BOOK REVIEWS

Anna Lowenhaupt Tsing

The Mushroom and the End of the World – On the Possibility of Life in Capitalist Ruins

Princeton University Press, Princeton, 2015, pp. xii+331, paperback edition, $47.75.

Reviewed by Thomas Klikauer

Initially, one wonders what mushrooms might have to do with the end of capitalism. Anna Lowenhaupt Tsing shows the connection in her beautifully illustrated anthropological book on a Japanese mushroom called *matsutake*. These mushrooms only grow in the ruins of nature after forests have been cut down so that its timber can be sold. This process turns nature into profits (Linebaugh 1976). But for Lowenhaupt Tsing, mushrooms signify not only the destruction of nature for profits but also the end of capitalism because it is a system that is pilfering earth (Benson & Kirsch 2010). Her detailed ethnographical study is also about those who work in global supply chains, like those working in the mushroom chain stretching across harvesting, selling, sorting, exporting, and – eventually – cooking and eating.

Lowenhaupt Tsing starts her book by noting that: 'ever since the Enlightenment, Western philosophers have shown us a nature that is grand and universal but also passive and mechanical' (p. vii) indicating that this can be linked to the Nietzschean (1886) idea that it is 'man's Christian masculinity which separates man from nature' (p. vii). For Lowenhaupt Tsing this is also connected to three forms of nature that she identifies:

- firstly, nature as ecological relations;
- secondly, nature under capitalist transformation (timber → profits)
- thirdly, nature that manages despite capitalism (p. vii).

With this precursor, Lowenhaupt Tsing's book expands as a field study undertaken between 2004 and 2011 in the USA, Canada, China, Finland, Sweden, Turkey and Denmark (where Lowenhaupt Tsing is the Niels Bohr Professor at Aarhus University). In her prologue she notes that 'this book tells of my travels with mushrooms to explore indeterminacy and the conditions of precarity, that is, life without the promise of stability' (p. 2). Throughout the book this is linked to the way 'humans destroy the liveability of the planet…despite the talk of sustainability' (p. 3). The corporate destruction of planet earth IS not 'despite' the corporate PR talk of sustainability 'but because of' it, reflecting the practices of what Managerialism calls 'corporate social responsibility' (Klikauer 2013). In sum, her book presents 'the story of precarious livelihoods and precarious environments' (p. 4).

On the environment, Lowenhaupt Tsing writes that 'geologists have begun to call our time the Anthropocene, the epoch in which human disturbance outranks other geological forces' (p. 16; *cf.* Hornborg 2016). The occurrence of the Anthropocene is linked to the dominance of capitalism. Set against capitalism, Lowenhaupt Tsing advocates that 'staying alive – for every species – requires liveable collaborations. Collaboration means working across differences…without collaborations, we all die' (p. 28; *cf.* Nowak & Highfield 2011). In other words, 'survival always involves others' (p. 29). But capitalism focuses on competition and profits, acting against human collaboration (Mander 2001), for example, when it creates 'sugarcane plantations' (p. 39). For Lowenhaupt Tsing, such plantations are 'the model for factories during the industrialisation; factories built plantation-style alienation into their plans' (p. 40). Much of what was learned at such plantations – strict hierarchies, control, punishment regimes, etc. – was later applied to the first factories that were also based on strict hierarchies, control and punishment regimes.(Thompson 1963). However, progress as such might also have positives, as Lowenhaupt Tsing notes when writing that 'unregulated loggers destroy forests more rapidly than scientific foresters' (p. 42).

All this also has negative pathologies when 'like a giant bulldozer, capitalism appears to flatten the earth to its specifications' (p. 61) as it is 'a system for concentrating wealth, which makes possible new investment, which further concentrates wealth [but] even in industrial farms, farmers depend on life processes outside their control, such as photosynthesis and animal digestion' (p. 62). Meanwhile at the

consumptive end of the capitalist process is, for example, 'Wal-Mart's total lack of concern with how a product is made' (p. 64). Between the mushroom in a forest and the end user are those who pick mushrooms – often working as a precariat that is ideologically camouflaged with the hallucination of being self-employed entrepreneurs while totally depending on those who buy the mushrooms.

At times, Lowenhaupt Tsing's depiction of mushroom pickers reads a bit like a romantic novel rather than emphasising the harsh realities of isolated gatherer groups in large remote US forests. But she interestingly observes that: 'many white mushroom pickers are advocates of US conquests abroad, limited government, and white supremacy' (p. 86). Also many mushroom pickers are recent, non-white migrants to the USA, as picking requires next to no language skills and formal education. Researching for her book Lowenhaupt Tsing visited many of those picker communities, often divided along ethnic lines. But she writes about this without much discussion of, for example, the conflicts between them and the rampant racism. Her stronger points are her depictions of the conditions of the working class that harvests mushrooms as part of a capitalist system. She writes:

> Global supply chains ended expectations of progress because they allowed lead corporations to let go of their commitment to controlling labour. Standardising labour required education and regularised jobs, thus connecting profits and progress. In supply chains, in contrast, goods gathered from many arrangements can lead to profits for the lead firm; commitments to jobs, education, and well-being are no longer even rhetorically necessary.

She quotes a Nike CEO as saying: 'we don't know the first thing about manufacturing. We are marketers and designers' (p. 118). The 'horrors of sweatshops' (p. 118; *cf.* Leaf 2012: 241f.) vanish into thin air just as much as 'life in human-damaged environments' (p. 131) which is actually more likely to be 'life in capital-damaged environments'. But one of the most significant – and highly illuminating – statements of Lowenhaupt Tsing's entire book relates to the social relations embedded deep in capitalist commodity chains:

> Before they arrive in the hands of consumers, most commodities journey in and out of capitalist formations. Think about your cell phone. Deep in its circuitry, you find coltan dug by African minders, some of them children, who scramble into dark holes without thought of wages and benefits. No companies send them; they are doing this

> dangerous work because of civil war, displacement, and loss of other livelihoods, owing to environmental degradation. Their work is hardly what experts imagine as capitalist labour; yet their products enter our phone, a capitalist commodity' (p. 134).

One might add that at the end of your cell phone, iMac, or almost any other electronic device may well be a rubbish tip near Accra in Ghana where children extract valuable metals (Hirsch, 2013). Beyond the child-labour stages of your iPhone, 'we have moved on to bar-coding life and gig data' (p. 179). Set against much of this and concluding her book, Lowenhaupt Tsing writes that 'sometimes common entanglements emerge not from human plans but despite them. It is not even the undoing of plans, but rather the unaccounted for in their doing that offer possibilities for elusive moments of living in common…forests [which] with their unbounded species and diverse ecologies are everywhere a challenge for privatisers' (p. 267).

Lowenhaupt Tsing's last words are 'what kind of book is this that refuses to end?...none of this would be possible without transgressing against the commoditisation of scholarship' (p. 287). To the extent that academic publications are themselves money-making machines (as posited by Monbiot 2011), there is considerable irony, if not complicity, in critical researchers and authors themselves becoming integrated into the system.

References

Benson, P. & Kirsch, S. (2010) Capitalism and the Politics of Resignation, *Current Anthropology*, vol. 51, no. 4, pp. 459-486.

Hirsch, A. (2013) This is not a good place to life: inside Ghana's dump for electronic wastes, *The Guardian, www.theguardian.com*, 15th December.

Hornborg, A. 2016. Post-Capitalist Ecologies: Energy, "Value" and Fetishism in the Anthropocene,
Capitalism,Nature,Socialism, http://dx.doi.org/10.1080/10455752.2016.1196229), p.1-16.

Klikauer, T. (2013) *Managerialism – Critique of an Ideology*, Basingstoke: Palgrave.

Leaf, R. (2012) *The Art of Perception: Memoirs of a Life in PR,* Chicago: Atlantic Books.

Linebaugh, P. (1976) Karl Marx, the theft of wood, and working class composition: a contribution to the current debate, *Crime and Social Justice*, vol. 6 (winter), p. 5-16.

Mander, J. (2001) The Rules of Corporate Behaviour, in: Goldsmith, E. & Mander, J. (eds.) *The Case Against the Global Economy – and for a turn towards localisation*, London: Earthscan Press.

Monbiot, G. (2011) Academic publishers make Murdoch look like a socialist, *www.theguardian.com,* Tuesday 30th August .

Nietzsche, F. (1886) *Beyond Good and Evil: Prelude to a Philosophy of the Future [Jenseits von Gut und Böse: Vorspiel einer Philosophie der Zukunft],* edited by Rolf-Peter Horstmann (2002), Cambridge: Campbridge Unviersity Press.

Nowak, M. & Highfield, R. (2011) *Super Cooperators: Evolution, altruism and human behaviour (or why we need each other to succeed)*, London: Penguin Press.

Thompson, E. P. (1963) *The Making of the English Working Class*, London: Victor Gollancz.

Franklin Obeng-Odoom

Reconstructing Urban Economics: Towards a Political Economy of the Built Environment

Zed Books, London, 2016, pp. xi, 286, paperback edition, $56.00.

Reviewed by Brendan Gleeson

In a rather vaunting 2014 essay, the geographer Erik Swyngedouw claimed: 'The realization that a combined and uneven socio-ecological disintegration is accelerating has spurred a global urban intellectual and professional technocracy in search of an ecological urbanity…' (p. 24). In his analysis, an increasingly self-referential global confederacy of professional urbanists and urban networks has reduced the planetary crisis to a socio-technical problem that requires expert management not political intervention, such that 'the focus is now squarely on how to sustain capitalist urbanity so that nothing really has to change'. The argument chimes with Wolfgang Streeck's (2014) larger observation that the increasing national and global reach of technocratic rule heralds the imminent failure of the 'post war shotgun marriage' between capitalism and democracy. This is perhaps nowhere more apparent than in western (especially Australian) cities where ever larger ensembles of globalised capital assert political and strategic authority in largely privatised realms of infrastructure, planning and urban technical expertise.

Against the increasingly depoliticised view of urban process identified by Swyngedouw, Franklin Obeng-Odoom's new book points 'towards a political economy of built environment'. Despite the tone of the claim,

this is, of course, a long established project in the western academy and beyond (in Australia, the work of Frank Stilwell and Leonie Sandercock, for example). As Obeng-Odoom correctly states, for at least half a century, mainstream economics has tended to produce strange 'highly mathematical, mystical' (p. vii) renderings of urbanisation that evidence no deep understanding of spatial processes and the political ecology that governs them. And then there are periods of prolonged inattention altogether, for example through the 1980s and 1990s during the 'long dark night' of the aspatial, ahistorical turn in Anglophone economics. In more recent years, economists have turned their attention again to cities – impossible to ignore given the global urban preponderance – arguably without any improvement to analysis or insight. Indeed, the much celebrated writings of Glaeser (*e.g.* 2011) exhibit the problem of recrudescence, in this case appeal to naturalistic interpretations of urban process (*e.g.* density as a determining force) thought expunged from post-positivist social science (Gleeson 2015). In other instances, the mysticism of economics is indeed to the fore. In his 2010 book *Climatopolis*, the UCLA economist Matthew E. Kahn assures us without any evidence that 'our cities will thrive in the hotter future'.

Reconstructing Urban Economics is a most welcome addition to the canon of progressive urban scholarship and Obeng-Odoom is its well qualified author. A previous contributor to this journal, he has received international recognition and awards for his work on social and urban economics and is presently based at the University of Technology, Sydney. From this point of accomplishment he has rendered a strong and refreshing account of the place and possibility for progressive economics in the contemporary urban age, drawing carefully from Georgist and Marxian traditions. In the spirit of both traditions the book takes issue with orthodoxy, especially neo-classical economics, from its outset and seeks to present a heterodox alternative to business-as-usual analyses of the all and ever more important built environment. The aim is to draw from the mainsprings of heterodox economics to present a fresh account of urbanisation in an age marked by unprecedented, if historically manifest, crises of ecology and human well-being. In sympathy with Swyngedouw, Obeng-Odoom underlines the necessity of the project by pointing out that much which purports to address the crisis, including (and perhaps especially) the field of environmental economics, is hidebound by theoretical orthodoxy.

Obeng-Odoom is right to decry the 'gulf between academic orthodoxy and real-world conditions' (p. 4) and to set political economy to the task of overcoming this breach. And yet there is another important sense in which no gulf exists at all; the correspondence of contemporary urban scholarship and professional training with the imperatives of accumulation should not go unremarked. The author himself makes the obvious but necessary point that mainstream urban economics is motivated by the 'philosophy of "property for profit"' (p. 3). The flourishing sub-fields of property and real estate scholarship are surely emblematic of an age, where, as David Harvey explains, urbanisation has never been more central to capitalism and the valorisation imperative. Academia generally, and certainly in this instance, is more and more attuned to the production of functional not transformative knowledge.

Reconstructing Urban Economics is in three broad parts. The first presents an explanatory framework that is a fresh synthesis of institutional, Marxist and Georgist accounts. It culminates in Chapter 3, the book's analytical 'centre of gravity', where a summary alternative to neo-classical urbanism is presented, broadly reflecting the postulates of critical social science which stress the various roles of structure, ideology, collective interests and state action. The second part of the book essentially presents a new and alternative account of the rise of global urbanism which widens the lens of conventional wisdom to accommodate consideration of critical factors including state, corporate and institutional power and, of great import, informal economic activity. Chapter 6 is notable for considering critically the sources and manifestations of urban poverty, too frequently ignored or trivialised by mainstream economics: indeed, Glaeser (2001, p. 9) has remarked, 'there's a lot to like about urban poverty'. The last act of the book, and for which its author deserves special praise, is to address the age old question, 'what is to be done?'. Here is presented an outline for a 'socio-ecologically sensitive future'. Agreeably, and consistent with the book's critical foundations, the lure of determinism is firmly refused. The contemporary compact city consensus is problematized, not embraced, recognising the alignment of capital's interest with much that passes for green urbanism. Obeng-Odoom's alternative urbanism is founded in a political ecology that draws from global human experience not simply the bastions of western technical expertise.

In some minds heterodoxy is the improbable and irresponsible counter to orthodoxy. *Reconstructing Urban Economics* reminds us that the reverse

is true and in the present age never more so. As its author states, in an urban age of capitalist hegemony dissent is surely the only path that 'leads us towards a more "grounded" and more useful political economy of the built environment' (p. 12).

References

Glaeser, E. (2011), *The Triumph of the City*, Macmillan, London

Gleeson, B.J. (2014), *The Urban Condition*, Routledge, London

Kahn, M. (2010), *Climatopolis: how our cities will thrive in the hotter future*, Basic Book, New York

Streeck, W. (2014), *Buying Time: the delayed crisis of democratic capitalism*, Verso, London

Swyngedouw, E. (2014), 'The Violence of sustainable urbanity', *Harvard Design Magazine*, 37, 24-29

Malcolm Knox

Boom: The Underground History of Australia, from Gold Rush to GFC

Viking, Melbourne, 2014, pp. 395, paperback edition, $34.99.

Reviewed by Kosmas Tsokhas

At a time when the mining boom has come to a close, Malcolm Knox surveys how, throughout their history, Australians have been effected socially and culturally by the mining industry. He shares the common view that, whereas mining once had not been seen as a source of national development, over the last decade or so Australia's economic fortunes have been linked to the price of iron ore, when China has replaced Japan as the dominant market, to the detriment of manufacturing and agriculture. However, because his purpose is to demonstrate that mining has been a permanent driver of economic development, Knox emphasises the ongoing role of prospecting and exploring for mineral deposits, of infrastructure in support of mining projects, of speculative investment and corporate entrepreneurship, of mining communities and regional towns, such that the distinctive causes and consequences of mining booms are submerged within the continuous flow of his narrative.

Nevertheless, reading Knox against the background of recent historical studies and basic statistics, it is possible to discern four major mining booms of unusually rapid capital accumulation and exceptionally high investment. In the nineteenth century, these booms included the gold rushes of the 1850s, whereby mining comprised about 35% of Gross Domestic Product (GDP) and exports of gold exceeded exports of wool for around 15 years. Next, the gold and metal discoveries in the late 1880s and the 1890s generated another boom, so that mining contributed about 10% of GDP, of which 50% came from gold, 20% from coal and the rest from metals such as lead, zinc, silver, copper and tin, while minerals provided 35% of export receipts.

Australian mine production declined in both absolute terms and as a share of GDP after 1900, until the mining boom of the 1960s and early 1970s reversed this trend when the output and exports of the mining industry soared. The recent boom, which was driven by iron ore, coal and gas projects, accounted for more than 50% of export income and resulted in a surge in the mining industry from about 4% of GDP in 2004 to around 11% in 2011.

When discussing the economic effects, like other mainstream authors, Knox assumes neoclassical concepts of comparative advantage and natural endowment, of factor costs and factor prices, of linear production functions and diminishing returns, whereby combinations of capital, labour, land and technological innovation produce outputs. An alternative approach can draw on the historical materialist concepts of the organic composition of capital and the rate of profit which refer to the ratio of constant capital (plant and equipment) to variable capital (manual and mental labour). This involves measures by corporations to widen the difference between socially necessary labour-time and surplus labour-time in order to raise the rate of surplus-value, by means of absolute surplus-value based on low wages and extended working hours and by relative surplus-value based on labour productivity. The latter occurs in accordance with the application of less labour to produce each ton of ore because the share of constant capital increases relative to variable capital.

In turn, as surplus-value passes through the circuits of industrial, money and commodity capital, it takes the form of profit of enterprise, of interest, and, in the case of land-based production, of ground-rent, whereby a quite stable absolute ground-rent is secured by holders of title to land and a differential ground-rent arises from variations in the

productivity and profitability of mineral deposits once constant capital and variable capital are applied to them. During the mining booms, differential ground-rent can be said to approximate "super-normal" profits from mineral sales at market prices equal to revenue less "outlays" where "outlays" include royalties as absolute ground-rent and the long-term rate of return to capital calculated as a percentage of net cash flow, so that the differential ground-rent is conceptualised as surplus-value as a kind of imputed return on total assets over and above the long-term rate of return to capital.

As this review suggests, after allowing for the peculiarities of the gold rushes of the 1850s, which were initiated by discoveries associated with the expansion of the settlement frontier rather than by relative prices, as the booms got underway and the mass of profit headed upwards, the productivity of labour raced ahead of wages before it started to decline once above long-term average market prices brought mines with less productive organic compositions into production. So long as the rate of surplus-value could be increased more rapidly than the rate of profit fell, the accumulation of differential ground-rent as "super-normal" profits would proceed until market prices converged to the long-term average, the mass of profit compressed and the booms exhausted themselves.

If we now turn our attention to each of the booms, renewed interest in the gold rushes has been aroused by a number of revisionist social histories of race and gender relations such as Fred Cahir, *Black Gold* (2012) and Clare Wright, *The Forgotten Rebels of Eureka* (2013). Knox has extended this research to the romance of wanderers, chancers and promoters who started the gold rushes. Surface gold mining, which followed discoveries by prospectors, used the Californian "cradle" that was a box with a sieve bottom and stood on rockers to separate out the gold. This was a form of "labour rich" production suited to minimal inputs of equipment, by which individual miners and their families or small groups of miners owned their means of production.

Going beyond Knox's descriptive account and his sometimes explicit and sometimes implicit neoclassical assumptions, which he shares with other contributors to the resurgence of mining history such as David Hill's *The Gold Rush* (2011), why would a historical materialist methodology enable us to explain how what had driven the boom eventually acted to slow it down? After surface gold had run out, as Knox affirms, mechanised quartz mining and deep reef mining by syndicates and

corporations took over. While the "super-normal" profits derived from the differential ground-rent generated by this kind of mining increased bank deposits, a rise in the organic composition of capital was indicated by the importation of about £2,000,000 in British capital per annum by Victoria and New South Wales after 1850, much of which was invested in mining equipment, whereas between 1830 and 1850 the average annual inflow had been around £340,000.

What Knox fails to explain is that, although gold had properties which distinguished it from other commodities, it was able to fulfil its role in relation to money and exchange because, like other commodities, it was the product of socially necessary labour. As the ratio between constant capital and variable capital shifted in favour of constant capital, this led to the associated tendency for the rate of profit to fall, as evidenced in lower extraction of gold per unit of labour-power from mechanised mining than from surface mining. This occurred under conditions when wages had elevated by 250% due to the enhanced bargaining power of labour and to cover the cost of the reproduction of labour-power at a superior socially acceptable standard than in the pre-gold-rush labour market. Eventually, a five-fold increase in the population reduced the price of labour-power, while the accumulation of variable capital in mining went down as the volume of investment in constant capital went up, so that wages levelled-off and started to fall. Now, labour-power was released from mining and investment was diverted to the pastoral and agricultural industries, and, more significantly, to railways and infrastructure, housing and construction, and manufacturing, as their rates of surplus-value picked up and their rates of profit adjusted.

In the late 1880s and the 1890s, as Knox shows, what amounted to a new mining boom displaced the pastoral and agricultural sectors as the main source of exports. This boom was based on gold from mines in and around Coolgardie and Kalgoorlie in Western Australia, near Mount Morgan, Gympie and Charters Towers in Queensland, and, in the case of lead, zinc and silver, at Broken Hill in New South Wales. Investment in these mines, Knox suggests, by entrepreneurs and financiers such as W. L. Baillieu and W. S. Robinson, stimulated interest in copper and tin, in coal for the provision of low-cost energy to railways, smelters and refineries, and, in the aftermath of the boom, with the assistance of tariff protection, for the manufacture of metal goods and the production of iron and steel.

While Knox is at his best when he describes the grandeur of engineering schemes that overcame the problems posed by the remote location of mines in relation to the availability of water, the transportation of equipment and the construction of housing, the supply of variable capital was at least as important at the start of the boom as demonstrated when the population of Western Australia increased from 48,000 to 180,000 and that of Broken Hill more than tripled from 6,000 in 1888 to almost 20,000 in 1891. Following the initial disproportional growth in variable capital, the velocity of investment in constant capital increased during the expansive phase of the boom on the goldfields of Western Australia and Queensland as cyanide techniques were introduced and extraction occurred by means of open-cut and hydraulic dredging and sluicing.

Meanwhile, the Broken Hill lead-zinc-silver mines went deeper and deeper and the organic composition of capital went higher and higher, because, for example, hard rock walls needed the application of pneumatic drills, transportation of raw material required steam engines and the crushing and concentrating of ore depended on specialised equipment. Additionally, as the boom gathered momentum, to treat and recover lead from ore involved investment in constant capital in the construction and operation of smelters at Port Pirie in South Australia linked by railway to Broken Hill, while Flotation processes more than doubled the recovery of lead, zinc and silver.

Whereas Knox exaggerates the extent to which the boom was initially sustained by and subsequently brought to a halt by the windfalls and follies of speculative investment from the London capital market, which involved the creation of hundreds of companies and led to spectacular prices of shares in unproven mines that produced few if any dividends, the labour theory of value emphasises how the acceleration and deceleration of accumulation can be explained in terms of the organic composition of capital, the rate of surplus-value and the tendency of the rate of profit to fall. In the early phase of the boom, high international prices for metals, especially in Britain and Europe, resulted in the agglomeration of differential ground-rent as "super-normal" profits, while the rate of surplus-value was boosted by the unemployment and deflation that came after the 1880s property bubble burst. But as the unemployment that had accompanied a rise in absolute surplus-value at the beginning of the boom fell away and the negotiating strength of labour grew, as wages were driven up and working hours were pushed

down, mining corporations resorted more and more to relative surplus-value from investment in plant and equipment.

In the meantime, for accumulation to continue at an accelerated tempo, the tendency of the rate of profit to fall was counteracted by the growth in the mass of surplus-value boosted by differential ground-rent as "super-normal" profits, but only as long as the total capital expanded more rapidly than the rate of profit went down, which, in turn, depended on the level of world prices for minerals. This was because accumulation expanded, not only in proportion to the level of profitability, but also in proportion to the weight of the already accumulated or overaccumulated capital, the valorisation of which was reduced by a fall in total mineral output per unit of labour-power as the boom slowed.

The turning-point was reached when the prices for metals toppled on the world market as a result of a depression that began in France in 1889, in Germany and Britain in 1890, compounded by the Barings banking crisis, and in the United States in 1893 which persisted through the decade as industrial production fell and international trade contracted. In Australia, constant capital was overaccumulated and rendered idle as unsold stocks of Lead, zinc, copper and tin mounted. Mines were closed or abandoned, plant and equipment was devalued by write-downs and write-offs, while mines such as those at Broken Hill ran at half capacity. After the defeat of a protracted strike in 1892, non-union contract labour was brought in, wages were reduced and working hours for those still employed were increased at Broken Hill as the employers resorted more and more to absolute surplus-value. Generally speaking, as one decade followed another, variable capital drained out of the mining industry into the manufacturing, pastoral, agricultural and service industries, so that, for instance, whereas in 1903 Australia produced 24% of the world's gold, by 1929 this had fallen to 2% due to competition especially from South African mines where the cost of socially necessary labour was much lower than in Western Australia and Queensland. Over the same period, this was reflected in a decline in the number of those engaged in the industry from 75,000 to 6,000.

The source of the next boom of the late 1960s and early 1970s, as Knox observes, was that iron ore, nickel, manganese, bauxite, oil and mineral sands had high export prices, while the proportion of total mine production sold overseas, especially into the Japanese market, increased from around 32% in 1960 to about 57% in 1973, while mining exports

made up more than 40% of total exports in 1973 compared with less than 15% in 1960. Knox confirms that this was reinforced by direct and indirect foreign investment in, and long-term export contracts for, the output of new mines, which made it possible for their operations to run at full capacity.

Not unlike his discussion of the 1890s, Knox goes on to revisit the record surge in the prices of mining shares, which were caused by transfers to and from Australian stock exchanges by foreign investors, epitomised by the incredible rise, as if of their own accord, in the shares of the nickel miner Poseidon NL. In fact, what was significant about speculation on the stock exchanges was that it resulted in nominal monetary gains and losses but did not create real value derived from relations of production, as was shown by the eventual level to which the shares of Poseidon NL and other mining corporations gravitated. Ultimately, after the roller-coaster ride of speculation, sooner or later, the prices of shares headed towards a threshold of profitability or rate of return on assets based on the accumulation of surplus-value from the difference between socially necessary labour-time and surplus labour-time in the context of international market prices.

If we look past the approach of Knox and the majority of other commentators on this boom, a preliminary survey of the balance sheets of the biggest mining conglomerates shows that more than half of gross receipts were spent on constant capital, through purchases of plant and equipment, as well as on energy and materials related to the operation of plant and equipment. The raised organic composition of capital, which was associated with large-scale underground and open-cut mining, permitted the spread of overhead costs and enabled the successful mining of ore bodies with low mineral concentrations. This built on continuous mechanisation within the labour process associated with a rebalance away from absolute surplus-value to relative surplus-value.

Although mining output increased by 10% per annum between 1960 and 1973, the mining work force grew by only 3% per annum because the rate of variable capital accumulation slowed relative to that of constant capital as the construction of new mines approached completion. Therefore, it can be assumed that this resulted in a gain in labour productivity, which it should be possible to recalculate in terms of relative surplus-value, of around 7% per annum. Given the increased ratio of constant capital to variable capital in mining, compared with

manufacturing, of as much as $1,000,000 per mine worker, there was higher per capita output in mining than in manufacturing, which, incidentally, had lost out from tariff reductions. Because manufacturing had lower rates of relative surplus-value than mining, it can be assumed that there was a redistribution of total surplus-value away from manufacturing to mining.

The advantage enjoyed by the mining industry was sustained by record export prices for minerals. This meant that the mass of profit increased at a faster pace than the organic composition of capital pressed down on the rate of profit, by which the rate of surplus-value rose faster than the rate of profit fell, until 1973 when the boom reached its climax as the oil crisis subdued economic growth in Japan, the United States, Western Europe and other industrialised countries that were dependent on oil imports for energy. Australia's inflation spiralled out of control because the appreciation of the exchange rate had not kept up with surpluses on the current account; wages rose faster than labour productivity increased; market prices for non-energy minerals inclined towards the long-term average; and the capture of differential ground-rent from "super-normal" profits declined, although there was a temporary recovery of sorts due to a "mini-boom" in energy projects in the early 1980s.

The boom of the 2000s was caused by a four-fold ascent in the prices received for minerals when the terms of trade had never been so favourable. While minerals were exported to China and to a lesser extent to India and other emerging industrialising markets, the largest and longest sustained decline in Australia's non-mining exports occurred. Consequently, it is argued, not only by Knox, but also by other recent authors like Paul Cleary in *Too Much Luck* (2011), Matthew Benns in *Dirty Money* (2011) and David Richardson and Richard Dennis in *Mining the Truth (*2011), that the appreciation of the exchange rate, which resulted from the export surpluses and capital inflows generated by mining, reduced the competitiveness of, and the demand for, manufactured and agricultural exports as well as for tourism and education services, although this was corrected in fits and starts by the depreciation of the exchange rate as the boom ended.

In theory, such structural changes, which parallel the experiences of the 1850s, the 1890s, the 1960s and early 1970s, can be understood in terms of the formation of an average rate of profit that occurs through the movement of capital from industries of lower profitability to industries of

higher profitability. Different rates of profit are governed by labour-time relations of value and surplus-value, whereby surplus-value is transferred by means of market prices from a branch of industry such as manufacturing or agriculture or services to another branch of industry such as mining. Labour-time values and prices will tend to coincide the more international supply and demand approximate each other, so that excess international supply may result in minerals being sold at prices under the value they contain with a downswing in the volume of sales and in the mass of profits, whereas excess international demand may result in minerals being sold at prices over the value they contain with an upswing in the volume of sales and in the mass of profits, which are reflected in currency movements that continually bring the price of minerals closer to or further from their cost of production. As values are transformed into prices, the generation of export surpluses by mining puts price pressure on non-mining import-competing and non-mining export-competing industries from the revaluation of the domestic currency against foreign currencies, so that mining attains a bigger share of total surplus-value than manufacturing or agriculture or services.

What then are we to make of the conclusion of David Richardson and Richard Dennis in *Mining Australia's Productivity (*2011), that average labour productivity or value added per hour worked across the mining industry declined, when compared with labour productivity in other sectors, which should have led to higher levels of relative surplus-value in non-mining than in mining? This can be explained by how above long-term average market prices, especially for iron ore and coal, which were extraordinarily higher than in the boom of the late 1960s and early 1970s, had allowed mining projects with less productive ratios of constant capital to variable capital, with higher costs and lower output per worker than projects with more productive ratios of constant capital to variable capital, to sell minerals at above their value and to accumulate differential ground-rent as "super-normal" profits.

All the same, what stood out was the inexorable tendency of the rate of profit to go into reverse, because, in spite of counter-tendencies, between 2003 and 2012, according to the Price Waterhouse Cooper report *Mining for Efficiency* (2014), annual investment in new plant and equipment capacity increased by 17% whereas the annual volume of minerals mined only grew by 5%. Furthermore, an overaccumulation of constant capital was recorded in the performance of plant and equipment at 18% higher in 2003 than in 2012, which led to the shut-down, postponement and

cancellation of less productive mining projects, as the boom decelerated once market prices were too low to obtain "super-normal" profits.

Although Australia's mining booms differed in their historical origins, in their main commodities, in their particular durations and in their specific impacts, the conceptual framework applied to each of the booms in this review has established the explanatory potential of the interrelations between the organic composition of capital and the rate of profit; the accumulation of constant capital and variable capital; the combination of absolute surplus-value with relative surplus-value; and the appropriation of absolute ground-rent and differential ground- rent. Irrespective of the reasons why overseas markets and sources of foreign capital changed from boom to boom, what proved to be decisive was the way that relations of production interacted with relations of exchange to amass surplus-value, in the form of differential ground-rent as "super-normal" profits, until adverse short-term cyclical movements and long-term trends in international prices curtailed the booms.

WHAT'S WRONG WITH ECONOMICS?

Mainstream economics, whether in the core areas of microeconomics, macroeconomics and econometric modelling or in anciliary currents such as game theory and behavioural economics, continues to be highly influential – in teaching, research and applications to public policy. Its critique can be a springboard for further development of political economic alternatives.

The next issue of *JAPE*, to be published at the end of 2017, will include a range of articles critically assessing various aspects of mainstream economics. Are the theories coherent? Are their assumptions reasonable? What insights or obfuscations do they generate? And what are the consequences for humanity arising from their practical application? Such critical assessment is necessary, timely and thoroughly appropriate as the central theme for *JAPE's* 80th issue.

Submitted papers are still welcome and can be considered for inclusion if received before the end of August 2017. Please contact the coordinating editor, Frank Stilwell: frank.stilwell@sydney.edu.au