

Mokyr, Joel: *A Culture of Growth. The Origins of the Modern Economy*. Princeton: Princeton University Press 2017. ISBN: 9780691168883.

Rezensioniert von: Floris Cohen, Utrecht University

„Economic history and intellectual history are two dynamic and active disciplines that barely intersect, which is a shame“, is the uncomfortable truth with which Joel Mokyr opens his latest, in many ways brilliant book. And yes, it is very true that most economic historians have difficulty even imagining that ideas may have some tangible impact on material products and material processes, whereas historians of ideas (in particular the sub-class of historians of science to which I myself belong) have tended over past decades to cultivate locally situated context at the cost, not only of in-depth study of some compound of ideas in its own right, but also of the large-scale, highly analytical pattern-seeking that the best economic historians are so good at. In combining the two disciplines in overall very well-informed, also nicely imaginative ways, Mokyr has done a great service to scholarship. By this I mean specifically scholarship regarding one of the few veritable key turning-points in our human past — a turning-point that, for full understanding, requires at least a solid command of the relevant socio-economic history as well as of the history of ideas in the broadest sense and of the history of science and technology in particular.

Indeed, Mokyr's book offers a whole range of well-balanced vistas on a perennial historical problem that over the past decade or so has most often been discussed with for label 'The Great Divergence'. In its most modest formulation, the problem is to explain the Industrial Revolution, regarded as one specific event in the late 18th and early 19th century economic history of Great Britain first, and then, in subsequent decades, of a range of later adapters (Belgium, the US, Germany ...). Phrased this modest way, the true dimensions get lost of a problem that in more ambitious terms runs about thus: how is it that our modern world (modern in the sense of by and large self-sustaining economic growth,

of the prosperity within reach of more and more common people the entire world over, of manual labor increasingly replaced or at least supplemented by ever more advanced machinery, in short, of the transition from an agricultural to an industrial society) took place in Western Europe rather than in any of the other advanced societies/civilizations of the world, notably in what is widely regarded as the readiest alternative candidate for effecting such a turning-point, China?

The question itself is one of long standing; let me now quote right away Mokyr's conclusions. Half-way the book he sums up two basic components of his final answer (p. 170): „This unique combination of political fragmentation with the pan-European institution of the Republic of Letters holds the key to the dramatic intellectual changes after 1500“. By the end of the book (p. 339) this is expanded into: „The big difference between Europe and the rest of the world was the Enlightenment and its implications for scientific and technological progress.“ And his complete answer, once again rendered here in a nutshell only, appears in the book's final paragraph:

„The European Enlightenment ... involved two highly innovative and complementary ideas: the concept that knowledge and the understanding of nature can and should be used to advance the material conditions of humanity, and the belief that power and government are there not to serve the rich and powerful but society at large ... The combination of these two and their triumph in the market for ideas created a massive synergy that led to the economic sea changes we observe, from industrialization and the growth in physical and human capital to the discovery and mastery of natural forces and resources that were still beyond imagining in 1750.“

So much for Mokyr's final conclusion; let me now examine in my own words rather than his what steps he successively takes to get there. In what I prefer to regard as an effort at soft-selling to his fellow economists his core message that ideas do matter indeed, we are treated in the first four chapters to a range of variations on the concept of 'cultural evolution'. We are treated there at the same time to the standard procedure that he follows in every single chapter of the book. That

procedure is to introduce and then to discuss from a wide variety of angles a concept or an idea or a theme by means of a vast amount of pertinent literature, such that Mokyr keeps introducing new aspects thereof in ongoing, as a rule very thoughtful, sensible and balanced dialogue with the relevant portions of that literature. In the case of 'cultural evolution' Mokyr's careful argumentation has not been able to cure my deeply rooted scepticism about the usage of evolutionary theory outside its proper, Darwinian terrain, yet I do grant the potential usefulness of these tactics to draw Mokyr's own co-professionals into an argument that they might otherwise regard as just too inherently far-fetched to merit the serious consideration it most certainly deserves.

Luckily, little of all this evolutionary theorizing affects the backbone of Mokyr's argument. He begins to mean real business in the fifth chapter, where he investigates how (if at all) some given cultural product manages to get spread to wider segments of society than its originator only. Adorning the various possible units of persuasion here at issue with the borrowed misnomer 'bias', Mokyr distinguishes between no less than nine such 'biases'. Some idea or other cultural product may catch on if it proves persuasive by its content, meaning that its persuasiveness varies with the extent to which it possesses 'tightness', i.e., a „power to fit the facts“ (p. 49)). Or the 'bias' is direct, i.e., derived from some educational authority in the widest sense. Then there is a 'bias' in favor of whether or not some new idea is inherently consistent and tends to confirm what the potential convert already took to be the case. Or persuasion takes place through imitation of people widely regarded as possessing superior knowledge and insights. Or sheer rhetoric, or highly frequent exposure may do the trick. Or the presence or absence of institutionally established norms may decide over one's willingness to be persuaded or not. Coercion may also help persuade, albeit in a rather unstable manner since not even the most tyrannical ruler can fully enforce people to believe certain things rather than certain others. Finally, people may perceive salient events like the Black Death or 9/11 as almost an invitation to change their views in favor of some novel one now appear-

ing on the market of ideas.

'The market of ideas', indeed — the historical presence of a more or less free, more or less open space where ideas can be exchanged now quickly turns out to be the decisive element in Mokyr's explanation of how the West is where our modern world first emerged. The crucial place and period on which he concentrates in the next chapters is Western Europe c. 1500 – 1800, culminating in what he most often calls the 'Industrial Enlightenment'. Crucial here is the 'Republic of Letters' — a term, current at the time, that is meant to express the ideal, at times approximating the reality, of open and free communication among scholars irrespective of their religious beliefs, of their further views and persuasions, and even of their social backgrounds. At least in Europe, so Mokyr argues, these three centuries are marked, broadly considered, by a relative prevalence of those 'biases' that favor innovation over those that tend to maintain the intellectual status quo. One major example of the former is persuasion due to the unique tightness of a whole range of new insights into natural phenomena, mostly attained through mathematics and/or experiment, whereas an example of the marked decrease during this period of the latter rests in the presence in Europe of a plurality of power centers that enabled ideas to move with increasing freedom from one place to another — the very hallmark of the Republic of Letters.

Crucial likewise to the rise of a mechanism that enables innovative ideas to move through the Republic of Letters and thus to spread with relative ease is what Mokyr calls 'cultural entrepreneurs' — particularly gifted, individual originators of clear-cut, highly innovative ideas that, in building forth on notions already around by way of broad conceptions and values, manage to bring those vaguer notions to a much more pointed and, as such, powerful focus. By way of striking examples of such 'cultural entrepreneurs' Mokyr dedicates two successive chapters to the work, but even more so to how posterity dealt with the work, of the two major British pioneers of the Scientific Revolution, Francis Bacon and Isaac Newton. What Bacon's work in effect brought about was the wide dissemination of the idea that the investiga-

tion of natural phenomena can, and ought to, serve useful ends, that is, the improvement of human destiny. The building of bridges between mathematical/experimental science and the construction of innovative machinery, even though not really successful until way into the 18th century, became, under Bacon's aegis, a widely shared ideal that also contained sufficient Christian elements to withstand any effort at suppression on grounds of sacrilege. While there is a broad congruence between Bacon's own views and what posterity made of them, in the case of Newton the gap is far larger. Both his *Principia* and his *Opticks* are works for those in the know — what was carried over from Newton, who was hardly an Enlightenment figure, into the Enlightenment was, above all, his brilliant demonstration that the universe solidly runs on such clear-cut, well-provable laws and other regularities of nature as he had put down in the two magnificent works just listed. In short, the new science, with Bacon and Newton widely regarded as its prime exemplars, was both inherently powerful and suitable for being applied in practice to the benefit of all of humanity.

Not that it is an at all easy or obvious process to 'apply' certain scientific results in practice. The rise of a science-based technology, which began quite haltingly in the course of the 18th century with Newcomen's fire engine (half a century later altered quite drastically by James Watt), was definitely a two-way affair, with technicians of a radically new kind as the indispensable intermediaries. Quite rightly does Mokyr distinguish between the arts and crafts of earlier times and of other places, where incidental innovation took place on a trial-and-error basis, and the kind of science/technology spiral (the term is from the Dutch physicist H.B.G. Casimir) that first emerged in 18th century Europe and that made the Industrial Revolution possible from the viewpoint of the history of ideas and of the kind of practice that these ideas now proved to enable.

In two final chapters Mokyr widens the picture further. It is one thing to argue that Europe owed its chance to stumble at best semi-deliberately into the Industrial Revolution to an Industrial Enlightenment due in good part

to the market of ideas sustained by, and in, the Republic of Letters. But it is something else to take it for granted that events like this could not possibly have happened in China. Did not something like a Republic of Letters and something like an Industrial Enlightenment exist in China to a sufficient extent to invalidate Mokyr's entire argument about what made Europe so special? With his usual balanced fairness Mokyr weighs the relevant differences and similarities in the histories of China and of Western Europe, giving much attention to the 'homeostasis' (Joseph Needham's term in this regard) that, in spite of all kinds of local and incidental innovation, kept marking Chinese civilisation in contrast to the 'on the move' mentality that had gripped Europe by the Voyages of Discovery at the latest. 'Fair and balanced' treatment for the largest part, to be sure: in a rare slip (p. 287) Mokyr attributes to Max Weber „the old chestnut“ that China never had any science at all. This in spite of the safe rule that whoever charges Weber (who of course did from time to time make mistakes like all of us do) with some particularly elementary blunder would do wise first to check what Weber really had to say on the subject in question, doing so preferably in Weber's original German rather than in the defective mess that still passes for translation of Weber's work in English.

We have, then, in Joel Mokyr an economic historian with a mind uncommonly open to, and filled with a great deal of knowledge of, relevant portions of the history of science and technology in their broad intellectual context — a historian given as well to large-scale, cross-cultural comparison. Indispensable as these qualities surely are if one seeks to come to terms with the big historical riddle of the 'Great Divergence', Mokyr is not (nor does he claim to be) the first economic historian to bring these to bear on the problem. When in the early 1980s I looked around for literature suitable for usage in a second year students' course on the nature and causes of the Industrial Revolution considered chiefly from the viewpoint of the contribution made to the event by science-based technology, I quickly settled on a book often reprinted and widely read at the time — David S. Landes' *The Unbound Prometheus* (1969). Its 40-page long in-

troductory chapter aims to do what, at much greater length, Mokyr has now undertaken as well. In what follows I seek to ascertain, by means of a succinct comparison between Landes' argument and that of Mokyr almost half a century later, whether and (if so) in what respects we may reasonably detect progress here — have we, thanks to Mokyr, now really come closer to a solution to the problem than already attained by Landes 49 years ago?

For Landes, the Industrial Revolution was above all a technological turning point (p. 1):

„The heart of the Industrial Revolution was an interrelated succession of technological changes. The material advances took place in three areas: (1) there was a substitution of mechanical devices for human skills; (2) inanimate power — in particular, steam — took the place of human and animal strength; (3) there was a marked improvement in the getting and working of raw materials, especially in what are now known as the metallurgical and chemical industries.“

To be sure, in his definition of what the Industrial Revolution was about he goes on from there to point at a range of concomitant changes — new forms of labor organization; new, factory-driven kinds of discipline, and the equally novel phenomenon of one technological change leading to another in a seemingly endless cycle of innovation. As compared with what had gone before, something unprecedentedly new did now happen (p. 3): „It was the Industrial Revolution that initiated a cumulative, self-sustaining advance in technology whose repercussions would be felt in all aspects of economic life“ — repercussions that, in their drawing ever wider circles, receive succinct treatment in their turn. That treatment, in all its brevity, concludes (p. 12) with the evocation of nothing less than the story of paradise: „In sum, the Industrial Revolution has been like in effect to Eve's tasting of the fruit of the tree of knowledge: the world has never been the same.“

For Landes, then, a sea-change in technology, somehow connected to new ways of knowing, is central to the Industrial Revolution and the vast economic, social, political and cultural waves engendered thereby. The difference with how Mokyr regards the event is surely one of degree rather than of kind,

and yet, we can already foresee a rather different approach when Landes raises the causal question: Why Europe?

After pointing out that on the eve of the Industrial Revolution Europe was already considerably more prosperous than regions elsewhere on the globe (in part due to a quickly ingrained habit of relatively late marriages), Landes opens his causal inquiry with some careful hedging (p. 14): „A definitive answer is impossible ... “; „any judgment must be based on an impressionistic examination of the record ... “; „one man's interpretation can serve to guide or sharpen the appreciation of others ... “ This is followed by announcement of the method taken, and then, right away, of the main conclusion to be reached (p. 14/15):

„The method of inquiry is to seek out those factors of European development that seem to be both significant and different; that set Europe apart, in other words, from the rest of the world. By holding Europe up against the mirror of the most advanced non-European societies, we should be able to discern some — surely not all — of the critical elements in her economic and technological precedence.

From this point of view two particularities seem to me to be salient: the scope and effectiveness of private enterprise; and the high value placed on the rational manipulation of the human and material environment.“

Landes seeks to shore up his first 'salient particularity' by means of reference to the relative security in Europe of private property against arbitrary state appropriation and/or extortion; to an increasing habit of dealing with property matters by contractual agreement rather than by force; to the rise of a relatively independent, vital and influential business class operating in relatively autonomous cities. Well aware that the concept of rationality that constitutes his second 'salient particularity' can mean many different things to many different people in many different contexts, Landes takes care to define it right away (p. 21) as „the adaptation of means to ends ... the antithesis of superstition and magic.“ The considerations he advances to sustain the idea of Europe's uncommonly high degree of rationality are the following: the Weber thesis (rightly interpreted as an apparent affinity between the Calvinist

work ethic and an inclination to accumulate wealth rather than squander it); the Scientific Revolution, in the course of which the new science began to serve „as the perfect bridge between rationality and mastery“ (p. 25), and due to which the orderly accumulation and transmission of knowledge about the world first became possible; a readiness, already acquired in the Middle Ages and never really reciprocated, to adopt from elsewhere technical inventions like the stirrup or the wheelbarrow; the absence of lethal outside threats at a time when the Muslim world turned inward due to waves of destructive invasions; the rise, beneficial for science and technology in the first place, of nation-states that held the European continent divided without destroying it. It is in this context that we encounter sentences very much like those written by Mokyr half a century later: „All of this gave Europe a tremendous advantage in the invention and adoption of new technology. The will to mastery, the rational approach to problems that we call the scientific method, the competition of wealth and power — together these broke down the resistance of inherited ways and made of change a positive good.“ In this connection Landes quotes rather extensively from a letter by Isaac Newton to Francis Aston about how one ought to behave abroad, with for main message that to learn is more important than to teach.

These, then, are in Landes' 1967 view „the crucial values of that European culture and society that gave birth to the modern industrial world: rationality in means and activist, as against quietist, ends.“ However, „these alone will not account for the entire discrepancy between Western economic development and that of the leading centres of civilization elsewhere.“ For what is still missing from the picture is the question of the extent to which early European imperialism contributed to the Industrial Revolution by enriching Europe all the while robbing the rest of the world of crucial resources. Here, too, Landes declares „consensus impossible“, going on to argue that the real question is rather whether the advantage that colonial expansion surely brought to Europe was a necessary, or perhaps even a sufficient, condition for the big breakthrough of the Industrial

Revolution. He answers that dual question in the negative, chiefly because, of the only three serious alternative contenders, China was hardly even touched by European expansion before the end of the 18th century, whereas the relative economic backwardness of both the Muslim world and India was due to the cultural and political history of their respective heartlands rather than to the surely present yet, for the time being fairly limited impact European expansion had on each.

So much for how Landes answered what has now become Mokyr's core question, too. After all those years I remembered so little of *The Unbound Prometheus* that I needed to prepare a dutiful summary before moving on to a comparison with Mokyr's book. There is therefore nothing foreordained about the outcome of the comparison, which I begin to oversee only now that I begin, tentatively, to write it down.

There is nothing foreordained, either, in both Landes' and Mokyr's conception of the course of human history. Large-scale comparative and analytical work covering many centuries is almost routinely open to charges of being presentist 'Whig history' in the sense of finding the present back in the past as if the past were predetermined to get us where we are now. While Mokyr is much more outspoken than Landes in his view of history as full of road-forks where things might have gone quite differently than they did, their manner of dealing with past events as displaying a certain inner logic that may at any unexpected moment break down due to the intervention of some other chain of well-explicable events is just about identical.

A large amount of similarity can further be observed without any difficulty in what is really Mokyr's core theme — Europe's comparatively large openness to new ideas, new inventions, new ways of doing things. It is also here that Mokyr's greatest merit comes clearly in view. While both authors are agreed on the profound significance of Europe's internal fragmentation, Mokyr's analysis of what the Republic of Letters stood for, and how through 'cultural entrepreneurship' the Enlightenment could arise and be enriched with the idea and the prospect of science made useful, is vastly better, because it

is vastly more specific, than what Landes has to say about basically the same subject. This even goes to details: while Newton appears in Landes' analysis only as the writer of a letter that has in the meantime appeared to be wholly spurious, Mokyr has quite a thorough grasp both of Newton's achievement and of what was made of it in Enlightenment days. It goes likewise to Landes' meanwhile quite obsolete idea of a radical opposition between the new science of the 17th century and contemporary conceptions of magic. In these, and in countless issues like them, the empirical advance of historical scholarship during the half century that separates Mokyr's book from Landes' introduction comes clearly to the fore.

So it does in Mokyr's two chapters on China, for which there is hardly an equivalent in Landes' admittedly far shorter effort at comparative analysis. In contrast, by way of a by-effect of the current framing of the problem of the rise of the modern economy as 'The Great Divergence', with Mokyr the Islamic world and India have fallen to the way-side and China alone is left as the only society which might conceivably have given rise to a science-based technology on which an industrialized economy could be based.

As to, finally, the role that the Scientific Revolution is being assigned in both books, let me say first of all how satisfying it is for a historian of science to find in the works of two prominent economic historians such an openness to the very idea that science was not foreign to how the Industrial Revolution came about. How exceptional this really is, appears in all its naked clarity from the wholesale absence of even a smattering of the history science in a whole range of recent works on The Great Divergence, be they written by Ken Pomeranz (who invented the term), or by André Gunder Frank or by Roy Bin Wong & Jean-Laurent Rosenthal or by ... (it is not hard to extend the list further). But ideas do matter, scientific ideas prominently among them, and that rare awareness pervades Landes' and now also Mokyr's books from start to finish. It is true that how both authors conceive of the extent to which, and how exactly, the new science of the 17th century had an impact on the machinery without which no

large-scale industrial mass production could have come about at all, is both rather different and still, in my view, not analyzed with sufficient discrimination. In particular, how in the admittedly crucial 18th century science and technology affected one another in certain cases and failed to do so in certain others, is a subject on which neither Landes nor Mokyr has even come close to saying the last word (even though in my view Landes was closer on the mark than Mokyr is when the centrality of technology in the Industrial Revolution is at issue). Even so one hopes that, with Mokyr's book, the idea that Landes sought to get across first, namely, that the history of science is indispensable for analyzing with any chance of success how it is that the modern economy arose where it did arise, has now finally become a fixture of every future attempt to write that history.

Floris Cohen über Mokyr, Joel: *A Culture of Growth. The Origins of the Modern Economy*. Princeton 2017, in: H-Soz-Kult 06.07.2018.