

# Chapter 27. THE DEVELOPMENT OF COMMERCIAL AND INDUSTRIAL SOCIETIES

## I. Introduction

### A. Evidence

*We have more information about this revolution than any other because it was so recent and because printing was one of the earliest inventions of the period.* However, as current political debates over the issues that divide first, second, and third world countries show, there is a great deal of dispute about how to interpret this information. We are in the midst of this revolution and any approximation to objectivity is hard to achieve—ethnocentrism and mythologizing abound.

### B. Commercial and Industrial Societies (re)Defined

*Commercial and industrial societies are those in which a majority of the population withdraw from the agricultural sector to participate in specialized occupations associated with trade and manufacturing.* As we saw in the chapter on trade, virtually all human societies trade—certainly all of them have elaborate patterns of internal redistribution. However, with the exception of perhaps a few trading city-states of antiquity, the class of primary producers of most human societies was far larger than the commercial and craft/manufacturing classes. Trade and redistribution involved relatively few commodities, and was mostly organized by kinship networks (on the smaller scale) and by political authorities (on the larger scale). Trade through the market mechanism seems to have been of variable but modest proportions throughout most of human history. A great exaggeration of the division of labor and the importance of trade marks the commercial/industrial revolution.

*A recap of data covered in Chapter 8.* An exact date for the beginning of what McNeill (1980) calls “the commercial transmutation” is hard to fix with any precision. He traces its roots back to the Mediterranean trade of the Roman Empire, together with the establishment of a tenuous trade with the Orient in the same period. The trade diasporas that engaged in this and later long distance trade in the Old World laid the foundations, but were clearly within the pattern long established by agrarian states, except perhaps for a few small, specialized city-states in Greece and elsewhere that might have fit our definition. China was the commercially and industrially most dynamic society in the world during the period from about 1000 to 1500 AD. The collapse of the Roman Empire and the ravages of the plagues combined to make Europe a blighted backwater for several centuries. Beginning about 1000 AD, this part of the world began an initially slow recovery as a vigorous trade grew up, first centered on the Italian city states like Genoa, Florence and Venice.

Some of these small polities probably fit our definition of commercial-industrial societies. By 1500 AD, the centers of commerce were moving to the Atlantic, and the voyages of discovery, by opening a global marine trade network, solidified the position of the Atlantic powers. Of these, the British were the most vigorous, especially after the industrial revolution began there in the 18th century. By 1800 or so Britain came to fit our definition, no doubt the first large society to qualify as commercial-industrial.

*As we saw in Chapter 8, the commercial and industrial “transmutations” had tremendous repercussions: occupational diversification, the growth of modern states, substantial population expansion, the growth of rationalism, eventually rapidly rising incomes in the industrial nations, and European political hegemony on a world scale. Because it is our kind of societies we are talking about, perhaps we are broadly ethnocentric about “our” revolution and exaggerate its importance. Still, these do seem, objectively, pretty impressive accomplishments relative to agrarian societies. The spectacular risks of modern technology—nuclear war and climate changes driven by greenhouse gas emissions—are perhaps proof enough that this event in human history deserves to be listed among the four<sup>1</sup> we examine in this part of the course.*

*The question to answer is why did the most recent great revolution in the culture core occur among unimpressive European folk?* Scholars from Marx and Weber to the present day have taken the “Rise of the West” as the capital fact of recent world history. Northwestern Europe had heretofore been one of the backwaters of the Old World, lightly civilized in a few places by the Romans, otherwise living under chieftains and petty kings and practicing a relatively primitive and unproductive agriculture. We have seen that even Mediterranean regions of Europe were comparatively backward from after the fall of Rome until 500 years ago. At 1400 AD smart money would probably have bet on some more impressive society, such as China, to lead the next half millennium. The European story has an rags-to-riches appeal, balanced by nouveau riche excesses.

## II. Hypotheses

(Our discussion is based on Tuma, 1971, and McNeill’s various books, especially his *Rise of the West* and *Pursuit of Power*).

### A. Easily rejected ones

*All serious scholars have taken the trouble to list a number of hypotheses that seem implausible.*

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1. origin of the human adaptive pattern, origin of plant and animal domestication, origin of states and stratification, and development of commercial and industrial societies

It does not seem that any kind of *external hypothesis* will account for the emergence of commercial and industrial societies. The climatic changes that were occurring during this period were not exceptional and probably did not affect Europe differentially. Commercial and industrial societies seem to have developed as part of the mostly slow and halting development of technology and other culture core elements that had been going on since the origin of food production some 9,000 years earlier. (Of course, on the geological time scale, the changes of the last 9,000 years have been exceedingly rapid.) Something must have been impeding earlier development that was removed or broken through in rather dramatic fashion about 1500. We need a progressivist theory to account for the collapse of some previous pattern of innovation limitation that prevented the emergence of commerce and industry.

*It does not seem as if the discovery of the New World was decisive to the fortunes of Europe.* American precious metals did provide money and a commodity desired in the Orient, and so facilitated trade. But the fortunes of Europe were already on the rise by 1500, and much the same trajectory seems likely to have ensued in the absence of the New World discoveries. Spain and Portugal, the nations with the earliest and largest gains from the New World fared poorly in the end, relative to those such as Britain, Holland, Sweden, etc. that came late or never developed a significant presence there.

*No one seems to have been able to defend the hypothesis that some key feature of the European physical environment was particularly important.* McNeill (1982) is at pains in his comparison of China and Europe to show that the Chinese had solved transportation problems on a considerable scale centuries earlier than the Europeans, and that in most essential respects the Roman period had most of the prerequisites that finally led to the commercial revolution 1500 years later. In China for example, the Sung Dynasty and the succeeding Mongol Emperors constructed a Grand Canal between the Yellow and Yangtze Rivers, used the cheap transport provided to develop a very impressive iron and steel industry in the coal and iron-ore rich area of Honan and Hopei, and developed a merchant fleet that made major voyages of discovery in the Indian Ocean (sailing as far as the east coast of Africa).

*The common ethnocentric folk theory of innate superiority is not tenable.* As races (genotypically), Northern Europeans, were just a bunch of barbarians that had fled more powerful peoples at various times in the past. During most of the period of Chinese growth, Northern Europeans were one of Eurasia's regions of underdevelopment. Southern Europeans clung to the shattered, faded glory of fallen Rome. As late as the 13th Century, Marco Polo found China much more impressive than his native Northern Italy—which at that time was the most developed part of Europe. The self-respecting civilizations of the continent must have viewed Europeans as a backward group in an unpromising corner of the world.

*In other words, it seems that any of the advanced agrarian societies could have evolved into commercial/industrial societies any time after 0 AD.* It happened to take 1500 years for the right combination of circumstances to occur to start the process, but it might well have taken more or less depending upon chance events, and these events were more or less equally probable in any of the advanced culture areas of the Old World. First Rome,

the China teetered at the edge of commercial and industrial development, but shrank back rather than forging ahead.

### ***B. Conflict Hypotheses (Internal Constraints Models)***

*Our first problem is to identify what slowed down the development of commerce and industry.* These are in some sense better than purely agrarian technologies if only because the resulting societies are richer and more powerful. Several conflict hypotheses have been advanced to try to account for the impediments on the path to commercial and industrial societies.

*These hypotheses are all derived from, or closely related to those of Marx, though most scholars do not seem to take Marx's exact model for the origin of capitalism too seriously.* Marx thought that any given means of production set up contending classes. The victory of a new class gave rise to revolutions that affected the whole structure of social arrangements. Many modern social scientists have borrowed the general idea that conflict between classes or interest groups within societies are important in explaining social change and cultural evolution. In general, the existing ruling class is likely to be hostile to developments implied by the evolution in technology if new technology implies social revolution, and uses its position of power to retard the progress of technical and social evolution.

*McNeill's hypothesis is typical of type.* The first thing to explain is why the commercial transmutation took so long. His starting point is the conventional notion of economics that competition is the spur to innovation. Open economic, political or military competition will reward successful innovations and encourage diffusion of useful innovations. The question, given the reality of substantial rivalrous competition and conflict in all human societies, is why innovation is usually quite slow compared to the pace set in modern commercial and industrial societies. The general idea is that elites will act to limit open competition in order to avoid technical and economic change that might undermine their dominant positions.

*First, states can and do limit trade:* The political dynamics of agrarian states work against very much dependence on trade conducted through free markets. First, most states are coextensive with most of the area over which really large-volume trade is possible. The shipment of goods and soldiers follow the same routes, and states tend to be limited, like trade, by the costs of transportation and communication. Thus most trade is internal, and easily subject to the dictates of state policy.

*Second, state limitation of trade will often be popular with traditional elites:* Market trade is liable to give rise to a class of wealthy merchants who are feared as political rivals by rulers. Political competition aside, ruling bureau-

crats and aristocrats usually disdain merchants, artisans, and the calculation and manual labor that goes with their occupations. Physically and ideologically, the rulers of states, otherwise the most sophisticated and wealthiest class, tend to be distant from the gritty world of economic enterprise. This is perhaps a by-product of the association in states of the secular and religious elite. State leaders have to cultivate an ideology of unselfish interest in the welfare of society as a whole. Mercantile enterprise manifestly depends on selfish calculation or perhaps it is just that elite status is usually ascribed, while the tumult of trade favors the achievement principle. In any case, those who might be in the best economic position to be innovators tend to be disinterested or hostile to innovation.

*Third, envy and hostility may characterize peasants and craftsmen as well:* The profits of traders excite the envy of peasants and craftsmen as well; they tend to feel that the traders' profits come from their efforts. Manufacturers are likely to harm the interests of traditional craftsmen through cheaper, less labor intensive production. Thus, elite regulation of merchants and markets is likely to be popular among the masses as well as among elites.

Fourth, 'normal' vices of markets existed: Presumably all of the vices of markets we reviewed in Chapter 22 existed, and both the strongest and largest classes viewed the vices as outweighing the gains to unregulated entrepreneurship.

*Finally, there is the temptation to confiscate "unfair" profits:* State authorities are always tempted to confiscate the accumulated wealth of merchants, and thus reduce incentives for engaging in trade.

According to McNeill, the result of all this generally tends to be an equilibrium in which the potentially dynamic market sector was kept small.

*McNeill uses recently developed historical data on Sung Dynasty China to illustrate the potential for the commercial transformation under the existing technology, and the way in which the political interests of agrarian states tend to inhibit this potential.* Beginning about 1000 AD China embarked on a long experiment with market rationality. This resulted in dramatic economic gains for China, as noted above, although one wonders the extent to which population growth cut into the per capita gains. But eventually the Chinese seem to have decided to cut this experiment short, around 1500. Once the decision was made by the central administration, it was relatively easy to implement, because of the strong Sung central administration. The commercial and industrial elites that suffered from the change in policy had no effective means to evade compliance. It is easy to imagine that another century of the market experiment in China would have led to their discovery of the New World and an era of Chinese, rather than European hegemony. As it was, many of the technical advances of the Chinese diffused back to Europe to feed the initially slower, but sustained, development of commerce there.

*European political disunity favored the commercial and industrial revolutions.* Most scholars seem to agree with McNeill that, by contrast with China, one important reason that commercial societies developed in such an unrestrained manner in Europe was its political disunity. The idea in our terms is that political disunity set up a situation in which a competitive arms race dynamic (which favored sustained general technical innovation) could flourish despite all the impediments to markets in advanced agrarian states.

*No strong empire formed in Europe.* In the late medieval period, the Church attempted to set up a unitary European state, the Holy Roman Empire, but without lasting success. Later, the Hapsburgs attempted to create a hegemony in Europe using the luck of their inheritance of large territories in Central Europe, Spain, and the Low Countries. The growing European regional monarchs' skill at balance-of-power politics and a little luck (e.g., the English victory over the Spanish Armada in 1588) prevented that and left the Hapsburg crown broke. Perhaps this was just an accidental failure of statecraft; the Chinese had recovered from periods of disunity, and the agrarian empire elsewhere remained the norm. Perhaps if fate had run with Hapsburg Philip II and his Admiral, the Duke of Medina Sidona, instead of with Elizabeth and her commanders like Francis Drake, during that fateful week 31 July-6 August 1588 when the Spanish Armada was defeated, Europe would have pulled back from the commercial/industrial revolution too. (Drake is a nice symbol for the ethical perils of an unrestrained commercial sector. He was a patriot/pirate, devout Protestant, sometime slave trader, and always the complete entrepreneur.)

*In Europe, for reason of historical happenchance, the radius of political power came to be and remained much smaller than the radius of effective trade.* A disproportionate share of trade was external rather than internal. This gave commercial entrepreneurs a substantial scope for independent action. When a local potentate's policy became hostile to commerce, one could always move to a new location. Market activity is a powerful stimulus to innovation, because any innovation that allows one firm to undersell the market and still make a profit can earn handsome profits. Political fragmentation tended to ensure that markets remained fairly free, since merchants and manufacturers had a hard time conspiring with governing elites to create a monopoly. Entrepreneurs in another jurisdiction could always organize a competitive enterprise. Recall from the chapter on trade the problems that Spain and Portugal had in enforcing trade monopolies in the face of English and other smugglers.

*To whatever extent market organization was more efficient, competing states were forced to favor it or decline in political and military influence.* Furthermore, the political competition between states favored a sound economic policy, if only to provide the where-

withal for weapons. The decline of Spain and Portugal is given as an example of the penalty for failure to stimulate market activity. We have previously seen how Spain tried to run trade with the New World as a state monopoly, rather than through market mechanisms. Her inefficient statist economic system impoverished Spain relative to the more dynamic Northern Europeans, and weakened the Hapsburgs as a result. Weapons developments themselves tended to be favored by competition between states, and fragmented states' purchases of weapons stimulated technical development and commerce. Thus, businessmen became an important influential class in their own right; rulers took to courting them instead of confiscating their wealth and suppressing their activities to satisfy popular and aristocratic resentment. In not a few states, merchants became the dominant class, as in Venice and Holland. In the end, European political chaos forced the agrarian elite into an alliance with merchants, bankers, and manufacturers, and to an unusual reliance on unregulated market economic activity that greatly rewarded innovation. Weber's Calvinists fell like sparks in the dry tinder of inter-state rivalry (see section D below). Today, nations that have spent more than fifty years under various communist banners are sacrificing socialist principles to enlarge market sectors—largely because their highly-bureaucratized and centrally-planned economies have been a handicap in competition with the West.

### ***C. Some Miscellaneous Impediments and Historical Factors***

*Barbarian invasions from the steppes destroyed Rome and badly and repeatedly disrupted the Chinese and Middle Eastern societies.* This set back the most sophisticated societies evolutionarily exploring in the vicinity of the commercial and industrial adaptation.

*Disease epidemics also dealt periodic setbacks to the societies most likely to undergo a commercial transformation.* Others have argued that the 14th Century depopulation due to the Plague was a spur to the development of capitalism because it made labor scarce and expensive, hence motivating entrepreneurs to invest in labor-saving innovations.

*Climatic deterioration during the late Middle Ages may have harmed the Middle East's prospects for leading social evolution again, as this region had from 9,000 to 4,000bp.* In the Middle East, the various Moslem empires (e.g., Turkey at the beginning of the modern era) were politically very powerful, but most of the fundamental innovations that overturned the agrarian order came from China and later the West. The Middle East was ideally suited to acquire innovations from both and become the leading culture area but did not.

### ***D. Non-Adaptive Trigger?***

*Some process generating variation non-adaptively is a likely candidate for furnishing the breakthrough that engendered the commercial and industrial revolution.* The suc-

cess of these commercial and industrial societies in war and exploitation in the event is convincing evidence of the superiority of this style of culture core, in the evolutionary sense of superior at any rate. Once developed, modern ideas have spread rapidly from centers of innovation like Venice and Britain. If some other society had made the breakthrough earlier, it ought to have achieved the dominance the Europeans enjoyed. Agrarian societies seem to have been primed for the commercial and industrial Revolution, awaiting only a spark to initiate the process. (Note that ethical superiority requires a separate argument; might doesn't necessarily make right. Just because Europeans have been the foremost military powers for the last 500 years does not by itself make them good guys.)

*Max Weber formulated the most famous trigger hypothesis.* Weber, an important turn-of-the-century figure in the development of the social sciences, formulated his theory in his essay *The Protestant Ethic and the Spirit of Capitalism*. He posed the problem in much the same way outlined above; why did Europe instead of the apparently more advanced Orient make the commercial and industrial breakthrough? There were four parts to his basic thesis:

*Weber argued that a certain attachment to rationality as a mode of thought had a deep tradition in the West.* According to Weber, Oriental societies did not develop the rationalistic philosophy of the Greeks, such as the ideas of deductive mathematical proofs, critical, objective, historical studies, elaborately rationalized theology, or rational legal codes. Weber did not seem to view rationality as especially useful in the classical context, just a formalistic preoccupation of the leisured classes<sup>2</sup>. Formal rationality might have originally arisen via runaway indirect bias perhaps, as a prestige form. But it was a pregnant preadaptation, because put to practical use it was to be the engine of the breakthrough.

*The second step of Weber's argument was connecting the idea of rationality to commerce and technical development.* Weber argued that men of commerce in the West turned rationality to some account in the Italian Cities, but that further developments were inhibited by the tendency of the prosperous to dissipate their profits in high living, the purchase of titles, gifts to the Church, and the like. Sensible people who make money spend it. The prevailing Catholic religious doctrine and aristocratic prestige norms were hostile to business and banking; trader's profits were viewed as the fruits of shady practices, interest on loans was forbidden by biblical injunction, etc. Accumulation and reinvestment was not encouraged. Successful businessmen sought to legitimate their ill-gotten gains by acquiring more legitimate, prestigious occupations. Venetians tended to marry into the old landholding elite and retire from commerce. Business was merely a means to an end, not an end in itself.

*The breakthrough came during the Reformation among the Calvinist sects that*

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2. We are all familiar with the characterization of rationality in the hands the Medieval scholastics: "How many angels can dance on the head of a pin?"

*combined a strong emphasis on rational means with ascetic personal habits.* The key idea in Calvinism was predestination. The elect were chosen by God, and his chosen were supposed to experience a “calling.” The called elect did not retreat into monasteries as is more typically the case in ascetic movements. Rather, they were supposed to live exemplary personal lives of honest hard work and thrift, a sort of worldly asceticism. The rational practice of one’s profession or business was encouraged, but conspicuous consumption was not. The entrepreneur’s conscience was protected from conventional anti-business norms by his sense that he was doing the work of the elect, and his exploited workers might feel the same way (especially if they were also Calvinists). This led rapidly to the accumulation of wealth that could only be reinvested in new enterprises because it couldn’t be spent on personal indulgence. The first capitalists were born as an accidental by-product of an obscure Genevan religious ideology, although one that tapped deep Western traditions.

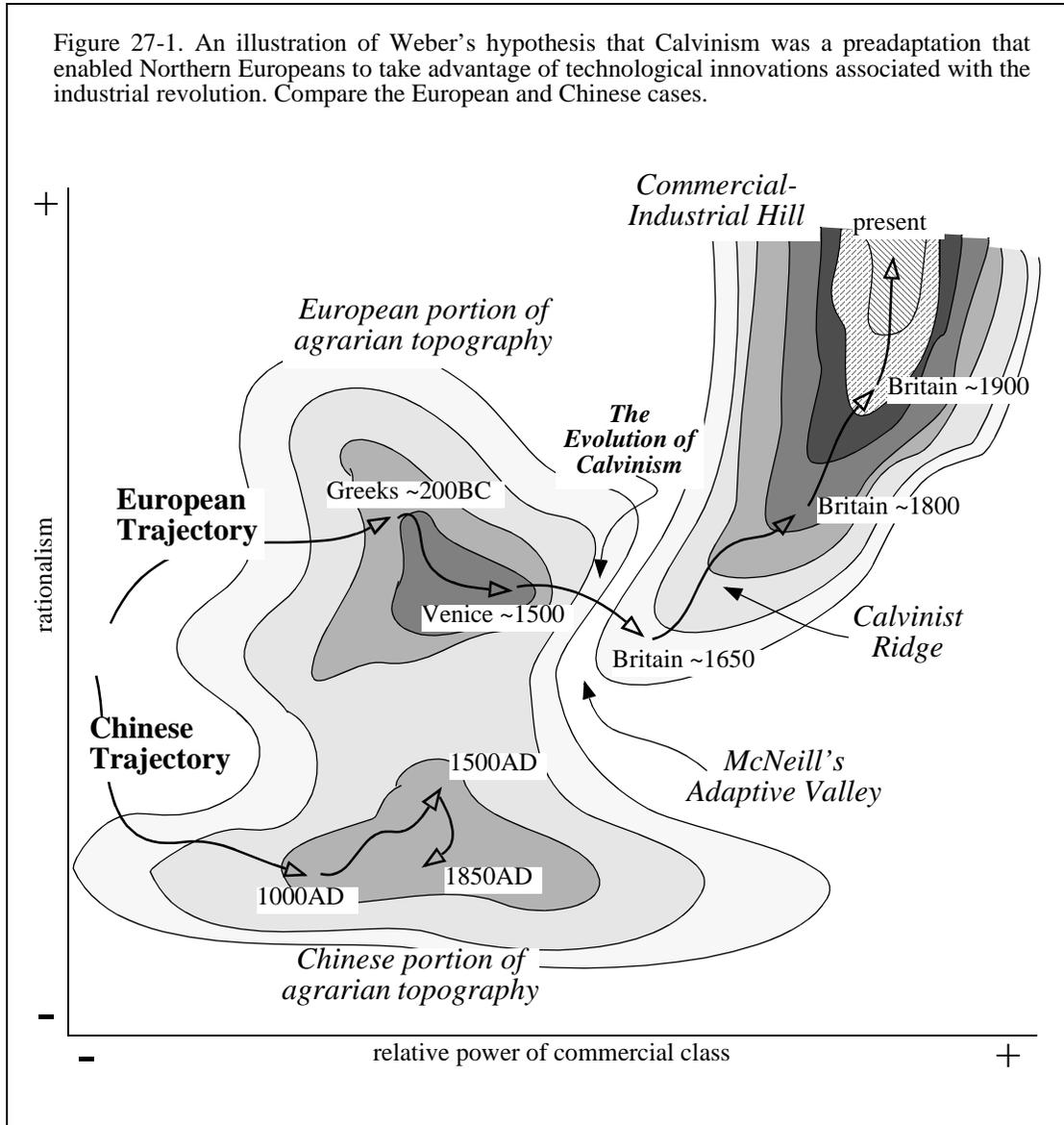
*Once the virtues of saving and investment were clear by this demonstration effect, the movement rapidly secularized.* Benjamin Franklin, with his homespun advice on how to get ahead, epitomized for Weber the Calvinist doctrine shorn of its religious ideology. Even the Catholic Church backed away from earlier structures against sound business practice, and religious prohibitions were no impediment in the Protestant countries, where commercial and industrial development became more dynamic. This hypothesis fits the pattern of shift of commercial activity from the Catholic Mediterranean countries to the Atlantic Protestant ones after 1500.

*Weber’s thesis has been debated for the best part of a century now, without a consensus emerging.* His hypothesis might be part of the answer at least. We’re attracted by it as at least a hypothetical example of the runaway indirect bias effect (a good source of non-adaptive cultural variation) might play a large role in this episode of cultural evolution. Weber’s scenario can be recast in terms of cultural evolutionary mechanisms that would account for how an evolutionary valley might be crossed by chance (the development of the Protestant ethic by the runaway or handicap process), followed by an arms race up the new-found adaptive slope (this is the competitive industrialization of the modern world in which we are all active participants). Figure 27-1 illustrates this idea using the topographical metaphor introduced in Chapter 23.

### ***E. Consequences***

*The commercial revolution challenged and upset all sorts of existing social arrangements, for example by leading to strong monarchical states in most areas of Europe.* The rise of absolutist monarchs at the expense of the nobility was in part the result of the rising importance of trade and manufactures, and an alliance between kings and the newly emerging bourgeoisie at the expense of the old landed aristocracy. The impact on non-Europeans was also substantial. In the mercantilist era between about 1550 and 1750, the more advanced European states like Britain competed strenuously with each other for overseas markets, while trying to protect internal markets. Chartered monopoly companies carried on much

Figure 27-1. An illustration of Weber's hypothesis that Calvinism was a preadaptation that enabled Northern Europeans to take advantage of technological innovations associated with the industrial revolution. Compare the European and Chinese cases.



of the trade, although there were always enough companies operating to keep competition keen, even ruthless. (See Chapter 17).

### III. The Industrial Revolution

#### A. Why Britain First?

*The next problem to explain is the industrial revolution.* This began in Britain around the middle of the 18th century. Now the problem of the commercial revolution occurs again on a smaller scale.

*Why Britain and not some other European nation?* According to the historian E.J. Hobsbawm, many Western European states had by this time well-developed commercial

sectors engaged in both domestic and overseas trade, all poised for the industrial revolution. He believes that British government policy was more steadfastly pro-business than any other, especially pro-foreign trade. The purchase of armaments especially naval guns and the like, to support this commerce stimulated industry, as did the overseas markets that the naval guns “protected”.

*Another answer is that merchants and the landed aristocracy were on closer terms in Britain.* The main resistance to industrialization in Britain tended to come from craft guilds, whose traditional occupations were badly upset by machine industry. Since the landowning and commercial classes had a larger common political interest in Britain than elsewhere, and because part of the landowners’ interest came from evicting farmers to raise wool for the export trade, a combination of competition for wage labor and political power reduced the effectiveness of guilds in Britain. Thus entrepreneurs were led to invest in manufacturing equipment instead of just commerce.

*The augmentation in military power from Britain’s industrialization forced other nations like France, to follow rush to industrialize, whether they wanted to or not.*

### ***B. Institutionalizing Economic Growth***

*Recall the argument from Chapter 22 that economic growth has “addictive” qualities powered by a compulsive attempt to satisfy ultimately unsatisfiable comparative wants.* Perhaps an important reason for the explosive rate of technical change after the industrial revolution really got rolling is that rates of economic growth outran population increase, as we saw in Chapter 16. This did two things, at least. It kept up a sustained flow of profits for reinvestment in new innovations; we escaped Ricardo’s stagnation scenario. It also gave the mass of the population a stake in economic development. People came to “enjoy” rising wealth and popular political pressure turned substantially from suspicion to relative enthusiasm, if not for market activity itself, at least for the benefit of rising incomes that to this day markets and private entrepreneurship seem most effective at creating. Socialist governments of Western Europe, such as that of Mitterand in France, reluctantly turn to the market to satisfy this desire, and the Communist nations have collapsed under pressures for lifestyle improvements that their economies couldn’t meet. How different this is compared to the classical situation where ruling elites found it popular with peasant masses and with their aristocratic supporters to curtail the market! Nevertheless, if the Easterlin-Frank hypothesis is correct, economic growth is built on a foundation of sand because in the end there is no satisfying comparative wants.

## IV. Conclusion

*McNeill speculates that rapid economic growth that has characterized the last few centuries is coming to an end. Plan rationality<sup>3</sup> (centralized planning) is gaining influence at the expense of the market. He guesses that the rapid technical evolution of the commercial and industrial periods will turn out to be a temporary lapse from conditions where innovation-inhibiting processes are much stronger.*

*Clearly, the flaws of markets attract a lot of attention, and just as clearly a return to the 19th century level of reliance on markets is unlikely. Also, the European style of small states protecting their sovereignty with balance-of-power techniques is a good deal more dangerous, given modern military technology, than it has ever been before. Still, arms races and comparative wants are powerful processes, the social analogs of individual addictions. No matter how unpleasant, even life-threatening, they are difficult to escape. It's a wild era to live in, but exciting as hell while it lasts. For the thrill seeker, the modern era is the ultimate roller coaster ride. For the conservative, it is a "stop the world, I want off" affair. It is difficult to guess what form the next temporary(?) equilibrium will look like or when we'll get there.*

*It is not difficult to reach the conclusion that the several factors McNeill mentions plus Weber's hypothesis are all required to explain the exact timing and locales of the commercial and industrial transmutations. It perhaps took a series of historical accidents to bridge the gap between classical agrarian and commercial and industrial societies.*

We're not at all sure how much agreement the compound hypothesis presented here would attract from scholars. The pieces *are* constructed from very well-regarded, if controversial, sources. The worth of the specific hypothesis aside, We hope the chapter illustrates how historical hypotheses with major elements of non-adaptive chance events might work. Note that the elementary mechanisms we've invoked in these hypotheses are not unscientific. We met indirect bias as a quite ordinary evolutionary mechanism in Chapter 14.

Perhaps the only reason that some processes seem to be unique and properly historical is that we simply cannot average over enough individual cases do statistics. Chance events that are large enough take away the tool scientists use to finesse probability—replication. In some cases there is only "one world, no control". A process that would be scientifically understandable if we had knowledge of some other worlds becomes historical when we are restricted to one. Is *this* the difference that produces a valid distinction between science and history?

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3. See Chapter 23, section IV.

## V. Summary

### ***Key Hypotheses:***

Political unity—fragmentation as a regulator of technical progress

Weber's Protestant Ethic

The power of comparative wants

## IV. Bibliographic Notes

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