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Dialectics of a (re)discovered sustainability

Pathways to a reconnection with indigenous thought

Dialectics refers to a philosophical tradition which can help us understand two key issues: [a] the *substance* of the new paradigm, and [b] the *process* by which it can assert itself:

(a) Substantively, dialectics shows how to transcend the narrow mind-set of linear and reductionist thought and embrace complexity. It shuns a rigid separation of categories and appreciates systems in flux, which is just what a new farming paradigm requires.
(b) The coming-into-being is embodied firstly in the principle of the negation of the negation – the 'new' paradigm is also a *re*discovery of indigenous farming practices, reasserted in the overthrow of capitalism-colonialism – and secondly in the 'leap of consciousness' required by transition.

A focus of this book is to bring radical socio-political thought closer to organic agriculture. Although, as methodologies, the organic movement might refer to systems theory, and Marxism to dialectics, in reality the two have much in common. In fact, from its origins in the 1930s, systems theory drew inspiration from the pre-Socratic philosophers (Drack, 2008), the same source which inspired Hegel in framing the dialectics which Marx subsequently developed. To emphasise these parallels, we need only juxtapose Hegel's remark (in his lecture on the leading pre-Socratic thinker Heraclitus), 'It is a great advance in thought to pass from Being to Becoming' (Hegel, 1995) with Prigogine and Stengers' remark that non-equilibrium systems reveal 'a glimpse of the road that

leads from being to becoming.' (Prigogine and Stengers, 1984). When general systems theory says '…fluctuations rather than stable states are obviously the rule…' (Scheffer and Carpenter, 2003), this sounds exactly like a quote from one of the pre-Socratics who, in turn, were drawing upon ancient Asiatic knowledge systems. This takes us back to the source: the indigenous approaches upon which we must draw as the practical inspiration for sustainable food growing. For the pre-Socratics, nature itself *was* the paradigm for dialectics; similarly Engels pointed out that his and Marx' dialectics were always a reflection of the real world, rather than an imposition of some theoretical framework upon it. It is most interesting that Engels chooses – to illustrate the embedding of dialectics within nature – examples from plant evolution and soil structure (Engels, 1969 [1894], p.162–4).

If dialectics is *about* ceaseless change, it must itself practice this, ceaselessly testing and enriching itself by confronting its own weaknesses. In their time, Marx and Engels were breaking fresh ground, and only by taking dialectics beyond the point reached by Hegel could they generate new propositions on the relations between matter and form (Günther,1964, p.271). Furthermore, as Wan shows (Wan, 2013), Engels' quest to break from reductionism and restore holism led him to insights which anticipate the notion of emergence in systems theory (c.f. Wan, 2013, p.429). And then Lenin, when he in turn addressed the legacy of Marx and Engels (Lenin, 1972 [1908]), realised that this voyage of unending discovery must continue: however farsighted Engels' work, it is not a question of science 'coming round to' truths 'revealed' by him, but rather, with each new scientific advance, we question existing definitions of dialectics. A revision of Engels' own propositions is therefore 'demanded by Marxism' (Lenin, 1972 [1908], p.300). Of course Lenin was writing when there were just the first inklings of what was to come in terms of relativity and quantum theory.

While the above emphasises constant advance and innovation, there is also, embedded within dialectics, a theme of *return*: to the wisdom of a time before we got side-tracked by reductionism**.** It's this relationship between innovation and rediscovery which is the soul of the negation of the negation.

The general explanation of this concept is as follows:

[1] The 'other' from which you demarcate yourself is the main bestower of your own identity: we see this in Spinoza's 'every determination is negation' or, in the form developed by Hegel, 'What something is…it is wholly in its externality' (Hegel, 1969,

p.528). In systems jargon, a system's identity depends on the area from which its boundary separates it and which determines it negatively (Zwick, 1983); from another angle, there is the 'skin' within which a living being maintains low entropy (Ho, 1998). Such a perspective is central to Hegel's great work *The Science of Logic* (c.f. Hegel, 1969, p.106).

[2] But this 'other', against which you posit your identity, cannot be eliminated, because then your own identity would cease! Therefore, the thing negated is (in Hegel's term) *aufgehoben*: 'sublated' or preserved-in-the-act-of-destruction. When the new stage is in turn superseded (negated), this liberates the negative determinant which it held imprisoned within it.

The 'messy mix': where new and old overlap

Translating this to our case, we have two successive moments:

[1] The scientific paradigms installed by early capitalism, and exemplified by Francis Bacon (Merchant, 1980), turned their back on holism, replacing it with reductionism, mechanistic and linear notions of cause and effect, and a violent aspiration to control nature, ignore its constraints and bend it to our will. The *agricultural* model was a direct reflection of this, as we have seen. On this basis, there occurred the modernist/capitalist rift, antagonistic to nature. However, modernism could not fail to pay tradition the compliment of continually attacking it, as its own negative determinant.

[2] Now, in the process of striving for a new paradigm (an indispensable part of which is radical political struggle), the first rift is repaired by a second, through which we tear ourselves free from capitalism. In this process the indigenous approach – holism, stewardship over nature, organics – reasserts itself. Of course, this does not simply mean turning the clock back because, as Heraclitus says, you do not step in the same river twice. Thus, biomimicry is not only the basis of traditional farming approaches (intercropping, agroforestry), but *also* the cutting edge of today's science of materials, or industrial design, an issue we will address in Chapter 11.

The breakthrough came when it was (partially at least) realised that the Baconian paradigm was bad science. As Capra points out (Capra,

1992), the scientific revolutions of the early twentieth century actually take us back to the ancients (and effectively, I would say, to indigenous thought): things like the quantum wave-particle duality (see Chapter 9), mind-boggling to mechanistic thinking, would not faze a traditional sage. And as we have seen (Chapter 5), today's academic soil-ecosystem research is often infused with the same respect and awe for nature's properties that the ancients had.

Should we then conclude that Merchant's critique of the distorted world-view of early capitalism (Merchant, 1980), however brilliant as a historical study, is flogging a dead horse with respect to today's situation? The answer is no, because in the real world, transitions necessarily occur in a confusing way, with parts of the process overlapping and out of synchronisation with others. We might see this as an expression of the 'messy mix' (Geels and Schot, 2007; Curry and Hodgson, 2008) mentioned earlier. Notably, corporate interests, part of imperialism, remain highly conservative, a fact nowhere better expressed than in the mainstream farming paradigm, whose dominance is scarcely shaken by all the evidence that its whole foundation is wrong. Here, linear and reductionist approaches, which are wholly out of date in scientific terms, still pass themselves off as cutting-edge: this has been the story from the Green Revolution right through to many aspects of today's biotechnology.

We will examine the imperialist basis for this in Chapter 10 but, at a conceptual level, the weird contradiction between scientific progress and reaction is one which Marxist analysis very much predicted: the progress back/forward to a (re)discovered dialectics is *itself* dialectical. In other words it is not smooth, linear or uniform, but rather uneven and lumpy, and notably punctuated by reactionary interludes.

Thus, in the *Dialectics of Nature*, Engels describes how, alongside the immense achievements of post-Renaissance scientific revolutions, came a damaging *reactionary* step: a static and ossified world-view. This world-view was pathetic compared to that of the ancient Greeks [or in fact, I would say, the indigenous perspective, one form of which was transmitted through the strong influence of Asian thought on the pre-Socratics], with their understanding of emergence from chaos and of the eternal cyclical flows of matter in motion (Engels, 1954 [1873–83], p.25). Such stale and static perspectives still ruled science teaching in Engels' day, but were (he said) being challenged by actual discoveries, including evolution: such discoveries had the effect of restoring an outlook where nature 'has its existence in eternal coming into being and passing away, in ceaseless flux, in unresting motion and change' (Engels, 1954 [1873–83], pp.30–1).

However, while Engels was right that research advances were pushing *in the direction* of such a rebirth of dialectics, something was also holding it back.

Thirty years after Engels, this was explained by Lenin, as he described the development of a physics which 'is making for the only true method and the only true philosophy of natural science not directly, but by zigzags, not consciously but instinctively, not clearly perceiving its "final goal," but drawing closer to it gropingly, hesitatingly, and sometimes even with its back turned to it. Modern physics is in travail; it is giving birth to dialectical materialism.' (Lenin, 1972 [1908], p.378). In this statement, Lenin surely draws inspiration from a similarly dialectical passage from Marx' *Eighteenth Brumaire of Louis Bonaparte*, according to which revolutions 'criticize themselves constantly, interrupt themselves continually in their own course, come back to the apparently accomplished in order to begin it afresh, deride with unmerciful thoroughness the inadequacies, weaknesses and paltrinesses of their first attempts, seem to throw down their adversary only in order that he may draw new strength from the earth and rise again, more gigantic, before them, recoil ever and anon from the indefinite prodigiousness of their own aims, until a situation has been created which makes all turning back impossible, and the conditions themselves cry out: Hic Rhodus, hic salta! (Here is Rhodes, leap here!)' (Marx 1969 [1852], p.401). This all looks very much like evolutionary learning.

The issue here is that paradigm-shifts are not easy. They are neither easy in theoretical terms, because of the leap of consciousness required, nor in practice, because of hindrances and setbacks encountered in class struggle. In fact consciousness and the practical movement develop hand-in-hand because each requires the other. This is indeed what we see today with food sovereignty: it is both a practical movement and one of conscientisation, the two being inextricably associated, as a kind of liberatory self-education in practice of the type advocated in the radical pedagogic work of Paulo Freire (c.f. Freire, 1972).

We can address the dialectic between objective change and consciousness through the following logic:

[1] As we saw in Chapter 5, the process of self-organisation and order-creation *needn't be purposive*, it just happens.

[2] However, in a human system, consciousness is decisive. The specifically human form of emergent order is more than just a prolongation of processes embedded in the general fabric of life, there is also the visioning of possible or desired futures;

the supposed neo-liberal (laissez-faire) 'refutation' of purposive action is simply a trick to bolster ruling-class dominance.

[3] Consciousness *itself,* however, is a natural process of self-organisation, of the mind, and therefore itself partakes of the objective order-creating process which it describes.

It is this third step which is actually crucial in dialectics: it is about (re) training how we think. So dialectics is a technique: our brain being *itself* a complex system, which we are employing to contemplate complexity, why not initiate a dialogue between the two, between the medium of exploration and its object? Can we *think* in an 'organic' way? Dialectics is rather like applying permaculture design to the mind, getting it to function like the natural system which in fact it is . . . including its 'Hic Rhodus' leaps into new regimes of organisation.

In this way, we cultivate a situation where order is only relative, things remain in flux, and above all we retain the ability to access the creative facet of chaos.

The realm of conscious visioning

So does emergent self-organisation mean getting things to march 'in step' like a Nuremberg rally? The systems literature seems ambiguous on this. Thus many discussions (for example, Strogatz, 2003) relate to systems where self-organisation is manifested in things moving 'into sync' . . . as when fireflies spontaneously co-ordinate flashing their light. We could take fractals as an example that occurs often in nature . . . yet this is not diverse at all, which is actually the whole point of fractals, and in Michel Baranger's explanation, complexity ceases in those regions of a system where chaos becomes fractalised (Baranger n.d.), i.e. too patterned. In contrast to such a uniform-ising definition of self-organisation, the earth-system (Gaia), as well as its subsystems – in particular the soil – are highly diverse.

Here we encounter a very important concept: 'criticality'. A system functions best when it is neither too disordered, nor rigidly ordered. Brian Goodwin puts it well: '. . . you shouldn't have too much order. You shouldn't have too much chaos. Perhaps you should be at the point where you can move backwards and forwards between the two . . .' (King, 1996). Criticality means the region of poise between the two. Bateson interestingly spoke of an 'ecology of mind' (Bateson, 1972), and we are always learning more about its analogies with

other ecologies. It has actually been argued that a community of bacteria operates like a brain (Prindle, et al., 2015), while the self-repair facility of chloroplasts in plants is similar to how the brain deals with its degraded components (Salk Insitute, 2015). Applying this to consciousness, there seems to be a kind of *frontier* (criticality) between the two definitions of emergence, i.e. the point at which *organisation becomes something other than simply marching in step*; a point interestingly made in recent research about sheep (!) who exhibit phases of dispersion alternating with ones of consolidation and mimicry (Ginelli, et al., 2015).

But the realm of consciousness takes this notion of criticality to a higher level. Thus, 'A key difference between inanimate and conscious objects is that for the latter, too much integration is a bad thing: the piston atoms act much like neurons during a seizure, slavishly tracking one another so that very few bits of independent information exist in this system. A conscious system must thus strike a balance between too little integration (such as a liquid with atoms moving fairly independently) and too much integration (such as a solid). This suggests that consciousness is maximised near a phase transition between less- and more-ordered states.' (Tegmark, 2014). Or, to express this slightly differently, consciousness arises at some critical point between monotony and chaos (Schulz, 2016); it is itself an issue of organisation, a phase transition, lying at the creative point where the freeness of a disordered system meets organisation (c.f. Tegmark, 2014, p.28).

I would argue that such research constitutes both a vindication of the project begun by Engels and Lenin – a bridging of the scientific revolution and dialectics – and an ongoing development, which challenges us to develop dialectics beyond the point which they attained.

Such a project was tragically interrupted in the Soviet Union during the Stalin period, but there are some hints that, in the 1960s, the Soviets were beginning to pick up the threads, with a particular focus being cybernetics. Thus, in a lecture at Leningrad University in 1960, L.A. Petruchenko argued: 'The contradiction between information and entropy, between order and disorder may be regarded as the basic contradiction of the cybernetic system . . . (seen from here) the principle of feedback . . . possibly represents a sort of dialectic movement.' (Petruchenko quoted in Günther, 1964, p.274). Similarly, E.V. Ilyenkov, whom I would see as one of the Soviet researchers of the 1960s whose work has retained most relevance today, strongly emphasises, in his interpretation of Marx, how the latter elucidated

capitalism from the standpoint of what is common to the operation of *all organic systems* (Ilyenkov, 1982 [1961], p.116).

Such arguments, relating to the frontier between order and disorder and the fundamental meaning of organic systems, invite us to apply them to sustainable agriculture; we will also return in Chapter 12 to considering the socialist experience in this regard. The point for now is that systems thinking, a pathway to overthrow the dead mechanistic paradigm and unify science with dialectics, has clear political overtones. Fundamentally, 'organics' is not just a chemical-free gardening tool, but a view on both the universe and our own social future.