

Peer Vries's Great Divergence/Joel Mokyr¹

Peer Vries's sprawling and ambitious survey of the literature on the "Great Divergence" is at once a monumental overview of a vast and multi-faceted literature that he has mastered like no other scholar (excepting perhaps Eric L. Jones) and a deeply personal document. Vries is nothing if not judgmental; he covers all hypotheses and views that have been put forward on "the Rise of the West," no matter how bizarre and outrageous, and then tells the reader that they are bizarre and outrageous. His candor and intellectual honesty, his lack of wishy-washy qualification and ambiguation make this book refreshing and engaging even for those who are already familiar with much of the literature that he covers. For those who are not and need a primer on a complex and contradictory literature, this book beyond any doubt is the place to start.

Much of the book, while meant to be a general discussion of the origins of modern economic growth and the rise of the "West," is concentrated on a comparison of China and Britain. While Vries explains the choice, the methodology is debatable. If Britain is meant to represent the "West" it is unclear how representative it is, and perhaps it would make more sense to compare it with the most developed part of China (the Yangzhi Valley) as Kenneth Pomeranz has advocated. Or else compare China as a whole with a larger part of Europe, including those parts such as Iberia and the Balkan, which for many decades were not part of the economic Rise of the West. Such quibbles aside, this book is monumental in its erudition, encyclopedic in its learning, and ambitious to match.

There is little in the literature about the Great Divergence that Vries does not survey, and his honest attempt to cover the literature is on the whole successful. He makes a special effort to do justice to the work done by economists in this area, and it is hard to blame him for a sense of bewilderment: are abundant natural resources good or bad for economic growth? What kind of institutions are really favorable for the emergence of prosperity and what kind is not? Is abundant labor an obstacle or an advantage? At some point he remarks with some despair that "it would be hard to find a thesis about the role of the State (in economic growth) that has *not* been wholeheartedly supported by some economist" (p.138). In this area, more than any other fields, economic analysis has not provided unequivocal insights.

Vries is a historical sociologist, which to this reviewer means that he is a bit of a Jack of All Trades. He knows the historical literature well, he is familiar with the theory of economic growth and development, but also knows a great deal about the literature on historical social change, state formation, religion, the history of economic thought, and the finer points of agriculture. Above all, however, in this book his tools are common sense, a historical intuition, and every once in a while a personal obiter dictum: this argument makes sense to me; this one does not. While the book's tone is never as vituperative and shrill as the writings of, say Andre Gunder Frank or James Blaut, he can be dismissive of arguments he disagrees with and minces no words when he feels that an argument is "silly." He tends to be even-handed in his citations, but then punctuates statements he finds particularly outlandish by "sic!"

¹Some of what follows draws upon my *A Culture of Growth: Origins of the Modern Economy* (Princeton, forthcoming, 2015).

The list of hypotheses that Vries finds unconvincing one way or another is long. He has little time for geographical explanations of the Great Divergence such as Ian Morris's recent *Why the West is Ahead*. Nor does he find much explanatory power in arguments that rely on factor prices, according to which British high wages are supposed to be responsible for the beginning of modern growth via an intensive search for labor-saving innovations, as recently applied to the Great Divergence by Rosenthal and Wong's *Before and Beyond Divergence*. Most of all, he is deeply skeptical of many of the claims of the so-called California School (sometimes abbreviated by Vries as "the Californians"). This school has claimed that the Great Divergence had fairly shallow roots, was a recent phenomenon (dating its start to the mid eighteenth century), and has eschewed deeper cultural explanations and any argument they deem to be "Eurocentric". Vries dissents not only from its more extreme and ideologically driven writers in that school such as Gunder Frank and Jack Goody, but also from its more measured and scholarly representatives such as Kenneth Pomeranz.

Vries's intellectual dilemma is one that is shared by the entire Great Divergence literature. There is something profoundly unattractive about the notion that Europeans were in any sense "superior" to those whom they surpassed so obviously in economic and technological achievement after 1750 and dominated politically for many decades. Many explanations in the literature reek of "triumphalism" and in some views border on racism. Yet, at the same time, we observe the basic facts of an ever larger gap in the development of East and West after 1750. Can we explain this gap without relying on some notion of the superiority of Western culture à la David Landes's *Wealth and Poverty of Nations* or the even more far-fetched notions of the superiority of Christianity in the view of Rodney Stark's *The Victory of Reason*? Clearly, this literature, has done its best, and the more they know about Chinese history, the more they tend to dismiss any notion of Chinese culture being somehow anti-technological. The best example of this remains Pomeranz's landmark *The Great Divergence*.

Vries's common sense and aversion to simple-minded approaches leads him, in contrast to Pomeranz, inevitably to deeper differences between East and West such as culture, institutions, and politics. But even here his healthy scepticism leads him to caution. The problem with such an approach as he points out (p. 435) is that while such an approach "need not be senseless or groundless or even wrong as many anti-Eurocentrists seem to think, but it means generalizing at such a high level of abstraction ... that it is impossible to use them as operational variables." There is no denying that caveat. All the same, some progress can be achieved by a narrowing of the concepts of "culture" to a more manageable unit, namely the beliefs regarding the social role of knowledge and natural philosophy held by the intellectual elite of educated and literate Europeans and Chinese. After all, if the engine of growth in Europe was useful knowledge and innovation as Vries points out (pp. 115-20), the cultural beliefs and values beliefs that counted were those of engineers, skilled artisans, mathematicians, astronomers, chemists, and physicians — not those of the population at large. The way that knowledge affected European society was top-down, not bottom-up. This is not to say, of course, that there were no flows in the opposite direction. Highly trained craftsmen and skilled technicians added a great deal to Europe's innovative success; but they properly speaking were part of an educated elite even if one would not see them as belonging to the *intelligentsia*.

The other way forward is to realize that Vries is unnecessarily constrained by his comparison between *Britain* and China. The Industrial Revolution was led by Britain, but it was a *European* phenomenon. The inventions and scientific advances that made it were the work of people from diverse nations, and while for a few decades Britain may have punched above its weight, it was very much a joint, multinational effort. Even the steam engine, which many regard as the epochal British breakthrough, was based on insights made by people of many nations, including the Italian Giambattista Dellaporta and the French engineer Solomon de Caus who realized early in the seventeenth century the properties of expanding and condensing steam, the German Otto von Guericke who did fundamental work on vacuum, the Italian Torricelli who first established the existence of the earth's atmosphere and the French Huguenot Denis Papin who built the first working prototype of the engine. By focusing largely on Britain, he does not sufficiently emphasize a more general European cultural change that clearly must be connected in some way to the subsequent economic revolutions and that we term the Enlightenment. In all fairness, Vries cites my *The Enlightened Economy* generously, but the emphasis on the culture of Enlightenment as a *primum movens* in the Industrial Revolution does not figure prominently in his account. Perhaps this is because of the (mistaken) notion that England did not have an Enlightenment, and the (equally mistaken) belief that France missed out on the Industrial Revolution.

How, then, did Europe and China differ in their ability to generate the kind of intellectual innovations that drove European science and technology to higher and higher levels? If in 1200 Europe was still a barbarian and primitive backwater compared to the technological and intellectual glories of Song China, half a millennium later the roles were reversed: Europe had produced a series of innovations that had created a clear knowledge gap between East and West. As early as the late 1500s some Chinese realized the early signs of such a gap, and allowed the Jesuits to help them reform their calendar based on European astronomy. By 1700 Europe had installed the likes of Galileo and Newton on the pedestal of natural philosophy to replace the Thomist orthodoxy that had entrenched the "ancients" as the single and uncontestable authorities on scientific matters. The intellectual incumbency in Europe had strangled new ideas in the late Middle Ages with the threat of persecution for heresy. In 1556 a statute at Oxford University still stipulated the basic texts for the study of fields: Ptolemy for astronomy, Strabo and Pliny for geography and thirty years later students were urged to only follow Aristotle and those that defend him. As late as c. 1580 could Oxford dons be fined 5s for teaching anything contradicting the master. By that time, however, it was becoming obvious that new winds were blowing in Europe and a few years later, authors such as William Gilbert and Francis Bacon dismissed much of the classical canon with barely-concealed contempt.

The entrenched orthodoxy did not give up without a fight, and as late as the closing decades of the seventeenth century could one find voices protesting the "moderns" in medicine, in mathematics, and in other branches of natural philosophy, bewailing the disrespect shown by experimental philosophers to the great minds of the classical past. By the Age of Enlightenment, however, this debate was all but over. A wide-ranging belief in progress took over eighteenth century Europe's intellectual community in the eighteenth century. No similar development can be found in China.

It should be stressed that such cultural beliefs were an elite phenomenon. What throws off the discussion of “culture” in many scholars, from Landes to McCloskey, is their focus on culture as some central tendency of the population. But for the purposes of technological progress, what matters is the culture of a relatively small elite: educated, sophisticated, networked, intellectuals, a few thousands of men (and a few brilliant women) who shared increasingly enlightened views about the capability of useful knowledge to create unimagined opportunities for the improvement of daily material life. It is the cultural beliefs of this elite that holds the key to understanding the role the Enlightenment played in bringing about the Great Divergence. That the hopes and aspirations of these literate and progressive men and women actually came to pass during and after the Industrial Revolution must be regarded as the most astonishing and fateful event of modern history. Their prophet was Francis Bacon, whose influence on the practice of science and its application during the critical years of the Enlightenment was immeasurable, not just in his native Britain but in equal measure on the Continent.

How could this have happened? And why did it not happen elsewhere? One contemporary who saw what was happening and explicitly asked the question of the Great Divergence two centuries avant la lettre hit the nail squarely on the head, not surprising given that he was none other than David Hume. In his essay on *The Rise of Arts and Sciences* he made an argument that since then has resonated with many. He felt that political fragmentation was the main reason behind European flourishing of useful knowledge. He was well aware of China’s past achievements in science and technology and its sophisticated culture (“politeness” in eighteenth century parlance), but in his day he felt that Chinese science was making slow progress compared to Europe. The reason seemed clear to him: In China, he argued, the authority of one teacher was propagated easily from one corner of the Empire to another and “none had the courage to resist the torrent of popular opinion, and posterity was not bold enough to dispute what had been universally received by their ancestors.”

What Hume was observing was a phenomenon we might think of as a highly competitive market for ideas. In every society in which any intellectual creativity takes place, original minds create innovations of some kind that they try to “sell” in the market, that is, persuade others that their view is correct and should be adopted by the audience. Like every market, the market for ideas can be more or less open, more or less competitive, have higher or lower transactions costs, have more or fewer taboos and regulations that constrain the exchange. Some agents in the market do exceptionally well in persuading a large number of potential customers and may be thought of as “cultural entrepreneurs.” Francis Bacon can be thought of in this way, but the same can be said of, say, Charles Darwin and Karl Marx.

The way out of the dead-end in which Vries finds himself is to realize that the European market for ideas changed in the decades between Luther and Newton. It became far more competitive, open, and dynamic. It was supported — as all markets must be — by institutions that set and enforced the rules of the game. The institution in question was not created by royal fiat or enacted after the Glorious Revolution. It was what systems analysts call “an emergent property,” the unintended by-product of the competition between European courts, rich aristocrats, and universities to attract the best mind in Europe. The name early modern intellectuals gave to this institution was the “Republic

of Letters” of which they viewed themselves as citizens. The French philosopher Pierre Bayle, who published a Newsletter entitled *Nouvelles de la République des Lettres*, wrote of these citizens that “this commonwealth is a State extremely Free. The Empire of Truth is only acknowledged in it; and under their protection an innocent war is waged against anyone whatever. Friends ought to be on their Guard against friends, Fathers against their children.” Everything was contestable and could be challenged. National boundaries and lineage mattered but little; observations, experiments, and formal (often mathematical) logic ruled supreme. In that kind of culture, the antiquated strictures of Ptolemy and Galen stood no chance.

The incentive that stimulated people to be so active in the Republic of Letters was *reputation*. One could not sell a newly discovered comet, a mathematical theorem, or the findings from a new experiment for cash, but one could try to persuade one’s peers of their merit and thus build one’s reputation. Reputation among peers was immensely valuable not only for its own sake but because it was correlated with patronage. Intellectuals sought patronage, mostly just because they needed to eat and protection, but also because such patronage reinforced and legitimized their innovations. Patronage depended on the evaluations and recommendations of senior scholars.

At the same time the competition between different polities in Europe weakened a major obstacle to intellectual innovation: the tendency of the status quo to protect its rents by using everything in its capability, including violence and intimidation, to nip innovations regarded as threatening in the bud. In the late Middle Ages, innovators such as Wyclif and Hus were met by a tenacious opposition. Resistance remained fierce for two centuries, including the efforts of the order of Jesuits, the storm troopers of the Catholic reaction. Among others, they did all they could to stop the advent of infinitesimal mathematics, as Amir Alexander’s wonderful book *Infinitesimal: How a Dangerous Mathematical Theory shaped the Modern World* shows in detail. But resistance could be found anywhere: the reactionary Calvinist Dutch theologian Gisbertus Voetius (Gijbert Voet, 1589-1676) forced the University of Utrecht, where he was rector, to condemn Descartes’s work and the University to enforce its nothing-but-Aristotle teaching policy. In Leiden, too, a demand was made to stop teaching Descartes’s writings on account of accusations of blasphemy and atheism (1642).

In the end, however, such resistance was doomed, because political fragmentation meant that the reaction could never coordinate their efforts, allowing innovators to play one power against another, an art in which some of them excelled. If all else failed, they could always move elsewhere, as many did. As a result, opposition to intellectual innovation weakened in the seventeenth century and in the eighteenth century it seems feeble and often was little more than lip service. Truly outrageous writers such as Julien Lamettrie might still have to leave their countries of birth and have their books formally banned, but such measures were ineffective and widely seen as such. By and large the powers that be took a “if we can’t beat them, let’s join them” attitude in the age of enlightenment.

The proudest product of the Republic of Letters was, of course, the Enlightenment itself. The Enlightenment advocated everything that we think of as essential to the phenomenon of modern economic growth. It was the cultural event that explains, more than anything else, the puzzling phenomena that Vries is concerned with. One of its central propositions, which I have termed the

“Industrial Enlightenment” in my *Gifts of Athena*, is the firm commitment to useful knowledge as one of the main avenues to prosperity and bliss. In many ways the faith in the possibilities of improvement along the entire range of human and social activities seems today naive and overly optimistic, but the whining of cantankerous critics (one thinks of Adorno and Horkheimer’s *Dialectic of the Enlightenment*) that somehow the Enlightenment had brought nothing but misery and was responsible for the horrors of the twentieth century seems today simply preposterous.

Why, then, did China not experience the Enlightenment so that it, too could cast off the shackles of ancient learning? In a way, it had *an* Enlightenment, namely the *kaozheng* movement in late Ming and early Qing China. The intellectuals of this movement felt that abstract ideas and moral values should give way as subjects for discussion to concrete facts, documented institutions and historical events. Chinese scholarship of this period was not inherently antipathetic to rigorous scientific study or even resistant to new ideas. It was based on rigorous empirical research, demanded proof and evidence for statements, and shunned away from leaps of faith and speculation. Yet it did not lead to anything remotely similar. Why? The answer is that, while China produced many scholars who took a critical view of their ancient authorities, the market for ideas worked in very different ways and suffered from a far more powerful position of conservative forces. For much longer than in Europe, incumbents were able to fight off serious challenges to the intellectual orthodoxy. While some scholars did raise serious questions about the neo-Confucian orthodoxy, it was typically about some point of interpretation of the ancients, not because they objected to the entire edifice of learning. As a result, the *kaozheng* movement never really took off as a movement that saw useful knowledge as the key to progress and truly radical views had to await the fall of the Qing Empire.

The few Chinese scholars who advocated anything remotely similar to their European counterparts such as Song Yingxing (1587-1666), the author of *Tiangong Kaiwu* (“The Creations of Nature and Man”), remained marginal. Song was an astonishingly learned man, termed “the Chinese Diderot” and the “Chinese Agricola” by Joseph Needham. Song, perhaps because he never was able to join the ranks of the elite, broke the barrier between natural philosophy and technical knowledge and his views made him a soulmate of some of the more progressive thinkers such as Bacon. However, Song was not to become the “Chinese Bacon”. His work had little impact on the intellectual life of his contemporaries. His book was published twice, with about 50 copies made, generating a “quizzical and inadvertent” interest as one specialist has put it — a long shot indeed from the vast impact that the writings of Francis Bacon made on his contemporaries and even more the writers who followed his ideas after 1650. No reprints of Song’s magnum opus were made in the Qing period (after 1644) and the resurrection of the work was due to the discovery of a copy in Japan that had been brought there in the 1880s. Or consider the mathematician and astronomer Mei Wending (1633-1721), who carefully compared Western mathematics and astronomy to Chinese knowledge, and pointed to the advances that the West had made. Yet he also felt that the moderns were in no way superior to the ancients, and that there is no progress in history; indeed the Western knowledge brought by the Jesuits had already been “present” in ancient Chinese texts. The accumulation of human knowledge is merely a token of the ancients’ superior merit, and just needed to be re-discovered.

To be fair, traces of this bizarre view, that much of the new discoveries had already been known in antiquity but were lost during the intervening dark age, can also be found in some European writings, not least in those of Bacon. But by the second half of the seventeenth century it became increasingly clear that truly new knowledge had emerged in Europe that had not been there before, and that this knowledge would change the world forever. This in turn reinforced the self-confidence of the citizens of the Republic of Letters and made them strike out into new directions.

The key to the difference between Europe and China's intellectual development lies in the institutional foundation of learning and useful knowledge. In China, a literate and book-heavy society long before literacy rates in Europe had even reached double digits, intellectual life was dominated by Neo-Confucian writings, above all of the towering figure of Zhu Xi (1130-1200). In the centuries after his death, Zhu's writing became the core of the material that every Chinese student had to master for the Civil Service Examination. The system of the imperial examinations tested candidates on their knowledge of the classical canon. While that may not have been its original purpose, the examination system turned into a powerful tool to defend incumbents against the threat of intellectual innovators who threatened their political power and the value of their human capital. The Mandarin civil service examinations, Needham insisted with some hyperbole, caused the system to "perpetuate itself through ten thousand generations" (*The Great Titration*, p. 202). In a society in which public office remained "the most important source of prestige and wealth" (Brandt, Ma and Rawski, "From Divergence to Convergence," *Journal of Economic Literature*, 2014), the best and brightest young men allocated their time and efforts to prepare for these examinations. In a famous passage, the Jesuit missionary Matteo Ricci wrote in c. 1600 in his *Diary* that in China "Only such as have earned a doctor's degree or that of licentiate are admitted to take part in the government of the kingdom... no one will labor to attain proficiency in mathematics or in medicine who has any hope of becoming prominent in the field of philosophy [that is the classics]. The result is that scarcely anyone devotes himself to these studies ...the study of mathematics and medicine are held in low esteem, because they are not fostered by honors as is the study of philosophy." The comparatively weak competition in the Chinese intellectual environment left the obsession with the exegesis and regurgitation of ancient texts unchallenged.

It is perhaps to fair to criticize Vries for leaving out intellectual history (including the history of science) largely out of his otherwise remarkably rich account. Intellectual history is too important to leave it to the intellectual historians. A more systematic approach to it helps one arrange the pieces of the institutional and cultural puzzles that he presents in a novel pattern, one that can shed light on the development of Europe in a new way. I therefore suggest that *Escaping Poverty* might fruitfully be read in conjunction with another mammoth-sized book by an eminent Dutch scholar at the peak of his productivity, namely Floris Cohen's magisterial *How Modern Science Came into the World* (2012). In it, too, an erudite Dutchman delves deeply into the comparison of East and West and the mysteries of the origins of Europe's astonishing successes in the events of the early modern age and provides a tour d'horizon of a gigantic literature on a vast subject. Between the two of them, with some help from economics, we will eventually figure it out.

