


REVIEW ARTICLE

Culture and institutions: a review of Joel Mokyr's *A Culture of Growth*

Geoffrey M. Hodgson 

Loughborough University London, London, United Kingdom of Great Britain and Northern Ireland
Corresponding author. Email: g.hodgson2@lboro.ac.uk

(Received 26 May 2021; revised 2 July 2021; accepted 2 July 2021; first published online 28 July 2021)

Abstract

This is a review of Joel Mokyr's fascinating book entitled *A Culture of Growth*. The work is summarized, noting its focus on Darwin-style evolutionary explanations of cultural change. But Mokyr's emphasis on cultural entrepreneurs and positive feedbacks in the procreation of ideas is insufficient to explain the origins of modern economic growth. Too much explanatory weight is placed on too few extraordinary people. It is argued that Mokyr's analysis should be extended, to bring the evolution of institutions, as well as the evolution of culture, into the picture at an additional level. The role of inter-state rivalry and exogenous shocks has also to be underlined. This kind of analysis can be developed within the framework of generalized Darwinism, which Mokyr himself adopts. This is a major and highly stimulating book.

Keywords: Culture; economic development; generalized Darwinism; ideas; Joel Mokyr; technology

JEL classifications: B52; N10; O14; O30

1. Introduction and overview

For more than 30 years, Mokyr's (1990a, 1990b, 2002, 2009, 2016) work has cast much light on the explosion of technological innovation and economic growth that began in Britain in the late 18th century and then spread around the world, bringing large increases in wealth and average life expectancy. Like the complementary work of Deirdre McCloskey (2010, 2016b), central to Mokyr's argument is the role of ideas and culture in driving change. Both authors argued that the crucial change was the emergence of a culture of progress based on the idea that mankind can improve its condition through science and rational thought. In his *A Culture of Growth*, Mokyr (2016) goes further and deeper into his explanation of the industrial take-off. The book develops an important conceptual framework. It is filled with a mass of fascinating detail. This essay is a review of that work.¹

Mokyr's (2016) book is divided into five parts, with an overall total of 17 chapters. In the first part, he outlines his theory of cultural evolution. The second part is devoted to the role of 'cultural entrepreneurs', particularly Francis Bacon and Isaac Newton, who have a chapter each. The third part goes into more empirical detail, highlighting how ideas were communicated and debated throughout Europe among leading thinkers in the 'Republic of Letters'. The fourth part examines how these developments prepared the ground for the Enlightenment and industrial growth. The final part compares developments in Western Europe with the different fate of Imperial China.

Mokyr is aware of the ambiguity of the term *culture* and he defines it in the following way: 'Culture is a set of beliefs, values, and preferences, capable of affecting behavior, that are socially

¹The author is very grateful to four referees for helpful comments on an earlier draft of this review essay. McCloskey (2016c) argued that Mokyr's (2016) book should earn him the Nobel Prize.

(not genetically) transmitted and that are shared by some subset of society'. He distinguishes culture from institutions by regarding culture 'as something *entirely of the mind*' which is 'to an extent, a matter of individual *choice*'. By contrast, institutions 'are socially determined conditional incentives and consequences to actions. These incentives are parametrically given to every individual and are beyond their control' (Mokyr, 2016: 8–9).

These are reasonable working definitions and distinctions, but quibbles are possible. Culture must be more than beliefs. If several people believe that it is currently raining, then it would hardly qualify as a cultural trait. Even if many people believed in a God, this would not be enough to constitute something cultural, unless we added the stipulation that they must also believe that others believe in a Deity. Culture in this sense is not simply shared beliefs, but the widespread belief that others share those tenets. Also, the extent to which culture is a matter of choice may be highly limited. We do not choose to be born into a particular culture or subculture, yet these contexts engender many of our beliefs. For Mokyr, like others, cultural transmission is a matter of learning in social networks. But this implies that culture involves social relations as well as beliefs. Culture is not entirely a matter of the individual mind.

Mokyr's definition of institutions is close to the near consensus that institutions are systems of rules, with incentives of different kinds to follow those rules (Hodgson, 2006, 2019a). But the distinction between culture and institutions still needs to be clarified further. This is too big a task for this review essay. But it needs to be addressed.²

Mokyr saw his definition of culture as similar to that of Alesina and Giuliano (2015) who regarded culture as synonymous with informal institutions. He also noted the similarity of his approach to the classic work in evolutionary anthropology by Robert Boyd and Peter Richerson (1985). Following this evolutionary cue, Mokyr explained that cultural change, at a sufficiently abstract level, is a process that involves the general Darwinian principles of variation, selection and replication, despite big differences at the level of detail. Cultural and genetic evolution both involve variation, selection and replication. But of course the detailed mechanisms are often very different. This framework is known as generalized Darwinism. Consistent with this approach, culture is distinguished from behaviour. Mokyr (2016: 9) treats 'culture as genotypical and actions as phenotypical'. His use of generalized Darwinism is an important milestone. So far it has not been used widely in economic history.³

In distinguishing between culture and institutions, Mokyr does not dismiss institutions from the explanation of cultural and economic change. As he put it: 'Institutions create the environment in which cultural evolution occurs' (Mokyr, 2016: 12). It could also be claimed that culture creates the environment in which institutional evolution occurs. For instance, legal systems were built to a large degree built on preceding cultural rules. In any case, Mokyr repeatedly stressed the importance of institutions, as well as of culture.

This is in contrast to the work of McCloskey (2010, 2016a, 2016b), who emphasized culture and ideas but does not acknowledge a major explanatory role for institutions. She claimed that there were no major institutional changes since 1500 that are capable of explaining what she called the Great Enrichment. She also narrowed the possible 'causes' of change to 'the mental states of human individuals', making the valid point that intentions and thoughts that motivate actions are crucial. She regarded mental states as (primary) causes. Other factors, including institutions, were seen as 'intermediate' (McCloskey and Silvestri, 2021). With this restricted notion of *cause*, McCloskey highlighted ideas as the crucial drivers of the Great Enrichment. But even if we accept this rather limiting understanding of a *cause*, institutions and other factors can still be part of the *explanation*, as Mokyr rightly admitted.

Greif and Mokyr (2016: 35, 38) praised McCloskey's contribution but criticized her for overlooking the institutional buttresses of economic and technological progress: 'innovation, too, needed

²Note that this consensus definition means that organizations are also a kind of institution. Despite a widespread interpretation, there is no clear evidence that North took a different view (Hodgson 2006, 2019a).

³Generalized Darwinism is outlined in Hodgson and Knudsen (2010), which Mokyr cited in his book, along with an article on the topic that he co-authored with this reviewer and others (Aldrich et al. 2008).

institutional support'. Furthermore, 'institutions may have changed more in the period leading up to the Industrial Revolution' than McCloskey admitted. Examples and evidence of major changes in British legal and financial institutions in that period are provided elsewhere (Grajzl and Murrell, 2021a, 2021b; Hodgson, 2017, 2021a).

Following Boyd and Richerson (1985) and others, Mokyr (2016: 48–56) identified a number of possible biases in the replication of cultural beliefs. Among these, he wrote of confirmation bias (where people choose beliefs that are consistent with their other ideas), conformist bias (where people tend to follow the majority) and authority or prestige bias (where the ideas of authoritative or prestigious people are adopted). Mokyr (2016: 20, 33–35) also emphasized the role of persuasion in cultural transmission. These and other biases result in different rates of growth of particular ideas. Culture evolves partly through these ongoing processes of differential replication.

Where do new cultural ideas come from, particularly those that lead to the development of knowledge useful to the improvement of the human condition? Mokyr's answer to this question highlights 'cultural entrepreneurs' such as Francis Bacon (1561–1626) and Isaac Newton (1642–1727). Mokyr (2016: 6) regarded such cultural entrepreneurs 'as the exceptional and unusual specimens who are the sources of evolutionary change: they are the ones who do not take the cultural choices of others as given, but try consciously to change them'.

Mokyr emphasized the inspirational contribution of Bacon, who developed empirical and experimental methods at the foundation of modern science. Bacon also understood the importance of an interacting community of scientists who compare and test competing explanations. His goal was to make science useful for human progress, by connecting it to technology. As Hill (1965: 110) wrote: 'Bacon's scientific method is the trial and error of the craftsmen raised to a principle'. Furthermore, Bacon reconciled science with religion, claiming that it was virtuous to reveal and respect the laws that God in his wisdom had devised to govern nature. This reconciliation helped to make Bacon's radical ideas more acceptable. For Mokyr, Bacon was the supreme cultural entrepreneur whose influence greatly contributed to the eventual industrial take-off.

But maybe too much of an explanatory load is placed upon Bacon. It is almost as if without him the Industrial Revolution would not have happened. I return to this problem below. While he sometimes advocated free trade (Hill, 1965: 97–98), Bacon was not a political liberal. For instance, he supported the use of torture (Langbein, 1976: 90). Mokyr's elevation of Bacon's influence contrasts with McCloskey's emphasis on the power of liberal ideas in promoting the Great Enrichment. Mokyr also overlooked Bacon's roles as royal legal advisor and Attorney General, and his major written contribution to jurisprudence (Kocher, 1957). Bacon was as much a legal and institutional entrepreneur as a cultural one. But Mokyr's focus is mostly on science and technology, and much less on politics and law. There are good reasons, some discussed below, to give politics and law as much prominence as science or technology in the explanation of modern economic development.

Mokyr (2016: 66) wrote: 'Cultural entrepreneurs change what people believe, and if enough important people are converted, they will change institutions to conform with the new beliefs and thus the environment in which the next generation of cultural entrepreneurs find themselves'. He concluded: 'What counts for economic history was the beginning of a long and drawn-out rise in the belief in the transformative powers, social prestige, and virtuousness of useful knowledge' (Mokyr, 2016: 267).

While the Industrial Revolution began in Britain and spread to Europe and other parts of the world, Mokyr showed that the culture of scientific endeavour was empowered by a European community that he dubbed the Republic of Letters. This autonomous organization of scientists began in England and France in the 17th century. His argument for its significance is powerful. European scientists in the 17th and 18th centuries were networked together in a way that promoted critical reflection and synergetic endeavour.

In the fifth and final part of the book, Mokyr turned to China as a case study. While China produced major innovations, many independently of Europe, after about 1700 it fell behind in terms of economic growth. Mokyr is careful to note a number of important Chinese thinkers that might have helped restore Chinese economic dynamism but failed for a variety of reasons. Strikingly, several of

those explanations are political and institutional. China lacked the plurality and rivalry of states in late medieval Europe. European political division created economic competition between territories for merchant trade and refuges for dissident intellectuals when they were threatened by authoritarian and conservative rulers. By contrast, Chinese geopolitics created a powerful state and bureaucracy, ruling over a large and well-populated area. As Mokyr explained in his book, this state bureaucracy hindered open dialogue and innovation. He also acknowledged the argument of Greif and Tabellini (2010) that the enduring absence of a sufficiently developed legal system in China obliged economic actors to rely on extended family or clan networks for contract enforcement and moral authority. By contrast, inter-state competition and widening trade helped eventually to generate more effective legal systems in Western Europe (Berman, 1983, 2003; Tilly, 1992). Part of the explanation of the China-Europe divergence hinges on institutions.

2. On cultural and institutional evolution

Much of Mokyr's argument is forceful and persuasive. The book is a treasure chest of information and insights. But my biggest criticism is that the evolutionary framework needs further development to sustain his argument. As it stands, the analysis depends too much on successive, fortuitous cultural mutations, each initially promoted by one individual. Too much explanatory weight is placed on too few extraordinary people.

Mokyr (2016: 26–27) recognized the need to explain evolutionary leaps. He pointed to the history of technology that shows 'totally new options' and the parallel existence of 'discontinuous leaps in culture'. But the point, however, is not only to observe them, but also to explain their appearance, and also to show why some of them succeeded and proliferated. Mokyr attempted an answer with 'mutations' followed by runaway 'positive feedback', particularly between propositional and prescriptive knowledge. But the latter is about science-technology feedbacks: it is not explained sufficiently how they may apply to culture.

Part of the problem is that Mokyr's account is largely a bottom-up explanation. Although he mentions interactions between individuals and their environment, including the possibility of runaway positive feedbacks, there is insufficient attention to the possibility that environmental changes and exogenous shocks may themselves trigger new bursts of innovative thought and economic development.

We have ample evidence that external shocks matter. For example, William the Conqueror's 1066 invasion changed English institutions and culture in fundamental ways. The 1688 invasion of Britain by William of Orange brought financial practices from the Netherlands, resulting in a major reconfiguration of British finance and administration. The growth of the British Empire spread English cultural norms and common-law systems to many countries. The arrival of American warships in Tokyo Bay led to the Meiji Restoration of 1868 and Japan's rapid transition from feudalism to a Western-inspired capitalist society.

This diffusion of crucial ideas and institutions from one country to another undermines the Marx-Schumpeter notion that evolution is the unfolding of a system exclusively 'from within' (Marx, 1976: 91; Schumpeter, 1934: 63, 1954: 391). Politico-economic development is often driven by military and economic competition between nations. While internal development is vitally important, the transmission of ideas from country to country or organization to organization is also a major feature in socio-economic evolution.

The persistence of the 'from within' claim is sustained by the ambiguity of the word *evolution* and a lack of clarity among 'evolutionary economists' and others as to whether it refers to a developing single entity (*ontogeny*) or to an evolving population of multiple entities (*phylogeny*) (Hodgson, 2011, 2019b). Yet modern biologists are fully aware of the importance of exogenous changes. Biology underlines both ontogeny and phylogeny in biological evolution.

Mokyr (2016: 163–4) briefly noted the importance of exogenous shocks in natural evolution, such as 'the spectacular proliferation of new mammalian forms at the beginning of the Cenozoic after the

extinction of the dinosaurs'. But shocks on this scale are catastrophic. They led to change because most species were wiped out. In the human world, we have to consider lesser exogenous pressures that lead to significant but not annihilating internal disruption, thus creating adaptive opportunities for effective cultural entrepreneurship. These (disruptive but not devastating) exogeneous shocks are not prominent in Mokyr's account, yet they are arguably very important.

Consider the two cultural entrepreneurs highlighted by Mokyr. First, it is no accident that Bacon was born and became prominent during a period of upheaval, following the English Reformation. Multiple external and internal shocks played a major role in Tudor and Stuart history. Henry VIII's break from Rome was motivated as much by a wish to dispel foreign power and enlarge his own, as by a desire to annul his first marriage. Huge economic disruption followed the resulting Dissolution of the Monasteries. The Reign of Elizabeth involved multiple defensive moves against repeated foreign plots and threatened incursions. As well as Bacon, this turbulent period produced William Shakespeare, Christopher Marlow, John Donne, Thomas Tallis, William Byrd and several other dramatists, poets and composers.

Newton was born during a century of heightened violence and revolution. In his lifetime, England was involved in several major wars. Hostilities with Scotland triggered the English Civil Wars of 1642–1649. The year 1688 saw a Dutch invasion. Newton's century also brought Robert Boyle, Robert Hooke, John Locke, Thomas Hobbes, William Petty, John Milton, Henry Purcell and many others of enduring influence. Their combined creativity is testimony to the importance of disruptive (but not devastating) exogenous shocks. Periods of disruption and uncertainty created a both an aesthetic yearning for constancy and security, alongside compulsive attempts to understand the disturbing predicament. Cultural entrepreneurs do not arise simply as random mutations in a singular stream of cultural transmission. They become energized, and may gain attention, as a result of the challenging special circumstances in which they appear to offer solutions or appeasements. These national and international circumstances evolve, and they too are subject to some kind of evolutionary analysis.

If the explanation rests mainly on the fortuitous mutation of cultural entrepreneurs, then why didn't successful, modernizing cultural entrepreneurs appear many thousands of years ago? Their emergence may have been prevented by the ubiquitous struggle for subsistence, the lack of a surplus sufficient to sustain a complex division of labour, and of insufficient institutions to support creative thinkers and innovators. On these grounds, cultural entrepreneurship would have to wait for large-scale sedentary societies with complex institutions, including states. That is less than 8,000 years ago. But then the evolution of these institutions becomes a necessary part of the explanation. Cultural mutations and feedbacks are not enough.

Cultural transmission in a tribal context is much less complex than in large-scale societies with hierarchical systems of authority. In tribal societies, cultural and technological knowledge is limited. Consequently, any one person can be aware of much of the know-how in the group. By contrast, large-scale societies have more complex divisions of labour and are repositories of more extensive and detailed knowledge. It is impossible for any one person to hold more than a small fraction of this knowledge. As a result, information transmission is generally more than person-to-person persuasion or imitation. It depends also on the reinforcing and filtering mechanisms of structured authority. This applies to modern technology, science and law. These systems of organized, practical and experimental knowledge depend on some degree of authority, to build sufficient consensus on key issues and assure the quality of judgement and research (Kitcher, 1993; Polanyi, 1958, 1962). Consequently, the cultural transmission of technological and scientific knowledge depends on the higher-level evolution of organized authority. The Republic of Letters lacked sufficient organized authority to establish modern science. The organized authority of experts, involving sufficient trust, helps to obtain assent to laws or scientific claims. Trust and authority are necessary because no-one can be an expert on more than a tiny fraction of the relevant knowledge. These considerations bring in institutions as well as culture. Institutional evolution must be understood, and not simply as person-to-person persuasion or transmission.

Assuming the existence of states, why didn't enough breakthrough cultural entrepreneurs emerge in the hundreds of years of (say) Ancient Greece or Ancient Rome? Why didn't a modern economy begin

to emerge much earlier than it did? We can point to innovative and inspiring thinkers such as Plato, Socrates, Aristotle, Archimedes, Cicero, Aurelius, Hypatia and many others. The absence of moveable-type printing technology helps to explain their failure to gain traction and produce a critical mass of transformative followers. But then the existence of a printing press in China as early as the 7th century creates a comparative analytical problem. In the 11th century, the Chinese had moveable type. Why didn't effective and transformative cultural entrepreneurs emerge in China in the 11th century or even before? Furthermore, when printing was developed in Europe in the 15th century, why was its cultural stimulus much greater in some European countries than in others? In explaining our modern origins, it is inadequate to rely on fortuitous cultural mutations alone. We have to consider the evolution of institutions, as well as the evolution of individuals and cultural beliefs.

As noted above, much of biological evolution is driven by contextual or exogenous changes. This was recognized by Darwin (1859) and it has become a prominent theme in biology (Corning, 2003, 2005; Mayr, 1960, 1982; Waddington, 1976; Weber and Depew, 2003). Furthermore, there is not simply a struggle for survival involving individuals, but also rivalry between groups within species, and obviously between different species. There are processes of selection acting on multiple levels. These help to explain major changes in the environment.

Consider the evolution of the modern state. The plurality and rivalry of states in late medieval Europe helped create the conditions for the emergence of capitalism (Ertman, 1997; Tilly, 1992). Water and mountains divided multiple lowland populations, making Europe difficult to unify by military force. The Romans nearly succeeded, but medieval monarchs faced more formidable European opponents. Unlike China and India, where large armies could sweep across the large plains and subdue whole populations, Europe remained divided into multiple states. The enduring rivalry of these states was an important stimulus to military and economic development. Growing military strength was necessary for defence and a growing economy helped to pay for it. Consequently, as Tilly (1992: 26) put it:

Other states ... strongly affected the path of change followed by any particular state. From 1066 to 1815, great wars with French monarchs formed the English state, French intervention complicated England's attempts to subdue Scotland and Ireland, and French competition stimulated England's adoption of Dutch fiscal innovations.

War between rival states periodically devastated Europe and often checked its development. But these traumas brought major institutional changes as well. England's conflicts in the 17th and 18th centuries promoted state-building, public financial institutions and more efficient administration (Brewer, 1989; Ertman, 1997). Wars in the 18th century and early 18th prompted the development of more efficient state administrations and reductions in public corruption (Neild, 2002).

As Mokyr (2016) fully recognized, another effect of European political fragmentation was the ability of critical intellectuals to seek refuge from persecution by moving to another regime. Inter-state competition also created some pressure on relatively enlightened states to develop policies to encourage merchants and trade.

Once a merchant class became well-established in a nation, it became a political lobby to defend its interests, reinforce countervailing power and enable the development of a relatively autonomous system of law. In countries where merchants had greater power and autonomy (contrast England with Spain), the rewards of global trade made this class even more powerful and led to institutional changes that further checked the arbitrary power of the state. Access to emerging Atlantic trade routes enhanced this process of positive feedback between commerce and countervailing power (Acemoglu *et al.*, 2005a, 2005b; Acemoglu and Robinson, 2012; Braudel, 1984; Cipolla, 1965). To be effective, these changed institutions also had to bestow a degree of political stability within a complex system with divergent interests (Ertman, 1997; Moore, 1966; Tilly, 1992). Where they emerged, countervailing power within pluralist constellations of institutions created spaces for the intelligentsia, the Enlightenment and the advancement of science (Mokyr, 2002, 2016). They also encouraged financial investment on a larger scale.

3. Selection and replication on multiple evolutionary levels

These developments involved multiple levels of institutional and cultural replication and evolutionary selection. Contrary to many writers, evolutionary selection is neither a simple nor a self-evident concept. First, we have to distinguish between objects and outcomes of selection. In nature, the objects of selection are organisms, all engaged in a struggle for existence. The outcomes of selection include the changing gene pool, resulting from differential selection of the organisms. To make sense of selection in the socio-economic world, a similar distinction must be made between objects of selection (i.e. *interactors*, such as organizations) and outcomes of selection (i.e. the pool of *replicators*, such as routines, customs, habits or ideas) (Hull, 1988). Second, there are different modes of selection, all of which involve an anterior set and a posterior set of varied entities in a population (Hodgson and Knudsen, 2010: ch. 5). The simplest case of selection is the elimination of some entities. This is known as subset selection because the posterior set is a subset of the anterior set. A more complex case is successor selection, which involves the creation of new, somehow related, entities (offspring) in the posterior set.

Evolutionary selection at the cultural level involves both subset and successor selection. There are numerous cases where individuals or organizations carrying ideas or habits are eliminated, and many cases where new individuals or organizations with new ideas or habits are formed. Selection at the cultural level is incessant. By contrast, evolutionary selection at the level of states and other large-scale organizations is generally very different in tempo. In particular, the elimination or creation of new states is relatively infrequent. Some expanding states subdued or fused with others, as England joined with Scotland in 1603–1707 and with Ireland in 1800. But otherwise, the elimination and creation of states does not account for much evolution at that level. Consequently, the evolution of states is more of a developmental process, which is very much stimulated by military rivalry and defence (Tilly, 1992). Much more common than the changing of boundaries and the assimilation of states is the replication of legal, technological and administrative structures and ideas from one country to another. It is not development solely from within.

As in the biological world, evolution depends on the environment and rivalry with others, as well as on the development of the organism itself. The stress on multiple levels of institutional as well as cultural evolution expands the analysis from ‘dual inheritance’, as found in the Boyd and Richerson (1985) approach. To embrace the complexity of change in modern economies, we require more than two levels at which information is replicated – more than genes and culture – and an accordant hierarchy of multiple levels of replication and hierarchic objects of selection.

With due caution, we can draw still more inspiration from biology. Maynard Smith and Szathmáry (1995) considered several major transitions in biological evolution, each involving a new way in which information is stored and replicated. They addressed primitive replication, RNA, DNA, animal societies and human language. Each of these introduced a new form of information transmission. Hodgson and Knudsen (2010: ch. 8) considered further informational levels in human society, including language, writing, law and science. The expanded hierarchy of objects of selection includes groups, organizations, legal systems, religious institutions, states and scientific institutions.

This is far from a developed theory, but by moving the focus away from individual cultural entrepreneurs alone, and by examining the tectonic plates of institutional change, it may help to understand the movers and changing contexts that drove and facilitated economic development and growth. Accounts along these lines may draw on arguments by Tilly (1992), Ertman (1997), North *et al.* (2009) and Fukuyama (2011), who bring national rivalries, and political, religious and legal institutions into the picture.

This picture of creative disruption followed by slower change is known in biology as punctuated equilibria (Eldredge and Gould, 1977). The idea has been taken up by social scientists, including Mokyr himself (Arthur, 1990; Baumgartner and Jones, 1993; Hodgson, 1991, 1993; Mokyr, 1990a, 1990b, 1991). Mokyr (1990b: 351–2) noted that ‘the economic history of technology displays a similar dynamic pattern of long periods of stagnation or very slow change, punctuated by sudden outburst like

the Industrial Revolution'. Part of his explanation for the uneven development of technology involved 'Cardwell's Law', where technological advances create vested interests that may ally with conservative forces to resist further innovation (Mokyr, 1994, 2002). But Mokyr (1990b: 354) admitted that we 'know very little about the causes of macroinventions' that cause rapid leaps forward in technology. We could say something similar about institutional change.

But we have several lines of possible future enquiry. Gould (2002: chs 8–9) argued that the notion of punctuated equilibria rests upon a hierarchy of evolutionary processes with multiple levels of selection. Shocks can lead to changes in the articulation of levels and to rapid changes in speciation. Similarly, in the socio-economic sphere, the shifting, interacting strata of institutional arrangements may lead to crisis, spur adaptations and result in discontinuous development. There is much more to be done, but multi-level evolutionary theory may offer a way forward.

4. Markets for ideas?

Much of Mokyr's argument is consistent with further development upon the lines indicated above. But unfortunately, he created a diversion from this path. I refer to Mokyr's overly repetitive use of the phrase 'market for ideas'. In the book as a whole, this phrase appears over 60 times, including 7 times on one page (p. 157). Is this merely a harmless metaphor? I think not. There is no effort to insist that the usage is merely metaphorical, and the frequency of usage suggests something more. Of course, some ideas, as intellectual property, can be owned and sold. But the vast majority of ideas under discussion in Mokyr's book are not traded, as John Milton put it in his *Areopagitica*: 'like our broadcloth and our woolpacks'.

Mokyr is not alone in his use of the term. Among many others, Ronald Coase was fond of the phrase too (Coase, 1974; Coase and Wang, 2012). Coase (1974: 389) addressed 'the market for goods and the market for ideas'. He claimed: 'There is no fundamental difference between these two markets'. His use of the term was not just metaphorical.⁴

In the context of the discussion above about levels of replication and selection, the 'market for ideas' pulls it all back to one level. It resists the hierarchical expansion required. While the Republic of Letters was important, describing it as a 'market for ideas' diverts attention from the organized hierarchy and authority that were necessary to create powerhouses of technological and scientific ideas, as they emerged in the 17th century. Elsewhere I have examined in detail several other misleading aspects of the non-metaphorical use of the term 'market for ideas' (Hodgson, 2020, 2021b: ch. 8). We *have* ideas, but mostly they are not deemed objects of property under any accepted system of legal or other rules. The ordinary communication or debating of ideas does not involve agreements with the shared intention of creating obligations according to those contractual rules. Much day-to-day conversation is not a transfer of specific rights. Certainly, there is competition between ideas and there is competition on markets. But this does not mean that all transmission of ideas is via a market. Competition takes place outside markets, as in the sports arena, the TV game show or the battlefield. Competition as such does not necessarily imply the existence of contracts or markets.

5. Conclusion

Mokyr's book is inspiring and hugely valuable. It is full of erudition and fascinating detail. But above all its virtue is to pose serious questions about the sources of modern economic growth and to develop the analysis further. In important respects, it is a step forward from McCloskey's (2006, 2010, 2016b) massive work in this area. Among other things, Mokyr is much more explicit about the importance of institutions. He also signals the usefulness of evolutionary thinking – using generalized Darwinian principles – in this area. One of my purposes in this extended review is to provide some indication of how this kind of analysis could be developed further. But we are all indebted to Mokyr for the great advances he has made, in the book under review and elsewhere.

⁴See Mäki (1999) for further criticisms of Coase on this issue.

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