grain prices
iv) see the enclosure maps: online

7) **The Economic Consequences of the Enclosures and New Husbandry:**

a) **continued debate about productivity changes:** but recent research supports view of major increases:

i) **Michael Turner's research:**
- from 1650 to 1750: crop yields rose (on average) by 36% (one century)
- from 1750 to 1800: yields rose another 30% (half century)
- from 1800 to 1850: yields rose another 78% for this half-century; and thus the period demonstrating the greatest increase

ii) **B.A Holderness:**
- similarly indicating that the period experiencing the greatest productivity increase was 1800 - 1850:

- with a per annum increase of 0.79% in productivity
- labour productivity: rose by 0.89% per annum
- labour productivity: rose by 0.50% per annum

iii) **Robert Allen:** for the longer period 1700 to 1850 (with no subdivisions by time)

- four-fold growth in Total Factor Productivity: between 2.32 and 2.46
- land productivity: rose by 37%
- labour productivity: rose by only 16%
- capital productivity: rose by 93%, by far the most important factor input for agriculture

b) **Robert Allen's Two- Stage Theory of the Agricultural Revolution:** 1640 - 1850

i) **The two-stages:**
(1) The Yeomen's Revolution, 1640 - 1740: marked by increases in land productivity: i.e., yields per acre
(2) The Landlord's Revolution, 1740 - 1850" marked more by increases in labour productivity

- increasing scale of farms meant less labour per acre & more specialization
- Evidence produced by table on Ricardian rents: showing greater increases in productivity as scale rose, but only to a certain maximum

ii) **My problems with the Allen Theory of the 'Yeomen's Revolution':**

(1) Ignores the evidence on the severe contraction in yeomen land holdings: from 27% to 15%, from 1690 to 1790 (after having risen from the 15th century): severest drop recorded
(2) Ignores arguments contending that Convertible Husbandry, as chief agent for increasing land productivity, could be achieved only (or best achieved) with enclosures
(3) Ignores arguments that the New Husbandry required large amounts of capital largely unavailable to yeomen farmers, especially those operating within communal Open Fields
(4) Ignores his own evidence indicating that of all factors of production capital played by far the major role in productivity increases.

c) **The evidence on enclosures:**

i) **Turner's evidence for 1801 (see Table in lecture notes):** clear productivity advantage of enclosed farms over Open Field Farms, for all grains, and for all regions of England (though varying by grains & regions)

ii) **Allen's data and tables show the same:**
(1)read the lecture notes for Allen's explanations for his own data – and why he does not agree with Turner's tabulated data
(2) Allen tries to show that productivity increases took place as well on Open Fields – but does not define them (or consider whether or not they contained engrossed holdings)

iii) **Allen's table on Ricardian rents:**
(1) shows clear gains from increased economies of scale of farms: larger farms required less labour per acre
(2) labour used more efficiently, with greater specialization
(3) implicitly: increased scale a function of enclosures

d) **Contributions of the Agricultural Revolution to the Industrial Revolution:**

i) **population and the food supply:**

(1) despite all the productivity achievements of the Agricultural Revolution, the agricultural sector did not succeed in feeding all of England's growing population: which doubled from 1760 to 1820 (6 to 12 million) and tripled again by 1910 (36 million)
(2) From the 1770s, England, having been a net food exporter (for over a century) became a net food importer — by the 1890s, England was importing 83% of its required food grains
(3) That again indicates the crucial role of foreign trade to accommodate that demographic and economic growth: to export goods & services to import foodstuffs and raw materials more cheaply (2nd term)

ii) **releasing labour for urban industrialization:**

(1) increased agricultural productivity and enclosures released surplus and redundant labour from the agrarian sector to be employed more productively in urban industrialization: chief contribution
(2) statistical evidence that even with increased numbers employed in agriculture, the proportion so engaged, as a percent of the total population fell: from 76% in 1500 to 36% in 1800, to 22% in 1850, to 7% in 1900
(3) In France, 43% of the population was still engaged in agriculture in 1900 – because France failed to undergo the same agricultural transformations as did England (2nd term)

iii) **increased capital investments:** in agriculture and industry

(1) increased capital from landlords: by 107% from 1700 to 1850, vs. 70% from tenants
(2) role of agriculture (landlords) in supplying capital for urban industrialization: next topic

VII: Week no. 7: Lecture no. 7, part a: on 24 October 2012

Banking and Finance before and during the Industrial Revolution

(1) **English Business Organization: 1550 to 1720:**

a) **Functions:** to provide both the lubricant (medium of exchange) and fuel (capital: both working and fixed capital) for the economy

b) **Private Partnerships:** the predominance form of business organization

i) an ancient form of business, dating to Greco-Roman times (in a European context)
ii) Unusual English feature: that a partnership was limited, by Common Law, to 6 members
iii) other basic features:
(1) partnership contract valid only so long as all partners participate in the common business venture: dissolution of the partnership on the withdrawal (sale of partnership share) or death of any partner
(2) profits and losses shared proportionally: in ratio of capital invested
(3) unlimited liability for debts, law suits, claims, etc: for all partners: collectively and severally (individually - that each individual liable for all debts, if others default)

c) **Joint Stock Companies:** an English innovation dating from the 1550s

i) **ability to raise far larger capitals:** than could any 6-member partnership: through the sales of stock or shares of ownership
ii) **collective business venture operating with a common capital that was permanent:** unaffected by death or withdrawal of any stockholders

iii) **negotiability of stock:** i.e., the right of stockholders to sell or transfer their shares to third parties

iv) **attractive features of negotiable stock:**
(1) to reap capital gains if the stock value rose
(2) in the meantime, to receive dividends, as proportional share of disbursed profits
iv) Board of Directors: elected by the stockholders: one vote per share owned
(1) Directors responsible for management and organization of the company
(2) declared dividends to stockholders: disbursement of profits (partial or total)

d) **Historical Origins of the English Joint -Stock Companies:**

i) **crisis of the English cloth trade on the Antwerp market in the 1550s:** collapse of cloth exports led to widespread unemployment

ii) **government response:** to promote immediate overseas commercial diversification to lessen dependence on both cloth exports (accounting for 90% of total export values) and on Antwerp (accounting for 90% of cloths exported)

iii) **New Overseas Joint-Stock Trading Companies:** which required vastly larger initial capitals for long-term long distance trade (ventures lasting 2- 3 years), requiring capital in ships, warehouses, inventory
(1) Muscovy Company: to Russia (1553)
(2) The Levant Company: to the Ottoman Turkish Empire (1581)
(3) The East India Company: to India and South Asia (1600)
(4) the Royal African Company: for the African slave trades (1662)
(5) the Hudson's Bay Company: for North American (1670)
iv) Other companies: from the 1690s (next day)

c) **Problems or Limitations of the New Joint Stock Companies:**

i) **Liability:** those lacking a charter of incorporation, making the company a corporate entity separate from its shareholders, were subject to partnership law, and thus to unlimited liability
(1) All of the new overseas trading companies had such parliamentary charters of incorporation, and thus limited liability for investors, along with charters of monopoly rights in trad
(2) But all the new companies from the 1690s, for domestic trade, finance, and industry, did not (except the new Bank of England, in 1694)

ii) **Markets for Shares:** lack of an organized secondary market for shares
(1) hindered the ability of shareholders to sell their shares to third parties, without a broker having connections
(2) solution: formation of the London Stock Exchange (by such brokers) in 1695
(3) followed by a proliferation of new joint stock companies

2. **The Rise of Private Banking in England: the 17th century Goldsmiths:**

a) **The twin foundations of modern banking:** kept separate before the Goldsmiths banks

i) **Bills of Exchange banking:** the creation and province of merchants in long-distance trade:

(1) bill of exchange: a command by a principal to a banking agent abroad to make payment on his behalf

- European financial instrument designed to finance international trade (or remit funds abroad)
- four-party letter: two principals in city A: the borrower and the lender
- and their two agents abroad, in city B: the payer (acting for the borrower) and the payee (acting for the lender)
- Principal 1 borrows money (or buys good) from principal 2 in city A
- uses those funds to finance his trade: shipping goods to city B, where his agent arranges the sale of the goods and deposits the proceeds in his bank account
- Principal 1 (borrower) 'draws a bill of exchange', or writes a letter commanding his agent in city B (the payer, or drawee) to accept the bill and make payment to the payee on a specified date, using the funds in his bank account
- Principal 2 (lender) similarly instructs his agent in city B, with a copy of the bill, to receive payment on the maturity date; and then to remit the funds to him in city A, by drawing another bill
- obviated the necessity of transporting precious metals over long distance: payments made in the local currency of each city
- also a means of evading the usury doctrine (the universal prohibition against lending money at interest): by disguising the interest in the exchange rate
- Most important European financial innovation in medieval & early-modern Europe: had no antecedents in the ancient world, and was not borrowed from the Arabs or Chinese (etc).
- Later called the 'acceptance' bill: because of the crucial role of the drawee or payer, in 'accepting' the bill and thus being obligated to make payment

(2) deposit and transfer banking: the creation and province of money-changers

- note: each prince, ruler of state or principality issued his/her own coins, usually denying legal-tender status to foreign coins
- thus a money-changer was necessary to exchange foreign coins for domestic coins, delivering the foreign coins to the ruler's mints
- From ancient Greek times (4th century BCE) money-changers became bankers, because they had to safeguard their inventory of coins and precious metals: so that others left their coins and precious metals, etc. with them for safe-keeping
- as bankers, these money changers soon realized that they could safely lent out a proportion of the coins placed with them on deposit: hence, fractional-reserve system of leading
- these money-changer-bankers also allowed depositors to pay other bank clients by making book account transfers: by which the debtor client instructed the bank to debit his account and credit the account of the creditor client with the agreed-upon sum.
- in medieval Europe, such book-account transfers were effected (as today) by using cheques
- after dying out in late Imperial Rome, such deposit-transfer banking was revived by money-changers in 12th century Genoa and Lombardy (Italy): and spread to Catalonia (Spain), France, Flanders – but not England
- Why did medieval and early-modern England not have deposit bankers: because money-changing was a royal monopoly (Royal Exchanger), whereas elsewhere money changing & deposit banking was a private enterprise, though licenced by the state

b) **The 17th-century Goldsmiths and the beginnings of English deposit banking;**

i) **The London Goldsmiths became the first real English bankers:** after the Civil War era (1642-60)

- they were originally a 14th-century London guild of jewellers and precious-metal artisans, i.e. goldsmiths
- but subsequently, many (or most) goldsmiths found it more profitable to trade in precious metals, even though trading in bullion, and especially exporting bullion (without a licence) was illegal
- So long as the Royal Exchanger exercised a crown monopoly on money-changing (and so long as the bans on exporting both bullion & coin remained in force), the Goldsmiths could not function as deposit bankers, as private money-changers had long done on the continent
- I have found documents as late as 1626 prosecuting goldsmiths for exporting bullion and for engaging in money-changing against the monopoly privileges of the Royal Exchanger

ii) **The Goldsmith Banks in The Restoration era:** from 1660

- Civil War era, from 1642 to the Restoration of the Monarchy (Charles II) in 1660: the office of the Royal Exchanger was evidently abandoned, since the crown could not enforce the monopoly (not after the execution of Charles I in 1649), and Parliament had no reason to uphold it
- The Goldsmiths, or family firms and private partnerships of Goldsmiths, were now free to engage in money-changing
- and thus in deposit-and-transfer banking, as had long been practised on the continent

iii) **Banking functions developed by the Goldsmiths, 1660 - 1700:**

- deposit and transfer banking: with current (non interest) chequing accounts and time-deposit savings accounts (paying interest), without cheques
- lending: on the fractional reserve system, which meant a three-fold potential expansion in the credit money supply, with a reserve ratio of one-third (reciprocal of the reserve ratio)
- discounting: commercial paper – by far the most important function
- note issue: the issue of paper bank notes, which not immediately but later became printed bank notes for rounded sums (£20, £10), made out to bearer – and fully negotiable

iv) **Discounting commercial paper:** bills of exchange, inland bills, promissory notes, etc.

- discounting is the sale or 'cashing' of a commercial bill before its stated date of maturity
- therefore, the amount of the redemption, 'the amount cashed', is discounted: the face value less the amount of interest due between being cashed and is maturity or redemption value
- The medieval usury ban had prevented discounting: which thus became legal only when interest payments became legal – in England, from 1571 (Elizabeth I - up to 10%).
- In the example given in the handout: a cotton spinner (factory owner) sells 1000 yds of cotton yarn in a forward-sales contract with 90 days delivery, receiving in payment a promissory note for £100
- the cotton-spinner immediately sells or cashes the note with his local banker, for £97
- he uses these funds for the working capital needs of his spinning mill (raw materials, wages, rent, heat, administrative costs) – but not for machinery (fixed capital)
- the banker collects the full £100 owing on the note's maturity from the issuer: thus earning 12.5% interest for the 90 days

v) **Negotiable (and thus transferable) credit instrument developed by the Goldsmith bankers, by 1700:** serving as acceptable substitutes for coined money, though not legal tender, so long as those holding these instruments were confident that they could be exchanged for real money, in the form of coin

- the cheque (negotiated by endorsement)
- discounted bills: bills of exchange, inland bills, promissory notes (IOUs)

- bank notes: finally in printed form, made out to bearer, for rounded sums
- discounted bills: inland bills, bills of exchange, promissory notes
- paper bank notes

3. **The Bank of England:** 1694 - 1797: its role in the English Economy

a) **Major Factors in the Formation of the Bank of England, in 1694:**

i) **Financing Warfare:** with France, 1689-1715
(1) Glorious Revolution of 1688: brought to the throne Mary II (daughter of deposed James II0 and her Dutch husband Prince William of Orange, as William III (1688-1702)
(2) He thus involved England in his ongoing war with Louis XIV
(3) Problem: crown's credit rating was so poor that it had to pay up to 14% to borrow money
(4) Parliament had asserted, with the Glorious Revolution, that it controlled 'the purse strings' – crown finances
ii) **Creation and Management of Permanent National Debt:** beginning with million pound loan of 1693
iii) **monetary scarcity (for reasons explained earlier):** requirement that a new bank print legal-tender banknotes

b) **Formation of Bank of England in 1694:**

i) William Paterson, a Scottish entrepreneur, his London banking associates, and Sir Charles Montagu, Chancellor the Exchequer provided the government with a permanent loan of £1.2 million, at 8% interest

ii) in return: received a dual monopoly: on government banking and on joint-stock banking (i.e., as the only legal joint-stock company bank allowed in England, so that all others were partnerships/family firms.)

iii) How the loan was made:
- in theory, the loan was to be raised by the sale of stock in the Bank of England
- but stock sales were initially at 10% down, on margin: took years to complete
- so the Bank immediately furnished the £1.2 million in the form of its own legal tender notes
- 'monetizing the debt': did cause some temporary inflation in the later 1690s

iv) **Bank Act of 1707:** Parliament closed loop-holes to confirm its monopoly on joint-stock banking

c) **Functions of the Bank of England:** nothing succeeds like success:

i) **as the government's sole bank:** accounting for 7% of its business incomes
- handling all gov't banking and financial operations, at home and abroad
- supplying bullion to the royal mints
- discounting Exchequer Bills (like Canadian Treasury Bills): allowing gov't to buy goods and services on credit, and allowing creditors to discount these bill

ii) **as a private commercial bank:**
- performing the same functions as the London Goldsmith banks, in competition with them: for lending and discounting
- most of the Bank's clients were, however, other banks and financial/commercial institutions

iii) **as a Lender of Last Resort:** embryonic role as a Central Bank

- The Dutch financial crises of 1763, 1773, 1783, 1793: revealed the impotence of its chief rival, the Wisselbank van Amsterdam (Exchange Bank of Amsterdam), which was not a credit bank
- in these crises, the Bank of England rescued its Dutch as well as English clients
- thus a movement of banking and finance from Amsterdam to London
- 1793 French invasions of the Dutch Republic ended role of Wisselbank
- 1797: threatened French invasion (Napoleon) and liquidity crisis led Bank of England to extent rediscounting privileges to all British banks and financial institutions, while also suspending convertibility of bank notes into gold ==> 'era of the paper pound' (to 1820)

d) **Strengths of the Bank of England:**

i) steady flow of government interest income on Bank's loans:

- 1694 - 1709: 8%
- 1709 - 1742: 6%
- 1742 on: 3% plus annual management fee of £4,000 = 3.75%

ii) payments for various government financial services

iii) earnings from discounting Exchequer and other bills

iv) sole right to issue legal tender banknotes

v) public trust and confidence, from its tripartite functions: as the government's bank, as Parliament's bank, and as a private joint-stock company bank, with full support of London financial community

VIII: Week no. 8: Lecture no. 7, part B: **on 31 October 2012**

4. **The National Debt and the Bank of England:** 1693- 1757

a) **1693: the creation of a permanent, funded, national debt:**

- national debt: the responsibility of Parliament, not the personal liability of the monarch
- funded debt: in that Parliament voted the taxes to pay the annual charges (interest) on the debt: chiefly in the form of excise (consumption) taxes and import duties
- permanent: in that the government had no obligation ever to redeem (pay off) the national debt, which were issued in the form of perpetual but negotiable annuities - sold on the Stock Exchange
- known as the 'English Financial Revolution': but with strong continental antecedents, immediately via the Dutch Republic, which inherited this institution from medieval Flanders

b) **annuities:** known on the continent as 'rentes' (rents)

- 13th century origins in towns of northern France and Flanders: to permit urban governments to evade the usury prohibition (against all forms of interest) by selling *rentes* or annuities: for fixed capital sums, in return for an annual stream of income
- origins to be found in 12th-13th century agrarian contracts in Mediterranean zone: whereby urban merchants/financiers invested in a peasant's agricultural enterprise (farm), paying a lump sum of non-redeemable capital in return for a perpetual income stream, as a form of rent.
- urban *rentes*: either for life annuities (extinguished on death of investor) or perpetual annuities, which could be sold to others, or passed on by inheritance.

- Pope Innocent IV: in 1250: declared *rente* contracts to be free from taint of usury, so long as the buyer could never demand redemption/repayment and so long as annual payments came from 'fruits of the land' => government payments universally made in form of excise/consumption taxes on agricultural products: bread, meat, wine, beer, wool, textiles, soap, etc. (very regressive taxes)
- system of urban finances based on *rentes* spread to territorial and then national governments in western Europe by 16th century: France, Habsburg Netherlands, Habsburg Spain, German (Habsburg) principalities: but not England before the Glorious Revolution
- *rentes* or annuities came to be traded on European stock exchanges from the 1530s: Antwerp (1532), Amsterdam (1608), and then London (from 1695)
- English 'Financial Revolution' based on perpetual negotiable annuities: imported from the Dutch Republic after the Glorious Revolution (1688-89): by new Dutch-born king William III

c) **chief stages in the creation of the English permanent funded national debt:**

- 1693: the Million Pound Loan: not a loan but a lifetime annuity paying 14%
- 1694: Bank of England loan, at 8% interest
- 1698: Parliament's creation of the New East India Company, as a rival joint-stock trading company to Asia, for a loan of £2.000 million, again at 8%
- 1709: Parliament allows the original East India Company to take over its rival, for another loan, of £1.200 million (interest rate unknown)
- From 1704 to 1710: series of 99 and 32 year annuities sold by the Exchequer
- 1711: formation of the South Sea Company

d) **The South Sea Company and the Bubble Crisis of 1720:**

i) **formation of the South Sea Company in 1711:** its nominal and actual purposes
(1) chartered joint stock company: with charter of incorporation, with limited liability
(2) ostensible purpose: to exercise a commercial monopoly on English trade with the South Pacific, a trad controlled by Spain, with its lucrative Mexico=>Philippines=>China links, based on silver and silks
(3) actual purpose: to take over all of the outstanding national debt, not held by the Bank of England and the East India Company: both in terms of short term loans and the 32-year and 99-year annuities
(4) 1711: South Sea Company bought up or took over £9.471 million in short term debts and debentures

ii) **method of conversion:** holders of short term gov't debt, earning interest at rates from 65.25% to 9.0%, were asked to convert those debts into South Sea Stock, paying a preferred interest of 5%

iii) **rationale for the conversion:**
(1) investors were converting a short term asset (or callable debentures) into a long-term, permanent asset
(2) South Sea Stock was negotiable: tradable on the London Stock Exchange, offering prospects of capital gains (from higher stock prices), as well as 5% dividends (so long as the stock was held).
(3) South Sea Stock for this reason proved to be good collateral for borrowing (loans)

v) **The Onset of Crisis:** the National Debt project of 1719-20
(1) proposal: to convert a total of £31.58 million in national debt issues into South Sea Stock (for same reasons as given above)

- £16.55 million: in short term debts + redeemable debentures
- £15.03 million: in 32-year and 99-year annuities (see above)

(2) 'Boiler-Room' activities:

- South Sea Company directors engaged in illegal activities to churn the market and drive up the value of shares: which in the speculative bubble rose from par at £100 to almost £1000 a share

- object: to ensure that fewer shares were traded for any given nominal or face value of debt, since conversion was based on share values

(3) But also, in order to raise new capital for this project, including purchasing national debt from those who did not want to convert, South Sea Company sought to sell new share issues
(4) To limit competition for new-issue sales, South Sea Co. asked for (and paid for) new statute limiting competition, in the form of:

vi) **The Bubble Act of 1720 and its consequences:**
(1) Bubble Act (as later named): restricted trade in shares of joint-stock companies (on the LSE) to those companies having charters of incorporation (and were acting according to their charter)
(2) While all the great overseas trading companies had such charters of incorporation (with limited liability for investors), almost all of the new, and land-based companies did not
(3) South Sea Company sparked the crisis by having three companies prosecuted for violations of the Act
(4) Result: severe stock crash (see graphs and stables), with all stock prices tumbling, but those of South Sea Company fell the most: since value of stocks in unchartered companies (or those not acting by the charter) would become without any trading law, by the Bubble Act.

vii) **Leverage and Liquidity:** the nature of all such financial crises, pricking bubbles and causing crashes
(1) **Leverage:** using a small amount of cash to buy an asset, on credit

- buying on 10% margin, with the remaining 90% financed by the broker's call loan: the stock instead was held by the broker as collateral for the loan: i.e., using £10 in cash to buy a marketable asset worth £100 – and hoping to sell that for a higher price, and thus very large profit on £10 investment
- if stock price rose from £100 to £110, the investor would double his investment (the £10 down payment) by his sale of the stock
- so long as stock prices rose, the broker was happy to hold the stock as collateral
- once stock prices fell, the stock lost its collateral value ==> so that the broker called his loans, for immediate redemption or repayment

(2) **The Liquidity Crisis:**

- once brokers called their margin loans, and sold (dumped) the stock, investors were forced to liquidate all or most of their assets: i.e., good stocks, such as Bank of England, East India Co
- form of Gresham's Law (bad money drives out good): here bad stocks drive out good stocks, by forcing their rapid liquidation to raise cash to pay off loans

viii) **Consequences: the Bubble Restriction Era of 1720 - 1825:**
(1) The South Sea Company effectively ceased to exist, except as a holding company for the government debt it either held or managed
(2) Parliament henceforth used the Bubble Act to restrict, indeed prevent the formation of any new joint stock companies, for just over a century (to its Repeal in 1825)

- any joint stock company seeking a charter of incorporation had to pay for a private act of Parliament, with high administrative and legal costs
- had to put up the capital in escrow with the Bank of England before charter was granted

(3) Result of these very onerous restrictions: there were no joint-stock companies available to finance capital formation in the new industries of the Industrial Revolution, not before 1825
(4) Canal companies: were the major and important exceptions,

- if only because canal companies had to acquire authorization (for eminent domain, etc) by private and acts of Parliament, to which incorporation charters cost little to add
- canals also obviously served the public good and entire nation
- canals were so expensive that joint-stock companies were the only possible solution

(5) The Industrial Revolution had to finance alternative financial solutions: to be seen next day

e) **Pelham's Conversion of 1749 - 1757:** the completion of the Financial Revolution

i) **1749: Sir Henry Pelham, Chancellor of the Exchequer (Finance Minister):** announced proposal to convert all of the outstanding national debt into one consolidated stock issue, paying 3% annually

ii) **Structure of the National Debt in 1749:** in summary: total of £70.441 million

- £19.6 million in debt held directly by the Three Sisters: Bank of England (£11.7), East India Company, and the South Sea Company == 27.8% of the total national debt
- £49.2 million in government 'stock': debt managed by the Bank of England (£25.6 million) and the South Sea Company (£23.6 million: from its conversions of 1711 and 1719) = 69.9%
- £1.6 million managed directly by the Exchequer = 2.3%

iii) **May 1750:**

- £50.751 million in 4% debts converted into 3.5% Consolidated Stock: 87.95% of total debts of £57.703 million
- major holdout: the South Sea Company holders of annuities, but the shareholders finally relented (on the threat of gov't redemption of their stock at par)

iv) **Christmas 1757:**

- all of the national debt (including South Sea Company 4% annuities) converted from 3.5% to 3.0% Consols
- key issue of persuasion for conversion: government promise not to redeem Consols for 30 years
- in fact, they were not redeemed until 1888 – in fact converted entirely into a new issue paying 2.75%, reduced by that year's statute to 2.5% in 2003, which rate still prevails today

v) **Consols:** Consolidated Stock of the Nation: perpetual annuities or 'government stock' traded on the London Stock Exchange

vi) **summary and future changes in the rate:**

- 1757: conversion of 3.5% and 4.0% stock into 3.0% Consols
- 1888: Goschen's Conversion of the National Debt into 2.75% Consols
- 1903: an agreed upon conversion into 2.5% Consols
- 1923: first year in which government was allowed to redeem 2.5% Consols
- 2010: the same 2.5% coupon or rate is still maintained: and currently (24 October 2013), Consols have traded on the London Stock Exchange at £66.09 = yield of 3.78%

vii) **Role of Consols in later 18th & 19th centuries:**

- major stock traded on the LSE, until the Repeal of the Bubble Act in 1825, and coming of the railways (financed as joint-stock companies)
- as perpetual annuities, with a guaranteed annual coupon: the most attractive long-term investment (the longer the term, the lower the interest rate), especially for investors predicting a continuing fall in interest rates.
- provided the safest of all possible savings and investments, with their stock-exchange values determined only market changes in the real rate of interest (determining yield and thus price)
- very important form of collateral for loans, as noted earlier
- provided chief mechanism for low cost public borrowing (with new issues of Consols: e.g. the New 3% Annuities of 1855)

5. **Importance of the Bank of England in the 18th and early 19th centuries:**

a) **positive contributions of the Bank of England:**

i) **management of national debt** ==> **reducing the national interest rate:** in creating a low cost, permanent funded, national debt, most of it during wartime,
(1) thereby in reducing the interest rate on government borrowing from 14% in 1694 to 3% from 1757
(2) that also greatly reduced the 'crowding out effect', hence lowering the general rate of interest, and providing relatively more and cheaper capital for private enterprise and industrialization.

ii) **completion of the English Financial Revolution:** 1694 - 1757
(1) although this Financial Revolution had begun in the early 13th century, in towns of northern France and Flanders, and though it was imported, almost fully developed, from the Dutch Republic into England, after the 1688-89 Glorious Revolution, the English improved and perfected this form of public finance over all other European countries
(2) English public debt, with the establishment of Consols, was almost fully based on perpetual, fully negotiable risk-free annuities (traded on international exchanges), other countries maintained a mix of life- and perpetual annuities; and most also had a higher component of loans or bonds
(3) perpetual annuities, being inheritable and inherently transferable, were far more negotiable than were life annuities, which were supposed to be tied to the life of one person, and extinguished on his/her death
(4) the cost (in annual payments) on perpetual annuities was usually only 50% of that on life-annuities

iii) **providing stable legal-tender paper bank notes**

iv) **acting as a 'lender of last resort': from 1797**

v) **providing the gov't with credit:** discounting Exchequer Bills

vi) **lowering the transaction costs of gov't:** in handling all gov't financial services

b) **negative features of the Bank of England (before 1826)**

i) **monopoly of joint-stock banking**: meant that all other English banks (before 1826) were restricted to being 6-member partnerships or family firms

ii) **reluctance to assistance non-client banks before 1797**

iii) **high denomination bank notes before 1797**

iv) **refusal to establish branches outside London:** before 1833 : hindered B of E note circulation

5. **The "Country Banks": private commercial deposit banking outside London**

a) **rise of the country banks** in England:
i) 1716: first such bank established was in Bristol (major commercial port); only 20 on eve of the Industrial Revolution, in 1760s
ii) by 1780 - 100 banks; by 1825: over 600 banks
iii) many were created by participants in the Industrial Revolution: canal companies, grain companies, industrial entrepreneurs, etc.

b) **functions: same as those of the London Goldsmith banks**: to provide the lubricant (bank notes) and fuel (working capital financing) for the Industrial Revolution

i) deposit and transfer banking (cheques)

ii) lending on fractional reserve system (1/3 reserves)

iii) discounting promissory notes: most important function: as seen in last lecture

iv) issuing banknotes: important because Bank of England notes did not circulate outside of London (no br branches in which to cash B of E notes)

c) **Role of the London banks:** acted to transfer savings surpluses (received on loan) from rural agricultural banks by relending them to country banks in industrial areas where those funds were needed for lending

d) **Faults and Weaknesses of the English Country Banks**

i) **Bank of England monopoly on joint-stock banking:** restricted them to being 6-member partnerships

ii) **result:** most were small, undercapitalized banks (while London banks had had a century to grow by profit-reinvestment and amalgamation: only 25% of capitalization of London banks

iii) **frequent bankruptcies, bank failures, and 'runs on the bank' became common:** Gresham Law of finance: 'bad banks drive out good banks' by causing panics

iv) **had no access to a Lender of Last Resort (i.e., Bank of England) before 1797 (see above).**

6. Banking in Scotland to 1825:

a) **Scotland's Advantages**

i) no restrictions on bank sizes: no limitations on number of partners

ii) **Joint-Stock banking had no restrictions:** Scotland had three large chartered joint-stock banks in 18th century and two more in early 19th century: all with limited liability

b) **development of the branch banking system**:

i) so that the highly competitive joint stock-company banks created branches in all the major towns and cities of Scotland (as did some large partnership banks)

ii) if one branch encountered difficulties in discounting or bad loans, it received an infusion of funds to shore up reserves from the head office

iii) Only one bank failure during the Industrial Revolution: Ayr Bank (1772), which had no branches

c) **England in 1825:** Commercial Crisis and bank failures of 1824-25 forced Parliament to remove restrictions on English banking and permit adoption of the Scottish model: to be seen in a later lecture

7. **Financing the Industrial Revolution:**

a) **joint-stock companies**: were largely unavailable for financing capital formation: except for the canal companies (whose formation required private acts of Parliament)

b) **commercial banks:** largely restricted to financing working capital, chiefly by discounting commercial paper, but also by lending (fractional-reserve system)

c) **mortgage and insurance companies:** played a major role in financing fixed capital formation

d) **The Private Business Firm: Self-financing the Industrial Revolution**

i) family members and partners pooled capital
ii) borrowing: from mortgages and personal loans
iii) profit reinvestment: i.e., profits not consumed by reinvested: see the Weber-Tawney thesis

e) **Low levels of capital formation during the Industrial Revolution**:

i) does this reflect institutional impediments to capital investment?

ii) or the relatively low-cost capital needs of early industrialization: especially in textiles?

iii) Phyllis Deane: from 1760-80: only 5% -6% of NNI invested in Net Domestic Capital Formation, rising to 8% by 1830, and surpassing 10% only from the 1830s, with railroads

iv) Finestone: higher estimates, but include housing stock and gross capital formation: not really comparable

IXa: Week no. 9: Lecture no. 8: 7 November 2012

Coal and Steam Power in the Industrial Revolution:

1. **Vital Importance of Coal for Modern Industrialization: its essential ingredient**:

a) **"An Industrial map of Europe in the 19th century was essentially a map of its coal-fields":** i.e., urban industrialization was almost everywhere concentrated around coal fields

b) **Anthony Wrigley:** importance of this historic shift from an organic to a mineral based-economy: from an economy based on wood, water, and wind to one based on coal and iron

i) **England's shift from an industrial economy based on wood and water to one based on coal:** was the first stage of modern industrialization:

ii) **beginning in the 16th century:** thus giving England a two-century head-start over the rest of the world

iii) **importance of coal in 18th-19th century industrialization:**
(1) coal to produce steam power
(2) coal purified into coke: to permit the revolution in iron-making and later steel-making

(3) coal and steam for the 19th century transportation revolution: in iron built steam powered railways and steam shipping (iron, then steel ships)
(4) coal-fired steam turbines: for both shipping and generation of electrical power
(5) the chemicals revolution: thousands of new chemicals extracted from coal-tars

2. **The Development of Steam Power in the 18th century:**

a) **what steam power replaced (ultimately):** animal power (horses and oxen); water-power; wind-power (in both wind-mills, and for sails on sailing ships).

b) **key motivations to develop steam powered engines:**

i) **16th-17th century fuel crisis:** high prices for wood led to increased demand for coal

ii) **problem:** increased coal mining meant deeper mine shafts ==> encountering flooding

iii) **solution:** more efficient pumps to pump water out of mine shafts (see lecture notes)

c) **key innovations in steam power:** in England (based on continental experiments)

i) **Thomas Savery:** 1698: steam-powered pump: did not work, but important for next innovation

ii) **Thomas Newcomen:** 1697-1712: steam-powered atmospheric engine:
(1) proved highly practical for coal-mines, to operate water-pumps: using cheap pit-head coal
(2) but too costly and inefficient to be used elsewhere): involved alternate heating and cooling of the piston cylinder (to produce the vacuum)

iii) **James Watt:** inventor of the successful steam engine
(1) 1763: working for Dr. Black at University of Glasgow: given a Newcomen engine to repair
(2) 1776: perfected an efficient practical steam engine (using a separate condenser to create the vacuum, while the piston cylinder kept permanently hot)
(3) In partnership with Matthew Boulton and Wilkinson: first used in their coal mines in Staffordshire and his Blast Furnace (iron smelter) in Shropshire
(4) 1781-82: double acting steam engine: using both steam power and atmospheric pressure (against vacuum)
(5) 1782: rotary steam engine, using flywheel and crank
(6) 1795: Soho Foundry (with Boulton), in Birmingham, to produce commercial steam engines

d) **economic importance:**

i) **economized on all three physical factors of production:** labour, land, and capital (see notes)

ii) **essential for urban industrialization:** in providing a far more mobile and elastic source of mechanical power that was not tied to water (river) or other sites

iii) **not the founder of the factory system, because original cotton mills were based on water-mills:** but did become, from 1820s, essential source of efficient power in urban factories

iv) **applications:** to be seen in next lectures on metallurgy (iron), textiles (cotton), railroads and steam shipping

IXb. Week no. 9: Lecture Topic no. 9: on 7 November 2012

The Industrial Revolution in Iron Manufacturing (to 1830): a Revolution in a Capital Goods Industry

1. **Introduction**

a) **The twin spearheads of modern industrialization, everywhere in the world:** (beginning with the British Industrial Revolution:

- (1) Metallurgy — iron, and then steel;
- (2) Textiles: chiefly cottons, then woollens and linens

b) **Importance of iron for modern industrialization:**
(1) as the chief building blocks of modern industrialization – for machinery, plants, buildings, bridges, railways, steam-ships, etc:
(2) and thus as a capital-goods manufacturing industry — in contrast to cottons, as a consumer-goods industry
(3) difference reflected in export statistics: iron exports were minimal before the Railway Age of the 1820s (and after), while cotton became Great Britain's overwhelmingly dominant export

c) **the chief forms of iron:** as indicated by carbon contents
(1) wrought iron: with about 0.1% carbon (almost pure): as the oldest and most widely used form of iron
(2) cast iron: with a high carbon content – 3% - 5%: product of the late-medieval introduction of the blast furnace (see below)
(3) steel: purified iron with 1% carbon added: the ideal form of iron, but extremely costly before the mid 19th century – and thus a luxury metal (reserved for miliary and medical needs).

d) **the importance of both coal and steam power for both the metallurgical and textile industries:**

i) **purified coal in the form of coke:** as the essential fuel to produce iron (and then steel)
ii) coal-fired steam engines: to power the machinery in both industrial revolution
iii) thus continuing the Wrigley theme: of the shift from an organic (wood) to a mineral (coal) economy.

2. **Iron manufacturing before the Industrial Revolution:**

a) **the ancient 'direct' process of iron-making:** iron-winning:

i) **the essential process involved the use of a carbon fuel:**
(1) to effect a chemical reaction to liberate iron from its natural form of iron oxide (Fe_2O_3): using wood charcoal as the purest form of carbon fuels
(2) the carbon combined with the oxygen to produce carbon dioxide (CO_2) to liberate the iron (Fe) from the Ferric Oxide compound (iron ore): $3C + 2Fe_20_3 \Rightarrow 4Fe + 3CO_2$

ii) **iron forges (Bloomery forges, Catalan hearths, etc.):** using wood-charcoal and water power
(1) The iron ore was heated in charcoal furnace or heath to welding heat
(2) water-powered tilt-hammers, from the 13th century (displacing human labour), pounded the near molten metal to bring the carbon (from the fuel) and other impurities to the surface, to be burned off
(3) final product, very costly, was purified wrought iron (see above)
(4) very small scale production: no more than 20 tons a year

b) **The Late-medieval 'indirect process': a preliminary industrial revolution with the Blast Furnace**

i) **Blast furnace - for smelting iron ores:** probably a German innovation, first found in eastern Low Countries in 1380s; but not introduced into England until the 1390s

ii) **An immense, 30-ft high, brick-kiln furnace:** using wood-charcoal fuels and water-powered bellows to create the blast of air, to achieve a high level of combustion ==> producing molten iron

iii) **smelting:** term given for the process of reducing iron-ore to its first usable stage, known as:
(1) pig iron – if the iron was to be further refined, into wrought iron
(2) cast iron - if used directly as a consumer product, by being poured molten into pre-shaped casts: for pipes, cannon barrels, pans, rods, etc.

iv) **military demands:** first major use, for producing cannons (but inferior to, but less costly than, bronze cannons)

v) **refining - the second stage:** in finery forges:
(1) using wood-charcoal fuel and water-powered bellows and tilt hammers (as in the 'direct process', described above).
(2) to decarburize the iron (carbon from smelting) and purify it into wrought iron
(3) much smaller scale than blast furnaces, though became larger than the earlier iron forges

vi) **economic significance of the blast furnace:**
(1) vastly reduced cost of smelting iron ore into basic iron, with large scale production
(2) created a truly capitalist iron industry: in which a capitalist had the resources to invest in or create a blast furnace (with hydraulic machinery), to acquire the raw materials (iron, charcoal), hire the labour, and market the finished products
(3) the earlier direct process using small forges were non-capitalist artisan industries in which the skilled craftsmen owned the blast-furnace, the tools, and raw materials but also performed essential labour.

c) **The Tyranny of Wood and Power**: limitations to growth and incentives for innovation

i) **the initially impressive expansion of the English iron industry:** from the 1490s, could not be sustained after the later 16th century, when industrial growth rates slowed down, and industry reached a plateau, by the Civil War era of the 1640s

ii) **Dual problems of the tyranny of wood and water:** both Ashton and Nef (read lecture notes)
(1) dependence on ever costly wood-charcoal fuels for both smelting and refining,
(2) dependence on water power for powering the bellows in both the blast furnace and the forge, and the tilt-hammers in the refining forges.

iii) **The wood-charcoal problem:**
(1) evidence shown in graphs and tables (lecture notes) for soaring wood and charcoal prices
(2) but Nef and Ashton wrong in contending that it occurred in the century 1540-1640: instead new evidence shows that a fuel crisis emerged only after the 1640s, and then became truly severe, with a widening gap between wood-charcoal and coal fuels,
(3) Statistics of smelting costs: that over 70% of the costs were in the wood-charcoal fuels
(4) 'friable' nature of charcoal: that charcoal cannot be transported, because it will crumble into useless dust if agitated or shaken during transport ==> so that the charcoal had to be created at the forest site
(5) that meant that the iron industry had to be small scale, dispersed and scattered through the countryside

where woodlands were more readily accessible
(6) The coal-fired reverberatory furnace, invented (Italy) c. 1540, could not be used with coal fuels,

- the coal problem: a very dirty fuel, with many contaminants that would corrupt and degrade any products being manufactured from it (i.e., from its combustion gasses)
- solution: the reverberatory furnace, which isolated combustion gases, while reflecting the heat on to the product being manufactured, as used in many other 16th- and 17th-century industries: brewing, soap-making, dye-making, brick and paper making, gunpowder, brass and metal finishing, etc.
- reason: because the carbon in the fuel had to be in direct contact with the iron ore in order to liberate the iron from the oxygen in the Ferric oxide compound

iv) **the water-power problem:**
(1) water-power sites also had to be scattered and rural where opportunity costs of locating water-mills were lower (far lower than in urban areas)
(2) water-power discontinuous: with winter freezing and summer droughts, often available only for 35 weeks a year

v) **dual tyranny dictating rural dispersion and small scale units:**
(1) rarely were there to be found industrial sites (close to iron deposits) that had sufficient supplies of both wood-charcoal and water power to justify side-by-side location of both furnaces and forges
(2) therefore another reason why the 17th century industry was scattered with small scale units in the countryside

vi) **Increasing dependence on imported Swedish and Russian iron:**
(1) by early 18th century, these imports accounted for over half of domestic English consumption
(2) Swedish and Russian advantages: no tyranny of wood and water: ample supplies of both in sparsely populated iron-making regions of both countries (with higher grade ores)
(3) English problem: danger that these foreign supplies, coming via the Baltic, could be cut off in times of war.

3. **The Industrial Revolution in Iron Manufacture: the use of coal throughout**

a) **The revolution in smelting:** coke-fired blast furnaces: Abraham Darby (1709)

i) **the ultimate answer to the fuel problem was to use coal in its purified form:** known as coke (coal that is burned to a carbon residue in an airless furnace)

ii) **Abraham Darby succeeded where many had failed, in previous decades, around 1709:** a coke-fired smelter to produce pig or cast iron

iii) **problems: why no revolution followed: why no one else built coke-smelters before the 1760s**
(1) because initially still higher cost than wood-charcoal blast furnaces
(2) because the process did not remove the silicon from the iron, thus adding an extra refining costs

iv) **the subsequent victory of coke-fired blast furnaces (smelters):**
(1) continued fall in coal prices (thanks to Newcomen's steam-powered drainage pumps), while wood charcoal prices continued to soar
(2) technological innovations in producing the blast: vastly cutting fuel costs (all by Scottish inventors)

v) **John Smeaton:** 1760: developed water-powered piston air pumps to replace the air bellows

vi) **James Watt:** 1776: application of his steam engine to John Wilkinson's blast-furnace with piston air pumps: the decisive breakthrough producing the real revolution in producing pig iron

vii) **James Nielsen:** the hot blast, in pre-heating the air before entering the blast furnace.

viii) **the victory of cast iron:** Darby's process, while not revolutionizing iron production, did produce far superior forms of cast iron because of the silicon residues, which acted as sealants to prevent fissures.

b) **the revolution in iron refining**

i) **victory of coke-fired blast furnaces (smelters) created a severe imbalance:** too much pig iron to be refined by current small-scale refineries (finery forges): hence one incentive for innovation

ii) **military incentive:** offered by the British navy: sponsored a competition, with large prize, to those who could produce good quality, low-cost bar iron, to remove England's dependency on imported iron'

iii) **Wood Brothers:** the 'Potting and Stamping' process invented in the 1760s (read the lecture notes): did reduce refining costs, but enough to produce a revolution

iv) **Henry Cort and Peter Onions:** in 1783, independently produced a viable solution in response to the British Navy's competition: known as the Puddling and Rolling Process
(1) Puddling: pig iron was heated in coke-fired reverberatory furnace (no direct contact with carbon need – the reverse was true: the elimination of carbon), provide reflected heat to burn out the carbon (decarburize) and other impurities, leaving a semi-liquid or jelly-like form of iron in puddles at the bottom of the furnace
(2) Rolling: the semi-liquid iron was forced through water-powered rollers to squeeze out all remaining impurities

iv) **James Watt's rotary steam engine:** in 1788, was applied to Wilkinson's rolling mills

v) **Richard Crawshay:**
(1)1790s, introduced many improvement in Puddling & Rolling process in the Cyfarthfa iron-works in South Wales:
(2) increasing the scale of output to 13,000 tons a year (mean statistics).

c) **Economic Consequences of the Industrial Revolution in Iron Making with coal throughout**:

i) **in general:** enormous increase in industrial scale, industrial concentration, and geographic concentration around Britain's major coal fields (ratio of 10 tons coal to 1 ton of iron)

ii) **Vertical Integration:**
(1) capital: as wealthy capitalists acquired coal mines, iron mines, blast furnaces (smelters), refineries, slitting mills (for finished iron)
(2) physical integration: of smelting and refining together, so that smelted pig iron be delivered directly to the refineries without having to expend extra fuel in reheating the iron

iii) **horizontal integration:** from amalgamation of iron firms into a few giant firms (15 firms controlled majority of iron production by 1815)

iv) **geographic concentration:** around major coal fields of South Wales, West Midlands (Shropshire,

Staffordshire), Lancashire, Northumberland, and then (from 1830s), also Scotland

v) **industrial organization consequence: oligopolistic competition**:
(1) with a few large producers, enjoying high barriers to entry (and thus competition) producing a homogenous product (i.e., bar iron same by all producers)
(2) highly unstable, cut-throat competition ==> leads to cartel organization

vi) **enormous increase in output (as measured in tons of pig iron):** from 37,000 tons in 1760s to 3,106,000 in the 1850s

vii) **But iron was only a very small, marginal export until the coming of the railways in the 1830s:** with exports of railway iron**:** see the tables in the published online lecture**.**

X. Week no. 10: Lecture Topic no. 10, on 14 November 2012

The Industrial Revolution in Cotton- Textile Manufacturing: a Consumer Goods Industry (first part)

1. **Importance of Textiles (Clothing) in Human History:**

a) **textiles are consumed to meet one of the three basic human needs, as necessities:** food, clothing, and shelter
i) protection against the elements: cold, heat, rain, snow, ice, sand storms, the sun (melanomas)
ii) protection against physical abrasions
iii) protection against a sense of shame: nudity as a social taboo in most (not all) societies

b) **luxury needs provided by textiles:** assertion of personal social status (social ranks) and social worth

c) **major types of textiles in human societies, past and present:**
i) wool-based textiles: woollens (many costly) and worsteds (most relatively cheap): predominant in medieval and pre-Industrial Revolution Europe (now rare, in 21st century)
ii) silks: the most luxurious of all fabrics (though rivalled by some luxury woollens)
iii) linens: from cheap to costly luxury fabrics
iv) fustians: a hybrid mixture of linen (warp) and cotton (weft): originating in 10th-century Egypt
v) cottons: an industry in which Asians excelled, but in Europeans gained mastery (temporary) thanks only to the technology of the Industrial Revolution

d) **Contrast with the Iron Industry of the Industrial Revolution era:**

i) **Iron Industry:** a capital-goods industry
(1) metamorphosis (transformation) from an artisan handicraft industry into a capitalist industry took place (in England) in the 16th century with the introduction of the Blast Furnace: no fundamental change in Industrial Revolution era except for very large scale increases
(2) chiefly chemical processes of innovation in using coal fuels, in the form of coke throughout, for both smelting and refining
(3) coal-fired steam power to operate machinery of smelting and refining: same as in cottons
(4) Industrial concentration around coal fields, with both vertical and horizontal integration
(5) Very large-scale production with oligopolistic competition: price-makers
(6) only marginal role in English foreign trade before the 1830s

ii) **cotton industry:** a consumer-goods industry
(1) capitalist metamorphosis took place in the Industrial Revolution era: from a rural, small-scale handicraft industry with production scattered across the countryside to an urban factory-based system of production using steam engines to power many and different machines
(2) But still smaller scale than found in the iron industry, with spinning and weaving mills or factories often kept separate
(3) pure competition (only industrial example): firms were price-takers
(4) major role in British foreign trade, accounting for 46% of exports by 1820s (maximum share, with relative decline, but not absolute, thereafter)

2. **Origins of the British Cotton Industry of the Industrial Revolution era:**

a) **a fustians industry:** (Egyptian origins: 10th century) that had spread to Italy, Germany, and the Low Countries during the medieval and early modern eras

i) One of the New Draperies that Flemish Protestant Refugees fleeing Spanish conquest and Catholic persecutions brought into East Anglia (Norfolk, Suffolk) from the late 1560s (Revolt of the Netherlands)

ii) industry had migrated NE to Lancashire and Scotland: in search of cheaper labour

iii) nature of the fustian textiles
(1) warp (foundation yarn on the loom): made from linen fibres (extracted from flax): strong
(2) weft (the yarn woven between the separated warps): made from soft cotton fibres (weak – too weak to be used for warp yarns)

iv) South-Asian (Indian) supremacy in cotton textiles
(1) based on continued use of the millennia-old drop spindle and distaff: which had always produced the strongest and finest yarns, whether woollen or cotton: read the lecture notes
(2) but drop-spindle spinning was very labour-costly: 18th-century Indian hand spinners took over 50,000 hours to produce 100 lb of cotton compared to 135 hours for Robert's self-actor steam mule of 1825
(3) European spinning wheels: introduced (from Muslim cotton industries) in late 12th & 13th centuries
- vastly increased labour productivity
- but produced much weaker and lower quality yarns
- originally used only for wefts in woollen industry

(4) Saxony Wheel: major improvement in 15th century, for spinning woollen/worsted warps – but not cotton.

b) **manufacture of fustian cloths:** processes

i) flax: retted and combed to produce linen fibres for spinning

ii) cotton: carded (brush-like multi-pronged instruments) the fibres for spinning

iii) spinning linen warps

iv) spinning cotton weft

v) weavers: used linen warp and cotton wefts to weave the cloth (see notes and diagrams)

c) **Industrial Production by the Putting-Out or Domestic System of Production:** a hybrid of mercantile

capitalism and artisan handicraft manufacturing

i) **Merchant clothier:** the mercantile-financial capitalist entrepreneur who supplied the raw materials (linen and cotton), the working capital needs, and the marketing of the finished fustian cloths:

ii) **The Master Weaver:** the industrial entrepreneur or sub-contractor employed by the clothier
(1) he received or 'bought' the raw materials on credit from the clothier
(2) he 'put out' the raw materials to the various artisans, chiefly female, who worked in their own homes or cottages in the surrounding countryside: the flax retters and comber, the cotton carders, the flax spinners (warps) and the cotton spinners (wefts)
(3) the weaver and his family or hired employees then wove the warps and wefts into fustian cloths
(4) the finished product was sold to the clothier

iii) **incomes earned in this putting-out or domestic system:**
(1)the weaver's income was in the form of profits, not wages,
(2) those whom he employed received piece-work wages, thus according to their output, since they were unsupervised

iv) **note that the capital costs of production :** are largely born by the artisans themselves, working in their own homes

v) **this putting-out system, in cotton-fustian textiles, was almost entirely rural:** though 'putting out' systems can also be found in early-modern urban craft industries as well

vi) **the metamorphosis from a rural putting-out system:**, using no powered machinery, to an urban-based factory system of production using steam-engines as a central source of power: the product of the two, separate industrial revolutions in spinning and weaving, to be seen in the next lecture.

3. **Domestic and Foreign Markets for the English Fustians Industry:**

a) **Role of English Mercantilism: the Calicoes Act of 1721:**

i) British East India Company imports of South Asian calicoes and muslins provoked strongly hostile reaction from the established textile industries: woollens and worsteds (though calicoes were a substitute only for worsteds – not woollens – as a cheap and light fabric)

ii) clamours for protection led to increasing restrictions on Asian textile imports and finally the Calicoes Act of 1721, which banned not only the imports but also wearing of foreign calicoes (but did not affect the re-export trade in calicoes and muslins)

iii) chief beneficiary was the new English fustians industry, whose products were the closest substitute for imported calicoes: so it gained control over the domestic market

iv) but the fustians industry was not competitive abroad, in either quality or price: not unless it changed its technology to produce an all cotton cloth

b) **The role of India and Africa:** for foreign trade in textiles

i) Calicoes Act had not prohibited import of Indian yarn, which could have been used to weave substitute

calico products within England

ii) But disintegration of the Muslim Mughal Empire after death of Emperor Aurangzeb in 1707 and ensuing civil wars with Hindus and Sikhs seriously disrupted trade in both calico textiles and cotton yarns

iii) Royal African Company:
(1) had been re-exporting large quantities of calicoes to West African (in purchasing slaves)
(2) with a lack of calicoes, had commissioned English fustian producers to produce all-cotton imitations of calicoes and muslins, but they were so inferior that they could not be sold

iv) hence incentive for technological change in the English fustians industry – all the more so when relative peace in India, by 1740s, restored re-export trade in calicoes and muslins

4. **The Revolution in Spinning**

a) **Wyatt and Paul:** 1738: the first attempts to mechanize spinning

i) after a decade of experimentation, developed the water-powered Spinning Roller to spin cotton yarn, and set up a factory

ii) proved to be a failure, but provided a key source for future successful innovation

iii) note that their experiments took place during the disruptions of trade in both calicoes and cotton yams

b) **Hargreaves Spinning Jenny:** of 1764 to 1770 (when patented)

i) vast improvement on the traditional spinning wheel to operate not one but up to 100 spindles

ii) moving carriage, with the driving wheel: when moved further away from the spindles, it attenuated the cotton yarns, and thus made them finer

iii) produced a cotton yarn as fine as any made in South Asia, but a weak yarn suitable only for the weft

iv) quickly displaced traditional spinning wheels in making weft yarns

v) used no mechanical power and required little capital: fitted in well with the rural putting-out system, with female spinsters working in their own homes.

c) **Arkwright's Water Frame of 1769:**

i) Arkwright not the inventor: stole the idea from John Highes

ii) used the basis of the Wyatt-Paul spinning rollers to have water-powered rotating 'throstles' spin the yarn

iii) result a cotton warp yarn could now be spun, one with sufficient strength, but lacking fineness to compete with Indian yarns: so that all cotton textiles were made from Water-Frame warps and Jenny wefts

iv) Arkwright also established first successful water-powered factory in cotton textiles

v) He also invented a water-powered carding machine to prepare raw cotton for spinning

d) **Crompton's Mule of 1774-1779**

i) a hybrid of the Spinning Jenny and the Water Frame: using the multiple spindles and moving carriage of the Jenny (to provide fineness) and the water-powered throstles (to provide strength

ii) England could now produce both warps and wefts of sufficient fineness and strength to be woven into all-cotton cloths rivalling the best South Asian textiles

iii) productivity gains: when Indian hand-spinners (drop spindles) took over 50,000 hours to produce 100 lb of spun cotton yarn, Crompton's original 1779 mule took only 2,000 hours, which he reduced to just 300 hours with his water-powered mule of 1800

e) **Robert's Steam-Powered 'Self-Actor' Mule of 1825:**

i) replaced water-power with effective, smooth running steam engines

ii) reduced time to spin 100 lb of cotton to 135 hours (40 hours today)

f) **Thorp's Ring-Spinning of 1830:**

i) an American innovation that superseded the mule everywhere but in Great Britain, before World War I (and in Britain after World War I).

ii) much lower cost, but not able to compete with mules in very fine (high count) yarns

f) **consequences of the victory of steam-powered mules in Great Britain**

i) reduced cost of cotton yarn by over 90% by 1830s

ii) principal factor in making the cotton textile industry an urban industry based on coal-fired steam powered factories

iii) democratic revolution: so reduced costs and prices of cotton textiles that they became cheaply available for mass consumption by even the lower strata of the working classes of Great Britain

iv) gender change: mule-spinners were exclusively male, who totally displaced female wheel and jenny spinners

v) also destroyed the cottage industry in spinning, at least

5. The Revolution in Weaving: a much longer process

a) **the revolution in spinning:** created a severe imbalance in the production process since cotton cloth manufacture obviously required the combination of spinning and weaving

b) **Cartwright's Power Loom of 1785-87:**

i) first attempt to resolve this problem: with a water-powered mechanized loom, and a weaving factory

ii) but the machinery was a failure: in causing damage to the yarns while weaving

iii) Cartwright went bankrupt when his factory failed: but provided the core solution

iv) the problems of mechanizing weaving were not fully resolved until the 1830s

v) Robert's Self-Actor Steam Power Loom of 1822-30: was the key break through (perfected by Kenworthy and Bullough in 1842)

c) **Why did weaving take so long to mechanize?**

i) very elastic supply of rural hand-loom weavers, because of Enclosures: number tripled from 1790s to the 1830s

ii) relative costs: weaving labour became cheaper while the machinery was far more expensive than in spinning factories

iii) trade cycles:
(1) meant that factories were often underemployed and not economic to run
(2) by 1840s, British exports and market power created sufficient stability to justify factories

iv) bitter opposition of male handloom weavers to factory employment and factory discipline
(1) burning factories to the ground was another disincentive to investing in power looms
(2) not a problem in spinning factories: because well-paid mule spinners had displaced females

6. The Cotton Gin:

a) **Eli Whitney:** a Connecticut Yankee: invented the cotton gin in 1792

i) machine to extract the short-fibred cotton from its boll, which had previously been prohibitively expensive

ii) but short-staple cotton was the only type that could grow in the US South (apart from some long-stapled Sea Cotton, grown in islands off the Carolina coasts)

iii) created a vast plantation economy and a vast expansion in African slave labour: as the major economic mainstay of the southern American states to the Civil War

b) **American exports:**

i) previously Great Britain had obtained its cotton from the eastern Mediterranean (Palestine-Syria) and India

ii) Now the U.S. became Britain's chief cotton supplier: exports rose from 0.5 million lb in 1793 to 120.0 million lb in 1820

iii) Note that Britain supported the South during the American civil war

7. Economics of the Factory System of Production in Cotton Textiles: potential gains

a) **technology: a central source of mechanical power**

i) originally water-power (hence cotton 'mills') and then steam-power

ii) shift to steam power meant a shift from rural to urban locations

iii) steam power to drive many machines of the same kind and also different machines: in spinning, carding, and weaving (though not always)

b) **increasing returns to scale:** economics of large-scale production, in comparing urban factories with the rural putting-out or 'cottage' system of production

c) **savings in transaction costs:** by concentrating production in urban locations, near centres of finance and marketing

d) **labour economies from factory supervision discipline:** impossible in rural putting-out system

e) **substituting relatively cheap capital for expensive labour:**

i) low wages do not mean low labour costs: have to be measured in terms of productivity

ii) rural putting out an inelastic system of production, in which costs rose sharply as clothiers ranged further afield to find carders, combers, and spinners

iii) enormous productivity gains from capital investment in steam-powered machinery

f) **Questions of Industrial Integration and Industrial Scale:** pure competition

i) unlike the iron industry, the cotton industry did not experience complete industrial integration
(1) 1856 statistics for Lancashire: 41% of factories were for spinning only, 24% were for weaving only and thus only 35% had integrated spinning and weaving within one factory
(2) reflects in part the long-delayed mechanization of weaving, before which many spinning factories had been established
(3) also reflects fact that many spinning factories specialized in very high-count fine yarns for export

ii) therefore, while the Industrial Revolution in cottons had created a metamorphosis from rural handicraft to urban capitalistic production, it did not produce the same scale changes as in the iron industry

iii) very large number of relatively smaller scale factories: with a total of 1,451 firms in Lancashire alone in 1856

iv) hence the essence of pure competition in the cotton industry
(1) producers selling homogenous, interchangeable products (at least in terms of fineness categories_)
(2) so many sellers and so many buyers that none could influence the price
(3) sales by weekly auctions.

8. Why did the Industrial Revolution take place first in cottons, before woollens? Read the lecture notes

XIa. Week no. 11: Lecture Topic No. 11: on 21 November 2012

Prices, Economic Trends, and Business Cycles in the British Economy, 1815 - 1873

This lecture was not given in class, but is available online (but not as a summary)

XIb. Week no. 11: Lecture Topic No. 12: on 21 November 2012

British Banking, Finance, and Business Organization: 1815 - 1873:

1. Problems of English Banking to the 1820s:

a) **small size and thus small capitalizations:**

i) **The Bank of England's monopoly on joint-stock banking, reinforced by the 1720 Bubble Act (ban on joint-stock companies without charters):** meant that all other English banks were restricted in size to either family firms or six-member partnerships

ii) **Problem not severe for London banks:** which had a full century to grow and amalgamate - from the 1660s to the 1760s.

iii) **But severe for the Country Banks – those outside London:** for, in having sprung up like mushrooms during the Industrial Revolution era, they all had small capitals, on average only 20% of those of London banks.

iv) **Small capitalizations** meant dangerously small reserves to back deposit and note issues

v) **Gresham's Law of banking:** the failure of one 'bad' bank – in discounting bad commercial papers and/or in making bad loans – could cause a panic and thus a 'run on the banks': ruining all the good banks as well, none of whom had reserves to cover all deposits and notes (nature of fractional reserve lending).

vi) **Contrary Example of Scotland:** which, not bound by English law, had five chartered joint-stock banks and many large partnerships banks
(1) large size and capitals permitted branch banking: so that the mother bank could bail out any of its branches encountering difficulties by replenishing its cash reserves
(2) In this era, only one Scottish bank failed (Ayr bank of 1772): with no branches

vii) **Overseas Commercial crisis produced a financial crisis in England:** so that 93 of England's 715 small banks (13%) failed, while none failed in Scotland

b) **the problem of uncontrolled note issues:**

i) **Crisis of 1797, as seen before, led to the era of the 'Paper Pound':** when the gov't allowed the Bank of England and indeed all other banks to suspend convertibility of notes into gold (and vice versa).

ii) **Bank of England and other banks:** also lowered their bank-note denominations from the £5 minimum to £1 (or even less, in Scotland).

iii) **That led to a horrendous proliferation of bank notes**, especially pound notes, which was blamed for the severe inflation that lasted until the end of the Napoleonic Wars.

iv) **David Ricardo's Bullion Report of 1820:** that the gov't must restore full convertibility and raise the note issues

2. The Bank Act of 1826: to resolve both of these problems and the financial crisis of 1824

a) **Repeal of the Bubble Act in 1825:**

i) **was actually the first step, in permitting the free formation of new joint-stock companies,** without the requirement of incorporation charters

ii) **but that had no effect on banking,** because of the Bank of England's ongoing monopoly

b) **Bank Act of 1826:**

i) **thus abolished the Bank of England's monopoly on joint-stock banking:** to allow the same free formation of joint-stock banks, though initially only outside of London

ii) **also required the Bank of England to establish branches** outside of London - in major English cities

iii) **restricted the issue of bank notes to a minimum denomination of £5** (as before 1797) - except in Scotland

c) **Bank Act of 1833:** permitted London banks also to organize as joint-stock company banks

d) **Results:**

i) **sharp rise in the number of English joint-stock banks**, and a relative decline in partnerships banks (many of whom were taken over by joint-stock banks): number of joint-stock banks rose to 99 by 1850, with a peak of 122 by 1875 (thereafter dwindling to 41, by 1913)

ii) **number of branches rose to 576 by 1850**, with a continuous rise thereafter to 6426 in 1913 (thus from a ratio of 3.67 per joint-stock company in 1850 to 97.84 in 1913)

iii) **sharp drop in number of bank failures,** though bank failures were not eliminated.

3. The Bank Charter Act of 1844: most important banking legislation of the 19th century

a) **philosophical and theoretical background:** the Quantity Theory of Money, though then called the Currency School

i) **basic assumptions that governed Classical Economics** in the 19th century:
(1) that the quantity of money directly and immediately determined the price level and interest rates, which in turn determined, or was determined in turn, by relationship of exports and imports in foreign trade
(2) that money was to be in the form only coin and gold-backed bank notes – and thus that the only bank notes to be permitted to circulate were Bank of England notes fully backed by its gold reserves

ii) **the trade-money supply price - trade model:**
(1) If England experience a trade surplus, if export revenues exceeded import expenditures, gold would flow into the country, and be exchanged for Bank of England notes
(2) If the money supply therefore rose by 10%, prices would soon rise correspondingly by 10%
(3) Export prices would rise, thus curbing exports, while imports became relatively cheaper: so that, as imports exceeded exports in value, gold would flow out, the money supply would contract, prices would fall, thus restoring exports and equilibrium

b) **Provisions of the Bank Charter Act:** based on these assumptions

i) **to split the Bank of England into two separate and autonomous units:** the Issue Department and the Banking Department

ii) **The Issue Department:** with one sole responsibility
(1) to control the note issue: so that at any given time the total note issue of Bank of England notes in circulation was to equal and never exceed the gold bullion reserves + the Bank's capital stock of£14 million
(2) the note issue and foreign trade: if England experienced a trade surplus and influx of gold, that gold, sold to the Bank of England, would be exchanged for new Bank of England notes, thus expanding the money supply

- if England experienced a trade deficit, and gold outflow, merchants who purchased gold would surrender to the Bank the B of E notes, which would be burned, thus contracting the money supply
- Then Bank of England was to take over the note issue of all other banks, and no new banks would be allowed to issue any bank notes

iii) **The Banking Department:**
(1) was instructed to act as a normal competitive commercial bank, in lending and discounting, and to follow, not lead the market
(2) In essence, the Bank was now forbidden ever to act as Lender of Last Resort
(3) The Bank quickly did so and reduced the discount rate to attract business

c) **Faults of the Monetary Provisions of the Bank Charter Act:**

i) **Fallacious nature of the 19th century Quantity Theory of Money**
(1) The modernized version is more useful: M.V = P.y – in which M is the stock of money, V is the income Velocity of Money, P is the Consumer Price Index and 'y' is Net National Income (real, or deflated)
(2) Thus an increase in M could be offset by a reduction in M and a rise in 'y' (especially if Δ M ==> a fall in interest rates and expanded demand)
(3) But also ignores factor-price stickiness, so that such price do not fall with a decline in M

ii) **that gold and Bank of England notes were by no means the only forms of money:** in fact, one consequence was a marked increase in the use of cheques and deposit-transfers and the use of other forms of near money

iii) **gold supplies were not static:** the 1840s in fact marked major gold mining booms in both California and Australia, producing gold flows that ended up, partly, in London

d) **Major Faults:** the Bank Charter Act exacerbated instead of relieving economic crises

i) **The crisis of 1846-47:** the catastrophe of the Irish Potato Famine and grain harvest failures

(1) large amounts of gold flowed out to purchase foreign grains at high prices
(2) the gold outflow was not matched by any fall in prices, as predicted by erroneous theory
(3) If the act had been followed, the ensuing monetary and thus credit contraction would had led to economic catastrophe
(4) Instead, the gov't suspended the act and directed the B of E to lend freely, to shore up cash reserves of financial institutions: the exact opposite of the act

ii) **the same scenario ensued in the financial crises** of 1857, 1866, and 1873

iii) **Walter Bagehot:** in 1873, the year of that latest crisis, he published his classic *Lombard Street*, in which he contended that the major duty of the Bank of England was (again) to act as a Lender of Last Resort in times of economic crisis, and thus contrary to the Bank Charter Act

iv) **1878: the Bank of England officially sets its own discount rate,** instead of following market rates

v) **1890: Bank of England successfully intervenes** in the severe financial crisis to bail out the Baring Brothers Bank (which was not bailed out again, when it failed a few years ago).

vi) **Still the record is mixed,** because many directors still insisted that the Bank of England's chief duty was to its shareholders, as a private joint-stock bank

vii) **the Bank of England's full evolution into a modern central bank had to wait** until after World War II (when it was nationalized).

4. The Origins of the Modern Limited Liability Corporation:

a) **The Repeal of the Bubble Act in 1720:** as seen earlier

i) **permitted the formation of joint-stock companies,** without parliamentary approval, and without a charter of incorporation

ii) **charters of incorporation, with provisions for limited liability** (limited the investor's liability to the amount of capital subscribed, in buying shares – usually on margin, so that full amount was due), were still difficult and costly to obtain

iii) **just as canal companies had been the only exception, in receiving limited-liability charters of incorporation before the repeal of Bubble, so railway companies (next topic) were the major exception** before the Limited Liability legislation of the 1850s.

iv) **So most joint stock companies lacked such charters of incorporation and limited liability:**
(1) and therefore their shareholders were treated as partners under Partnership Law, bearing full and unlimited liability for debts and legal obligations of the company
(2) only those with connections and knowledge of the firm, and with wealth, were likely to buy shares

b) **Why the opposition to allowing limited liability?:**

i) **moral hazard (according to the modern concept):** the belief that if shareholders were protected by limited liability then those running the business firm would be far mor likely to undertake dangerous risks, engage in dangerous speculation, or even fraud: the heritage of the Bubble Crisis

ii) **adverse selection:** that if share-holders were protected by limited liability, then risk would be transferred to lenders and bondholders, who would likely demand higher interest rates. Note that risks always have to be shared between different types of investors

c) **The continental Société en commandite (began in French law, later 17th century):** offered an ideal compromise that would have dealt with both moral hazard and adverse-selection problems

i) **limited liability offered to all silent partners** or investors who took no active role in the firm

ii) **unlimited liability therefore for directors** and those investors managing the firm

iii) **but the British never, ever considered this continental model**. Why?

d) **Why Parliament finally accepted limited liability in the 1850s:**

i) **major changes in technologies that required vastly greater sums of capital:** to make enterprise viable

ii) **international competition encouraged increases in scale economies** to be competitive

iii) **realization that firms with large-scale capital requirements could not raise such capitals** by attracting savings of the risk-adverse majority of the middle classes

e) **Limited Liability of Legislation of 1856 - 1862:**

i) **1856:** Joint Stock Companies Act: any seven persons registering a joint-stock company, with a list of directors (names and addresses) and supplying an annual balance sheet, was given a charter of incorporation, offering limited liability to shareholders, without private acts of Parliament or any other costs

ii) **1857:** These provisions applied to joint-stock banks, initially excluded

iii) **1862:** provisions were extended to cover liability for bank notes (but only Bank of England issued bank notes in England, though two Scottish banks continued to do so).

iv) **Subsequently, some 5,000 joint stock companies** received such charters – and some failed.

v) **By no means all British firms wanted to be incorporated:** many family firms and partnerships refused for losing control and identity to shareholders.

XIc. Week no. 11: Lecture Topic No. 13A: on 21 November 2012

The 19th-century Transportation Revolutions: in steam-powered railroads and steam shipping:

1. The Revolution in Steam-Powered Railroads: the second transport revolution:

a) **importance for Great Britain:**

i) **completed first phase and introduced second phase of modern industrialization:** with far larger scale forms of industrial capital investments

ii) **completed Britain's national market integration:** only partially achieved by canals

iii) **but did NOT alter the industrial urban map of England:** previously established by the combination of coal-fields and canals

iv) **made the iron (later steel)industry a major export industry:** in the export of railway iron, locomotives, rolling stock (railway cars), etc.

v) **major factor in transmitting modern industrialization to the continent** and the rest of the world

b) **importance for continental Europe, the Americas, and Asia:**

i) **relatively much more important than for Britain:** since
(1) continental transport facilities were far more primitive – with fewer canals
(2) distances between industrial resources, cities, and ports were much greater

ii) **created not only integrated national but also continental market economies**

iii) **In essence railways for the first time made possible and feasible modern industrialization** elsewhere

c) **Origins of the Railroad in Great Britain:**

i) **canals:** first stage of the modern transportation revolution provided key problem: as natural monopolies they had become slow, inefficient, and costly (in exacting market rents)

ii) **George Stephenson:** completed others' experiments to achieve first cost-effective steam powered locomotive:
(1) 1825: the Stockton-Darlington Railway: competition proved that locomotive was superior to a stationary steam-engine pulling cars by a cable- but both with iron cars with wheels on flanged wrought-iron rails
(2) 1829-30: the success of the 'Rocket': the Liverpool-Manchester railway

iii) **railway building booms followed** in 1830-36, 1842-52, and 1860-72

d) **initial problems with British railways:**

i) **no standard gauge:** Stephenson used the traditional coal-mine gauge of 4 ft 8 in, while Brunel used the wider and far more efficient 7 ft gauge, to carry larger cars at faster speeds

ii) **Parliament in 1846:** made the Stephenson gauge the national standard (but other gauges lasted to 1890s)
iii) lack of state control and state planning or direction

iv) **result:** over 1100 railway companies were formed

v) **market forces, with amalgamations, and bankruptcies** reduced this number to 128 by 1900 (when four large companies dominated the national railway system)

e) **economic importance of railways in Great Britain:**

i) **capital formation:**

(1) major aspect and form of large-scale capital formation from the 1830s: £630 million invested by 1870
(2) In 1840s: railways accounted for 2/3 of all capital investments (7.5% NNI
(3) debate between Phyllis Deane and Charles Feinstein on levels of capital formation: read lecture notes

ii) **financial institutions:** shares of railway corporations, with limited liability provisions, opened up the London Stock Exchange and also the new provincial exchanges of Manchester and Birmingham to trading in industrial shares

iii) **Market Expansion and Industrial Scale:**
(1) by lowering both transportation and communications costs and time-periods (1838: the electric telegraph)
(2) by eliminating local monopolies that had been protected by high transport costs from long-distance competition ('tariff of bad roads'): so that far larger scale national firms could service the entire national market, eliminating such local, small-scale competitors
(3) by reducing the need for larger inventories of supplies, and hence saving on working capitals (to be used to enhance fixed capital formation)

iv) **major impact of the coal and iron (later steel) industries:**
(1) railway surveys: led to discovery of vast new coal and iron mines
(2) vast increases in coal consumption:
- coal, purified as coke, to produce iron
- coal-fired steam power in producing iron, operating locomotives
- coal for domestic consumption, as it became a much cheaper fuel to produce and transport

(3) vast increase in iron consumption:
- for railway tracks, locomotives, rolling stock, bridges and building
- export of railway iron for construction abroad

v) **impact on agriculture:**
(1) immensely beneficial for marketing perishable fruits and vegetables
(2) cost saving (and weight-saving) in transporting livestock
(3) vast increase in labour mobility, promoting urban industrialization, created labour scarcity in rural areas

vi) **Note: not until the 1870s did railways profit more from commercial cargoes than passengers:**
(1) from 1830s, canals responded by becoming far more efficient and competitive in transporting bulk cargoes
(2) narrow railway gauge and imperfections in technologies did not make cargo transports economically viable until improvements in and from the 1870s
(3) railway milage more than doubled, as did capital investments, from 1870 to 1914

XIIa. Week no. 12: Lecture Topic no. 13B: on 28 November 2012

2. Steam Powered Oceanic Shipping:

a) **importance:** created for the first time (though in combination with overseas railways) a truly integrated global economy: one that fostered or forced an international division of labour, and the operation of the law of comparative advantage – to the extent that Free Trade prevailed in the 19th century.

b) **particular advantages for Great Britain:** but chiefly only from the 1870s

i) allowed Britain finally to gain world supremacy in shipbuilding: from New England

ii) allowed Britain to gain world supremacy in international shipping, trade, banking, maritime insurance, and finance (especially in acceptance bills – bills of exchange):

iii) allowed Britain to import far more merchandise than she exported: from these revenues from shipping, banking, finance, and insurance

iv) allowed Britain similarly to gain naval supremacy: so necessary to protect international shipping lanes

v) forced Britain, but only in conjunction with Free Trade and the Gold Standard (next day's lecture) to obey the Law of Comparative Advantage: to shift from agriculture to industry, trade, and banking – by importing foodstuffs far more cheaply than they could be produced at home.

c) **origins of the Transportation Revolution in Steam Shipping:**

i) when the Dutch lost their supremacy in shipbuilding, in later 18th century, they lost it not to England, but to New England (the US), with comparative advantages in timber and ship-building skills: as seen in the 19th century supremacy of the Yankee Clipper Sailing Ships

ii) 1783: French experiment on the Saone river, near Lyon: but did not succeed

iii) 1788-89: first successful use of steam power in Great Britain, for primitive paddle wheelers, in Scotland

iv) 1807: an American, Robert Fulton credited with perfecting the steam-powered paddle-wheeler for commercial use on rivers and for coastal shipping

v) **problems with paddle-wheelers for 0trans-oceanic shipping:**
(1) wooden ship hulls and iron machinery could be damaged or destroyed in ocean storms
(2) machinery and immense amounts of coal fuel required left too little space for cargoes & passenger
(3) inefficient: required far superior form of steam-powered machinery and also needed iron

d) **Coming of Iron Built Ships:** why iron was so necessary

i) far greater strength and resistance to high powered stress from more powerful machinery

ii) lower weight: an iron built ship cost 25% less than a comparable sized wooden (oak) ship

iii) far more durable, and less likely to suffer leaks or storm damages

iv) by 1840s, iron-built ships cost 15% less to build than oak-built sailing ships

v) iron construction permitted and promoted far, far large scale ships

vi) first uses of iron-build ships, from the 1840s and 1850s: the British Navy, the East India Company, and the Trans-Atlantic Inman and Cunard Lines

e) **Brunel and Steam-Powered Ships:**

i) 1836: Isambard Brunel (owner of the Great Western Railway, with the 7 ft gauge): invented the steam-powered screw propeller (as with all modern ships): but needed more powerful steam engines, and iron

ii) 1854: first practical compound steam engine for ocean shipping: followed by triple and quadruple maritime steam engines in the 1860s and early 1870s

iii) 1884: Charles Parsons invented the steam-turbine for maritime shipping

iv) results: 10-fold increase in power, with 90% reduction in fuel costs, and 60% reduction in freight rates, by 1900

f) **Trans-Atlantic commercial shipping:**

i) **Inman and Cunard Lines:** offered far superior passenger shipping, compared to 'steerage' offered on sailing ships
(1) individual staterooms, beds, linen, soap, etc
(2) three cooked meals a day, with fruits and vegetables (against scurvy)
(3) on board doctors and nurses

ii) **cut passenger fatalities by over 90%** from what had been common on sailing ships: at double the price

iii) **vast global importance:** in promoting cheap international migrations, especially to the Americas and Australia-New Zealand

iv) **comparisons of the Sirius in 1838 (wood:** with sail and paddle wheel) vs. Mauritania in 1907 (steel, with steam turbines:
(1) tonnage: Sirius - 700 tons, vs. Mauritania - 31,938 tons
(2) horsepower: Sirius - 320 HP, vs. Madonna - 70,000

XIIb. Week no. 12: Lecture Topic no. 14: 28 November 2012 (final lecture of Semester I)

Great Britain and the Age of Free Trade: Finance, Foreign Trade, Capital Exports, and Imperialism in the 19th Century (1815 - 1914):

1. British Foreign Trade and the Free Trade Movement:

a) **follows logical from the previous lecture on the two steam-powered transportation revolutions:**
- in railroads (national & continental economies) and
- oceanic shipping (global):
- the Free Trade Movement made possible a more globalized economy made physical possible by these transport revolutions

b) **British foreign trade in the 18th century involved following economic transformation:**

i) an almost exponential, 25-fold expansion in the real value of world trade from the 1840s, for which Britain was a major beneficiary, especially in world shipping

ii) the British-born philosophy of Free Trade: from the Classical School of Economics

iii) British, European, and American capita exports to the rest of the world

iv) The adoption of the Gold Standard internationally: necessary component of Free Trade

v) Transformation of the British economy by Law of Comparative Advantage: forcing a contraction of the agricultural sector and shift to industry, commerce, and finance ==> marked improvement in living standards

vi) European imperialism: both the 'Imperialism of Free Trade' (1840-1870) and the 'Era of Capitalist Imperialism' (1870- 1914): who benefited (not the victims of Imperialism)

2. **The Classical School of Economics and the Free-Trade Movement**

a) **Adam Smith and Classical School of Economics:**

i) **a full-scale assault on the principles and policies of Mercantilism:** i.e. Protectionism, Navigation Laws, etc. (during which era Industrial Revolution took place)

ii) **therefore an attack on Colonialism:** and thus on Imperialism itself

b) **Basic principles of Classical School Economics:**

i) **Laissez-Faire:** from the French, 'to leave alone, to let be, without hindrance'
(1) that the government must refrain from any interference with the market economy, and allow the market economy function by the profit-maximizing 'laws' of the 'Invisible Hand'
(2) that the government must restrict itself to law and order, national defence, and ensuring that principles of fair competition prevail (i.e., no monopolies, special licences, etc.)

ii) **Law of Comparative Advantage:** that countries prosper best with the optimum national and international welfare gains if each country specializes in pursuing those economic activities (plural, not singular) in which it enjoys a comparative advantage, allowing other countries freely to do the same, while freely-trading with all other countries: i.e., exchanging surpluses efficiently produced

c) **Free Trade (and total anti-Mercantilism) was thus the logical outcome of both policies:**

i) **Eden Treaty with France, in 1786:** showed the impact of Free Trade principles (when France was influenced by a similarly anti-Mercantilist movement: the Physiocrats)

ii) **but that ended with the French Revolution:** in 1789 (and ensuing French Revolutionary wars)

3. Hindrances to the Coming of Free Trade, until the 1840s:

a) **the French Revolutionary and Napoleonic Wars, 1792 - 1815:**

i) higher taxes on trade, by all combatants, to finance warfare

ii) other war-time impediments to international trade: blockades, embargoes

b) **Mercantilism of British Businessmen:** when the Industrial Revolution had developed and prospered under Mercantilist, protectionist umbrella: 'if it ain't broke, don't fix it'

c) **Foreign tariff barriers against British goods:** rising trade barriers both during and after the Napoleonic

Wars, to protec. European industries against lower-cost British competition

d) **The British Corn Laws:** proved to be the chief barriers

i) Protection of English/British farmers goes back to the 1690s, with various Corn Laws (Corn = grain)

ii) War and Population growth had caused wheat prices to soar from 1790s to 1815, encouraging British farmers to add high-cost marginal lands that proved unprofitable at the end of the war

iii) Sharp fall in post-Napoleonic War grain prices ==> protectionist clamour

iv) **New post-war Corn Laws:**
(1)1815 Corn Law: total ban on grain imports unless grain prices rose above the war-time average of 80s a quarter; but proved to be unworkable
(2) 1828 Corn Law: permitted grain imports with a sliding scale of protective duties: the higher the domestic grain price, the lower was the duty; the lower the price, the higher the import duty

iv) **The Corn Law were the central, overriding issue in British politics,** and the chief barrier to the adoption of Free Trade, with two rival political parties
(1) Tories: or Conservatives: who were chiefly (not entirely) supported by land owners, who believed that their economic welfare depended on maintaining the Corn Laws (protection)
(2) Whigs: or Tories: who were chiefly (not entirely) supported by urban voters, especially merchants, bankers, industrialists, professionals, academics, who were increasingly supportive of Free Trade, while many Whigs supported Free Trade just to punish the Tories.

e) **Fiscal Problems:** how to replace the important government revenues from import duties and other trade taxes if Free Trade were adopted (meaning the end of such taxes)?

4. Factors Promoting the Free Trade Movement from the 1830s:

a) **conversion of more and more British businessmen to Free Trade:**

i) Those business who supported the Whigs came to support Free Trade if only to oppose the Tories

ii) Growing belief that to prosper form exports Britain had to allow imports – to allow foreigners the purchasing power to buy British goods

iii) demand for tariff free imports of industrial inputs, including agricultural goods

iv) Ricardo's Wages Fund Theory: that wages determined by the cost of living (i.e., cheaper imported food)

v) belief that British industrial supremacy removed any fear of foreign imports

b) **Political Reforms favouring the Whigs:**

i) 1832 Reform Bill: redistributing parliamentary seats by population, thus giving far many more seats (ridings) to urban centres, where Whig support was the strongest

ii) 1839: Anti-Corn Law League: formed to combat the ongoing 1836-42 depression with working class

support

c) **Tax Reforms:** to resolve the Free Trade fiscal problem

i) 1840: Royal Commission on Taxation: recommended drastic revision of import duties, most of which were shown to be too costly to administer

ii) 1841 Election: victory of (ironically) the Tory regime of Robert Peel on Tax Reform

iii) 1842 Budget: sharply reduced many import duties, removed other restrictions, and made up for the lost revenue by imposing the old income tax: 7d in the pound

iv) 1845 Budget: more reductions in import duties, especially reductions and changes in the Corn Law, and a further increase in the income tax (undermining Conservative support for Peel)

5. **The Repeal of the Corn Laws and the Aftermath:**

a) **1845-46: combined agricultural disasters:**

i) disastrous harvests across Europe led to sky-high famine prices, and gold outflows (see lecture on Banking: Bank Charter Act)

ii) **Ireland:** also suffered from ruin of its potato crops (disease) bringing famine and economic penury: half a million died and two million emigrated

iii) Robert Peel, the Tory Prime Minister of the day, was forced to repeal the Corn Laws to permit free imports of foodstuffs, but depended on Whig support to do so.

iv) After the repeal, the Whigs combined with the angry anti-Peel Tories to bring down his government.

b) **New Whig or Liberal Regime:** brought in almost complete Free Trade by 1849, when the Navigation Laws were also repealed (but really by then a dead-letter)

c) **Free Trade Movement expanded in Britain and Europe with evangelical fervor:**

i) **1860:** Cobden-Chevalier Treaty with France: serving as a model:
(1) Britain had retained some high duties, up to 20%, on silks and wines (not protectionist, since Britain produced neither silks nor wines – though duties did protect beer and spirits)
(2) used as bargaining chips to have the French reduce duties against British goods

ii) **This treaty was used by Britain, France, and other countries** (e.g., German Zollverein) to negotiate a series of bilateral free trade treaties throughout Europe

d) **The 1873 'Great Depression' and the end of the international Free Trade Movement**

i) **Fruits of the international transportation revolutions proved to be crucial issue:** ==> produced a flood very cheap foreign grain imports (from the Americas, India, Latin America, Australia, etc) into Europe ==> threatened ruin of European farmers

ii) The 187s crisis also produced industrial depressions ==> industrial clamour for protection

iii) The 'union of pork and iron': united agricultural and industrial interests to restore tariff barriers and then to increase them steadily throughout Europe and Americas

iv) Only Great Britain remained staunchly true to Free Trade (until 1916).

v) Result in Great Britain: severe contraction of its agricultural sector, to be seen in first lecture in January: but with increased national welfare in rising living standards

vi) Law of Comparative Advantage thus transformed Britain more than any other country.

6. The Importance of the International Gold Standard for Free Trade:

a) **Free Trade cannot work without fixed exchange rates:**

i) for otherwise countries can defeat the purpose of tariff-free, tax-free Free Trade by devaluing their currencies: to make exports cheaper abroad and imports from abroad more expensive

ii) that was the cruel lesson of the Great Depression in the 1930s, when countries abandoned gold

b) **The Provisions of the Gold Standard:**

i) that each country values its currency in a fixed number of grams of fine gold: and does not alter that rate

ii) each country allows free and perfect conversion of paper bank notes into gold, and gold into notes

iii) therefore, all countries on the gold standard necessarily permit the free exchange of their currencies with gold and thus with each other at fixed rates

iv) exchange rates can vary only by the 'gold shipping points': i.e., the cost of shipping gold rather than paying by acceptance bills (bills of exchange)

c) **benefits: for all countries**

i) free flow of goods, services, and capital – without exchange rate impediments

ii) large savings on transaction costs

iii) fosters foreign investments: by ensuring investors that they can receive their investment earnings (dividends and interest) and repatriate their capital in gold

e) **costs for governments:**

i) **prevented them from engaging in fiscal and monetary policies** to stimulate and benefit their own economies – especially to combat unemployment

ii) thus required balanced budgets ==> no deficit financing

iii) impossible to maintain such a gold standard in times of war: and thus this system collapsed with World War I

iv) question: how is the gold standard regime related to the use of the euro in the European Economic Community today – and how can the problems of Ireland, Greece, Portugal, and Spain be resolved??

d) **Heyday of the International Gold Standard:** 1840 - 1914 :

i) Great Britain: effectively on the gold standard from 1721, and by law by legislation of 1816 and 1844 (Bank Charter Act)

ii) France, Germany, Italy, Spain, etc. followed, with Russia the last country, in 1897.

7. British and European Capital Exports:

a) **capital exports a major feature of European expansion of global trade in the 19th century:**

b) **major phases of British capital exports:**

i) 1792-1815: Britain financed the anti-French alliance, displacing the Dutch as the chief capital exporters

ii) 1815-1836: Britain exported far more capital in financing new European governments and state governments in the U.S – until the American financial crisis of 1836 (when 9 state gov'ts defaulted, as did some European gov'ts) ==> producing severe industrial depression in Britain

iii) 1842-1873: Britain resumed its role as an even greater capital-exporter in financing and building railroads throughout Europe, the Americas, Latin America, and Asia

iv) **1873 - 1914: the Era of 'New Imperialism' or 'Capitalist Imperialism',**
(1) when Britain became a 'mature creditor nation' engaging in a wide variety of international capital investments, thereby receiving substantial foreign incomes from interest and dividends on investments
(2) France, Germany, and the US also became major capital exporters
(3) Lenin: argued in *Imperialism: the Highest Stage of Capitalism* that:

- maturing capitalist nations had to export capital to survive in international competition
- that the very export of capital was imperialism subjecting recipient countries to control by the capital exporters

v) **Note from the table in the lecture notes that Britain always:**
(1) imported a greater value of goods than she exported (Commodity Account)
(2) more than made up that difference by 'invisibles' income: from shipping, banking, insurance, international finance, and foreign investments
(3) The resultant surplus on Current Account represents the growing positive value of overseas capital investments.

8. Capitalism, Imperialism, and Racism:

Finally, in this last lecture for the first semester, I provided a short lecture on Imperialism and Racism: a non-Marxist interpretation. In essence, the concept of 'races' is pure fiction, but a very convenient fiction to justify Imperialism. Differences in skin pigmentation (presence or relative absence of melanin) in no way

justify any concept of supposed 'racial divisions'; and I presented (or tried out) my Darwinian 'solar' hypothesis to explain the emergence of these differences, hinging on the vital role of Vitamin D (according to very recent scientific discoveries).

- read the lecture notes
- consider above all the ideological contradiction between Free Trade and Imperialism
- why is European Imperialism the source or foundation of modern racism, but going back to the Portuguese and other European countries' engagement in the African slave trade, from the mid 15th century.

SECOND TERM: JANUARY TO APRIL 2013

XIIIa. Week no. 13: Lecture Topic no. 15: on 9 January 2013:

British Agriculture and Agrarian Changes, 1815 - 1914.

A . **Lecture no. 15 on British agriculture combined elements of both lectures 13, on the Transportation Revolutions, 14, on Free Trade and Foreign Trade**

1) **to examine the particular impact on Britain's agrarian economy:**

a) to see how both of these major factors (combined with the economics of the Gold Standard) forced Britain to obey the Law of Comparative Advantage:

b) so that Britain radically contracted its agriculture sector, especially for grains, in order, finally, to import almost 90% of its foodstuffs, by the eve of World War I,

c) thereby releasing resources and factors of production to be invested and engaged more effectively elsewhere in its export-oriented economy.

2) **We saw how the two transformations worked together:**

a) a radical reduction in the agricultural sector, overall;
b) and a shift within that sector away from grain towards the production of other arable products- especially perishable fruits and vegetables – but especially to livestock products.

3) I will argue at the end of the course that these developments together explain how Great Britain ended up with having by far the highest standard of living in Europe, up to World War I (though not as high as that in North America).

B. **The history of English/British Agriculture underwent four phases from 1792 to 1914:**

1. **1792 - 1815: the era of the French Revolutionary and Napoleonic Wars, marked by very high agricultural and especially grains prices, from a combination of:**

a) **dramatic population growth that outstripped Britain's capacity to feed herself,** so that Britain became forever more a net importer of grains and then of other foodstuffs

b) **war-time disruptions that severely limited grain imports**

c) **paper-money inflation,** during the era of the 'paper pound', when the currency was no longer backed by gold (1797-1821)

2. **1815 - 1846: The era of the Corn Laws, with sharply falling prices, once peace and imports were restored.**

a) **With falling prices, forcing marginal lands out of production,** both land owners and tenant farmers clamored for protection in the form of two new Corn Laws: of 1815 - 1828. They were discussed in the previous lecture on Free Trade (in late November).

b) **Despite some technological advances, with the completion of enclosures and the spread of the New Husbandry,** overall progress was hindered by the projectionist of the Corn Laws

c) **low agricultural wages also discouraged mechanization**

3. **1846 - 1873: the Era of Free Trade and 'High Farming'**

a) **Despite the repeal of the Corn Laws and then end of protective tariffs,** British agriculture experienced a surprisingly era of prosperity

b) **While grain prices fell, they continued the same trend of falling prices,** without a sharp change in prices

c) **falling grain prices, and thus cheaper bread, liberated consumer income to be spend on superior goods:** especially meat, dairy products, leather goods, perishable fruits and vegetables

d) **British agriculture also experienced significant gains from the development of railways during the 1840s to 1870s:** sharply reducing most agricultural costs and expanding urban markets, especially for livestock and non-grain arable crops

e) **This was also the period of extensive mechanization, using steam powered machinery,** so that British agriculture was over 50% mechanized by 1900 (vs. under 10% in France)

i) increased steam-powered mechanization was a response to a growing scarcity of labour (not the reverse): a growing scarcity caused by both railroad building and urban industrialization, which together drew more and more agricultural labour away from the countryside
ii) The spread of chemical fertilizers was an equally important advance related to mechanization

f) **The advent of chemical fertilizers**

i) That was related to steam-powered mechanization: because the horses and oxen so displaced no longer consumed so much fodder crops and thus did not produce as much manure
ii) furthermore, most fodder crops had been nitrogen-fixing legumes
iii) hence the need for nitrogen-based chemicals to replace these natural fertilizers
iv) but this topic will be left to the lectures on Germany, which gained world leadership in chemical and chemical agriculture

4. **1873 - 1914: the era of the 'Agricultural Depression', with sudden and sharply falling grain prices**

a) **the sudden, sharp fall in grains prices from the early 1870s to the late 1890s, by almost 45%:** was chiefly the result of the aforementioned combination of the dual transportation revolutions (world-wide railway building and steam shipping) and of Free Trade (with the Gold Standard – to prevent protection via currency manipulation – i.e., devaluations)

b) **Britain alone in this era remained completely faithful to Free Trade,** while most other countries restored protectionist tariffs to save their farming communities

c) **the result in Britain was a dramatic shift away from grain growing,** as indicated, to livestock raising

i) but overall a major contraction of the agricultural sector: from 25% to just 7% of the GNP by 1914
ii) part of the fall in grain prices was due to monetary deflation and thus the post-1896 recovery in grain prices was partly due to monetary inflation, to be discussed in later lectures

d) **the overall gains for Britain were the shift of resources (capital, labour, land):** from agriculture to be more productively employed in industry, commerce, and finance

e) **and these events also led to a sharp rise in British living standards, the most rapid in the 19th century:** and by far the highest living standards in Europe by 1914 (if lower than those in North America).

XIIIb. Week no. 13: Lecture Topic no. 16: on 9 January 2013:

Great Britain and the Revolution in Steel-Making, 1856 - 1914:

1. **Lecture no. 16 was devoted to the Revolution in Steel-Making,** which Britain initiated and in which the British held industrial leadership -- until the 1890s, when Germany and the US both surpassed Britain in steel-making, for reasons to be seen later.

2. **Steel is the ideal form of iron,** with the right amount of carbon (added to molten wrought iron) --
i) about 1.0% to 1.5% -- to ensure that it is the strongest form of iron, with the best resistance to stress: in contrast to both cast iron (2.5% - 4.0% carbon),
ii) which is very hard, but also brittle, and subject to shattering; and to purified wrought iron (about 0.1% carbon), which will bend under stress.

3. **As such, steel was the ideal and requisite metal for the so-called Second Industrial Revolution in mechanical power:** involving the steam turbine (for both ocean shipping, as seen earlier, and electrical generation), electrical power, and the internal combustion engine; and to that we will later add the new chemical industries.

4. **The initial major consumers of steel were the transportation industries (railways and stream shipping),** the military, large-scale construction, and the engineering and machine-tool industries. World industrialization after 1860, with the tripartite revolution in steel making, would have been impossible without cheap and high quality steel, previously a luxury metal.

5. **The three components of the Steel Revolution were:**

a) **the Bessemer Converter (1856):** for the mass production of low cost bulk steels.

i) Bessemer steel cost 75% more per ton than did wrought iron (Puddling and Rolling Processes),
ii) but steel rails lasted from 10 to 22 times longer than did wrought iron rails.

b) **the Siemens-Martin Open Hearth (1861-64):** with a much smaller scale, for the production of far higher quality, precision steels

c) **the Gilchrist-Thomas 'Basic Process':**
i) which allowed both types of furnaces to produce steel from phosphoric iron ores ('minette' ores), which otherwise fatally contaminated the metal.
ii) the chief beneficiary of this process was Germany with such large deposits of minette ores, especially in Alsace-Lorraine (taken from France in 1871) and the Ruhr valley.

6. **Great Britain, as the pioneer**, dominated the first Age of Steel, until the 1890s

a) when both Germany and the US overtook Britain in bulk steel production
b) the reasons will be examined when we come to the lecture topics on German industry
c) but we will see that German pre-eminence was limited to Bessemer steel, so that Free Trade forced the British to seek out their comparative advantage: in Siemens-Martin Open Hearth steels (high quality)

XIVa. Week no. 14: Lecture Topic no. 17: on 16 January 2013:

Part IV: The Spread of Modern Industrialization: The 'Slow Industrialization' of France, 1789 - 1914.

1. Barriers to French Economic Development: for independent reading

2. The Debate about the Performance of the French Economy in the 19th century

a) **The debate about the supposedly 'slow industrialization' of 19th-century France** is one that necessarily must be conducted at greater depth after the end of this set of lectures on France

b) **We discussed two major but very common errors in this debate, about 'homogenization:**
i) treating France as a one geographic entity, ignoring the very considerable regional variations, especially those north and south of the Loire River
ii) treating the 19th century as one unified time period, ignoring the several phases of economic growth and decline

c) **In summary, the preponderant opinion, but not universally accepted, is that:**
i) overall France did not experience the rate of economic growth and economic development especially that are to be found in Great Britain. Germany, and the United States.
ii) but French economic growth in the 19th century is still very impressive compared with French economic changes in previous centuries, and with much of the rest of the world in the 19th century.

d) read the full lecture notes for the other issues involved in this debate, to be more fully resolved at the end of the lectures on France.

3. **The French Revolution, pro and con:**

a) We next dealt with the economic consequences of the French Revolution (1789-1792), whose most

beneficial positive contribution was national unification and market integration, whose importance was highlighted by a survey of French political and economic history from the later 12th century.

b) Wars were indeed the worst curse for the French economy, beginning with the many 18th century wars, but especially the French Revolutionary and Napoleonic Wars, 1792-1815.

4. **French Railways:**

We continued that theme with the physical integration of the French national economy with the several railway booms of the 19th century, both before and after the Franco-Prussian War of 1870-71, so disastrous for France.

5. **Agriculture:** The most important economic consequence, and probably the most negative consequence of the French Revolution, concerned Land Reform, Peasant Emancipation, and agrarian changes, which will be considered fully in the subsequent lecture no. 18, on 21 and the first half of 28 January 2009. This lecture will be vital for understanding the nature and consequences of agrarian changes in Germany, Poland, and Russia, from 1815 to 1914, in subsequent lectures.

XIVb. Week no. 14: Lecture Topic no. 18, part 1: on 16 January 2013:

The French Revolution and French Agriculture, 1789 - 1914:

1. **These two lectures on French agriculture (concluding on 23 January) concern the most important economic consequence, and probably the most negative consequence, of the French Revolution (1789-1795)**.

2. **These lectures will be vital for understanding the nature and consequences of agrarian changes for modern industrialization not only in 19th century France,** but also in Germany, Poland, and Russia, from 1815 to 1914, as analyzed in several subsequent lectures.

a) Thus the French Revolutionary Land Reforms constitute a paradigm necessary for understanding the nature and forms of modern industrialization everywhere in 19th-century continental Europe.

b) We shall later have to see how Germany, Russia, and Poland resembled or differed from the French Revolutionary model.

3. **The first lecture of this set began with an analysis of the historic,** geographic, and climatic nature of medieval and early modern French agriculture, both south and north of the Loire River, forming the major agricultural and economic boundary, historically, in France.

a) **South of the Loire:**

(i) most of this region continued to practise Mediterranean 'Dry Farming', basically unchanged from Roman times. For arable grain agriculture, it meant basically a two field system: with winter wheat and fallow, and with very little livestock, because of inadequate pastures and fodder crops.
(ii) Having never been subjected to true feudalism and manorialism, there was virtually no Common Field (communal) farming; and grain agriculture was undertaken by individual small-scale peasants, most with inadequate resources and very low productivity.
(iii) But there three other forms of agriculture, practised separately from arable grain agriculture: viticulture

(vineyards for wines), olive oil cultivation (olive groves), and livestock raising, which were all very capital intensive forms of farming.
iv) Share-cropping, known as métayage, evolved in later medieval Italy and southern France to resolve the problem of how to supply both land and capital to poor landless peasants to engage in this form of agriculture.
- Through individual contracts (non-feudal), landowners -- often urban merchants -leased land with such capital to poor peasants who supplied the landlord with half the harvest as payment of both rent and interest.- -
- Further details on its important functions will be found in the published online lecture, and in subsequent lectures.

b) **France north of the Loire:**

(i) in the zone of classic medieval feudalism, from the Loire to the Rhine Rivers -- most peasants lived and worked their tenancy lands in a feudal-seigniorial regime of communal farming, with Open Fields (or Common Fields),
(ii) much like those already seen in England, with an integrated and symbiotic system of mixed farming:
(1) i.e., combining livestock raising with arable farming, generally with a three-field system.
(2) But while northern agriculture, especially in having so much more livestock, was more productive than most of southern agriculture, it was historically less productive (generally) than that founds in the Midlands of England.

4. **The various classes of French peasantry: in the 17th and 18th centuries (to the French Revolution)**

a) **villeins**: dependent peasant tenants of French manorial or seigneurial estates:
- with the continuation of Common Field farming,
-and hence the virtual absence of both enclosures and Convertible Husbandry in northern France until the Revolution,
- descendants of former serfs, who, with the virtual extinction of serfdom by the 15th or 16th centuries had the securest property rights of any peasants in France
- role of the Parlement de Paris in guaranteeing such property rights to undermine the feudal aristocracy (in favour of the king) was explained

b) **leasehold peasants**:
- peasants who rented or leased lands, on fixed written contracts, from landlords, feudal and non-feudal:
- lands that were leased out from the lord's domains (and thus not a permanent loss), held by both free and villeins

c) **métayers or share-croppers, chiefly found in France south of the Loire River:**
- free landless peasants who received land, capital (working and fixed), and protection from landowners (often urban landowners) in return for half of their harvest: as both rent and interest
- non feudal: freely engaged written contracts
- explanation of why the scattered nature of share-cropping holdings prevented enclosures

d) **allodial or freehold peasants:** very few, and not considered in this lecture

5. **From Grundherrschaft to Gutsherrschaft, 1480 - 1789:** Reconstitution of the large domains

a) **To set the consequences of the French Revolution in proper historic perspective,** the lecture then concerned the remarkable changes in French agriculture from the 1480s to the 1780s, which witnessed the reconstitution of large centralized estates in many parts of France, estates left largely unimpaired by the

Revolution.

b) **To facilitate this analysis, comparisons were made between two types of feudal estate regimes,** using the German terms: *Gutsherrschaft* (estates based on the sale of agricultural commodities, using servile labour) and *Grundherrschaft* (estates based on rental incomes from free peasant tenants).

c) **the 'embourgeoisement' of French agriculture:** the reconstitution of large estates in much of France from the 1480s to the 1780s:

i) **was not the achievement of the old feudal aristocracy but of bourgeois-based newcomers:** wealth merchants, financiers, government officials, lawyers and other professional who purchased feudal lands from traditional aristocrats facing hard times:

- the old aristocrats were known as the *noblesse d'épee* (nobility of the sword – descendants of military knights);
- and the newcomers were disdainfully known as the *noblesse de robe* (nobility by dress, alone)

ii) **we discussed in this last part of the lecture how the newcomers acquired lands** from both poor and lesser feudal nobility and from peasants to recreate large estates

iii) **As in Tudor-Stuart England, the inflationary forces of the Price Revolution era (1520-1650) hastened this process:** by undermining the economic status of traditional nobles living on fixed feudal incomes (so that their costs of noble living soared beyond their mean), while increasing the economic rent on agricultural lands, thereby providing the profit incentive for bourgeois entrepreneurs (with commercial capital) to buy up noble lands – and also to take lands from their peasant tenants

ii) **problem:** inability to engaged in enclosure as did their bourgeois counterparts in Tudor-Stuart England – for reasons to be explained in the next lecture

v) **Marc Bloch:** French historian who (in 1931) first called attention to this 'embourgeoisment' of formerly feudal lands in France during these three centuries: noting that the French Revolution (1789 - 1793) left these reconstituted large estates largely intact, so that Revolutionary France was not – as traditional myths state – a land of just of a multitude of small peasant proprietors

XV. Week no. 15: Lecture Topic no. 18, part 2: on 23 January 2013:

The French Revolution and French Agriculture, 1789 - 1914:

1) **The concluding part of lecture 18 examined the consequence of the French Revolutionary Land Reforms ("peasant emancipation"), with the supposed abolition of Feudalism, Manorialism (Seignioralism), and Serfdom (virtually extinct by the Revolution):**

a) **The Revolutionary Land Reforms of 1789 - 95:** designed to abolish feudalism, manorialism, and serfdom (or its remnants), with the goal of achieving 'peasant emancipation'

i) **such changes pertained chiefly only to northern France (north of the Loire),** and pertained chiefly only to the villein peasant tenants under former feudal-seigneurial regimes.

ii) **Because métayage (share-cropping), which became so predominant in France south of the Loire,** was non-feudal, it was left untouched by the first Revolution, and abolished only in the second Revolution of 1848.

iii) **Inheritance Law of 1795:** stipulated that all lands (property) be subdivided equally amongst all male heirs

on their inheritance: supposedly led to:
(1) piecemeal subdivisions to very small, uneconomically-sized holdings
(2) demographic stagnation also a consequence: to prevent further uneconomic subdivisions of inherited holdings, more and more French peasant families chose to have fewer and fewer children
(3) most male heirs, guaranteed their share of the family farm, would not leave their farms to seek their livelihood elsewhere, and would not marry until inheriting their share ==> delayed age of marriage ==> smaller family sizes (as features of the European Marriage Pattern)

iv) **hindrances to enclosures provided perhaps the chief negative consequences:**
(1) meant the lack of Convertible Husbandry (for reasons discussed in English enclosures)
(2) inability of either landlords or their tenants to acquire mortgages: which required defined ownership
(3) hindrance (if not inability) to adopt and use more advanced techniques: requiring collective consent of all communal peasant tenants
(4) inability to breed better forms of livestock: breeding impossible with intermingled communal flocks, herds

v) **why peasants and even some landlords preferred to retain communal farming:**
(1) economic security and stability provided by village risk-sharing (as seen earlier, in England)
(2) accommodating disguised unemployment
(3) for landlords: whose demesne lands were intermingled with tenancies in open-fields: to gain the benefit of having the tenants plough their lands

vi) **Only the coming of French railroads in 1850s promoted voluntary enclosures:**
(1) by peasants who agreed to swamp holdings to form consolidated plots:
(2) in that railways promoted more profitable forms of market-oriented agriculture
(3) but such enclosures still meant very small sized holdings: unlike large-scale capitalist farms in England and eastern Germany (Prussia: see later).

b) **Common Assumptions about the economic consequences:**

i) severe impediments to engaging in enclosures and in achieving scale economies
ii) agricultural inefficiency: low productivity, per unit of manpower and per hectare of land
iii) inadequate supplies of industrial raw materials from agriculture
iv) inadequate savings and capital investments in agriculture: because of low productivity
v) labour immobility: insufficient labour released for urban industries
vi) demographic stagnation: slow population growth
vii) slow and incomplete industrial urbanization
viii) slow growth in domestic demand for industrial goods: inadequate market growth

c) **evidence for demographic and economic stagnation in French agriculture to 1914:**

i) **various tables demonstrating** low birth rates, low rates of population growth, far less urbanization than in Britain and Germany, far lower levels of agricultural productivity.

ii) **government survey of French farming in 1881:**
(1) demonstrating that 87.5% of the 3,504,000 French farms were under 20 hectares (50 acres).
(2) On the other while large estates, those over 40 hectares (100 acres) constituted only 4.1% of the number of farms, they accounted for 45.9% of the total area. As March Bloch had observed, the reconstitution of large estates, from the 1480s to the 1780s, though only piecemeal and scattered, was left largely unchanged by the French revolution

2) **French agriculture from the French Revolution to World War I: 1789 - 1914: a survey noting alternating cycles of growth and stagnation:**

a) **agricultural productivity in France, Britain, and Germany, 1815 - 1914:**
This lecture concluded with evidence for an explanation of why outputs and productivity in French agriculture were so much lower than in either Great Britain or Germany

i) the comparison with Britain is skewed by Britain's abandonment of much of its agriculture, as it obeyed the Law of Comparative Advantage after the adoption of Free Trade and Agriculture,

ii) while France and Germany resorted to higher tariff protection to insulate their farmers from the flood of cheap foreign grains, that resulted from the post-1870 transportation revolutions.

c) **In summary, the British advantages over the French:** lay in having more than twice as much land and three times as much capital per farmer.

i) **In that same context, we discussed Patrick O'Brien's thesis of 'path dependency':** to explain why Great Britain became an industrialized and urbanized economy, reducing its agricultural sector so dramatically, long before France.

ii) **The essence of the 'path dependency' thesis (Patrick O'Brien), to explain the French failure to transform its agricultural sector, lay in:**
(1) France's natural resource endowments, climate, and topography: why they were inferior to those found in England.
(2) and the legal-institutional inheritance that explained the strengths and continuity of communal farming, i.e., the failure to achieve enclosures before the Revolution. But that thesis logically pertains only to northern France and we brought forth other reasons for southern France, involving the institution of métayage or share-cropping.
(3) in essence, the typical English (or later, typical Prussian) farmer had far more land and far more capital (especially in the form of livestock) at his disposal than did the typical French farmer
- but within France, the same comparison explains why northern French farmers were more productive than southern French farmers

3. The Fundamental Questions Posed in Lecture Topic no. 18 on French Agriculture:

a) **Were the perceived faults of French agriculture in the 19th century the product of:**

i) **ill-advised features of the French Revolutionary Land Reforms, in particular:**
(1) guaranteeing the property rights of French peasants to the extent of preventing Enclosures, and thus the adoption of Convertible Husbandry, scale-economies, mechanization, etc.
(2) The 1795 Inheritance Law: requiring equal subdivision of peasant holdings by inheritance, thus leading to continual 'morcellement': or piece-meal, small-scale holdings

ii) **or the 'Path Dependency' thesis:** Patrick O'Brien's thesis that France was the victim of:
(1) a combination of climate, topography and natural resource endowment inferior to those of Britain (and Germany)
(2) the deeply imbedded survival of institutional features of French feudal-manorial agriculture: those that were the product of the pro-royalist anti-aristocratic legal decisions of the French Parlement guaranteeing th property rights of French peasants (but in fact only of the feudal villein peasants in the North

iii) **How does the O'Brien thesis deal with French agriculture south of the Loire:** and the problem of non-feudal métayage (and how did I deal with the problem?)

b) **Did the faults of 19th century French agriculture provide the principal impediments to the economic growth and industrialization of 19th-century France:** in particular its slow rate of population growth and urbanization

c) **To what extent did the French Revolutionary Land Reforms provide the model for land reforms and agrarian changes elsewhere in 19th century continental Europe:** especially in Germany and Russia**.**

XVI: Week no. 16: Lecture Topic 19: on 30 January 2013

French Banking and Financial Institutions in the 18th & 19th century: to 1914

1. **French financial institutions: the Bank of France**

a)This lecture began with another aspect of historical path-dependency: to explain why the heritage of French financial disasters, especially those of the 18th century, help to explain why the Bank of France, founded by Napoleon in 1800, pursued such ultra-conservative monetary policies, which they imposed on the private banking sector.

b) **The policies of the Bank of France were examined,** dealing with the criticism that they unduly restricted the supply of money and of credit: making each too inelastic

i) The very high reserve ratios required for the Bank of France and other banks: thus restricting lending and the creation of bank money

ii) very high denominations for banknotes: minium of 500 francs (when average annual male income was only300 francs

iii) restrictions on discounting commercial paper

iv) Bank of France's refusal to act as a lender of last resort

c) **The evidence comparing central-bank interests rates in 19th century France, Germany, and Russia do not vindicate that negative view,** since French rates were always the lowest

d) **A fair conclusion may be that financial conservatism served the French economy well,** even though the Bank of France was reluctant to act as a central bank, as a lender of last resort, as will be seen in the next topic.

2. **Investment Banking: the era of the 'New Bank':**

a) **The 'Haute Bank':**

i) we began by examining the structure of French private banking, centred on Paris, in the early 19th century: dominated by Protestants (Huguenots) and Jews

ii) the reasons why these two minorities, subjects of considerable social and economic discrimination, dominated French private banking were discussed

iii) a principal factor was the international nature of their commercial banking (linked to foreign trade) and the importance of international connections with co-religionists.

b) **The 'New Bank:**

i) **The central part of the lecture dealt with the rise of a very radically new form of banking in continental Europe:** investment banking, which first arose in the post-1815 new Kingdom of the Netherlands and then in France.

ii) With a virtual vacuum in capital markets, in contrast to well developed capital markets to be found in Britain, and with far larger initial capital costs of industrialization, the British type of deposit banking offering only short-term credit, chiefly for financing working capital needs, would hardly suffice.

iii) The new investment banks – the first of which was founded in Brussels in 1822 (then part of the Kingdom of the Netherlands) provided long-term financing for large-scale fixed capital requirement,

iv) raising the investment capitals from the sale of stocks in their banks, but also by organizing syndicates to market Initial Public Offerings (IPO) in stocks and bonds.

c) **Credit Moblier:** 1852 - 1867

i) The next part of the lecture was a case study of the most prominent and indeed only true investment bank in 19th-century France: Credit Mobilier, which had a dazzling 15-year career (1852-1867),

ii) until it collapsed in a liquidity crisis, one in which the Bank of France refused to act as Lender of Last Resort.

iii) The collapse was due largely to the enmity of the Bank of France and the Rothschilds

iv) But following the collapse of Credit Mobilier, the Rothschilds took up investment banking, though restricting their investment banking large to other parts of Europe

v) Whether or not France's banking and financial structure was a factor that either promoted or retarded 19th-century industrialization is an unresolved debate.

d) **patterns of French savings and investments:**

i) What is not debated is the fact that collectively the French came to invest almost 50% of their savings abroad, by 1914: for both institutional and political reasons (financing Russia as a counterpart to Imperial Germany).

ii) Was this a result of 'path dependency;" given the dominance of Protestant (Huguenot) and Jewish banking firms whose success had been based on their international connections with co-religionists and on international commercial and financial transactions?

iii) or was it the result of traditional French business antipathy to banks and the reluctant of small French firms

– family firms and partnerships – to subject themselves to the control of banks?

XVI: Week no. 16: Lecture no. 20: on 30 January 2013

The Debates about French Industrialization and Economic Growth in the 19th century (or 1815 - 1914):

1. Natural Resource Endowments and the Coal Problem:

a) **Coal:** We began with the natural resource endowment problems: in particular, the scarcity and high cost of coal for French industry.

i) As a noted economic geographer once contended, 'an industrial map of Europe in the 19th century was essentially a map of its coal fields'.
(1) Remember the crucial importance of coal as the essential ingredient of modern industrialization: for the iron and steel industry; for steam power and steam engineering, and thus for the transportation revolutions in railroads and ocean shipping;
(2) and also for the Second Industrial Revolution in electrical power (coal-fired steam turbines) and the new coal-based chemicals industry.

ii) Because smelting one ton of iron ore required about ten tons of coal, economic logical dictated that metallurgical industries be located near coal fields, not iron ore fields.

iii) But for both political and economic reasons, France had one major exception in her steel industry located near the Lorraine iron ore fields (that part of Lorraine left to France after the 1870 Franco-Prussian war).

iv) Even afer the coming of the railroads in the 1850s, transporting coal remained high cost. Since France had to import about 35% of its coal needs in the late 19th century, the problems involved not just high transport costs, but also high import tariffs, and high cartel-price imposed on the sales of German coal from the nearby Rhineland (to be explained more fully in the lectures on German industrialization).

b) **The Iron and Steel Industries:**

i) We then dealt with the iron and steel industries, noting how France coped with the coal problems, through large-scale, cartelized, and heavily capitalized steel firms (10 of which controlled over 80% of total output by the 1890s).

ii) A fuller explanation of the role of tariffs and cartels in explaining the success of both the French and German steel industries must await our subsequent lecture on German industries.

c) **Other 19th-century Industries: Textiles, Foodstuffs, Automobiles:**

i) Next we considered the two major industries in terms of employment, value of output, and capital investments: textiles (woollens, cotton, linens, silks) and foodstuffs, the more important of the two.

ii) We explained why French textile industries had little impact on France's foreign trade.

iii) The great industrial successes in the late 19th, early 20th century lay in hydro-electric power and especially automobiles,

iv) automobiles: an industry in which France gained European predominance up to 1914, but then lost that predominance to Great Britain in the inter-war period (1919-1939).

2. **French Industrial Growth and growth rates, 1815 - 1914:**

a) **the family firm and the question of industrial scale:**

i) We also dealt with the thorny issue of industrial scale, in particular responding to David Landes' famous thesis that small-scale family firms proved to be the curse of 19th century French industrialization.

ii) In contrast, I provided evidence of very significant large-scale industries, of recent econometric evidence indicating the French industries had achieved optimal scales by the 1860s, in terms of product choice, capital requirement, and market conditions.

iii) I also argued that, since France's historic comparative advantage had been in luxury manufactures, small scale production was in fact desirable for many reasons, especially concerning quality-controls and market reputations.

b) **the debate about French industrial and economic growth in the 19th century:** especially 1860 to 1914.

i) The final session dealt with the debate about French economic growth in the 91th century: in aggregate terms, in which France compares badly; but in per capita terms, it fares well.

ii) I argued, however, that per capita evaluations that do not take full account of demographic changes, and the relationships between population and economic growth, can be very misleading.

iii) In any event, the crucial statistic to be noted is that in 1900, as measured on constant 1970 US dollars, per capita output in France, at $883.00, was only 67.8% of that for Great Britain, at $1,302.00.

iv) Indeed of the five major countries compared, France fared the least well, in 1900.

v) Other statistical comparisons can be found in the online lectures, including the subsequent lectures on Germany, Russia, and Great Britain (1870 - 1914).

XVII. Week no. 17: Lectures nos. 21 and 22: for 6 February 2013

Section V: the Rapid Industrialization of Germany, 1815 - 1914:

The common, unifying theme of all these lectures is the increased role of the state in German economic development and industrialization.

XVII: Part I:

A. Lecture no. 21, part A: German Market Unification: the Zollverein and the Reich.

1) **This lecture began with the historical explanation of the feudal fragmentation of Germany, in the old Habsburg Empire (from 1272 to 1789):**

a) then followed the changes produced by both the Napoleonic Wars and the Congress of Vienna (1815):

b) producing the German confederation of 39 separate states.

c) **The story of German unification begins with the territorial acquisitions of the Kingdom of Prussia, in the west (Rhineland), after 1815:** beginning with Prussia's Maassen tariff of 1818, designed to integrate the new western territories into Prussia, with a common free trade zone and common fiscal system, and weights and measures (metric).

2) **Fears of Prussian economic domination led, in the 1820s, to the formation of rival customs unions under Saxony and Bavaria:** and then to the creation of the pan-German Zollverein

a) In turn, that led to the unification of the three, under Prussian domination, in the German Zollverein (Customs Union) of 1834,

b) whose consequences up to and beyond the creation of the German Reich or Empire in 1871, were explored in this lecture.

c) post Imperial German foreign trade policies: the shift from Free Trade to Protectionism were also explored.

B. Lecture no. 21, part B: German market unification with the new railroads:

1) **The Zollverein soon led to extensive railway building in all the major German states,** with military and political considerations often overriding economic rationale.

a) **In all states, the French model of state leadership:** and state guarantee of railway bonds was followed.

b) **After 1871, German unification with the new Reich,** under Prussian domination, led to Prussia domination of all the German railroads, and state ownership of many.

c) **the railways were never fully nationalized :** because the other state and kingdoms in the Empire were still fearful of Prussian domination.

2. **The most notable feature was Prussian government policy of railway fares to foster industrialization:** to use the railway fare structures in a Mercantilist fashion to promote industrial exports and curb industrial imports into Germany.

a) the Prussian government, in either owning or controlling most of the key railways, used its economic power to imposed a centralized system of fares:

b) low fares on the transport of imported raw materials and on the transport of finished manufactured goods to the leading seaports for export

c) with) higher fares on the transport of manufactures for internal consumption within Germany

XVII: Part II: Lecture no. 22:

Germany: Peasant Emancipation and Agricultural Modernization to 1914:.

1) **The agricultural and agricultural geography of Germany:**

a) **in Germany the two major agricultural zones were those west and east of the Elbe river:**

b) **Our chief focus is chiefly on East Elbia,** the chiefly Prussian lands east of the Elbe river.

c) **The historical origins of the key differences were given in terms of the Germanic Drang Nach Osten,** from the 1180s to the 1320s:

i) the Germanic conquest, colonization, and settlement of chiefly Slavic lands east of the Elbe,

ii) which were settled by western colonists who were given personal freedom and virtual ownership of their lands.

2. The major problem of East German Serfdom:

a) from the late 15th and 16th centuries emerged the so-called 'Second Serfdom':

i) **by which formerly free peasant communities were absorbed into large feudal estates,** which subjected most of the peasants to a form of serfdom much harsher and more pervasive than any experienced in the West: in exacting forced labour services and other payments, beyond which free peasants had paid landlords

ii) **By the 16th century, a mirror-image dichotomy emerged,** and one that largely explains the growing gulf between East and West, in terms of both economic growth and freedom.

b) **A four part model was presented to explain the rise of the Second Serfdom:**

i) **the Domar Demographic Model:**
(1) a demographic model of population decline, in the 17th century, in which serfdom was imposed to prevent peasants, now enjoying a more favourable land:labour ratio, from gaining and exercising market power to lower land rents and raise wages:
(2) very similar to Marc Bloch's model for explaining early-medieval serfdom (explained in ECO 301Y)
(3) Problems:
- can apply only to the century of demographic decline, from 1640 - 1740, but much of eastern Europe had been subjected to serfdom long before then
- does not explain how feudal landlords had or gained the power to impose such serfdom

ii) **the Hobsbawm Commercial model:**
(1) a commercial model, more applicable to the prior century, the 16th,
- with rapid population growth, commercial expansion, and Dutch commerce, which together led to the formation of large commercial grain estates in East Elbia (Prussia and Poland), especially along the Vistula River, worked by servile labour
- incentives and objectives: to export grains and lumber to western European towns whose rapid growth far exceeded western capacity to feed those towns and provide lumber for shipbuilding, etc.

(2) Problems:
- cannot apply to all of eastern Europe – cannot apply to many regions not exporting to the West
- does not explain continued growth of serfdom from 1640s on when Baltic grain-lumber trades suffered

decline

iii) **the Blum - Brenner institutional model (class relations between lords and serfs):**
(1) to explain how militarily powerful lords were able to displace monarchical and urban powers in order to oppress their pleasantries:
- eastern monarchies and towns lacked powers to check military power of feudal nobility
- eastern peasant communal farming lacked the cohesive village strengths found in the West

(2) Problems: does not explain why eastern feudal landlords had the economic incentive to subject their free peasant tenants to serfdom, especially in extracting rents in forced labour (*corvées*)

iv) **Munro's monetary model:**
(1) I offered a variant explanation of this commercial model in terms of an inflation-based model to explain the shift from *Grundherrschaft* -- a manorial economy chiefly based on land-rents of peasant tenants - to *Gutsherrschaft* -- a manorial economy chiefly based on commercial exploitation of large demesne estates -- exporting grain, livestock products, lumber etc -- and worked by servile peasants, who paid their rent in labour services (when the value of money-rents had sharply fallen);
(2) The dynamic element is provided by inflation: from both
- the monetary expansion of the Price Revolution era, ca. 1520 - ca. 1650
- the ravages of coinage debasements in Germany and Poland during the 30 Years War (1618-48): as fiscal policies to finance warfare

(3) The landlords' problem under *Grundherrschaft* (as elsewhere in much of Europe): their peasant rental incomes were in the form of fixed, unvarying money payments stipulated in money-of-account (and never adjusted for inflation, while most of their other feudal incomes were also in fixed money-of-account payments
(4) The landlords' solution: shift from *Grundherrschaft* to *Gutsherrschaft* manorial economies
- convert peasant tenancies into servile tenancies owing labour rents and rents in kind, rather than money rents
- absorb former tenancies into an enlarged demesne (domain), worked by servile labour, to produce grains, lumber, livestock products, etc. for export

(5) This model works best in combination with the previous two models – and is valid only in certain areas (especially Prussia and Poland, if not so much Russia and Central Europe)

3. German 'peasant emancipation' or 'land reform:

a) **the basic theme is state emancipation from above:** in order prevent or avoid revolution from below,

i) as with the French revolution, which French Revolutionary and Napoleonic armies had exported into Germany.Of those by the kingdoms of Saxony, Bavaria, and Prussia,

ii) the most important were the Prussian Stein-Hardenberg Reforms of 1807 to 1821.

b) **Stein-Hardenberg Peasant Land Reforms: In essence, allowed German serfs -- principally those in East Elbia – to gain both personal freedom and landownership:** by surrendering a portion of their previous tenancies to landlord ownership:

i) For the richer peasants (with plough teams): from one third to one half of their lands were surrendered, depending on their status (proof of hereditary tenure).
ii) Poor peasants, lacking plough teams and hereditary claims to land, were excluded to provide a continuing labour force for the large landlord (Junker) estates in East Elbia

c) **But the 1848 Revolution led to Prussia's 1850 Emancipation law freed all remaining serfs:** under far more liberal conditions.

d) **My thesis was that this 'emancipation' in East Elbia chiefly benefited the large Junker landlords in East Elbia,** chiefly by allowing them now freely

i) to separate their domain lands from peasant Open or Common Fields, and thus to enclose them – since so many landlords, in leasing demesne lands to peasants had left them interspersed with their own lands; and
ii) to acquire much a large quantity of lands from former serfs (including those freed serfs who decided to sell their lands and emigrate with capital to industrial area)..
iii) objective: to create large blocks of land under landlord control in order

- to enclose these lands
- apply convertible husbandry and the technological advances explained below

e) **Germany west of the Elbe underwent far less dramatic changes,** and experienced changes similar to post-Revolutionary France, with preponderance of owner-occupied small peasant farms, with little enclosure before the coming of the railroads.

3. Rapid Agricultural Progress in post -1860 German:

a) **The final part of lecture 22 analyzed the very impressive agricultural progress in 19th-century Germany,** but especially on the great enclosed estates in East Elbia,

b) **There are four major aspects of productivity gains and both agricultural and economic progress:** chiefly to be found on enclosed lands practising Convertible Husbandry

i) **the introduction and widespread diffusion of nitrogen-fixing leguminous crops (as seen in England),** which also served as fodder crops for livestock;

ii) **the cultivation of various root crops -- sugar beets and potatoes especially -- which had great industrial importance (sugar refining,** alcohol), while also supplying fodder for livestock;

iii) **the introduction of various chemical fertilizers,** in which Germany gained world supremacy;

iv) **mechanization, with steam-powered agricultural machinery,** which, in so far as they displace livestock, thus required a greater use of chemical fertilizers.

c) **Several statistical tables on agricultural outputs, productivity gains,** population growth, urbanization, and labour mobility serve :

i) **to demonstrate the very great contributions that German agriculture made to industrialization**, especially from the 1870s: particularly in

- promoting rapid population growth
- allowing transfer (or emigration) of an increasingly larger share of rural population to be engaged in urban industrialization: especially a shift of labour from the rural east to the urban west

ii) **Please do look at these tables, comparing especially the German data with the French data,** to justify the conclusion that post-1850 agrarian changes were far more conducive to economic and demographic growth and especially to industrialization than in 19th-century France (or Russia)

XVIII. Week no. 18: Lecture no. 23: for 13 February 2013

Section V: the Rapid Industrialization of Germany, 1815 - 1914 . A common theme of all these lectures is the increased role of the state in German economic development and industrialization.

Lecture no. 23: German Banking and Financial Organization, 1815 to 1914.

1. **The Importance of banking and financial institutions for German industrialization in the 19th and early 20th centuries:**

a) **This lecture analyses the significance and great success of German banks:** most especially the Investment Banks or 'universal banks' or Kreditbanken in financing German industrialization from the 1850s, and especially from the 1870s.

b) **As we saw with banks in the British Industrial Revolution,** so also German banks proved to be vitally important in providing both the lubricant and the fuel for the industrial machine:
i) the lubricant in the form of paper money, credit, financial intermediation, etc.;
ii) the fuel, in the form of financing the working capital needs of the Industrial Revolution with short term credit.
iii) The radically new difference was the role of banks in financing long-term, fixed capital formation.

c) **These financial aspects of modern banking provide the veritable life blood of any modern economy, in terms of both Leverage and Liquidity:** for which a proper and feasible balance is the requisite for economic stability and growth
i) **Leverage:** in financing asset accumulation by borrowing: so that a ten-percent loan can finance the acquisition of assets with ten times the market value – but not to extend leverage so much that readily pricked asset bubbles are created.
ii) **Liquidity:** always a problem with financial and economic crises
(1) in general: to ensure an adequate supply of short term credit and an adequate supply of money and financial intermediaries to permit the economy to function efficiently, at low cost
(2) in particular: the ability of debtors to use cash to redeem short term loans without having to liquidate other, investment-earning assets (and to avoid doing so at fire-sale prices)

d) **most economic crises are caused by financial crises:** which inevitably lead to de-leverage and consequent lack of liquidity:
i) so that firms cannot borrow and lack funds to meet their financial obligations
ii) 19th and early 20th century Germany largely escaped these dual problems of leverage and liquidity, thanks especially to the successful and almost always profitable functioning of its new investment banks.

2. **The Gershenkron Thesis and Banking-State model of financing industrialization:**

a) **The focus or our financial analysis in the Gerschenkron model:** it stipulates that 19th-century 'Late Starters' or 'backward countries', such as Germany (or Prussia and eastern Germany) and Russia, simply could not follow the British model:
i) it was not only impractical, was impossible to rely merely on market forces and laissez-faire economics.
ii) Instead, a strongly interventionist role of the state was required, in all sectors;
iii) in industry, and alliance of the state with the radically new joint-stock investment or universal banks was necessary for industrialization to grow and succeed

b) **Universal Bank: is now the most common term for the new investment banks:**

i) because they provided all of the traditional functions of banking; i.e.,
(1) traditional, British-style deposit and transfer banking, with extensive discounting facilities,
(2) combined with financing fixed capital formation: in the form of long-term loans and in terms of underwriting IPOs – in stock and bond issues.

ii) The focus of the lecture is on Gerschenkron's particular thesis for Germany.

c) **The first part of the thesis explains why the Investment Banks were necessary:**

i) to fill a large vacuum in the capital markets, i.e., in the absence of those long-developing British financial institutions that had made investment banks unnecessary in 19th century Great Britain;

ii) to finance a take off into rapid industrialization in large-scale heavy industries, now dominated by metallurgy, for which current technology and scale requirements, in international competition, meant far larger-scale initial capital investments than were required for the British Industrial Revolution;

iii) to accommodate a socially and culturally different society,
(1) one dominated still by conservative, wealthy landowners -- those with the most income and savings for investments -- who were far more inclined to invest in land, mortgages, and government bonds than in business and commercial enterprises.
(2) Thus if investment banks could attract their savings deposits, or investments in the banks, they could channel those savings into direct industrial investments (in terms of both short-term and long-term credit, and underwriting).
(3) The crucial historical fact that none of these investment banks failed and that generally they remained highly profitable – paying dividends or interest returns of 6% to 8% – explains why and how they succeeded in attracting the savings and investments of the wealthy landowners;

d) **The second part of the Gerschenkron thesis concerns his views on the outcomes:**

i) **The eight great investment banks (Kreditbanken, D-Banken, universal banks, etc.)** successfully financed the rapid development and growth of large scale German industries by filling the pre-existing vacuum in German capital markets:
(1) in particular in mining and metallurgy (coal, iron, steel); transport (railways and steam shipping); and the new electrical industries.
(2) In providing a surrogate stock market – selling both IPOs and marketing existing stocks and bonds – before the final and complete formation of the Berlin, Frankfurt, and Hamburg stock exchanges.

ii) **Growing Investment Bank control over the major industries that they financed**: especially by holding shares in the industrial firms that they financed in selling IPOs

iii) **Investment banks promoted the development of German cartels:** especially those engaging in oligopolistic competition (to be elaborated in the next lecture, on German industrialization)

iv) **Investment banks promoted far more and far better industrial research** (technology) and market research

e) **We then dealt with the subsequent critics of the Gerschenkron thesis, focusing on four:**

i) Neuberger and Stokes (1974); Edwards and Ogilvie (1996); Fohlen (1999, 2003, 2006); Burhop (2006): read the full lecture notes analysing, discussing, and critiquing their views, accompanied by many tables (to sustain their and my own conclusions.

ii) **In essence the critics contend that:**
(1) the Gross Banken misallocated resources and misdirected economic growth by favouring and subsidizing their specific clients,
(2) That they discouraged the formation and progress of alternative or rival financial institutions that could have provided a more competitive and less biased approach to industrialization.
(3) That their role, being restricted to only a few major industries, was far less important than is traditionally assumed (an argument that contradicts the other criticism)
(4) for other criticisms: see the full lecture notes
(3) Carsten Burhop, the latest, is the most balanced: agreeing with Gershenkron on their importance up to the mid or late 1880s, and partially agreeing with the critics for the period thereafter, up to 1914

iii) **I concluded by quoting Charles Kindleberger:** 'The great investment banks constituted less than a tenth of the total assets of financial assets, but were found at the critical margin affecting economic growth.'

iv) **My only qualification was that in fact these banks accounted for over a quarter of such total financial assets by 1914** – and even more if we take account of their cooperation in financial syndicates with other German banking institutions

3. **German Imperial State or Central Banking:**

a) **The last and very brief part of the lecture dealt with the role of the new German Central Bank:**

i) **the Deutsche Reichsbank,** formed in 1875, from the former joint-stock bank, the Royal Bank of Prussia,

ii) **with a monetary unification under the gold standard** and a bank monopoly on the money supply.

b) **In essence, its historical significance is one of positive neutrality:** it did what was required of a central bank, without being responsible directly for economic growth but without being responsible for any economic disasters or even liabilities.

XIX. Week no. 19: Lecture no. 24: for 27 February 2013 (following Reading Week)

Section V: the Rapid Industrialization of Germany, 1815 - 1914 . A common theme of all these lectures is the increased role of the state in German economic development and industrialization.

The Rapid Industrialization of Germany in the 19th and early 20th centuries

1. **An overview of 19th century German industrialization:**

a) **Relatively slow economic growth of the various German states (not yet united) in the 18th and early 19th century:** up to about the 1850s: well behind France and the Netherlands, as well as Great Britain.

b) **The initial 'take-off' period, from the 1850s to the 1870s:** key features
(1) The German Zollverein, of 1834: political forces for market unification.

(2) German Railroads: for the physical integration of the Germany economy
(3) the Prussian Emancipation Law of 1851, and agricultural modernization thereafter;
(4) the role of the Investment Banks or Universal Banks.

c) **From the 1870s to World War I:**

i) the period of most rapid and complete industrialization was from the 1870s to World War I: in steel, chemicals, and the electrical industries, all 'new' industries from the 1860s.

ii) In steel, Germany gained European mastery by the 1890s;

iii) and in the other two -- chemicals and the electrical industries -- Germany gained world mastery (i.e., ahead of both Britain and the US) also by the 1890s.

iv) Was Germany a victim of the so-called 'Great Depression' of 1873-1896, a deflationary era:
(1) no evidence of any such depression, though the trade statistics indicate a slower rate of export growth
(2) but the evidence also indicates faster growth rates and the final achievements of industrial supremacy in the following inflationary era: 1896 - 1914.

2. **The German Steel Industry, from the 1870s:**

a) **We used the Webb thesis (1980):** to explain how Germany gained European mastery in steel production (or in many aspect of steel production).
i) Contrary to expectations of traditional economic theory, the explanation lies basically in the combination of protective tariffs, industrial cartels, investment banks, and state support for those cartels.

ii) Tariffs and cauterization soon led to almost complete vertical and horizontal integrations, with large increases in scale economies, involving extensive mechanization.

iii) Vertical integration and extensive mechanization led to significant productivity gains, especially in fuel economies, by producing steel 'in one heat' -- converting pig iron into steel while still semi-molten, by savings on transportation and transaction costs, and by economies of scale.

iv) Steel cartels, owning iron and coal mines, and railroads, subsidized inputs, especially coking coal, while charging much prices to those outside the cartel, especially to foreign buyers (chiefly France); and offered discounts to ensure compliance with cartel pricing and market sharing.

b) **The ongoing debates about supremacy in the post-1870 steel industry:**

i) David Landes had made many of Webb's points earlier, in 1979, stating that 'The Germans put big and bit together, while the British kept small and small apart.'

ii) Those views were challenged by Donald McClosky, whose reply in turn provoked further responses.

iii) Thus we discussed the Landes-McCloskey-Allen debates, in which McCloskey (1981) had contended that the British steel industry was at least on a par with the American and German steel industries, if not superior in some aspects.

iv) The statistical evidence presented led us (or me) to conclude that the British steel industry, by the 1890s,

was inferior in productivity and pricing to both the American and German steel industries.

v) Indeed 70% of German rolled steel went to British and Imperial markets.

vi) Price evidence shows that while German cartels exported steel at somewhat lower prices than those charge in the domestic markets, nevertheless, German steel export prices were still lower than British domestic prices, for comparable steel products.

c) **How did the British respond and survive in the international steel markets?**

i) With Britain's steady resolve to maintain complete free trade and the Gold Standard, how did the British steel industry survive?

ii) The answer lies in Comparative Advantage:

- the Germans had a distinct absolute and comparative advantage in Bessemer steel,
- while the British conversely had a comparative advantage in Siemens-Martin Open Hearth Production: producing higher cost but far higher quality steel, with smaller scale economies.

ii) Both industries in fact shifted over the long run to Siemens-Martin, but the British maintained a lead until World War II.

3. **The New Chemical and Electrical Industries, both of which were coal-based.**

a) **Germany's natural resource endowment,** with ample supplies of coal (and also potassium and sulphur) provides one explanation, but hardly a compelling one since Britain had even more ample supplies of coal.

b) **The difference,** we argued, lies in Germany superiority in science: with scientific, engineering, and technical education, with far stronger links to the new industries than found anywhere else; and the evidence was presented in much detail, summarized in one table.

c) **The new chemicals industry had two key branches, both linked to coal, from which all these chemicals were extracted or synthesized:**

i) **aniline dyestuffs and alkali or soda based chemicals**, exemplified in the name of a leading German chemicals firm, then and now: BASF, located in Baden Baden, Wurtemberg: Badische Anilin und Soda Fabrik.

ii) for both, the world's textiles industries – by far the largest global industry – provided the major consumers

iii) but from coal tars, these new chemical industries produced many thousands of different products: dyestuffs, medicinal products (e.g., Bayer aspirin), pharmaceuticals, perfumes, soaps and bleaching products, explosive, etc: see the lecture notes

d) **German world mastery in the international chemicals markets:**

i) By 1900, Germany was producing 90% of the world's dyestuffs, so vital for all textile industries

ii) and 50% of all the world's chemicals, in all forms.

iii) In the early 20th century, to World War II, the leading German chemicals cartel was I.G. Farbenindustrie (guilty of war crimes in WW II -- in supply the chemicals for the mass murder of Jews, Slavs, Roma (gypsies),

and others: composed of BASF, Hoechst and Casella, Bayer, and several other smaller firms

d) **The new electrical industries were also coal-based:**

i) since coal-fired steam turbine (invented by the British scientist Charles Parsons in 1884) generated almost all the electrical power.

ii) Germany, unlike France, Switzerland, and Italy, did not use much if any hydro-electric power.

iii) For this industry the German investment banks played a far greater role than in chemicals, since the industry involved very large-scale, heavily capital-intensive units, based on mass markets, with mass consumption in terms of:
(1) electric urban transport (trams, streetcars, underground trains),
(2) mass urban electrical lighting (while the British still used coal gas);
(3) telephones, and finally, by the 1890s
(4) industrial machinery, including electric furnaces for steel-making.

e) **German world mastery in the new electric industry, producing both capital goods (producers' goods) an and consumer goods:**

i) By 1910, Germany was the leading exporter of electrical goods, from small appliances to giant dynamos and generators,

ii) accounting for 50% of world exports,
(1) 2.5 times greater than those of the US or Great Britain.
(2) Siemens-Schukert became the major German cartel in this industry.

4. **Cartels: provided the final topic on German industrialization**

a) **important because so much of Germany industry** was engaged in cartel or syndicate organizations (lists given in the online lecture notes).

b) **the key features are:**

(1) the role of protective tariffs,
(2) the strong legal support from the German government and Supreme Court (in contrast to Britain and the US, where cartels were illegal -- but not in France and Russia),
(3) both support and direction from the investment banks.

c) **Cartels achieved their greatest importance in industries subject to unstable oligopolistic competition:**

i) competition between a vew very large scale firms, with major impediments to entry (high capital costs), producing homogenous or undifferentiated products (though in a wide variety of such products:

ii) each required its own separate cartel structure).

iii) Such competition was often cutthroat and highly unstable: so that investments banks, anxious to preserve their investments and equity stakes, promoted cartels to ensure stability.

d) **Certainly cartels, usually condemned in traditional microeconomic theory courses, provided Germany with enormous benefits:**

i) the usual charges against cartels -- that they misallocated resources, became inefficient, robbing domestic consumers of the 'consumer surplus', etc -- are in no way vindicated by the history of, say, the German steel industry; nor of the chemicals industries.

ii) instead, they provided relative industrial and employment security.

iii) investment in research and marketing was undoubtedly the chief benefit, especially from those cartels backed by the great investment banks:
(1) the large-scale investments in industrial and market research, responsible for thousands of innovations directly benefitting world consumers.
(2) consider that far-smaller scale business units engaged in more direct competition lacked both the will and the resources to engage in such research: so costly, risky, with no guarantees of payoff
(3) But cartels, in promising stability and more guaranteed profits and market shares, could thus better undertake such risky investments in research

iv) why would cartels, as monopolistic organizations designed to control or set prices and market shares, be interested in industrial product innovations?
(1) because such controls affected only their domestic German markets, while they still had to compete, often fiercely for international market shares with other national competitors
(2) because, for both domestic and foreign markets, often the greatest profits lay in being the first to produce totally new products, for which – though only in the short run – there were no competitors, and for which their investments in marketing research and expertise could create consumer demands, and thus high profits.
(3) Think of the case of modern computer and related electronic products, and observe their price histories: from very high prices with the original product and thereafter steeply falling prices with international competition (attracted by monopoly rents).

XX. Week no. 20: Lecture no. 25a: 6 March 2013

Section VI: Russia, The Beginnings of Industrialization, 1815 - 1914: Barriers to Economic Growth and Agrarian Changes in Russia, to 1917

- **begun on 6 March and completed on 13 March 2013.**
- **Again, a common theme of all these lectures is major role of the state in Russian economic development and industrialization, with both positive and negative consequences.**

Section A: Barriers to Economic Growth: Russian advantages and disadvantages

1. **Russia had three major natural advantages**:

a) abundant, rich natural resources, indeed those needed for modern industrialization (including agricultural lands);

b) **a large and growing population**;

c) **the advantages of being a 'Late Starter', especially**

i) in being able to import capital and the most up to date technology; and
ii) to use both to engage in large-scale forms of modern industrialization.

2. **Russia's natural disadvantages: principally**

a) **vast distances and thus**

b) **very high transport costs in utilizing her rich natural resources:**
i) with a far more primitive, undeveloped transportation structure than found in western Europe
ii) with so many rivers that flowed the 'wrong way': into the Arctic Ocean – the Volga being the major exception, flowing south into the Caspian sea

c) **some disadvantages in being a late-starter:** especially in being dependent on foreign capital, with a consequent development of a 'dual economy' (see the lecture notes)

d) **her agrarian sector was, above all, the most serious hindrance:** with a long heritage of serfdom.

Before proceeding to the resolution of these problems, we returned to:

3. **The Gerschenkron model, on the 'Economics of Backwardness'**,

a) **his principal theme:** is that 'Late-Starters' and especially those with primitive or 'backward' economies, such as Russia, could not afford to follow the British laissez-faire model and wait for market forces and liberal economics to achieve growth.

b) **Instead, the modern industrialization of these 'backward late-starters' demanded a very active interventionist role of the state:** to promote both industrialization and increased military power: in the case of Russia, the primary fear was German (Prussian) aggression.

c) **For Russia, Gerschenkron's principal thesis:** is that the Russia government bungled very badly in its task of liberating and modernizing Russian agriculture.

d) **The beginnings of modernization:** from
i) Peter the Great (1682-1725): the first Czar to seek to emulate the West and commence modernization
ii) to the disaster of the Crimean War (1853-56), in which Russia was defeated by an alliance of Ottoman Turkey, Great Britain, and France,
iii) forcing the Russian state to modernize, to permit modernization of its military forces, and modernization had to begin with the transformation of the agricultural sector.

Section B: Russian Agriculture: The Emancipation of the Serfs and Agrarian Changes, 1861-1914:

The primary question: Did Russian industrialization take place despite her agrarian changes -- as Gerschenkron contends (i.e., the thesis of abysmal government failure) or because of those changes (the Paul Gregory thesis)?

1. **The Second Serfdom in Eastern Europe (already seen in studying Germany:**

a) **a summary of the historical, geographical, and economic forces that led to the Second Serfdom in**

eastern Europe:
i) including Russia and Poland, from the late 15th or 16th centuries to the 18th century:
ii) the commercial, demographic, and institutional-feudal models
iii) my additional monetary-price model, concerning the Price Revolution and coinage debasements: the role of inflation, for landlords with fixed rental incomes, in promoting a shift from Grundherrschaft to Gutsherrschaft (see the lecture notes):

- from a manorial economy based on cash rents from free peasant tenancies to
- a manorial economy based on the commercial, export-oriented exploitation of an expanded demesne, utilizing massive amounts of servile labour (from serfs who pay rent on their holdings in labour)

b) **The adverse economics of serfdom: bondage to the manorial lord's estate, with arbitrary exactions, chiefly in the form of labour services**

i) why it was a major hindrance to economic growth in terms of: labour immobility and low productivity, with some statistics as evidence.
ii) Nowhere in eastern Europe had serfdom become so widespread, so pervasive, and so onerous as in Russia (though restricted to European, and not Asian, Russia), and excluding Finland and the Baltic provinces.

c) **Serfdom in Russia:** about half the population was peasant; and over half of them were servile, to one degree or another.

2. **Czar Alexander II's abrupt Emancipation of the Serfs in March 1861**:

a) **emancipation from above to avoid social revolution from below, as in Germany -- but with very mixed results:**

i) According to the principles of a liberal market economy, landlords had to be compensated for their capital losses, in terms of servile manpower and property holdings.
ii) The state, having assessed the market value of all Russian estates, issued Redemption Bonds to landowners, to cover 80% of the estimated loss of that capital in emancipation
iii) the peasants were expected to pay the remaining 20% in order to gain full personal freedom and title to their lands.

b) **Why landlords generally gained more than did the former serf peasant tenants:**

i) Most peasants found that gaining such liberty and land was easier to achieve by surrendering some portion of their tenancy lands, in the form of plough strips scattered within and among the great Open Fields (as seen in western pre-modern agriculture).

ii) Furthermore, since, as in western Europe, the estate lord's domain lands had become intermixed with peasant tenancy strips in the Open Fields,

iii) the combination of Emancipation itself and of peasant land transfer allowed many entrepreneurial landlords to engage in enclosures -- strictly segregating their lands from the peasantry -- and thus adopt the techniques of agricultural modernization, as already examined for western Europe.

c) **the special case of Russian Poland:**

i) We also dealt with the Poland, the former kingdom of Poland, fully absorbed into Russia, after the

Napoleonic Wars, in 1815, as a special case.

ii) Serfs liberated by Napoleon were not re-enserfed with the defeat of Napoleon, in 1815;

iii) with the 1861 Emancipation decree, most Polish peasants were already free, as were those in the Baltic provinces and Finland (acquired afer 1815)

iv) 1863: unrest provoked by the Polish nobility, who felt short-changed, led the Russian government to grant even more favourable terms to the Polish peasantry.

v) in 1865, Polish peasant were given full and free title to their lands and 10,000 new peasant holdings were created from czarist state-owned lands.

d) **The consequences of Russian peasant emancipation in terms of land transfers from peasants to large estates:**

i) Across the Russian Empire, we find that 'only' 4 percent of peasant lands were transferred to landowners in the Russian Empire
ii) but if we exclude Poland and the Baltic, the percentage rises to 13%;
iii) in the richest agricultural lands, which were all market- and export-oriented, the percentages of peasant losses vary from 23% in Ukraine to 41% in the Volga River valley (from Kuibyshev – now again Samara -- to Saratov).
iv) Obviously market forces explain those differences in peasant land transfers
v) At the same time, however, we find, with the development of a much more active and monetized land market, that many of the lesser nobility sold lands – perhaps 27% of their total from 1880 to 1914 – to both private urban investors (merchants, etc) and to peasants: a two-way flow of land

3. **The Gerschenkron model and thesis on the costs of peasant emancipation and agrarian reform:**

a) **The Obshchina and the Mir:** the basic model concerns the post-Emancipation Russian peasant communal village (and has nothing to do with Russian estate agriculture, nor with independent peasant proprietorship:

i) **the Obshchina:** the village and its agricultural lands

ii) **the Mir:** the village council that governed the Obshchina, and served as the government agent for the collection of 'obrok' and state taxes:
(1) the combination of taxes and implicit interest payments,
(2) usually 6%, to help the state finance its annual payment on the Redemption Bonds held by landlords.

b) **Repartition:** In Gerschenkron's view, the most insidious feature of this system was the periodic repartitions or redistributions of the peasant tenancy lands

i) in the form of scattered plough strips in the Open Fields, which were re-allocated to the peasant families of the obshchina, every 10 - 12 years, using family size (population) as the benchmark for reallocations: i.e., the more children the greater the likelihood of acquiring more lands.

ii) This system, if not new, expanded from35% of peasant lands in 1870 (9 years after Emancipation) to 87% by the early 1890s.

iii) As Gerschenkron commented: 'Nothing was more revealing of the irrational way in which the village commune functioned than the fact that the individual household had to retain the abundant factor (labor) as a precondition for obtaining the scarce factor (land)'.

iv) I, however, offered an hypothesis to explain its rationality, from the point of view of the Mir itself: it provided a way by which, with state support, the Mir could impose its coercive will on the Obshchina, by rewards and punishments in reallocations.

c) **Further state-imposed changes in Russian agriculture: 1881 - 1917**

i) 1881: all servile holdings to be Redeemed (Land Redemptions finalized);

ii) 1885: abolition of the Poll Tax;

iii) 1897 - Repartitions henceforth to be undertaken
(1) only once every 12 years and
(2) only with consent of 2/2 of the peasants in the Obshchina;

iv) 1905: Russia's humiliating defeat in the Russo-Japanese War, which provoked and led to:

v) the abortive 1905 Revolution: which was sparked by both peasant and industrial discontent

vi) **1906 - 1910: the Stolypin Land Reforms** (ending with his assassination in 1911), permitting the break up of an obshchina with 2/3 majority vote;

vii) By 1914, about 22% of the Russian communal peasants had left their obshchinas

Summary of the Gerschenkron Thesis:

A. Gerschenkron: costs of the mir-obshchina system of Russian peasant farming, after the 1861 emancipation:

1) **Periodic land repartitions:** from 35% of villages in 1870s to 87% in 1890s:

a) peasant tenancy strips redistributed every 10 - 12 years according to family size

b) rural overpopulation and diminishing returns, as each family sought to increase number of children in order to gain more land (or retain own holdings)

c) land improvements discouraged for fear of losing them with next repartition

d) result: disguised unemployment on crowded lands, with zero MP

2) **Peasant immobility: the major curse:**

a) **young peasants could not leave the land without father's consent:** who would obviously object that the sons' departure would worsen the family's holdings in next repartition

b) **young peasants also could not leave without permission of the Mir council:** who would agree only

in the departing peasant paid off his share of obrok (rent) and taxes

c) **the Mir was responsible for collective payment of the obshchina's obrok and taxes:**

d) **departing peasants were not allowed to sell any of his holdings:** and thus had to depart without the capital available to departing German and Polish peasant

3) **Peasant grievances concerning:**

a) **misallocated lands under repartitions:**
loss of communal grazing lands and even holdings held before Emancipation

b) **loss of lands:** to obtain both personal freedom and property rights

c) **excessive payments to the Russian government:** of *obrok* and taxes (in eyes of many peasants): that the state exacted such payments in order to finance the import of foreign machinery and other capital goods: 'hunger exports'

B. The Gerschenkron model on post abolition Russian agriculture:

1) **The abolition of serfdom in Russian communal agriculture: the negative results for economic development:**

a) peasant immobility and falling peasant productivity
b) tenancy repartitions: disguised unemployment, with further declines in productivity

2. **Economic consequences of peasant immobility and falling productivity:**

a) inelastic labour supply - meant scarcity of labour for urban industrialization

b) labour supply uneducated and unskilled for modern industry

c) inadequate domestic demand for industrial goods: because low productivity meant low incomes
d)low level of savings and thus of domestic investments

e) insufficient domestic supply of foodstuffs and raw materials for urban industrialization

f) thus, low levels of industrial urbanization: so that Russian society remained chiefly rural and agrarian, and poor

XXI. Week no. 21: Lecture no. 25b: on 13 March 2013

Section VI: Russia, The Beginnings of Industrialization, 1815 - 1914: Barriers to Economic Growth and Agrarian Changes in Russia, to 1917

begun on 9 March and completed on 13 March 2013.

Again, a common theme of all these lectures is major role of the state in Russian economic development

and industrialization, with both positive and negative consequences.

1. **The major topic of Russian agriculture:** the consequences of the abolition of serfdom:

a) **We did so by re-examining the Gerschenkron model:**

i) **in the light of the objections from its chief critics, especially Paul Gregory:** with their evidence to indicate that progress in Russian agriculture after 1861 was far greater than that indicated by Gerschenkron,

ii) **while also noting that the Gerschenkron thesis, in so far as parts of it may be valid, pertains to only a very limited portion of the vast Russian empire (up to 1914):** communal peasant agriculture in parts of European Russia only.

2. **A summary of the Gerschenkron Model on Post-Emancipation Russian Agriculture: How the Russian government bungled Land Reform (in his view):**

a) **That the fundamental flaws lay in periodic Repartitions**

i) periodic Repartitions, or redistributions of peasant tenancy holdings -- in the form of plough strips scattered in and amongst the three Open Fields (as in pre-modern western Europe) -- according to family size,

ii) the state: in providing the village Mir the powers to administer the operations of the Obshchina or village commune and to collect rents, taxes, and obrok.

iii) The periodic Repartitions -- involving only 35% of Russian villages in 1870 and 87% in 1890 -necessarily encouraged the growth of family sizes, if only to protect family land-holdings, and led to a combination of rural overpopulation, disguised unemployment, and falling or even negative marginal productivity of labour.

iv) Repartition killed incentive to improve lands worked, given the likelihood that the peasant family would lose some existing lands and hold new plough strips after the next Repartition.

v) It also bred peasant grievances, because so many viewed the periodic Repartitions as unfair, especially when families lost lands.

vi) While Gerschenkron called this system irrational, the state's rational was to enhance the power of the village Mir, as the state's agent in collecting obrok and taxes.

vii) None of the critics really deals with this Repartition issue: on how taxes should have been collected.

b) **A major consequence therefore was the other problem: Peasant immobility, and hence an inelastic and thus scarce supply of labour throughout the economy**

i) that remained the central curse, even though the supposed objective of abolishing serfdom was to give peasants freedom, including the freedom to move, and land.

ii) According to Gerschenkron, peasant sons could not leave the obshchina without permission of both their fathers (family) and the Mir itself;

iii) neither the father of the peasant family nor the mire could afford their departure and loss of determinants

of both land holdings (in the next Repartition) and provision of village obrok.

iv) Peasants who did manage to leave could not sell any land, which belonged to the family and to the Mir, and thus lacked the capital that emigrant German peasants enjoyed.

c) **In Gerschenkron's view, this highly adverse combination of peasant immobility and drastically falling productivity had highly predictable results that hindered industrialization and economic growth:**

i) a rigidly inelastic labour supply;
ii) a grossly inadequate supply of educated and skilled labour -- leading Gerschenkron to argue that the scarcest input or resource in highly populous Russia was labour;
iii) low incomes and thus inadequate demand for industrial goods in the domestic Russian market; iv) inadequate domestic supplies of savings and capital;
iv) inadequate supplies of inputs for industrialization: not just labour, but also foodstuffs and industrial raw materials;
v) and low levels of urbanization -- and European Russia was only 15% urbanized on the eve of World War I, in 1914 (but up from 6% in 1880). *

3. **Criticisms of the Gerschenkron Model:** chiefly by Paul Gregory (an American historian):

a) **That Gerschenkron ignored regional variations, especially in non-Russian parts of the Empire:**

i) Gregory contends that rapid growth in the non-Russian parts of the Empire, comprising more than half, more than compensated for any losses in traditional Russia.

ii) I provided some such information on Finland, the Baltic provinces (modern day Estonia, Latvia, Lithuania) and Poland.

b) **Even within Russia and Ukraine, Gerschenkron focused exclusively on what happened in traditional villages communes (the obshchina):**

i) **he neglected to consider the significant progress achieved on estates** of many gentry and aristocratic landlords, and also even those of prosperous 'kulak' peasants.

ii) **For large estates in Russia and Ukraine, landlords benefited there as did their counterparts in eastern Germany:** from the conversion and addition of former peasant tenancy lands into enclosed market-oriented farming estates. See further remarks on enclosures below: in having their domain lands finally separated from peasant communal lands, allowing them now to enclose and then to engage in all aspect of modernized agriculture (convertible husbandry, multiple course crop rotations, chemical fertilizers, stream-powered machinery).

iii) **Furthermore, most peasants, responsible for 20% of the Emancipation costs, gained both freedom and some land only at the expense of surrendering parts of their land holdings**, from 50% to even 75%, to landlords.

iv) **Thus peasant losses, while 13% overall in the Russian Empire,** excluding Poland, the Baltic, and Finland, ranged from 23% in Ukraine to 41% in the rich Volga River Valley (Samara to Saratov).

v) **Landlords sought to reap such gains** in those areas best suited to high productivity, commercialized agriculture, and export markets.

vi) **Indeed, Tsarist Russia, from the 1880s became one of the world's largest grain exporters,** producing 70% of its export earnings, up to World War I.

c) **Gerschenkron called these 'hunger exports'**: grain exports at the expense of the Russian peasantry: attributing these grain exports to high taxation and indeed expropriations: for which there is no proof, according to Gregory.

d) **Gerschenkron ignored the positive evidence of a far more active land market (so did Gregory to some extent):**

i) while landlords gained much land from former serf peasants,

ii) other less enterprising landlords, of the spendthrift aristocracy and gentry, ultimately sold 27% of their landlholdings to richer peasants (kulaks) and bourgeois merchants by 1914.

d) **Gerschenkron vastly exaggerated the plight of post-Emancipation Russian peasants:** even within the obshchina system, and ignored evidence of their mobility and even prosperity.

e) **Gerschenkron had contended that productivity and thus rural incomes fell:**

i) for which Gregory supplies much contrary statistical evidence (and note that Gerschenkron provided very little such evidence.

ii) I had presented earlier some seeming support from previous independent evidence: that suggested an increase in grain production of only 43%, while population grew by 117%, from 1860 to 1910).

iii) But Paul Gregory's statistics show the exact opposite: in terms of 1913 gold rubles (real values), grain production grew by 124% from 1885 to 1911-13 (1,183 million rubles to 2,654 million rubles)

iv) and total agricultural output grew by 96.7% (from 3,025 million to 5,948 million rubles);

v) personal consumption (all Russia) grew by129% (from6,661 million to 15,273 million rubles), while population, as noted, grew 117%.

vi) Thus in per capital terms, consumption rose from about 61.33 rubles in 1890 to 95.04 rubles in 1913.

f) **Rising land prices:**

i) viewed by Gerschenkron as another negative indicator of the plight of the peasantry, also contradicted by Gregory:

ii) Gregory contends, instead, that rising agricultural and land prices provides an indication of both increased total factor productivity and of prosperity: i.e., an enhanced demand for land, especially from property owning free peasants and small estate owners

g) **Did the state promote and protect communal agriculture?:**

i) this issue is, in fact, not really discussed by Gregory or other critics

ii) **but I presented arguments (based on scattered evidence and logical deduction) to the contrary**: that the process of peasant emancipation, requiring the serfs to pay 20% of the costs, actually led to significant land transfers to landlords (as noted above), and

ii) **allowed landlords to separate their demesne lands from peasant communal lands:** and thus to engage in enclosures and thereby to adopt convertible husbandry, multi-course crop rotations with nitrogen-fixing legumes, chemical fertilizers, machinery, and other techniques of modernized agriculture

iii) read the lecture notes in full on these issues.

(21) XXI. Week no. 21: Lecture no. 26: also given on 13 March 2013

A very brief lecture on Russian Railways and Industrialization, from ca. 1850 to 1914

1) **The Russian railway structure, from the 1850s:**

a) **There were five fundamentally important railway systems** that permitted Russian industrialization and much more rapid economic growth from the 1850s,

i) but the most important were from the mid 1880s to 1914:

ii) so important when vast distances and previously very primitive transport facilities had prevented the utilization of much of Russia's rich land and mineral resources:

b) **The major Russian railways:**

i) **The Great Russian Railway Company:**
(1) begun in 1857 as a private joint-stock company, and nationalized in 1882:
(2) running from Warsaw (Poland) north-east to St. Petersburg, south-east to Moscow and Tula, south to Kharkov and then Kiev, in Ukraine, and then north-west to Warsaw: the world's largest railway company. ii)

ii)**The Trans-Caucasian Railway, founded in 1883:**
(1) running from Baku on the Caspian Sea, linking its oil fields to Batum on the Black Sea, for ocean transport:
(2) Russia was briefly the world' largest oil producer and exporter, in the late 1890s

iii) **The Trans Caspian Railway, also founded in 1883:**
(1) linking Astrakhan, where the Volga flows into the Caspian, to the Aral Sea, and beyond, to the east:
(2) opening up vast new cotton plantations in Turkish Central Asia (Kazahkstan, Uzbekistan, Tadjiskitan)

iv) **the St. Catherine's Railway (Ekaterinoslav), founded in 1886:**
(1) linking up the vast coal deposits on Lugansk, on the Donets, which flows into the Don and the Sea of Azov (Black Sea) with the even more immense deposits of iron ore at Krivoi Rog, on the Dnieper, north of Crimea, and with also vast iron fields in the Crimean peninsula itself.
(2) This railway made the southern Ukraine the Russian equivalent of Germany's Ruhr-Rhine industrial complex.

v) **the Trans-Siberian Railroad, constructed from 1891 to 1900:**
(1) running some 6800 km, from Moscow to Vladivostock on the Pacific:
(2) built for political reasons: to unite European Russia (from the Baltic, via St. Petersburg) across the Urals into and across Asia to the Pacific Ocean
(3) its real importance lay in the 20th & 21st centuries.

2. The role of the state in Russian railways:

a) the role of the Count Sergei Witte**:** Minister of Finance (1892-1903) and Prime Minister (1903-06)
i) **chiefly responsible for the rapid expansion of the Russian railway system, from 1891** (having sponsored the construction of the Trans-Siberian Railroad, before becoming Finance Minster)

ii) **role of the state similar to that found in Germany and France:**
(1) state subsidized railway finances (borrowing): by providing state guarantees for railway bonds
(2) sponsored state ownership, so that Russian gov't owned 2/3 of railways by 1913
(3) governed the railway fare structure, again in a 'mercantilist' fashion: subsidizing transport of raw materials and finished manufactures to ports for export.

iii) **importance will be seen in the next lecture on Russian industrialization;** but also for agriculture (grain and cotton) and the export trades.

XXII: Week no. 22: Lecture Topic no. 27: 20 March 2013

Section VI: Russia, The Beginnings of Industrialization, 1815 - 1914:

D. Russian Banking and Finance: to 1914.

1. The Role of the State in the Russian Economy and in Banking Institutions:

a) **Again the Russian state had long played a decisive role in establishing banks:**

i) beginning with the first state bank in 1754.
ii) This and subsequent banks were essentially mortgage banks designed to assist the nobility and gentry in financing their estates.

b) **Russia's defeat in the Crimean War of 1854-56: produced a final crisis** (1856-57) that led to the collapse of tall these banks.

2. Gosbank: the establishment of Imperial Russia's official state bank:

a) **In 1862, these older banks were replaced by a new state bank:** Gosbank (Government Bank),
i) which was in fact a new department within the Ministry of Finance;
ii) as such it represented a far more direct government intervention in the financial economy than found anywhere else in 19th-century Europe.

b) **Gosbank began by acting as a regular commercial bank:**
i) i.e., a bank of deposit, transfer, lending, and discounting;
ii) subsequently it established over 900 branches throughout Russia, while also sponsoring the creation of

new joint-stock banks.
iii) From the 1880s, it normally handled about 25% (or more) of total lending and discounting in Russia.

3. Gosbank and Russian monetary policy: the Gold Standard and gold ruble.

a) **The chief importance of Gosbank lay in its monetary policies:**

i) in putting Russia on the international gold standard, in the years 1894 to 1897,
ii) indeed as the last major country to join that international group.
iii) That success was due to one man: Count Sergei Withe, Minister of Finance, who successfully converted Russia's previous purely fiduciary paper currency (no metallic backing) with a fully, 100% gold-backed paper ruble.

b) **Its objective was to induce a much greater influx of foreign capital:**

i) by offering investors the right to repatriate both principal and investment earnings (interest and dividends) in gold -- i.e., in that rubles were convertible into fixed amounts of gold and thus freely exchangeable into any other gold-standard currency.
ii) Previously investors faced the uncertainty of returns in unbacked paper rubles, whose values had fluctuated considerably on foreign exchange markets.

c) **Many historians have criticized this gold ruble monetary policy on three major grounds**.

i) That it was unnecessary, since large amounts of foreign capital had flowed into Russia for over the ten previous years, since the mid-1880s

ii) That it was far too costly: in terms of both
(1) high taxation, especially on the peasantry,
(2)and high interest rates to attract foreign gold-backed loans, both of which were used to build up the gold reserves of Gosbank:
(3) high taxes and high interest rates, the critics contend, suppressed internal demand

iii) Requiring 100% gold backing was an absurdly strict and repressive condition:
(1) as was contended for France (when the Bank of France had 50% gold backing), that high gold reserve made both the supply of money and the supply of credit rigidly inelastic,
(2) thus curbing potential economic growth.

d) **The responses to the critics:** a justification of the gold ruble policy

i) **For foreign investments:** the gold ruble policy clearly worked:
(1) from 1885 to 1897, annual foreign capital inflows had amounted to 43 million rubles = 0.5% of Net National Income;
(2) from 1897 to 1913: foreign capital inflows rose 4.4 fold: to an annual mean of 191 million gold rubles = 1.5% of Net National Income

ii) **Taxation:** did it become too severe of a burden?
(1) While per capita taxes did rise, in nominal terms, from 5.41 rubles in 1885 to 11.79 rubles in 1910, those values do not take account of the inflation from 1895.
(2) Taxes, as a percent of net national income, remained unchanged throughout this period at a stable 13%,

while taxes as a percent of gross industrial output fell by half: from 51.3% in 1885 to 25.5% in 1913.

iii) **The interest rates:**
(1) While interest rates (central bank discount rates) rose from 6.10% in 1885-90 to a peak of 7.80% in 1895-1900 -- and well more than double those rates found in Berlin and Paris -- the rates then fell, once the gold ruble had proved successful: to a new low of 5.10% in 1908-12.
(2) At the same time, the gold reserves of Gosbank also fell, because those previously high levels were no longer needed to command confidence.

iv) **The money supply:** did the gold standard policy make it too inelastic?
(1) The money supply: if M1, narrowly defined, is calculated to include not just notes and coins but also chequable current accounts in the banking system, the evidence supplied by Ian Drummond simply refutes any arguments about an inelastic money supply:
(2) there is no correlation between M1 and the gold reserves,
(3) M1 rapidly expanded, greatly outpacing the growth of the gold reserves, and continued to grow, exponentially, when gold reserves fell after 1897.

c) **conclusions:** The simple fact is that Russian industrialization after 1885 was totally dependent on the influx of foreign capital.

5. Gosbank and the Private Banks of Imperial Russia

a) **Gosbank's role in fostering the growth of private commercial joint-stock banks:**
i) chiefly in St. Petersburg and Moscow, supplying up to 25% of the capital for some of these new banks
ii) and thus holding voting shares on their boards of directors

b) **The Investment Banks:** before 1905

i) The chief agency for funnelling the influx of foreign capital were the investment banks, both domestic and foreign;
ii) indeed most of the domestic Russian banks came to be taken over (bought up) by foreign banks and investors.
iii) The Industrial Depression of 1900-06, the Russo-Japanese War and Russian Revolution of 1905:
(1) very harmful consequences for those foreign investors who had invested directly in Russian enterprises
(2) these events also forced the government to focus its attention on the discontented peasantry

c) **The Role of the Investment Banks, 1906 - 1914:**

i) the government now left the key role of promoting industrialization to the Investment Banks, which led the great Industrial Boom of 1906-1913,
ii) by which time almost half of Russian banks were foreign owned,
iii) and so were most of the new heavy industries in Russia.

d) **Imperialism from such foreign investments?**

i) Those circumstances had led Vladimir Lenin, the future Bolshevik leader, to publish his seminal book *Imperialism: the Highest Stage of Capitalism* in 1916.

ii) The thesis in essence contended that the New Imperialism was ipso facto the export of capital;

iii) and that such capital exports and consequent economic dominance of foreign lands was the mechanism by which western capitalist were seeking to avoid their ultimate fate:
(1) to avoid a continual fall in the rate of profit, which would lead to increased exploitation of the working classes, driving them to Revolution and the victory of Communism;
(2) and thus they sought to avoid this fate by exporting capital to extract higher rates of profits in less developed countries.
(3) This topic of course relates to this term's B List Topic on The Theory of Capitalist Imperialism

e) **Why France was the largest foreign investor in Imperial Russia (to 1917):**

i) Finally, we noted that the largest single share of foreign capital came, unexpectedly, from France.
ii) The reasons are political, as France sought to build up the Russian economy and military as a counterweight to their new enemy: Imperial Germany

XXII: Week no. 22: Lecture Topic no. 28: 20 March 2013

Section VI: Russia, The Beginnings of Industrialization, 1815 - 1914:

E. The Industrialization of Russia to 1914: Metallurgy, Petroleum, and Cartels:

1. A review of the role of the state in the economy of Imperial Russia: in agriculture, railways, and banking

2. The role of the state in foreign trade: the role of protective tariffs:

a) **A new feature to be observed now is commercial policy:** high tariffs, culminating with the Mendeleyev Tariff of 1891 ("Monster Tariff"),

b) **two roles of protective tariffs, with a greater importance than as a fiscal policy to raise revenues:**

i) To encourage of force foreign firms to jump over the tariff barriers by establishing branch plants in Russia, to produce and sell their goods there, in the Russian market

ii) To provide the foundations for and protection for state-sponsored industrial cartels: since, as we saw in Germany, cartels cannot be successful unless they curb foreign as well as domestic competition

3. The Metallurgical Industries: coal, iron, and steel

a) **the former supremacy of Russia in world iron production:**

i) We recalled, from the study of the British Industrial Revolution, that in the 17th and in much of the 18th century, world leadership in iron-making was shared by Sweden and Russia (in the Ural Mountains region):

ii) both of which had rich iron ores, ample timber and thus relatively cheap charcoal fuels, and abundant water-power, not to mention cheap labour.

b) **the Impact of the British Industrial Revolution:** when the Industrial Revolution allowed the new coal-based coke and steam technology to gain ascendancy, the Russian Urals industry declined.

c) **The new Russian metallurgical industries:** especially in Ukraine:

i) The new primary source of a new and rapidly growing metallurgical industry lay in Ukraine:

ii) railways: made possible by the role of the St. Catherine's Railway(1886)
(1) in linking up the immense coal deposits of Lugansk, on the Donets, near its junction with the Don (flowing into the Sea of Azov)
(2) with equally immense and rich iron ore deposits of Krovoi Rog, on the Dneiper, and the Kerch Peninsula in Crimea.

iii) The whole region became the Russian Empire's equivalent of the German Ruhr valley.

iv) Of course this industrial success was fundamentally based on foreign capital: indeed, foreign capital was responsible for 85% of Ukraine's steel production, from the 1880s.

3. The Petroleum Industries:

a) **The other major new industry was Petroleum:**

i) based on the Trans Caspian Railway (1883) linking the oil fields of Baku, on the Caspian, with Batumi on the Black Sea, for oceanic transport;

ii) and of course also on foreign capital and protective tariffs (to keep out American oil).

b) **Markets: both export and domestic demand:**

i) Briefly, around 1900, Russia enjoyed world supremacy in exporting oil, but soon lost that to the U.S.

ii) For Russia in particular, the chief market and source of consumption of petroleum was not the automotive nor chemical industries, both of which later (post WWI) became paramount;

iii) but rather kerosene fuels, to provide lighting for peasant households, as was also true in China -- providing Standard Oil Company's major overseas market (US petroleum cartel: ‘Oil for the Lamps of China’).

4. Industrial Cartels:

a) **factors that promoted industrial cartels in Russia:** for much the same reason as in Germany:

i) **Direct foreign investment by large scale foreign firms:** who were themselves often members of industrial cartels.

ii) **Industrial financing by syndicates of investment banks,** as in Germany.

iii) **Advantage of being a late starter**: begin large scale with the most advanced industrial technology, to compete with other countries.

iv) **Government policy**:

(1) to promote large-scale industrial cartels, sustained by protective tariffs and sympathetic courts: (2) that was deemed the best policy to promote rapid industrialization in those sectors most likely to increase Russia's military power.

v) **scarcity of industrial labour**: another aspect of Gerschenkron's thesis

b) **Chief Industrial Cartels in Imperial Russia:**

(1) Pradamet in iron and steel (1902) and
(2) Produgol in coal (1906).

c) **Industrial Scale:**

i) **As in Germany,** those cartelised industries were characterized by having very large scale.
ii) **Over 40% of all Russian factories:** employed more than 1,000 workers each.

d) **Urban Industrialization:**

i) had more than doubled between 1860 and 1913:
(1) from 6.6% to 15.3% of the population of European Russia
(2) butut still it was only 15%.

ii) The growth of an urban industrial labour force:
(1) had similarly doubled, in fact doubled from the 1880s;
(2) but again, it was still only 2.3% of the population of European Russia in 1914.

XXIII: Week no. 23: Lecture Topic no. 29, Part A: 27 March 2013

VII. PROBLEMS OF THE BRITISH AND INTERNATIONAL ECONOMIES, 1870 - 1914:

A. Economic Trends, 1870 - 1914: 'The Great Depression' and After

1. **Introduction: Problems in the British Economy, 1870 - 1914:**

For an overview, we considered four interrelated debates about the British economy, from 1870 to 1914, all of which are major essay topics, for this term:

a) **Industrial Retardation:**

(1) did the British economy experience a decline:
(2) and was it an absolute decline or a relative (to the past, and to other countries)?
(3) 'Retardation' indeed means 'slowing down', slower rates of economic growth;

b) **Was British entrepreneurship responsible for this 'industrial retardation', or relative decline?**

(1) Much of this topic has already been analyzed in studying German industrialization, where evidence was presented to indicate social, economic, cultural, and political reasons with negative effects on British entrepreneurship in this period. Read the lecture notes on Germany

(2) Did British business experience a ‘Buddenbrooks’ syndrom? Read the lecture notes.

c) **the Era of 'New' or 'Capitalist' Imperialism, and the role of capital exports:**

(1) We discussed the Marxist-Leninist thesis behind this debate: that the export of capital, as it did occur in ever larger amounts from the 1870s, was ipso facto Imperialism,
(2) with economic dominance over new colonies, principally in Asia and Africa, that did not require outright military conquest; but also economic dominance over other areas of the world.
(3) Statistical evidence was presented to show the large increases in British capital exports from the 1870s,
(4) and also evidence to show that the British were investing proportionately far more of their capital abroad than at home.

d) **Did Great Britain also experience a 'Great Depression', during the shorter period of 1873 - 1896:**

(1) was that an international or domestic phenomenon;
(2) and if the latter, was it closely related to the three other problems under examination?

2. **Key aspects of the 'Great Depression' debate: also involving the 'industrial retardation' debate:**

a) **Public Perceptions of a ‘Great Depression’:** from foreign trade and prices.

b) **Steep Deflation experienced in this era:** unprecedented since the 'late medieval Great Depression', during the later 14th century.

i) **Falling prices is not a trivial phenomenon:** because it generally means, for industrialists and tradesmen, that their product prices are falling, while their real factor costs -- for labour (wages), capital (interest) and land (rent) -- are rising in real terms (even if stable in nominal terms).

ii) **But such price-cost squeezes, resulting from deflation,** can themselves be the vital trigger for productive innovations.

c) **Agriculture:**

i) Certainly British agriculture experienced, if not a 'depression', a severe contraction in the face of a flood of foreign agricultural imports, with a gold-standard base Free Trade regime

ii) unlike most other countries, which had abandoned Free Trade, to restore tariffs to protect their farmers.

d) **Foreign trade:**

i) experienced certainly periodic slumps after 1870-4;

ii) and British exports did not recover that level until 1895-99.

iii) **As Arthur Lewis noted, British trade experienced four problems:**
(1) the loss of foreign markets to industrial growth in those countries, in so far as they established import-substitution industries;
(2) the invasions of those markets by British competitors;
(3) barriers to most foreign markets with rising protective tariffs; and finally

(4) invasion of British home markets by foreign competitors. We had earlier noted the invasion of German steel products, from the 1890s.

e) **Capital investments, domestic and overseas investments:**

i) statistical data was again shown to demonstrate that the British were investing a far smaller share of their national income in domestic capital. than did the Germans, in particular,

ii) and correspondingly an increasingly larger share in foreign capital investments.

iii) Did the British come to rely far too much on overseas earnings at the expense of their domestic economy: i.e., by investing too little in domestic manufacturing and other potential areas of growth?

f) **The Unemployment Question:**

i) most people, rightly or wrongly, associate 'depressions' with high and higher levels of unemployment. Was that the case in Great Britain from 1873 to 1896?

ii) employment statistics, from two sources, were presented:
(1) while unemployment rates did rise, somewhat during the period of the so-called Great Depression,
(2) they did not rise above 6% for any five year periods,

iii) and were far from the truly high rates experienced between World War I and World War II (and were lower than current rates in Canada).

g) **Levels of National Income (NNI and NNP) and the concept of 'Depression':**

i) There is no agreed upon definition of the word 'depression' a term that some restrict to the historically unique circumstances of the world economy, 1929 - 1939.

ii) We all agree on the meaning of the term 'recession': a net decline in real NNI and NNP over two successive quarters of the year – hence a short-term phenomenon.

iii) Possibly we may define 'depression' as a far deeper and far more prolonged recession.

iv) If so, the national income data for the UK do not substantiate a 'depression' thesis, since (as the tables in the notes show) there was no significant decline recorded in NNI, which indeed continued to grow, even if slowly, through the entire period: thus negating any concept of 'depression' (a deep and prolonged recession).

h) **Conclusion:** while there were periodic recessions and trade slumps, there was no 'Great Depression'.

3. **The Deflation of 1873-1896: monetary or real causes?**

a) I**n terms of the Fisher-Friedman quantity theory of money,** we can argue that this deflation was essentially the product of monetary stagnation, on the monetary side, and cost-cutting, thus price-reducing technological changes on the real side:

b) **consider the Friedman equation of exchange:** M.V = P.y, in which 'y' stands for real net national product,

i) ‘y’ or real NNI steadily grew, thanks to technological changes, capital investments, and a vast expansion in world trade

ii) we reviewed the extent of technological changes in both production and trade (transportation) that led to world-wide falls in most commodity prices

iii) and NNI grew to a much greater extent than did the volume of money payments.

c) **The Gold problem:**

i) at the same time, world gold mining slumped (with no new mining booms), so that available world gold supplies did not increase to keep pace with increased volume of world production and trade.

ii) In era of gold-backed currencies, the declines in world gold mining and transfers of gold for various purposes (monetary and industrial), inhibited monetary expansion, to explain the deflation, but one in which real factors were just as important, indeed more important, as indicated above.

4. **The World Inflation of 1896-1914:** the pre-War boom

a) **here, the real factors do not provide a convincing explanation of this pre-war inflation:**

i) we can hardly argue that the tempo of technological changes slowed down

ii) Arthur Lewis: rising marginal costs in world agriculture, leading to rising food prices: but than can hardly explain an overall rise in prices, i.e., genuine inflation.

iii) Rostow's Keynesian thesis, as an exception: on the changing nature of capital investments:
(1) with far longer periods of gestation, in technologically more complex forms of industrial growth,
(2) combined with economically wasteful investments in rearmament,
(3) so that capital expenditures created incomes not matched by an immediate increase in consumer goods, etc. [that is, an increase in both I and G, in terms of the formula, $Y = C + I + G + (X-M)$.

b) **Money and Gold:**

i) For this inflationary era, the prime cause must be sought in monetary factors:

ii) especially the major new gold mining booms -- of South Africa and the Yukon -- along with substantial increases in gold mining in much of the rest of the world.

iii) Graphs were shown to demonstrate the exponential increase in gold stocks from the 1890s to World War I.

5. **Productivity changes in the British economy, 1870 - 1914:**

a) **Three sets of data, based on the researches of Charles Feinstein and Arthur Lewis, were presented:**

i) with sometimes conflicting results for individual decades within the overall era of 1870 - 1914.

ii) But they all conclude, in all forms of comparisons, that British productivity, and especially industrial productivity, was lower in the period 1896 - 1914 than it had been in 1873 - 1896, which in turn was lower than the preceding era, back to the 1840s.

iii) All sets of data, with no exceptions, show that the period the poorest productivity performance was from 1900 to 1913

iv) Do these negative productivity data, indicating rising marginal costs, help to explain the rise in prices?

b) **As Deirde McCloskey had earlier contended,** the British economy fared better in the Victorian era (to 1901) than in the Edwardian era that followed (to 1914).

XXIII: Week no. 23: Lecture Topic no. 29, Part B: 27 March 2013

Section VII. PROBLEMS OF THE BRITISH AND INTERNATIONAL ECONOMIES, 1870 - 1914:

B. British Banking Institutions, 1870 - 1914: experiments in investment banking

1. **Did the British adopt and take up investment banking after 1870:**

a) **The central question to be asked is:**

i) did the British, after witnessing the success of investment or Universal Banking on the continent, decide to follow suit: to engage in investment banking as well?

ii) While there are numerous examples of important investment banks to be found in London, from the 1870s, most of them were internationally-focused merchant banks,

iii) principally engaged in acceptance banking, to finance foreign trade and foreign governments,

iv) and most of them were foreign in origin.

b) **There was some minimal investment banking undertaken:**

i) by these foreign merchant banks, along with some London-based joint stock banks,

ii) they did occasionally engage in forms of investment banking:
(1) in financing overseas railroads and governments,
(2) especially in North America. Some also tried investing in domestic British firms,

iii) but generally without much success.

c) **In general, these investment banks were too small-scale, to be cost effective:**

i) especially the family oriented banks,

ii) far smaller in scale than German investment banks,

iii) to be successful in an area of enterprise that involved very high fixed costs, especially start up costs.

d) **Not until after World War II:** would British banks gain the economies of scale and large capitalizations to become successful in investment banking.

2. **Late 19th century financial disasters:**

a) **The last part of the lecture focused on some financial disasters:**

i) the failure of the City Bank of Glasgow (1878) and

ii) the near collapse of the Baring Brothers bank in the 1890s (lending to bankrupt South American gov'ts)

b) **that also dissuaded British banks from investment banking:**

i) and thus encouraging them to remain wedded to traditional and very conservative deposit and transfer banking,

ii) principally, with short term discounting and short-term loans.

XXIV: Week no. 24: Lecture Topic no. 30: Wednesday, 3 April 2012 (last class)

Section VII. PROBLEMS OF THE BRITISH AND INTERNATIONAL ECONOMIES, 1870 - 1914:

Part C: Varieties of Economic and Industrial Experiences, 1870 - 1914: Living Standards and Industrial Scale

1. The Sharp Rise in British Living Standards: from the 1870s

a) **The steep rise in real wages and living standards is the most significant feature of the British economy and society from the 1870s to World War I:**

i) **perhaps the most significant increase to have occurred in England since the 15th century**, even if real incomes, having fallen during much of the Industrial Revolution era, were rising (for virtually everybody) from the 1840s.

ii) The evidence for this was presented in several colour graphs and many tables.

iii) **The levels of real wages and real incomes achieved in Great Britain, by the eve of World War I, were higher than anywhere else in Europe,** though not as high as had been attained, above all, in the US, or Canada, or Australia, in 1914: see the evidence in the graphs.

b) **Causes of the rise in real incomes:**

i) **Deflation and nominal wage stickiness:**
(1) In my view, the principal cause of the rise in British real incomes was the deflation experienced from 1873 to 1896: in that, while nominal money wages did not rise, or not by very much, the cost of living fell substantially.

(2) See the formula: RWI = NWI/CPI.

ii) **causes of the deflation, 1873 - 1896:**
(1) In turn the major cause of the was, despite the admitted power of monetary factors (as discussed in the previous lecture), cost-cutting and thus price-cutting technological changes.
(2) The most important was the combined impact of the steam-powered revolutions in transportation which opened up many new areas of the world to food production, for truly globalized world markets.
(3) The British, enjoying the combined advantage of Free Trade and the Gold Standard, gained from agricultural imports at world prices,
(4) while most other European countries protected their farmers with higher tariffs, thus denying the 'gains of trade' and the rise in real incomes that the British public enjoyed.

b) **Medical Factors: higher living standards were also due to a veritable revolution in public health:**

i) **capital investments in water-purification** and mechanized sewage systems, from the 1880s.

ii) **Momentous scientific discoveries of Robert Koch and Louis Pasteur:** led directly to these improvements
(1) of the bacterial transmissions of diseases (viruses were discovered only in the 1920s);
(2) and the realization that about 80% of diseases are water-borne.
iii) No other discovery or innovation had such an enormous impact on the fall in mortality.

c) **Education and Literacy:**

i) **Finally, great progress in literacy:** provided yet another significant contributor to rising living standards

ii) **especially from public investments in mass primary-school education:** a country's social and economic progress can best be measured (in my view) by calculating the ratio of total expenditures (capital and gov't) in education to those in the country's military and police forces

2. **Questions of Industrial Scale in the British Economy and British Economic Growth:** 1870 - 1914:

a) **The role of Free Trade and the Gold Standard:**

i) **You are advised to consider here the possibly negative role of both Free Trade and Laissez Faire in preventing the British from engaging in industrial cartels**, which together, as we saw, were principal agents of a dramatic increase in industrial scale in several industries not only in Germany, but also in France and Russia.

ii) Note that in Germany, France, and Russia the state fostered the growth of cartels and large-scale industries

- not only through protective tariffs (see Russia' Mendeleyev Tariff)
- but also by law and judicial institutions, which upheld the validity of cartel contracts, which were illegal in Free Trade Britain.

iii) **A free-trade anomaly:** internal free trade, as see saw last term, with the Industrial Revolution, and especially with the early transportation revolutions – canals and the early railroads – in achieving market unification did promote larger industrial scales:

iv) **in having a few large national firms serve the entire national market,** instead of dozens of small regional firms serving their own local markets, protected by 'the tariff of bad roads'

b) **The role of banking institutions:**

i) the fact that British banking was still dominated by deposit banks that specialized in either short term lending or discounting for working capital rather than fixed capital needs

ii) and the virtual absence of investment banks in the British economy, until the mid 20th century.

c) **The mainstays of the British economy from 1870 to 1914 remained those already seen:**

i) coal mining, metallurgy, textiles, shipbuilding, international trade and finance.

ii) British supremacy in world trade and finance was in part the product of its supremacy in shipbuilding, gained only after 1870, but lost after World War I.

iii) Shipbuilding, shipping, and finance (banking, insurance, overseas investments) together provided the most powerful force for growth and prosperity in the British Victorian economy of this era.

Part D: Industrial and Commercial Advances: the Consumer Goods Revolution.

1. **The Consumer Goods Revolution, 1870 - 1914:**

a) **a veritable revolution in consumer goods :**was the associated and equally important aspect of economic and social change in the British economy from the 1870s to World War I, and thus during the so-called 'Great Depression' era,

i) both their production and distribution.

ii) The tertiary sector, for merchandising, and distribution is equally important.

b) **Causes of the Consumer Goods Revolution:**

i) **the product of the two related factors just discussed:**
(1) the sharp rise in real wages and real incomes, and
(2) increased levels of literacy with advances especially in primary education.

c) **Consequences of these two factors:**

i) Thus, given that the major factor in the rise of real incomes was the sharp fall in the cost of foodstuffs, for which demand is relatively inelastic,
(1) that change permitted most of British society to spend far more of their disposable incomes on other consumer goods,
(2) those that constituted this revolution: e.g., a wide range of new electrical goods and appliances, sewing machines, bicycles, and later, also automobiles, cameras, telephones, machine made clothing and footwear, packaged consumer goods, and a wide variety of paper publications: books, newspapers, magazine, journals.

ii) That latter aspect – the importance of the variety of print media – of course reflects as well the

improvements in mass literacy, mass education.

d) **The Revolution in the Tertiary Sector:** mass merchandising

i) **This Consumer Goods Revolution would not have been possible without a related revolution in the tertiary sector:** marketing and distribution.

ii) **That involved especially:**
(1) the introduction of French-style department and chain stores,
(2) with standardized, pre-packaged goods, and
(3) stipulated, advertized prices (no market haggling for individual items).

iii) **That mass advertizing in turn depended on the development of the paper-publishing industries:** book, journals, magazine, newspapers, flyers, etc., for such advertizing, in turn necessary for mass marketing.

iv) Both thus involved a leap-forward in scale economies for marketing and distribution.

2. **The New Industries in Britain, from the 1870s:**

a) **The two key new industries of the so-called Second Industrial Revolution, both of them coal-based:**

i) the electrical industries and the chemical industries,

ii) in which Britain was, by almost uniform agreement, a failure.

iii) **What was the source of that failure in the German-style electrical and chemical industries:**?
- the relative lack of British skills in research sciences and engineering, and poor links between such sciences and business, as we previously found in comparing British and German businesses and industries in this era?

b) **The new electrical industries:**

i) the chief factor may not have been science and education, but natural resource endowment (or an anomalous consequence of abundance of coal).

ii) **one of path dependency:** Britain's overwhelming reliance on coal gas -- from having such abundant, cheap coal -- for urban mass lighting.

iii) **The Germans, lacking such forms of lighting, had quickly taken up electrical lighting,** which in turn had provided one of the essential foundations of mass consumption and thus of large scale mass production or generation of electrical power (which in turn had convinced investment banks to support this new industry).

iv) **Britain in fact did not even have a central grid for electrical power until the mid 1920s:** and did not switch to electrical power for household use until the 1930s.

c) **The Chemicals Industries:** failure in the coal-based industries but surprising success in an even newer wood-cellulose based chemicals industries

i) For the coal-based chemicals industry there is not such a ready explanation;

ii) Science and Education? But the convenient theory of British inferiority in sciences and engineering does not wash well here: because Britain in fact achieved major successes with major innovations in an entirely new branch of chemicals: wood based cellulose chemicals.

iii) **Paper products:**
(1) The most important aspect of innovations in this new industry was in the production of vastly cheaper forms of paper and newsprint:
(2) as a substitute for costly and inelastic supplies of linen-rag based paper (still the best paper in the world): produced by immersing wood chips or wood pulp in lime sulphite.
(3) Here again, the forces for industrial expansion were not just the sharp rise in real wages and urban mass consumption, but also, again, mass literacy.

iv) **The other two major branches of the cellulose chemicals industries were:**
(1) nitrocellulose plastics, to displace costly and inelastic supplies of bone, horn, and even metals: celluloids and bakelite, in particular
(2) rayon, originally developed to be a substitute for silk but became instead a substitute for cottons -- and thus ironically provided one of the reasons for the downfall of the British cottons industry.
(3) By the 1920s, Courtaulds was producing 50% of the world's supply of rayon.

v) **Cartels in chemicals:**
(1) By the 1920s, with an end to Free Trade, the British chemicals industries had become a powerful cartel in the form of Imperial Chemicals Industries,
(2) which divided world markets with two other cartels in the inter-war period: Germany's I.G. Farbenindustrie and the U.S. Dupont Nemours.

d) **The Automobile Industries:**

i) **The final topic is the emergence of the British automobile industry,** which, before WWI, was no competitor to the German, French, or American industries.

ii) **Its story is intriguing, an somewhat irrational:**
(1) it began with the sewing-machine industry in Coventry (Midlands), which, during the slump of the 1880s, used its industrial techniques to produce bicycles, developed and popularized by the French.
(2) That promoted the demand for personal as opposed to public transport (trains, trams, etc) and led to the development there of the British automobile industry.

iii) **But influenced by the industrial format of sewing machines and bicycles, it was far too small scale,** with over 200 firms in this region to World War I.

iv) **The decisive changes came with World War I (1914-18):**
(1) It transformed this industry by adopting American-style mass production, assembly line techniques to produce tanks and armored cars.
(2) That in turn created a new inter-war industry -- in the 1920s and 1930s -- that rapidly surpassed the French and German to be second only to the US in world trade.

v) **Of course the backsword and forward linkages of automobiles, buses, and trucks** gave it the impact on the 20th century world economy that steam-powered railroads had on the 19th century economy.

e) **W. Arthur Lewis (1978) on the importance of the Consumer Goods Revolution:**

i) 'The essence of the industrial and agricultural revolutions in the first three-quarters of the nineteenth century was in new ways of doing old things: of making iron, textiles, and clothes, of growing cereals, and of transporting goods and services..... [But] In the last quarter of the nineteenth century the revolution added a new twist -- that of making new commodities: telephones, gramophones, typewriters, cameras, automobiles, and so on, a seemingly endless process whose latest twentieth-century additions include airplanes, radios, refrigerators, washing machines, television sets and pleasure boats'.

ii) We added several more, from the 1970s (when the book was written): above all computers, printers, scanners, internet, etc., micro-wave ovens, mobile and cellular telephones, I-pods, I-phones, I-pads, PDAs and 'smart phones' (blackberries, etc), digital cameras, the wide variety of stereo musical devices, etc., and advanced HD TVs (now including 3D TV and movies).

3. **The Economic, Social, and Cultural Consequences of Modern Industrialization:**

a) **the positive consequences are overwhelming:**

i) **a totally unprecedented exponential rise in real incomes,** throughout societies, and in living standards, so that even the poorer strata of our societies are immeasurably so much better off than were their and our ancestors

ii) **an enormously wide range of new consumer goods:** undreamt of by our ancestors

iii) **consider this quotation from Adam Smith's *Wealth of Nations* (1776), in illustrating his principal purpose – in attaching the tenets of Mercantilism (or the Mercantile System, as he called it):**

> Consumption is the sole end and purpose of all production; and the interest of the producer ought to be attended to, only so are as it may be necessary for promoting that of the consumer. The maxim is so perfectly self-evident, that it would be absurd to attempt to prove it. But in the mercantile system [Mercantilism], the interest of the consumer is almost constantly sacrificed to that of the producer; and it [Mercantilism] seems to consider production, not consumption, as the ultimate and object of all industry and commerce.

iv) **In other words, we economists and economic historians must always ask this fundamental question about the processes of modern economic growth, and industrialization in particular:** do they lead to human betterment, to increased human welfare, especially from the vantage point of the average consumer, not the average producer

v) **Equally important the enormous increases in public health,** well-being, and the extension of longevity (reduction in birth rates), also unparalleled in human history

b) **the negative consequences:**

i) **income and wealth inequalities:** both within modern societies and between countries in the world today

(1) In recent times, over the past few decades, income inequalities have increased in North America, not diminished as predicted.

(2) The significance of the Kuznets curve (with which this course was introduced:

- that the early stages of economic growth and industrialization require some transfers of income and

wealth from the lower strata (working classes) to the entrepreneurs (upper income strata, usually, those who innovate and create the mechanisms of economic growth

- but the fruits of economic growth are ultimately more widely distributed so that all income strata of society benefit from the rising real incomes and living standards

(3) Question: are such disparities greater than or lesser than those that prevailed in the pre-industrial World?

(4) Certainly it may be argued that such disparities are greater in the underdeveloped non-Western worlds than in the contemporary Western societies.

ii) **European Imperialism:**

(1) did European industrialization give such western nations the economic power and military means to impose their will upon and control other parts of the World?

(2) But European imperialism began long before industrialization, with 15th-century Portugal, soon followed by Spain, England, France, and the Dutch in the 16th centuries

(3) Europeans did not invent imperialism – which seems to be a condition of human societies

(4) Nevertheless, many European and North American nations, from the mid 19th century in particular, did gain the power, from industrialization, to achieve more powerful, effective forms of imperialism

iii) **Global Warming:**

(1) note that coal was and remained the essential ingredient of modern industrialization, everywhere in the world
(2) that coal-burning produces not just noxious pollution but Carbon Dioxide that traps the sun's heat and leads to global warming, through the 'green house' effect
(3) But methane gases from livestock agriculture also contribute to the 'green house' effect
(4) As one former student sagely commented: modern industrialization has not necessarily allowed us all to escape the Malthusian Trap -- just to delay for some time its inevitable and deleterious consequences.
(5) See the online graph accompanying this lecture (on the lectures website).

iv) **But again, to conclude:** modern industrialization, despite all its negative attributes, has brought about an unprecedented and previously unimaginable rise in living standards for the vast masses of the population, and not just the wealthy, at least in advanced first and second world countries.

This was the last lecture for the course: ECO 303Y: The Economic History of Modern Europe, to 1914, given in the academic year 2012 - 2013 (possibly for the last time, though I certainly hope to be able to give this course again)