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The mainstream farming paradigm – what went wrong?

Three faces of alienation

To resolve the problem, we first need some understanding of how (at the level of basic world-view) the current bad path-dependency became entrenched. We may speak of three closely-linked aspects:

First, the notion of *dominating or 'mastering' nature*. The 'mastery' mindset arose in the phase of nascent capitalism, from the sixteenth century onwards. The conceptual images were violent and sexual, an issue highlighted in Carolyn Merchant's major contribution to political ecology (Merchant, 1980).

Second, the intrinsic link between 'mastering' nature and *expropriating people*. This in turn had two aspects: within the core (Europe) it is expressed in dispossession of the rural population – and of women, as Merchant shows – as well as enclosure of the commons; with respect to the global South, it is expressed in colonialism. Colonialism was all about an imagined right and duty to exploit *a region of nature which indigenous peoples were allegedly neglecting* (Biel, 2015a). Thus, in eighteenth-century international law, 'when the nations of Europe, which are too confined at home, come upon lands which the savages have no special need of and are making no present and continuous use of, they may lawfully take possession of them and establish colonies in them [...] if each nation had desired to appropriate to itself an extent of territory great enough for it to live merely by hunting, fishing, and gathering wild fruits, the earth would not suffice for a tenth part of the people who now inhabit it.' (Vattel, 1972 [1758], p.45). This issue is still with us, for example in today's 'land grabs': whatever their features specific to the most recent period (e.g. hedge fund investment), in essence

they carry forward a process embedded in capitalism from its origins, which had always included these twin themes:

(a) assuming rights over a certain portion of nature, and
(b) crushing the resistance of the peoples whose tradition prescribed a duty to nurture and protect it. This also had the more specific effect of severing agricultural science and technique from the direct producers.

Third, the *repudiation of holism*, and its replacement by reductionist and linear thinking. Reductionism and linearity are really expressions of the same thing, in that to assume a system is determined by only one of its parameters implies a simplified chain of command, or of cause and effect. In its concrete application to our topic, the simplification of cause and effect seemingly made it possible to control farming systems *by homogenising the inputs* (strains of seed, fertiliser). It also connects with the previous two points: if the aim is to privatise and commodify (i.e. enclose) some area of nature (an area of land, knowledge, resources), that area must be torn away from the whole and dissected into bite-sized portions.

These three features are all expressions of *alienation*, which in its narrower economic sense means separating us from the conditions and product of our labour and, in a wider sense, a psychology which cuts us off from nature. It also cuts us off from *the consequences of our acts* . . . this last point being so important to food systems, where people are deprived of responsibility or knowledge of where their food comes from.

Indeed the history of food provides a very good case of the dominationist/reductionist paradigm, an approach which, once initiated, set in motion a path-dependency wherein each new phase tends to go further on the same route. This explains a paradox of capitalism: while its history is one of constant innovation, there is nevertheless a sense that each innovation simply embeds you further in the *same* trajectory: thus, chemicals → Green Revolution → GMOs, etc.

The Malthusian spectre

The forms of alienation just discussed came in through early capitalism's rapid and cataclysmic overthrow of the old agrarian society. In a way, the ruling-class discourse was lastingly influenced by the experience of that transition and, particularly, by the threat to property and class

dominance from popular insurrections of the eighteenth and nineteenth centuries.

An important duality arises here. While alienation and plunder of nature were bad, the destruction of the old society – at least in the case of feudalism in the metropolitan countries – opened up a progressive potential which the mass movement wanted to explore, and the propertied interests wanted to crush. Radical movements sought to resist the imposition of a *new* exploitative system in place of the old one. At the same time, in the global South, there was a still-more-epic resistance against colonial genocide. And although it is true these struggles may have failed in preventing the establishment of capitalism and imperialism, in another sense they were not really failures because they set in motion a tradition of struggle which is still highly relevant to today's transition issues.

The massive disruptions of nascent capitalism posed acute problems to the ruling order: where previously most people had grown their own food, now there was a rapidly-increasing urban population which, firstly, had to be fed somehow and, secondly, was deeply alienated through dispossession from the land. The perfect storm of a proletariat, torn from the old society and lacking a sense of identity or place within a new one, *and on top of this also hungry*, gave recurrent nightmares to the dominant classes.

This nightmare, which in one guise or another has haunted them all the way through until today, found expression in the economic theories associated with Thomas Malthus. His vision was deterministic: food supply could never keep pace with population. Throughout the succeeding decades, propertied interests have shown a certain duality with respect to Malthus. On the one hand (the part of Malthusianism which appeals to them) his determinism tended to stifle the argument of revolutionaries, namely that people could conquer poverty and famine by overthrowing corrupt exploiters and rebuilding society in a rational co-operative spirit. To defeat radicalism, the conservative argument always needs to rubbish co-operative solutions and, in this sense, Malthusian economics offered a pseudo-scientific rationale for the ideas of seventeenth-century philosopher Thomas Hobbes, namely that removal of political authority would result in a *bellum omnium contra omnes* (war of all against all). While the ruling class genuinely fear such a loosening of social bonds, they also find it useful to *exaggerate* the threat of a falling-apart of society, thus frightening off humanity from the kind of socialistic paradigm-shift which could resolve alienation and exploitation.

On the other hand, the bit of Malthus that ruling classes do not like so much is the pessimism. They must convince others, and themselves, that *they* can solve the food problem. In effect, the modernist drive to food productivism was an effort to conjure away the unacceptable face of Malthus. This would obviously only delay the reckoning because, if the productivist model itself came unstuck (as is happening now), the spectre would rise once more.

Malthusian fears thus remain persistent and, arguably, even gather strength under today's neo-liberalism. Temporarily, during the heyday of modernisation (roughly from the end of the Second World War until the beginning of the 1980s), any notion of 'limits' had been repressed by the presumed omnipotence of a reductionist 'science'. However, the neo-liberal counter-revolution of the 1980s, which put paid to modernism, paved the way for a Malthusian comeback, reinforced in a different way during the same period by the rise of environmentalism, which found Malthus' catastrophist streak a useful representation for the seriousness of ecological constraints.

Today, we therefore find a significant tendency in many commentaries (e.g. O'Hagan, 2015) to view current high-profile conflicts – notably Syria – as manifestations of a *bellum omnium contra omnes* triggered by food scarcity. True, it is an empirical fact that the twin food prices spikes of 2008–11 were strongly correlated with social unrest, a finding promoted with great fanfare – with a view to getting the US State Department to take the threat seriously and build it into their contingency plans! – by the New England Complex Systems Institute (Lagi, et al., 2011). However, this argument requires quite subtle analysis. What is correct is that the unsustainable productivist paradigm had offered only temporary solutions to food supply, and remained highly vulnerable to the ecological shocks (for example, drought in Australia) which immediately triggered the price spikes. What is dangerous is to take this as confirmation of a deterministic Hobbesian-Malthusian outcome whereas, on the contrary, such shocks could equally well stimulate a collaborative response of creative system-change, in the spirit pioneered by the French Revolution (as we will argue in Chapter 5). In this sense, the spectre of disaggregation remains a covert fear, triggering the 'new paradigm' discourse just as much as it did the earlier productivism.

The continuity of ruling-class fear of a hungry mob occasions an interesting paradox. Capitalism transforms production and technology radically and, as Marx and Engels point out (Marx and Engels, 1969 [1848]), it has to *keep on* transforming these, probably at an accelerating rate, or it would die. We see the result in agribusiness and factory

farming, which have been transformed in their technology, distribution, investment, trade etc., not once but several times. On the other hand, in terms of the underlying property relations which this whole edifice *protects and serves*, the system remains highly conservative, one might almost say immobile. Although initially the birth of capitalism carried a narrative of industrialists striving to overthrow feudal landowners (and this continued through the struggle over the Corn Laws in nineteenth-century England), in a profounder sense all propertied classes have common interests, and capitalism quickly learned to accommodate with and subsume a conservative, even archaic, order of landowning rather than challenging it. Here, we can signal an interesting parallel between the critique of English landholding made by the Land and Freedom movement (for example, Girardet, 1976) and the analysis of Indian society conducted by Marxist-Leninists in the 1960s–1970s (for example, Bannerjee, 1984). Both reveal how the modernising elite is grafted upon extremely backward structures both in physical landholding and, ideologically, within the worst and most reactionary aspect of what is known as 'tradition'. It was surely one of Marx' great achievements that, in the context of a mode of production which appeared essentially industrial, he continued to stress the fundamental role of landed property. He thus argued that, 'The history of landed property . . . would indeed be the history of the formation of modern capital', and 'The inner construction of modern society, or, capital in the totality of its relations, is therefore posited in the economic relations of modern landed property . . .' (Marx, 1973 [1857–8], pp.252; 275).

Given the threat of radical protest, and the perception that it was linked to hunger, what solution could capitalism find? The answer was to seek a scientific fix, and – as tends to be the way with fixes – this was simplifying and reductionist.

Reductionism and the chemical paradigm

In a natural order, given that 'The pollution of one is the meat of another' (Lovelock, 2000, p.6), there is no real entropy at the level of the system as a whole. It is true that, if we take a single animal or plant, its existence as a living entity is reflected in the ability to dissipate entropy (Ho, 1998) so, in that sense, it does indeed degrade its food by excreting it as dung. However insects or bacteria evolve to convert this into a useful input which is welcomed elsewhere in the system. The only truly linear flow therefore occurs when the earth dissipates, into the coldness

of space, an energy which is *quantitively* the same as the solar energy which entered in, but with higher entropy (in other words its quality is lower) (Penrose, 2010, p.78–9).

Traditional farming had been strongly embedded within this natural system of loops and flows. Then, with the rise of industry in the eighteenth century, there inevitably occurred the imperative to increase productivity to feed a rising urban population. The question arose of whether this could be achieved by an *intensification of the existing (organic) approach*.

It made a certain sense to say agriculture should be accorded a special status, retaining its organic links to nature, and simply intensifying these in a more 'scientific' way. Embodying this view, the Physiocrat school of French economists believed that agriculture *is* the real economy, industry being sterile and merely transforming what exists (Quesnay, 1888). Here, there is some interesting convergence between the political Left and the organic movement: Malcolm Caldwell, in his critique of imperialism, very much affirmed the Physiocrats (Caldwell, 1977), while the early English organic movement – in addressing what had gone wrong with mainstream farming – similarly blamed industry and finance for imposing on farming a purely economic rationale with which it is incompatible (Conford, 1998). As an exercise in political-ecology fiction, we might devise a scenario where capitalism remained ring-fenced within its own (primarily industrial) sphere, while farming was permitted its own realm where the cycles of nature are insulated from those of accumulation.

Historically, however, such a separation could not endure. The underlying reality was that agricultural landholdings were concentrated through a process of expropriation, and set on a course of total extirpation of feudalism's compromise with village-level commons regimes. The knowledge which drove early capitalist 'scientific' agriculture, *even when still organic in a physical sense*, was already stolen away from the direct producer (c.f. Zelem, 1991) and it was precisely because science was now floating on an elitist plane, cut off from the complex realities of the cultivator, that it fell prey to that reductionist quest for simplistic, single-cause approaches which was already characteristic of capitalism from its inception. In fact, in the Death of Nature argument (Merchant, 1980), there is an intrinsic link between the expropriation of nature via land-grabs (dispossession, resource-grabs, knowledge-grabs), and the reductionist paradigm of science. It was therefore impossible to ring-fence agriculture from the rest of the economy.

The foundations of chemical reductionism were laid in the nineteenth century and at this point, before pesticides and herbicides came

in, the main focus was on improving fertility. Everything was reduced to inputs of three elements: nitrogen (N), potassium (K) and phosphorus (P). Among these, a particular emphasis fell on nitrogen, and the great fix was to find a way to manufacture this synthetically, through the Haber-Bosch process (Leigh, 2004), derived from fossil-fuel feedstocks.

The N-P-K idea in itself has a value. In English gardening lore it is enshrined in the mnemonic shoots-roots-fruits: nitrogen is good for leafy crops, phosphorus for root-crops, and potassium for flowering or fruiting crops. Thus, for example, in the case of a home-made organic fertiliser derived from Russian Comfrey Bocking 14 (*Symphytum* × *uplandicum*), employed by the author, it is helpful to know that it is high in P and K and we may therefore expect it to be beneficial when applied to a crop like potatoes where there exists an inverse relation between the volume of green ('shoots') and of tubers, so you don't want too much N.

Where it becomes a problem, however, is if everything is *reduced* to these inputs. This is what led Justus von Liebig, who in the early nineteenth century first discovered the role of N-P-K, to warn about the fatal risks which would follow such reductionism (von Liebig, 1843). Von Liebig's warnings in turn influenced Marx (Clark and York, 2008; Bellamy Foster and Magdoff, 2000). The error in reductionism is to lose sight of complexity, in this case by failing to perceive the *systemic* sources of fertility. Where traditional farming operated in partnership with complexity, modern farming undermines it.

From this direction, the critiques made by Marxism and by the organic movement are essentially similar. Where Marx foresaw that capitalist agriculture 'leaves deserts behind it' (quoted in Perelman, 1987, p.37), Alfred Howard, the founder of the English organic movement, observed – employing an interestingly socio-political image – that 'the land has gone on strike' (Howard, A., 1943); thus Marxism and organics can converge, which is one of the normative propositions of this book. Since Marx' day, and Howard's, these predictions of soil-destruction have been fully confirmed. With a recognition that soil conservation is 'central to the longevity of any civilization'(Montgomery, 2007, p.6), media interest is now awakening to the fact that soil is disappearing (Hough, 2010), an interesting notion being 'peak soil' (Montgomery, 2008). In fact, soil is vanishing at up to 50 tonnes per hectare per year, 100 times faster than its formation rate (Banwart, 2011), and cannot quickly be replenished (Arriaga, et al., 2012).

The loss of soil itself is one of the profoundest features of what we can now see as a crisis, not just of food systems but of humanity's relations with nature.