

ON A PROLETARIAN SOIL

PART I: STONES

SIMON YULL

LUMSDEN, 6TH NOVEMBER 2015

DRAFT EDITION, GLASGOW, 27TH JULY 2017

REVISED, ABERDEEN, 22ND APRIL 2018

There is a small, narrow track that runs along the buildings at the back of the Sculpture Workshops, between the bothy kitchen and the first of the farm fields. Walk up the left-hand side of the bothy next to the washing lines, or between the bits of discarded metal and stone behind the sheds. Go onto this track, turn left and walk to the road that comes up the left-hand side of the workshops and heads into the hills. Turn right and walk ahead.

You will cross a cattle-grid. There are fields on either side. Sheep in the fields to the right and cows in those to the left. Further up you will come across one or two horses on the left and some farm buildings. Keep going.

Coming into view on the left you will see a modern house and some woods with a smaller asphalt roadway leading up to them. These are Coreen Cottage and Coreen Woods.¹ When I first came here I climbed up the embankment into the woods. According to Ordnance Survey maps the roadway leads directly onto a path that passes through them. The path is no longer visible. It has long since been covered by fallen logs blanketed in slippery moss and molds. I left the woods and headed back to the road, continuing up the hill past the Lumsden Water Treatment Works on the right. Not long up from here the road ends and becomes a dirt track, heavily overgrown with tall grasses, reeds and gorse. Parallel lines of tractor trails cut through them. Keep going. You will cross a wet, muddy section where a small run of water spills out below the gate of a field that adjoins the Coreen Woods. The bars on the right of the gate have been bent apart. You can climb over the gate or bend down and step through the gap. Do this and continue up the field keeping to the left-hand side near the woods.

This is a hay field and I have come here at different times when it has been grown with crops, harvested, or turned over to a thick clay earth. On this visit, in late Autumn, the field was in harvest, dotted with round hay bales. We saw two young fallow deer grazing on the straw stubble. They left footprints and fresh droppings, clumps of pellets the size of brazil nuts.

¹As older residents can recall this area was once a golf course, the woods are comparatively recent.

Not long after entering the field, we came across long extruded excrement containing small seeds and fibres deposited into holes in the ground. Badgers leave droppings in this manner around their setts and at the perimeter of their home territory.² Nearby we came across a footprint which could have been that of a badger. Perhaps there are badgers here. I don't really know.

Continue upwards keeping near the woods to your left as the ground curves gently round and goes over a brow. Ahead, in the far left corner of the field, you will see a low pile of stones where a young birch tree grows in amongst them. When you reach the stones you are here.

When I first came across these I, quite wrongly, assumed they were the remains of a collapsed shepherd's bothy or fank and I had in my mind the misread recollection of an old dwelling marked on the map. But I walked without a map and this was not the dwelling which in fact lies on the other side of the Coreen Woods to the north and is the remains of an Iron Age structure. Old maps of this area show stone walls surrounding the field and I assume that in this pile are stones from those dismantled walls which have since been replaced by wire fences. Older rusted fence wire coils in amongst the stones. This is the kind of agricultural detritus that some, seeking recreational escape within the countryside, may wish edited out of their consumption of nature. But these are evidence of a worked, active farm just like the turned-over earth. As much evidence of labour as the "pattern under the plough."³ They are part of the ongoing circulation of matter between 'nature' and 'culture' that undermines the very duality such words create.

Stand up and look around you. Every inch of land in all directions demonstrates as much intervention by humanity as every inch of city-space. Every inch of city-space demonstrates as much the presence of nature as the hills and fields you see around you.⁴ What differs are the forms, varieties and dynamics in each context. This does not mean that we should absolve or blindly accept all forms of materiality that we have created or intervened within but it does ask that we not make assumptions about what is authentic and what is not. There are many contexts and conditions of 'nature' each with specific histories and politics, and each at a particular moment in a longer evolution. When we oppose the urban and the rural, and project opposing moral values onto them, we fail to understand the histories and conditions of what we call

²The badger has special latrines, where the droppings are deposited in small, oblong holes about 10 cm deep, scraped in the earth by the badger using its front paws. The holes are not covered after use, and may be used several times. They are often found near the sett or in particular areas right next to a track. They can be more isolated, but are nearly always by a well-used track." – Bang and Dahlström 2001, pp. 188–189

³Evans 2013.

⁴There are a growing number studies of urban wildlife and the ecology of urban spaces, notable examples include Fitter 1984, Gilbert 1991, Wheeler 1999, Goode 2014 and, in literary form, Woolfson 2013.

nature and our relation to this. Nor should we assume that we are dominant in all these. Humanity may have become ubiquitous but this is not our era. For some lifeforms humanity is intrusive and destructive whilst for others perhaps the only care they know.⁵ For many lifeforms, however, humanity is simply a pervasive background condition like viruses, bacteria or worms.

Looking back the way you came you will see an empty farm house over to the left. Evidence, in some small way, of the decline in populations previously required for and sustained by agricultural work. Other empty farm houses dot the land to the west of the Clova Estate. Over to the right, to the north-west of Rhyndie, in the distance, you will see a large conical peak, the Tap o'North. The remains of an Iron-Age fort sits upon its summit. Below you will see that Lumsden lies within a gentle valley. This was once an area of boggy moorland between the watersheds of the Bogie and Don rivers. The town of Lumsden dates from around 1825 but as the Iron Age fort to the north and the souterrains to the south demonstrate, the area has been inhabited far longer.

Lumsden forms part of a geological area known as the Dalradian Assemblage, a complex mix of land and rock types created through the folding and metamorphoses of structures and sediments laid down in the Pre-Cambrian to Lower Cambrian period. The Cambrian period dates from around 541 million years ago during which the single supercontinent of Pannotia began to break up into smaller land masses. This was a process accompanied by, and possibly catalysing, the rapid evolution of oceanic lifeforms from simple cellular structures to those which form the basis of all animal types today. The northern boundary of the Assemblage lies along the Great Glen Fault, running through Appin and Inverness in the north. The southern boundary along the Highland Boundary Fault, running through Aberfoyle, Dunkeld and Edzell.⁶ To the east of Lumsden, around Inverurie, is a highly arable area, known as the Garioch, that has been farmed since Neolithic times.⁷

The soils of the Garioch are fed with calcium, phosphorous and iron minerals from the gabbroid rocks (formed from molten magma) which are less acidic than the granite that dominates the land around Bennachie and between Alford and the Highland Boundary Fault. The acidic, boggy nature of this granite bedded area meant that for a long time it lay less developed. With the expansion of quarrying and rail systems in the eighteenth and nine-

⁵Arne Næss, a theorist in one branch of Deep Ecology, has argued that the ability to care for other species is one of the most significant and hopeful aspects of the human condition, see Næss 1984. What constitutes 'care' of animals by humans is itself a complex question however, one which entails considerations of issues such as farming, conservation, and pet rearing. For some discussion on these see, among others, Haraway 2008 and Wilkie 2010.

⁶For a detailed outline of the geology see Johnson 1991.

⁷Whittow 1977, p. 157, The Gazetteer for Scotland <http://www.scottish-places.info/towns/townfirst4083.html#sthash.FPZBOx3f.dpuf>

teenth centuries the rich limestone deposits of Banffshire in the north were transported down and mixed into the ground to neutralize the soil. A network of drainage systems reclaimed land around the marches. Areas of bog and moorland became agriculture.⁸ This soil is an *industrial* soil, its condition dependent as much upon human labour and various industrially produced supplements as upon existing environmental factors. We might also say, extending Richard Lowentin's analysis of the economics of agriculture, that it is a *proletarian* soil, positioned as much within circuits of capital as within the cycles of precipitation that regularly drench the land.⁹ The low-lying crofts and farms of Lumsden, Chapelton and Clova are all typical of such arrangements. A crisis in the markets or a rise in the water table may one day claim them back. The unpredictability of markets does not make them analogous to weather systems or other 'natural' phenomena, but neither are they entirely distinct from one another. Our weather is increasingly subject to market forces. Through insurance, housing and speculative finance, the flow of water becomes confluent with the liquidity of capital.

Turning the opposite way and looking ahead you will see the brown bracken of the Coreen Hills cut across in diamond shapes by tracks. Sections lying between these have been blackened by muir burning. This is where the deer come from. The pair we had spotted before had run this way and a trail of prints ran through the mud along one edge of the stone pile.

Now look to the stones themselves. A mix of grey silicates with a few white and orange quartzes. Many are already substantially submerged into the soil, and they appear to be sinking back into the land from which they were once excavated. This is the work of worms, who through the process of digesting and excreting soil gradually turn the land over, pushing lower soils up to the surface in worm casts and slowly covering and drawing down heavier elements which lie upon it. For Darwin, who studied them for much of his life, earth-worms were intrinsic to the formation of the earth on both the smallest and largest of scales in a manner that outweighed that of human influence:

When we behold a wide, turf-covered expanse, we should remember that its smoothness, on which so much of its beauty depends, is mainly due to all the inequalities having been slowly levelled by worms. It is a marvellous reflection that the whole of the superficial mould over any such expanse has passed, and will again pass, every few years through the bodies of worms. The plough is one of the most ancient and most valuable of man's inventions; but long before he existed the land was in fact

⁸A process recalled in names such as Boghead Farm which we passed on the road.

⁹Lewontin 1998

regularly ploughed, and still continues to be thus ploughed by earth-worms. It may be doubted whether there are many other animals which have played so important a part in the history of the world, as have these lowly organized creatures.¹⁰

Look more closely at the stones. They are covered in a profusion of different colours and textures that are the thick life of mosses, lichens and molds. Mosses are more prevalent along the northern side of the stones, giving a thick furry covering over the stone. It may well have spread from the woods that they face towards. Requiring more moisture they tend to grow away from the drier south-facing sunlight areas where the more colourful lichens can be spotted. These become more intense in colour with more sun exposure. In deeper, more moist crevices which rarely get any sun however, a bright green mold or algae can be seen.¹¹

Sprouting up in amongst many of these moss patches are small green cup-like structures on stalks. We called them “faery cups.” They are not part of the moss but rather a lichen growing alongside it. The small brown dots around the rim of each cup mark where the lichen spores are produced. Many of the rocks are covered in large circular areas of white. The black spots rising up in the centre of each area being where this species produces spores. The bright orange and yellow over many of the stones may have been due to colouration in lichens caused by variations in sunlight, minerals from the stones themselves or reactions to fertilisers blown from the fields. Spreading across the stones and up onto the trunk of the birch is a leafy crottle lichen used to make dyes. Soaked in water these create yellow-browns, crimson and purples whose colours are fastened by a mordant of urine.

The small flat crusts of green and dark brown lichens may be a species known as a ‘map lichen’ due to the dark line that forms around the edges, separating one from the other like borders on a map. Map lichens generally grow at a rate of no more than 1mm a year and so the average radius of the patches found here can be taken as an indicator of how long the stones have been present.¹² On my last visit, the average radius varied around 10mm to 13mm suggesting the stones have been here little more than a decade. A related but rare variety found on acidic rocks in Scotland is described by one guide as “the oldest of all living things.”¹³ The oldest known fossilized lichen, *Winfrenatia reticulata*, was discovered near the Tap o’North, in a seam of red sandstone deposit called the Rhynie chert.¹⁴ The fossils of the Rhynie chert

¹⁰Darwin 1972, p. 313.

¹¹The growth patterns of lichen and moss can be used as a navigation guide, see the chapter on “Mosses, Algae, Fungi and Lichens” in Gooley 2014.

¹²*Rhizocarpon geographicum*, see Gooley 2014, p. 116.

¹³*Rhizocarpon alpicola*, see Laundon 1980, p. 5.

¹⁴<http://www.abdn.ac.uk/rhynie/lichen.htm>

date from the early Devonian period, following the Cambrian, when Northern Europe was joined with Greenland and North America as part of the Laurussia land mass. The chert appears to have once been an environment not unlike that of the hot springs in Yellowstone National Park where a profusion of distinctly coloured algae, lichens and slime molds grow upon the shallow edges of sulphurous water pools.¹⁵ Standing here, we are not so far from that landscape, as alien as it might seem to imagine it here.

The First Established Beings

Lichens are not plants but rather the product of a symbiotic partnership between fungi and algae. The algae are generally capable of living freely whereas the fungi are dependent on the algae for extracting nitrogen from the air and synthesizing carbohydrate nutrients. The fungal structures, in turn however, can provide more stable environments for the algae, helping maintain moisture and protecting them from the weather. Their metabolic processes synthesize new compounds and can transform an inhospitable environment into one favourable to other lifeforms. Gradually dissolving down rocks, feeding minerals into the soils and creating surfaces that plants can take root on. In this way the arid landscapes of the Cambrian era were gradually transformed into those capable of sustaining plant life, creating the more complex habitats of the Devonian. Some of the earliest evidence of this is preserved in the Rhynie chert including the earliest insect uncovered in 1919 by a local minister and amateur naturalist, the Reverend William Cran. The landscape you see around you was at first made possible by the actions of lichens and they are all around us, still slowly transforming it.

It has been argued that it is through symbiosis that life first emerged and continues to evolve providing one of the mechanisms through which variation and adaptation are introduced into species. Lynn Margulis (1938–2011) identified a process through which simple bacteria combine into more complex forms capable of reproduction, movement and metabolism, producing energy from sources such as light, nitrogen and oxygen.¹⁶ The bright green in the crevices between the stones that we are standing by is provided by photosynthetic bacteria in plants, *chloroplasts*, and various species of *cyanobacteria* in molds and scum. *Mitochondria* process oxygen and are present in all animals, plants and fungi. *Spirochetes* are moving bacteria who swim and wriggle through all kinds of substances: mud, slime, mucus and living tissue, within the intestines of tiny insects, or in the deer pellets and

¹⁵<http://www.abdn.ac.uk/rhynie/analogues.htm>

¹⁶Margulis 1998.

badger droppings we passed on our way here. These are the *protists*, the “first established beings.”¹⁷ Ernst Haeckel (1834–1919) added protists to the taxonomy of life under the new kingdom of *Monera* and mapped many different species in obsessive, crystalline drawings.¹⁸ Herbert F. Copeland (1902–1968) revised and divided Haeckel’s scheme into two groups: *Monera* for those bacteria with no nuclei and *Protoctista* for those with nuclei, the latter term coined by Scottish naturalist John Hogg (1800–1869) to define that which lay between plant and animal.¹⁹ Within the fossils of the Rhynie chert protists have been found inside algae that are inside plants.²⁰ We depend upon various bacteria within our own bodies, such as the microbiome in our guts, but even the composition of our organs and tissues may be the product of prior syntheses of different bacterial compounds.²¹ The nerves cells in our brains are composed of tubulin protein found in centriole-kinetosomes protists and Margulis argues that the hair-like structures, *cilia*, in our throats and on women’s fallopian tubes are derived from originally free-living spirochetes that integrated with other ancestral bacteria.²²

In an era before microscopes, when we could not see into plants and soil, stone, saliva and tissue, Aristotle described those creatures that crawl and swim and fly from mud and slime as *autochthones*, born from the earth directly.²³ He could not see or analyse the tiny eggs and larvae from which they developed. In Greek thought, the autochthones are not only restricted to such basic creatures however. Cecrops, the mythical founder of Athens, a creature half-human half-fish was also of the autochthones.²⁴ The political classes of Athens would claim a similar genealogy. Drawing upon an etymological play that linked *laoi*, people, to *laes*, stones, they mythologised themselves as a “hard people” born from the stones that lay within the very soil they took dominion over.²⁵ The trope of the autochthone naturalized

¹⁷Both the term *protist* and the related *Protoctista* have been subject to changing historical definitions and their identification often poses a problem for taxonomies that has resulted in a varying and sometimes conflicting use of the term. I use it here in a broader more inclusive sense closest to that used in Margulis, Corliss, Melkonian, and Chapman 1989.

¹⁸See the collection, for example, in Haeckel 2000.

¹⁹Margulis 1998, p. 60–61. John Hogg, On the distinction between a plant and an animal, and on a fourth kingdom of nature. *The Edinburgh new Philosophical Journal* (new series) 12, 216–225 (1861).

²⁰Margulis 1998, p. 62.

²¹<https://en.wikipedia.org/wiki/Microbiota>

²²Margulis 1998, pp. 47–49.

²³“Of mobile animals the hermit-crab is said to arise spontaneously from soil and slime, and various insects from dew falling on leaves in the spring; in decaying mud or dung; in timber; in the hair of animals; in flesh, and within the intestine of animals ...” — *Historia Animalium* 548a, 551a, 547b. See French 1994, pp. 66–67.

²⁴Another name given to Cecrops was *Erichthonius* deriving directly from auto-chthonos, Bambach 2003, pp. 52, 197.

²⁵Aristotle 1984b, p. 39, Loraux 2000, pp. 11–12.

both the inclusive and exclusive dimensions of Athenian democracy. The political equality of Athenian citizens derived from their equality of origin, all were born the same of the same source. Equality was given by nature to those “first established beings.” For all who were not born in this way however, such equality was not given. Because true Athenian men were born from the soil and not from a human mother, women could not truly be citizens for their origins differed even when married into or descended from one of the elite families. Similarly, those born elsewhere could not share in the decisions that shaped a land that did not, literally, course through their veins.²⁶ In ancient Greece the femininity of Gaia was not based in a notion of matriarchal power but rather that the soil and woman were seen as resources from which man replenishes himself - marriage laws echoed and derived from agricultural laws.²⁷ The autochthone is invoked to provide an answer to questions that are placed beyond investigation. In nature, it served to explain the source of creatures whose originating forms were too small for the unaided human eye to see, and in politics, to justify why some were more equal than others.

In classical Greek thought, and in Aristotle especially, nature and politics do not stand in opposition to one another. There is no realm of nature separate from that of human affairs. Nature, *physis*, is spoken of by Aristotle purely in terms of what is characteristic, the nature of a thing as we might say.²⁸ That which is natural is, according to Aristotle, that which is necessary to something achieving its purpose - its *telos*. In his defence of slavery Aristotle claims that it is the physical differences between the freeman and the slave, one walking upright whilst the other is bent towards the ground, that determine their place in society, rather than their postures deriving from the differing demands society placed upon them.²⁹ Nature and politics are inherently intertwined in Aristotle for only that which is natural, in this sense, can be necessary to the existence of the *polis* (the state) and, retroactively, that which has become necessary to the governance of the *polis* must have arisen from its nature. And just as that which is determined by nature justifies that which is politically and socially determined for Aristotle, so too

²⁶“We and our kind, all brothers of the same mother, believe ourselves to be neither masters nor slaves of each other; rather equality of origin (*isogonia*) established by nature obliges us to seek political equality (*isonomia*) established by law.” — *Menexenus* 238e–239a, quoted in Loraux 2000, p. 22.

²⁷See Blundell 1995 and Loraux 2000.

²⁸See the discussion in French 1994, pp. 16–21.

²⁹“But it is nature’s intention also to erect a physical difference between the body of the freeman and that of the slave, giving the latter strength for the menial duties of life, but making the former upright in carriage and (though useless for physical labour) useful for the various purposes of civic life ... It is thus clear that, just as some are by nature free, so others are by nature slaves, and for these latter the condition of slavery is both beneficial and just.” — Aristotle, *Politics* 1254b–1255a, Aristotle 1958, pp. 13–14.

does that which mirrors contemporary political structure determine what is most natural for animals:

... the animal must be conceived after the similitude of a well-governed commonwealth. When order is once established in a city there is no more need of a separate monarch to preside over each several task. The individuals each play their assigned part as it is ordered, and one thing follows another because of habit. So in animals the same things happens because of nature, each part naturally doing its own work as nature has composed it.³⁰

Physis and *politeia* are integrated in relation to their constitution, how each is composed so as to act together.³¹ Not only are they conceptually parallel for Aristotle but they were also investigated through parallel methodologies. Just as his studies of animal life were based on collections of empirical examples gathered within the library of the Lyceum so too did Aristotle and his students gather examples of existing political systems in order to subject them to comparative and taxonomic analysis.

The majority of these documents are lost or known only in fragments. The most substantial and best known to us is the *Athenaion Politeia* (translated as *Athenian Constitution*), commonly attributed to Aristotle but now largely considered to be the work of one of his students.³² The surviving text describes the institutions and procedures of Athenian political life focusing around the rise and fall of Solon, the ruler who introduced substantial democratic reforms into Athens in the 5th century BC.

The original Greek term *politeia* was first translated as ‘constitution’ only in the 19th century by Benjamin Jowett in his 1885 version of Aristotle’s *Politics* and later adopted by Frederic G. Kenyon’s translation of *Athenaion Politeia*. Translations of the word in the 16th century rendered *politeia* as ‘Commonweale’.³³ Our modern understanding of a political constitution is one of a document that defines a set of principles upon which the state draws a contract with its citizens, as first implemented in the constitutions of France or the United States. These principles are both foundational and

³⁰Aristotle, *Movement of Animals* 703a, Aristotle 1984a, p. 1095.

³¹In all cases where there is a compound, constituted of more than one part but forming one common entity – whether the parts be continuous [as in the body of a man] or discrete [as in the relation of master and slave] – a ruling element and a ruled can always be traced” – Aristotle, *Politics* 1254a, Aristotle 1958, p. 12.

³²See P.J. Rhodes introduction to Aristotle 1984b. There are records listing at least 158 different political systems studied by Aristotle and his students.

³³For a historical outline of these translations and their relation to changing political debates see Stourzh 1988, pp. 35–36. The surviving fragments of the *Athenian Constitution* were first discovered in 1879.

final. The *Athenaion Politeia* however describes neither a set of ‘first principles’ nor a contract between citizens and their state but rather more of an empirical record. It provides no account of a constitution of Athens in the modern sense but rather as a processes of continual change that it calls the *metabole politeion*.

In contrast to the modern concept of political constitution defined in terms of structure and principles, the term *politeia* relates more to the conduct of those who act within such structures. For writers such as Herodotus and Xenophon to speak of the *politeia* was not to speak in terms of an abstract system of governance but rather to describe the daily life of those governing citizens, those property-owning male citizens, in whom the power of the *polis* was embodied. The *politeia* is that which puts the state in motion, gives it *physis*. This motion is itself within a process of transformation, *metabole politeion*, of growth and decay driven by responses to contingent events, such as famine or war, or internal corruption and stagnation.³⁴

When Aristotle seeks to define what the most appropriate arrangement of all things can be, what is both “the good and the best,” it is not the state to which he draws reference, nor its most disciplined structures such as the army, but the household, the *oikos*. The stability of the *polis* depends upon, and is mirrored through, the stability of the *oikos*. The *oikos* is the basic organ from which the living body of the *polis* is constituted. Through which legitimacy is defined in terms of property ownership conferred by descent, and in which the members do not conduct themselves as equals, as in the forums, but as part of a strict hierarchy.³⁵

The *oikos* represents an ideal model, for Aristotle, of the balance between social structure and the management of natural resources. The Athenian *oikos* was a landholding property, closer to the Clova Estate than the ordinary homes of Lumsden High Street. The management of such estates is most famously outlined in Xenophon’s *Oikonomikos* (“The Estate Manager”), a text which has been a recurrent reference point for Western theories of politics and economics and, indeed, from where the very word ‘economics’ itself derives.³⁶ Whilst the analogy between nature and politics, *physis* and *polis*, is one based on the relation between structure and command in which each component has its given role, that between nature and ‘housekeeping’, *physis* and *oikonomia*, is based on the relation between structure and

³⁴Liddel 2010 discusses the broader development of *metabole politeion* in Greek political and historical writing and gives the contrasting example from Darius where the decline of a state is seen as related to its tendency towards stasis.

³⁵See Cox 1998 and Loraux 2000. The passage is in Aristotle’s *Metaphysics*, book 12. For an analysis of this passage in relation to notions of ecology in Aristotle see Marie Leroi 2014, pp. 318–327.

³⁶For an outline of the significance of Xenophon to thinkers such as Machiavelli, Adam Smith and Marx see Mitropoulos 2012, pp. 53–59.

utility in which resources are made best use of. There is an engendering to this in that, whilst the husband governs the *polis*, his wife manages the *oikos*.³⁷ Just as Aristotle's understandings of nature and politics support one another through a set of self-reinforcing metaphors, so too are nature and housekeeping brought into self-reinforcing relations throughout his writings: "Like a good housekeeper, nature is not in the habit of throwing away anything from which anything useful can be made," and most frequently in the refrain "nature does nothing in vain."³⁸ This judicious utilisation of resources is integral to Aristotle's teleological principle. In accordance with this, nature always moves towards that which is necessary. The nature of any given entity is evident in how it fulfils this goal, whether this be the growth of horns or the necessity (as Athenians might see it) of slavery. Whilst this involved constant transformation, through growth, generation and corruption, this is not an evolutionary principle. The final goal, the *telos* towards which every being strives is an eternal, predetermined form, its *eidos*. It is through shaping matter in the form of an eternal idea that, for Aristotle, life approaches the divine and becomes 'good'.

Polis and *oikos* where distinct realms traversed only by those free men who were masters in both. In the development of the modern concept of the state as a political body these two spheres become increasingly infused within one another. The city state and then the nation state are conceived of as one grand household in which economic necessities increasingly take precedence over and determine the extent of political freedoms, whilst domestic space is increasingly reconfigured in terms of political structure and legislative order.³⁹ As colonial exploration and new methods of scientific observation expanded our awareness of nature, the relation of *physis* and *oikos* becomes integrated into the structure and conception of different national economies. The vast taxonomic projects of Linnaeus were orientated towards enabling the global productivity of nature to be reconstructed at home, transforming Sweden into a self-contained economic ecosystem. In works such as *The Oeconomy of Nature* (1749) and *The Polity of Nature* (1760) Linnaeus begins to interpret nature in terms of interlinked systems of exchange.⁴⁰ Adam Smith abstracts the allocation of roles within Xenophon's *Oikonomikos* into the principle of division of labour whilst seeking to apply the knowledge of the new natural sciences to philosophy and economics.⁴¹ Marx satirised Darwin for rediscovering "amongst the beasts and plants, the

³⁷For an analysis of the formation and significance of gender politics within this, and their relation to the development of Western law and economic governance, see Cox 1998 and Mitropoulos 2012.

³⁸An overview of the use of these themes can be found in Marie Leroi 2014, pp. 146–150.

³⁹This follows Hannah Arendt's analysis in *Section II: The Public and Private Realm* of Arendt 1998.

⁴⁰Schabas 2005, p. 31.

⁴¹Smith's theories of moral sentiment and of the value of labour reflect the ideas of his col-

society of England with its division of labour, competition, opening up of new markets ..." even whilst drawing on elements of Darwin's theories and at one point sending him a copy of *Das Kapital* as a mark of respect.⁴² Other advocates of Darwinism were less nuanced and not only embraced but extended the conflation of evolutionary theory and capitalist economics. In England, Thomas Huxley, Henry Galton and Herbert Spencer, in France, Clémence Auguste Royer and, in Germany, Ernst Haeckel.⁴³ Haeckel projected Adam Smith's division of labour directly onto evolutionary process, ranking not only different species but also distinct human races and, in this way, informing his promotion of eugenics as a means of maintaining the 'purity' of breeds and abilities.⁴⁴ Just as for Aristotle, nature was understood in a mirrored relation to the *polis* and *oikos*, so too did emerging capitalist theory fashion itself as the realisation of a supposed set of natural laws within human commerce and re-conceived of nature in terms of a competitive yet self-balancing network of exchange. A new integrated conception of "nature's household" was born. The *nomos* (law) of the household became the *logos* (discourse) of nature and Haeckel gave it a name: ecology.⁴⁵ It is the advent of ecology as a particular thinking of nature, as a self-balancing system of interacting agents, that folds nature fully into capital.

Natural histories are political writings. Nature defines the limits and possibilities of the political. Nature is interrogated in order to understand what the political might 'properly' be, structuring the limits and possibilities of power, whilst our understanding of the limits and possibilities of nature are themselves constrained by the politics we already have or lie within their existing desires.

In the mytho-political constitution of ancient Athens stone marks both the origins and limits of power. Not only in the birth of the ruling *autochthones* but in the structure of power as marked on the land. It was this that the reforms introduced by Solon in the 5th century BCE sought to address. In an autobiographical poem justifying his actions he describes this

leagues the physicians William Cullen and Joseph Black. In their new Physics intangible entities as distinct as oxygen or emotions could be conceived alike as 'subtle fluids' transmuted through the air and through the nervous system to be 'fixed' into the blood through respiration or in the soul as affect or empathy. Labour, understood this way, could be fixed into the object of production thereby conceiving of its value like a substance that could be stored, transferred, measured and exchanged. See Mitropoulos 2012, pp. 53–54, Schabas 2005, pp. 80–89.

⁴²Beck 2009, pp. 310–311.

⁴³Darwin rejected many of these interpretations even whilst trying to acknowledge the proposals that different followers of his work made. He rejected Galton's concept of eugenics as being based on a gross misunderstanding of how evolution worked and of Spencer he wrote: "His conclusions never convince me ..." See Beck 2009.

⁴⁴For an account of Haeckel's work and its political impacts see Gasman 1971.

⁴⁵Stauffer 1957. Whilst Haeckel is widely regarded as the first to use the term in 1866, it has also been attributed to Eugenius Warming.

as a moving of the boundary markers, the *stelai*, transforming the status not of people but of the earth itself:

... from whom I removed
The markers that were fixed in many places,
The Earth which once was enslaved but now is free.⁴⁶

Solon's reforms were far-reaching, he freed slaves, cancelled debts, allowed exiles to return and restructured the institutions of the *politeia*. These brought harsh criticism upon him from both sides of Athenian society. The landowners feared their power would diminish too far whilst for those in indentured servitude the changes were insufficient. Setting himself up "in the ground between them, Like a *stela*,"⁴⁷ Solon substitutes himself as the sole marker of power in place of those he removed. His poetry interprets the *polis* not terms of its *eidōs*, of the *autochthone* as the enduring form in its mythic origin, but in terms of its *physis*. The *metabolē politeion* becomes a transformation in matter, a moving of the stones, that re-aligns the relation between those who work on the land and those who are born from it. Yet, whilst Solon is credited as laying the foundations of Athenian democracy, his changes were short-lived. The *Athenaion Politeia* charts a movement from democracy to tyranny in successive waves of 'political metabolism'. For Aristotle this was its inevitable, natural fate. He did not support democratic government believing that it lacked sufficient hierarchy and, being too unstable to last, it could never be 'good'.

And these stones here at our feet? These too are a boundary that has fallen and been replaced. The markers of our modern liberal democracy that carve up the land in its relation to capital. On one side a farm field, on the other a commercial wood plantation. Nearby, hills kept deliberately barren through muir burning for commercial grouse shoots. And, in between, a small patch of boggy waste ground, sustained perhaps through tax rebates.⁴⁸ Every inch of land is accounted for and, just as for the water table in the valley below, capital and law determine the nature of this land. How do we stand, then, in relation to something that is growing in this way?

⁴⁶Aristotle 1984b, p. 52.

⁴⁷Aristotle 1984b, p. 53.

⁴⁸There is often an association between common land and waste land. This stems from the reconceptualism of land by 18th century economists as 'productive' and 'unproductive', a distinction which does not derive from the ability of a given piece of land to support life but rather from its potential to produce profit, see Perelman 1984 and Harvey 2006.

Oikos – Mythos

This rephrases a question that Martin Heidegger (1889–1976) put to his students in a seminar given on 17th November 1933 in which he asks them to imagine a flower growing beside a fence. He asks them to think upon the distinction between that which is natural and that which is manmade and, thereby lead them to his own understanding of nature as *physis* as that which has created itself, that which “... without human intervention, coming from itself, streams around human beings, gives them rest or unrest, calms or threatens them.”⁴⁹

What guides the way in which each entity creates itself from within is, according to Heidegger, its particular kind of Being – what it is for something to-be-in-itself. For Heidegger, the way of growing that we see around ourselves and amidst the stones here could never be true *physis* for it arises not from a ‘letting-be’ of the flower unto itself but from ‘production’, an understanding of the world in terms of what can be made from it rather than for itself. In this way, Heidegger distinguished between a making in which things are unconcealed in their true Being, as the bud reveals the flower within, and that in which things are produced in accordance with humanity’s needs. These needs act upon nature as a “standing reserve” to be taken from as desired.⁵⁰

Whilst this is a perception that resonates with many critiques of modern technology and industrialisation, such as that of Ruskin in the 19th century and many different ecologists today, for Heidegger this was not the consequence of the Enlightenment, the Industrial Revolution, or what we now call the Anthropocene.⁵¹ These, rather, were the culmination of a process that had begun much earlier and were first fully articulated in the *Metaphysics* of Aristotle. Heidegger argued that whilst Aristotle asked the right questions as to the nature of Being, he was mistaken in his attempt to answer these by presenting Being as arising from the substance of things. Being, for Aristotle, was defined in terms of eternal forms (*eidos*) expressed in the physical structure and constitution of each type of thing from which their nature (*physis*) and way of acting upon the world was derived. For the free-man and the slave their distinct forms of Being are expressed in the shape and posture of their bodies and it these that determine the kinds of activities

⁴⁹Heidegger 2013, p. 24.

⁵⁰The classic exposition of this is Heidegger 1977. The term ‘Being’ with a capital B is the standard translation of the German word *Dasein* used by Heidegger and is given this spelling to denote its use as a specific conceptual category.

⁵¹The relationship of Heidegger’s ideas to those of his contemporaries is discussed in Zimmerman 1990. The relationship of Heidegger’s philosophy to ecological thinking, and especially to post-war radical ecological movements, is examined in Zimmerman 1994.

their nature is suited to. Similarly, in Aristotle, there is a hierarchy of being. From those who raise themselves up from the land, the most superior being man, down to those who are closer to the ground, the deer, the badger, the worm, each being successively inferior. Heidegger argued conversely that Being followed from the *way of doing* that distinguished one kind of entity from another, what he called *Dasein*, a 'being-there' which, in a reversal of Aristotle, is temporal and contextual. It is Being that shapes the physical qualities of each form of life.

These stones, then, are not merely detritus, abandoned as their value in sustaining a boundary fell apart through weathering and subsidence, nor are they merely a reserve to be called upon when a new need arises. It could be said that they have a form of 'Being' of their own, a 'being-there' which we gather into our world as we come upon them, unconcealed beyond the brow of the hill. And so too the deer, which are not a stock to be maintained, or the badger, which is not a pest to be controlled. Each unconceals itself to us as a 'being-there' with the stones. As do the lichen who weather their surface and the worms who burrow and unsettle their ground. We can think this way with Heidegger, it seems, merely by letting things be and gathering our senses. From this formulation Heidegger challenged those who saw the animal as an 'inferior' form of human or the human as a 'superior' kind of animal. Animal and human simply possessed different kinds of 'being-there' with the world. So it may seem, but there are limits to Heidegger's world.

In a seminar series prior to that of 1933, Heidegger illustrated his conception of Being as a way-of-doing through a comparison of three kinds of entity that, he argued, had clearly distinct forms of interaction with the world and therefore distinct kinds of Being: the stone, the animal and the human. The stone he described as "worldless" for it was merely present in the world but had no awareness of its own interaction with other entities, no sense of a world to which it belonged and, therefore, no actual sense of Being in Heidegger's terms. The animal he described as "poor in the world" for whilst it was conscious of interacting with others and had some sense of a world to which it belonged, it could not reflect upon or communicate this sense to others or refashion the manner in which this sense was revealed. It therefore had only a partial sense of Being. Full Being could only be achieved by those given language or, as Heidegger put it, by those who dwelt within language and thereby could be described as "world-forming." For Heidegger, this was a 'way' that lay open only to humankind.⁵²

These kinds of 'being-there' were irredeemably distinct, separated by what Heidegger called an "abyss." Whilst humans might not be superior to animals, the kind of interspecies companionship or trans-species politics such as Donna Haraway proposes would, in Heidegger's account, be a

⁵²Heidegger 2008.

fallacy.⁵³ Elsewhere Heidegger reinforces this in claiming that the animal is unable to order actions in time and therefore has no sense of time and or history.⁵⁴ The animal cannot, in Heidegger's account, enter into the political for in order to be political one must be able to make decisions that have historical consequences. A stone, even less so.

This structure of Being is significant to Heidegger's seminars on the state, indeed he recounts it using a piece of blackboard chalk in place of the stone, not because he wishes, like Haraway, to discuss the possibility of including animals and stones within our concept of the political but rather to emphasize the conditions under which certain peoples must form a state and from which others must, in his view, be excluded. For Heidegger political capacity derives from the relation between Being and state. A state is constituted not in the agreement of its laws or in terms of a contract with its citizens but in the historical Being of its people. A people cannot have a history without a place in which one's Being is "rooted." Those who are rootless therefore (explicitly, for Heidegger, the nomad and the Jew) are without a true consciousness of their own history and cannot have a politics or be part of a state.⁵⁵ This builds upon a more fundamental argument that Heidegger makes, following from his discussion of chalk and animals, in which he relates human consciousness of Being to a people's commitment to the state, and that those who lack true consciousness "of their Being in the whole of the world" are not only less than human but less than the animal or the stone, merely nothing.⁵⁶ Heidegger's world is, therefore, not so much one of gathering and enfolding but of limits and exclusions.

Through this notion of rootedness Heidegger reasserts the principle of autochthony in a new form. Whilst drawing from Greek sources this does not define autochthony in strictly genealogical terms, but rather through the

⁵³See Haraway 2003 and Haraway 2008. The relation of Heidegger's analysis of animal-being to later philosophies of the animal and human is explored in Calarco 2008.

⁵⁴Heidegger 2013, pp. 33, 37.

⁵⁵"History teaches us that nomads have not only been made nomadic by the desolation of wastelands and steppes, but they have also often left wastelands behind them where they found fruitful and cultivated land — and that human beings who are rooted in the soil have known how to make a home for themselves even in the wilderness. Relatedness to space, that is, the mastering of space and becoming marked by space, belong together with the essence of the kind of Being of a people. ... From the specific knowledge of a people about the nature of its space, we first experience how nature is revealed in this people. For a Slavic people, the nature of our German space would definitely be revealed differently from the way it is revealed to us; to Semitic nomads, it will perhaps never be revealed at all." — Heidegger 2013, pp. 55, 56.

⁵⁶"A people that turns down a state, that is stateless, has just not found the gathering of its essence yet; it still lacks the composure and force to be committed to its fate as a people." — Heidegger 2013, p. 46. "Without consciousness, the knowing and caring about the height and depth, greatness and powerlessness of their Being in the whole of the world, they are no longer human beings, and since they cannot be animals or plants or objects, at bottom they are nothing at all. With the loss of consciousness, human being becomes null." — Heidegger 2013, p. 48.

claim of a privileged ontological relation between a people and their environment, expressed in German as *Bodenständigkeit* (literally a ‘permanence of the ground’). In defining this as how “nature works on the human being, roots him in the soil, only when nature belongs as an environment,”⁵⁷ it could be argued that there is an ecological dimension to Heidegger’s thought, making it the philosophical counterpart to Haeckel’s science as some would later claim. Yet in his lectures of the 1930s Heidegger dismisses ecology as failing to address questions in a “fundamental way about locale.”⁵⁸ Heidegger rejected the *logos* of modern science as false reason, one that verified facts but did not reveal the truth as *aletheia*. Nothing could be gained from knowing the origins of life, if a people could not experience the archaic origins of its own Being.⁵⁹ *Bodenständigkeit* could only be revealed as myth, as *oikos-mythos*.

This is expressed in a poetic mythology that Heidegger weaves around the Black Forest landscape of his home. In a memorial address to celebrate the anniversary of the First World War hero Leo Schlageter, Heidegger locates Schlageter’s bravery as deriving from the *Urgesteine* (‘primitive stone’) of Black Forest mountains where he was born, echoing the originary myth of the ancient Athenians.⁶⁰ In a speech for public radio entitled “Creative Landscape: Why Do I Stay in the Provinces?” Heidegger locates his own philosophic work within the same landscape, embedded within the “gravity of the mountainside and the hardness of their primeval rock, the slow and deliberate growth of the fir tress, the brilliant, simple splendour of the meadows in bloom ...”⁶¹ This self-created mythology seeks to confer an archaic privilege upon those who are rooted in the homeland and the political project to which he believes they must commit themselves.

This project collapsed with the defeat of Nazism in the Second World War and a darkness fell over Heidegger’s mountain. Rejecting the explicitly political language of his earlier work, Heidegger withdrew into a contemplative quietude and, following Holderlin’s evocation of the river Isthier, reformulated his ideas in a poetic vocabulary of ‘dwelling’, ‘gathering’ and ‘care’.⁶² Proposing a philosophical stance of letting-be rather than one seeking to shape the futural destiny of his people, he deepened his critique of how our experience of the world was increasingly enframed by modern technology. It was this post-war writing that was to have a huge influence on certain

⁵⁷Heidegger 2013, p. 55.

⁵⁸This occurs in the midst of his discussion of what he claims to be the inability of Semitic and nomadic peoples to understand Being, see Heidegger 2013, p. 54.

⁵⁹“In excavating the “essential” sources of Greek *aletheia*, Heidegger will conflate Pre-Socratic *arche* with Athenian autochthony. The term “archaic” will now designate an experience rather than an epoch.” — Bambach 2003, p. 215.

⁶⁰Bambach 2003, p. 59.

⁶¹Heidegger, Bambach 2003, p. 64.

⁶²Heidegger 1996. See also Nichols 2009.

forms of ecological politics and their cultural expressions, to the extent that George Steiner would state that: "If there is a metaphysics of the ecological movement, it is Heidegger's."⁶³ Heidegger spoke to those disillusioned with the modern world who sought a more 'authentic' life, yet, perhaps not unsurprisingly, the flow of Heideggerian thought into the ecological movement has mostly led to the emergence of a form of cultural ecologism that only loosely relates to, and sometimes opposes, the scientific discipline from which it takes its name and in some forms seems more concerned with projecting personal subjectivities onto the world rather than learning from it.⁶⁴ Murray Bookchin rejected Heidegger's influence as encouraging a self-indulgent mysticism, particularly within the North American Deep Ecology movement where it was most prevalent.⁶⁵ Arne Næss, a key figure within the European branch of Deep Ecology, whilst acknowledging there may be "interesting similarities" between his Ecosophy and the concept of 'care' in Heidegger's later writings nevertheless remained sceptical of too strong a relation between Heidegger and himself.⁶⁶

At a time in which much of Heidegger's earlier writing and private notebooks were unknown, his quietude was often interpreted as a rejection of the regime he had once supported. The recent publication of this material has shown this was not the case. As Charles Bambach demonstrates, the change in Heidegger's later writings did not reflect a departure from these commitments, but rather an encoding of his earlier ideas in a new form.⁶⁷ The critique of technology in terms of its uprooting of humanity and of scientific language as being rootless operates according to, and thereby continues, the same logic that structures the anti-Semitism of his 1930s lectures. It is within the language of 'dwelling' and 'gathering' and letting-be that the principle of *Bodenständigkeit* resurfaces as he calls for in a Memorial Address given in the 1950s:

... releasement toward things and an openness to mystery gives us the prospect of a new autochthony. This could one day even

⁶³Steiner 1981.

⁶⁴This is one of Val Plumwood's key criticisms of Deep Ecology in which the 'ecological' self echoes the expansive Being of Heidegger: "The other side of the self-contained master identity then is the incorporating, totalising, or colonising self, which recognises the other only as part of the empire of the same, as colonised or as assimilated to self. Such a self cannot recognise unassimilated otherness; it presses everywhere against the boundaries of the other, having no recognition of its own limits or of the other as a source of resistance, and is driven by an expansionary and aggrandising dynamic." – Plumwood 1993, pp. 157–158.

⁶⁵See Bookchin 1991 and the discussion in Zimmerman 1994, pp. 162–164.

⁶⁶See Næss 1997. This is not surprising for a philosopher such as Næss who worked within the analytic tradition that Heidegger had opposed and whose main contribution outside of Ecosophy was a theory of meaning in language based upon mathematical set-theory.

⁶⁷Bambach 2003.

be appropriate for calling back the old, now rapidly vanishing autochthony in a changed form.⁶⁸

It is this prospect of a “new autochthony” that attracts a new generation of right-wing thinkers to Heidegger, most notably Aleksandr Dugin in Russia, but there are others who see this as integral to an ecological approach. Describing the alt-right as “a philosophical descendent of Deep Ecology,” Brett Stevens explicitly seeks to revive and promote the right-wing dimensions of Heideggerian thought through their connection to the aims of the ecology movement.⁶⁹ He expresses this unity through the concept of what he calls an “organic society” that will be “something like an ecosystem,”⁷⁰ and will favour “hierarchy, aristocracy, culture-driven standards and transcendental goals.”⁷¹ Similar ideals are mirrored in the European *Nouvelle Droite* (‘New Right’) and *Génération Identitaire* which embeds ecological values and calls for greater biodiversity within principles of ‘ethnic differentialism’ (a form of nationalist separatism based on perceived racial and cultural difference) and the reassertion of ‘native’ white cultures.⁷²

Whilst not explicitly Heideggerian, the principle of autochthony permeates aspects of US conservationist culture. Sarah Jaquette Ray describes how the concept of ‘wilderness’ emerged out of a process of internalising the frontiersman ideology of colonial expansion, enabling the construction of a myth of new ethnic origins in the figure of the rugged, lone male shaped by their encounter with a ‘raw’ nature whilst simultaneously excluding those indigenous peoples who had originally lived there.⁷³

Dave Foreman, who was a founder member of Earth First! and developed the initial principles of rewilding, maintains that conservationism properly belongs within conservative politics and the ideals of the Republican Party of which he is a member.⁷⁴ For Foreman, rewilding builds upon the practice of maintaining reserved wilderness spaces through the re-introduction of lost

⁶⁸Quoted in Bambach 2003, p. 331.

⁶⁹Stevens 2017. Stevens celebrated Anders Breivik’s murder of teenagers in Norway at the Worker’s Youth Camp in 2011. In 2016, he was a co-organiser of the conference of Neoreactionary speakers at the LD50 gallery in London, see *LD50’s Fascist Conference in Hackney, Secrecy, and the Attempt to Introduce Racist Ideology into the London Artworld: A Brief Overview and Chronology* available at <https://shutdownd50.tumblr.com/>.

⁷⁰Stevens 2016.

⁷¹Stevens 2017.

⁷²For a detailed analysis and history of how these groups evolved and their involvement in the ecology movement see Ross 2017.

⁷³“Without being overtly racist, and backed by the authority of the new science of ecology, environmental views distinguished between those who belonged within America’s privileged boundaries and those who threatened its superior nature — understood both as physical wilderness and as the essential identity of the national body politic.” — Ray 2013, p. 15.

⁷⁴Lloyd 2005. Foreman and Earth First! have long since parted ways, with many in the movement now rejecting his approach.

predator species. The most basic principles of rewilding, those of the reintroduction of such species and development of potentially self-sustaining ecosystems have gained wide support among conservation biologists.⁷⁵ Yet, even some of its earliest proponents within the science community, such as Michael Soulé, acknowledge that Foreman's original conception was "mostly aesthetic and moral" and that the emphasis upon large predators could only be appropriate in certain contexts.⁷⁶ In Foreman's model the conservation of wilderness is directly linked to the control of human populations. Foreman, and the Rewilding Institute that he founded, promote restrictions on population growth and migration that reductively measure environmental impact in terms of a simple equation with population numbers that does not consider social and economic factors.⁷⁷ Foreman and the Rewilding Institute claim that population control must be applied across all humanity, yet it is always those who are not quite white enough who are portrayed as the most problematic and the most expendable.⁷⁸ It is those who are most adversely affected who become null:

... the worst thing we could do in Ethiopia is to give aid — the best thing would be to just let nature seek its own balance, to let the people there just starve ...⁷⁹

Rewilding, as formulated by Foreman, operates as a process of exclusion based upon a static concept of nature that is curated by man.⁸⁰ Foreman's rhetoric is echoed in Finnish environmentalist Pentti Linkola's demand that we need to be "cruel" in order to save nature from mankind, going beyond Foreman's stance to advocate terrorist acts as a means of population reduction.⁸¹ In the context of the Great Warming that accompanies the current Great Extinction migration due to climate change is already increasing and may well reach scales never previously experienced.⁸² This is not only a rootlessness of humans but of other life as well. An autochthonic model of national enclosure is no response to this. The danger is that the challenges

⁷⁵For an overview of different approaches see Lorimer, Sandom, Jepson, Doughty, Barua, and Kirby 2015.

⁷⁶Soulé and Noss 1998.

⁷⁷See Institute 2012, and Foreman 2013.

⁷⁸Foreman has also been active in supporting closure of the US-Mexican border through the campaign group Apply The Brakes linked with far-right funder Don Weeden, see Ross 2017.

⁷⁹Dave Foreman, quoted in Zimmerman 1994, p. 167.

⁸⁰Rewilding as a concept and a practice, however, does not exclusively belong to Foreman. There are those, for example, who link it to Ivan Illich's notion of de-schooling and explore tactics such as rewilding urban spaces. In this form rewilding may become not an enclosure but a coming-of nature through which it may indeed become 'self-willed' — the etymological origins of the word 'wilderness' that Foreman likes to recall.

⁸¹Linkola 1989.

⁸²See Parenti 2011.

of current environmental developments become coalesced around a politics that, if anything, will exacerbate rather than alleviate the situation, promoting a kind of species-centric nationalism (as we see in right-wing adoptions of bioregionalism) and catalysing the apocalyptic fantasies of Guillaume Faye.⁸³ It is not myth-making we should look to but rather something more akin to what Karen Barad calls *mattering*, the process through which “matter comes to matter,”⁸⁴ and of a conception of life that does not see the *chthonic* in terms of the extended self or a hierarchy of being.

What nourishes the plant

Before the protist comes the proton. The hydrogen nucleus extracted from a split atom of nitrogen was named ‘proton’ as the first (*proton* in Greek) fundamental particle.⁸⁵ The basic building block from which, it was then thought, all other nuclei were built. Each physical element is uniquely defined by the number of protons within its nucleus. Hydrogen, the water-forming, has one. Helium, the sun, has two. Lithium, the stone, has three. Then Beryllium four, Boron five, Carbon six, Nitrogen seven, and so on. Energy at a cellular level arises from the back and forth movement of protons across the cell’s outer membrane. The protists have this, the bacteria and archaea have this, and we have this too.

From cracks in the sea floor, warm alkaline waters surge up and into the cold acidic oceans. Chemicals react and precipitate into minerals and salts forming tunnel vents in the meeting of the two solutions. The proton-rich resources of the seawater cascade into the proton-poor alkaline creating energy along the gradient of their flow. It was in this thermodynamic transformation, arising spontaneously from geological movements, that the first cellular forms capable of extracting energy from their environment may have emerged. First as leaky pockets of proteins dependent upon the action of the vent waters, then gradually accruing more substantial proteins and molecules that enabled them to move beyond the vents and to spread, replicate and evolve — rootless and ungrounded.⁸⁶

Under the heat of the sun, the large surfaces of the oceans evaporate and are carried up into the air. If the water was pure H₂O it might remain here

⁸³Faye’s writing predicts a series of ecological and political catastrophes that will destroy modern civilization and give birth a new spiritualistic, neo-medieval society. He was part of *Nouvelle Droite* and is influential among right-wing adherents of both Primitivism and Accelerationism.

⁸⁴See Barad 2003 and Barad 2007.

⁸⁵Named by Ernest Rutherford (1871–1937) who split the atom in 1917.

⁸⁶What Wächtershäuser 1990 calls the “evolution of the first metabolic cycles.” For a detailed presentation of this theory see Lane 2016.

as a vaporous mist forever expanding gas-like across the horizon. But the proteins, minerals and bacteria caught within the mist create discrepancies in mass causing small gravitational attractions that pull fine droplets back towards one another. Clouds form. Carried by air currents they pass over dry land where differences in temperature and air pressure cause further coalescence. The mass increases within the cooling vapour, the droplets grow in size, succumb to earth's gravity and fall from the sky.

Where the rains fall the droplets trickle over the stones, run down between their cracks and soak into the soil where they gather. As the gathering beneath ground increases, it breaks the surface in small ponds, puddles and runlets and these in turn gather volume and speed and move, first slow and then gushing, pouring, running beneath the fence and down the path we climbed upon the hill.

As it runs over stones and through soil, water is transformed. Absorbing the chemicals set free by lichen and decomposed in the excretia of worms: phosphorus, nitrogen, sulphur. These in turn feed other microbial forms: bacteria, fungi, algae, are absorbed into plants and digested by animals.

Not far from the stones, 52 metres beneath the soil, groundwater gathers in a borehole. From here it is extracted and processed in the Treatment Works below the field and stored in the reservoir that supplies Lumsden's water. When we drink a glass of that water we pour the stones into our bodies. Within our guts a host of other bacteria break this down releasing nutrients that are absorbed into our blood. We sweat and salts exude through our pores. We bleed. We cry. We piss and shit our bodies back into the sea.

But this is no narrative of blood and soil or rootedness in the land. Such mythic stories are only possible because of their blindness and withdrawal, because of what they conceal or choose not to see. Deflating such narratives, the 19th century physiologist Jacob Moleschott (1822-1893) stated that "we are all similarly dependent on air and soil, on men and animals, on plants and stones."⁸⁷

Moleschott was one of a disparate groups of chemists, physicists and physicians, some inspired by the philosophy of Feuerbach, who were exploring how energy transfers from one medium to another within biological processes.⁸⁸ From this arose the notion of the metabolic cycle, through which matter was constantly broken down and built up to release and retain energy. Echoing the pre-Socratic philosophers, physical bodies were

⁸⁷Moleschott, *Die Lehre der Nahrungsmittel: Für das Volk*, 1850, p. 221, quoted in Gregory 1977, p. 88.

⁸⁸Others in this group included Justus von Liebig, Ludwig Büchner and Karl Vogt. For an historical analysis of this see Gregory 1977.

no longer viewed as stable, static entities but as the result of constant, temporal change.⁸⁹

For Moleschott this takes on quasi-religious dimensions that conflate global capital with prefigurations of the Gaia hypothesis: “For just as trade is the soul of commerce, the eternal circulation of material is the soul of the world.”⁹⁰ For Karl Vogt this inspired a commitment to libertarian free-market principles whilst Ludwig Büchner linked metabolic theory to the struggles of the working class, offering the analysis of fatigue and need for recuperation in support of shortening the working day.⁹¹

A keen follower of the developments in science, in personal correspondence with Büchner and others, Karl Marx (1818-1883) began to incorporate metabolic concepts into his theory of capital, adapting Hermann von Helmholtz’s notion of *Arbeitskraft* (labour-power).⁹² Through this, Marx equates the labour-power of the worker to the fertility of the soil as jointly subject to the intensification of production under capital, noting that:

...all progress in capitalist agriculture is a progress in the art, not only of robbing the worker, but of robbing the soil; all progress in increasing the fertility of the soil for a given time is a progress towards ruining the more long-lasting sources of that fertility. The more a country proceeds from large-scale industry as the background of its development, as in the case of the United States, the more rapid is this process of destruction. Capitalist production, therefore, develops technology, and the combining together of various processes into a social whole, only by sapping the original sources of all wealth — the soil and the worker.⁹³

Seeking a name for the worker who was no longer a peasant farmer or an artisan, Marx adopted the term *proletariat* from Roman constitutional law. The *proletarii* were those of lowest status in Roman society who owned no property and were valued only for their ability to produce children — *prōlēs* being Latin for ‘offspring’.

Whilst the clock and the steam engine enabled the abstraction of labour that creates the proletarian worker, it was the plantation that created the

⁸⁹“With each breath that passes from our lips we exhale part of the food we eat and of the water we drink. These change so quickly that we may well say that in a space of from four to six weeks we are materially quite different and new beings ...” — Ludwig Büchner, *Kraft und Stoff*, 1855 (1920 English), p.16, quoted in Wendling 2009, p. 64.

⁹⁰Jacob Moleschott, *Der Kreislauf des Lebens* (1857) p.40, quoted in Schmidt 1971, p. 87.

⁹¹For Vogt see Gregory 1977, pp. 195, 199-201, 204, for Büchner see Wendling 2009, pp. 77–81.

⁹²See Wendling 2009, p. 83.

⁹³Marx 1976, p. 638. The translation of the last sentence has been taken from a different source that is more direct than Fowkes’s version.

proletarian soil. Donna Haraway underlines this in arguing that it is the plantation that inaugurates the new relation between economy and nature, from which the need for an ecology, a study of nature in terms of the *oikos* arises. A plantation creates a controlled environment in which the extraction of resources can be maximised. Initially, the plantation was established within a colonial or dis-located space and dependent on imported labour (at first through slavery then later migrant workers) so as to abstract it from its immediate geographical and social context and thereby enable it to be managed as a self-contained ecosystem, as an *oikos* that is located not within the terrain of a nation or state but in terms of capital.⁹⁴ As the restructuring of land-ownership through enclosure displaced peasant communities and created a larger body of potential abstract labour the plantation was internalised as a space-out-of-nature that became the model for both the industrial farm and the factory.⁹⁵

Just as machinery enabled the intensification of production in labour, the intensification of production in soil was implemented through the importation of artificial fertilizers and minerals to control the acidity and nutrient balance of the soil. The constant depletion of resources from an external area, such as limestone from Banffshire, disrupted the normal flow of the metabolic cycle within the land resulting in what Marx called a “metabolic rift.”⁹⁶

Steam power connected the linear process of burning coal, resulting in the physical exhaustion of a resource, to the cyclical turn of the wheel that drove the transfer belt bringing factory machines to life. This linking of linear entropic processes to the *perpetuum mobile* of production is the spiral dance through which capital seeks to evade and keep ahead of its collapse. But the machine not only replaced, or transformed, the hand of the worker, it also transformed and replaced the processes through which the fertility of soil is maintained. This was particularly evident with nitrogen for which easily extractable naturally occurring resources were scarce. Nitrogen is extracted from the air by symbiotic bacteria from whom it is absorbed by plants. Grazing animals absorb that nutrition and return it through urine and excrement. Various pre-industrial farming systems maintained nitrogen levels by adding human waste to the fields.⁹⁷ Early Improvement farming methods relied on nitre deposits, from bat guano, imported over colonial trade routes.

⁹⁴See the discussion in Haraway, Ishikawa, Gilbert, Olwig, Tsing, and Bubandt 1991.

⁹⁵The crofting system in Scotland can be seen as a transitional part of this process. The Duke of Argyll, one of the first crofting lairds, based his crofting settlements on the layouts of his plantations in Jamaica.

⁹⁶For a summary of this see Saito 2014.

⁹⁷For a history of such practices and their eventual suppression see Laporte 2002.

In 1828 Friedrich Wöhler discovered a process through which *urea*, the chief chemical component of urine which helps release nitrogen, could be artificially synthesized. Justus von Liebig's work on organic chemistry led to the first artificial fertilizers in the mid-19th century and in 1910 the development of the Haber-Bosch process enabled large-scale industrial production of chemical fertilizers. The rift opened ever wider, with problems arising now more from over-use of nitrogen than from depletion. Relying on extreme heat, the Haber-Bosch draws heavily on fossil-fuel consumption. The spiral dance continues and those who wish to keep the wheel spinning place their hopes in the harvest of Rutherford's split atom.

Marx described *Das Kapital* as a natural history of capitalism's development. As such this was limited by the conceptions that the natural sciences of his day might offer. These were dominated by a notion of the organism as a discrete individual entity struggling against its environment which, to a large extent, Marx inherited. Metabolic theory began to break this down, conceiving of labour as a "process between man and nature," through which the worker "acts upon external nature and changes it, and in this way he simultaneously changes his own nature."⁹⁸ But early Marx retains the sovereignty of man over nature of liberal philosophy. This would shape the state socialist programs of the 20th century in their attempt to compete with and surpass capitalist development. Only in his later unpublished writings was he able to address the more-than-human dimensions of capital in detail.⁹⁹

The proletariat composes a political collectivity in terms of a common subjectivization. To reconceive the proletariat as both "the soil and the labourer" means realising a common subjectivization that is not wholly human. This also involves a rejection of the workers' state as *telos* which merely enfolds the conditions of capital into a permanent form.¹⁰⁰ A proletariat arises so as to nullify the very conditions that have created it and in doing so to erase the necessity of its own coming-to-be. In this sense, its relation to power is metabolic, it forms so as to transfer energy and in doing so dissipates itself into the newly emerging entity. The proletariat only truly comes into being through and during such transformation.¹⁰¹

In rejecting the organicism of liberal ecology how do we form such a collectivity? In responding to this, Haraway calls upon the idea of *sympoiesis*,

⁹⁸Marx 1976, p. 283.

⁹⁹See, for example, Saito 2016 and Rosemont 2009.

¹⁰⁰This was a key point of contention from Marx towards other labour movements of his day, as set out in the *Critique of the Gotha Programme* (1875).

¹⁰¹Perhaps only in the experiments of the early soviets, in the radical dissenters from the International such as the anarchist Piotr Kropotkin, or in the *tektology* of Alexander Bogdanov do we see glimpses of what a proletarian transformation of humanity *and* nature could be. For Kropotkin see Kina 1995, for Bogdanov see Wark 2016.

a term she adopts from M. Beth Dempster who describes it as a process in which collectively-produced systems evolve with no “self-defined spatial or temporal boundaries.”¹⁰² This builds upon the symbiotic processes identified by Margulis in relation to lichen and protists. Recent work in this field has begun to unravel how all animals “are composites of many species living, developing, and evolving together.”¹⁰³ Symbiotically, there is no such thing as an organic individual but rather assemblages of “interspecies communication.”¹⁰⁴ Symptosis extends this across the social and biological without collapsing one into the other — following from Haraway’s earlier figuration of the cyborg. There is no purely biological determinant of social being nor a purely social construction of material being but rather a co-creation of what Haraway calls “natural/social embodiment.”¹⁰⁵ This is neither orderly nor coherent in the sense of an organism but rather, “monstrous, nonholistic and dislocated” in the sense that Catriona Mortimer-Sandilands and Timothy Morton call a *Queer Ecology*.¹⁰⁶ Alex Johnson describes this as the principle of *and also*.¹⁰⁷ This *and also* expands through the most basic relations.

Just as shit marks the boundaries of a badger’s habitat but is also the passage of the world as it flows through us, excretia marks both the boundaries and continuum of care and of our “natural/social embodiment.” As parents and children we are obsessed with shit. We anxiously examine the changing colourations of our child’s first excrements. What my child excretes nourishes my soul. This materiality of care is the gut relation.¹⁰⁸ As the child enters the world it quickly acquires bacteria, first from the mother but then also from its environment, from its other relations and co-habitants. This expands as the child enters nursery and acquires bacteria from the care workers and other children. But the child is also a conduit, and the parents acquire bacteria and microbial enrichment from the child. Illnesses are transmitted from the nursery to the home, our immune systems synchronise. The parents’ digestive cycles and microbial constitution are altered. The smell and texture of our faeces echo one another. It is not simply that the parents produce a child but also that the child creates the parents. Not only that “the

¹⁰²Haraway 2016, p. 61.

¹⁰³Gilbert, Sapp, and Tauber 2012, p. 326.

¹⁰⁴Gilbert, Sapp, and Tauber 2012, p. 328.

¹⁰⁵Haraway 2004, p. 85.

¹⁰⁶Morton 2010.

¹⁰⁷Johnson 2011. “... if straight identity means *I am*, and gay identity means *I am not*, then queer can mean *I am also*.” — Alex Johnson, Johnson and Hoffner 2011.

¹⁰⁸Elizabeth Wilson proposes that it is through the gut even whilst in embryo that we first gain a sense of the relation between self and others: “... the infant is in intensive relations to external objects — to parts of the world, parts of its body, parts of other people that have been taken in through the gut. Right from the beginning, other things are a core part of me. Right from the beginning, I am impurely, relationally, enterically constituted.” — Wilson 2015, p. 39 (enteric: of the intestine).

child is father of the man” in a spiritual or emotional sense, as Wordsworth put it, but that biologically, at a certain level, I am my daughter’s offspring. I am the offspring of her nursery workers and of her friends and their families but also of their pets and other creatures we live among. I am the offspring of the soil in our gardens and the fields where our food comes from. We are all the offspring of the excretia of worms.

In this sense my daughter also unmakes me, unravels me from the genetic filiations of patrimony and from the organicist filiations of family, nation or tribe. Whilst a child is often the epitome of the kind of heteronormative relations that are reinforced in ideologies of an “organic society,” when seen from the perspective of a sympoiesis of bacterial kinships, the child can also become a questioning and queering of such relations. Like the gay and lesbian geese that Johnson describes, there are other ways of being parents. And like the wolf-girl in Angela Carter’s version of *Peter and the Wolf* there are other ways of being children, between families, between kinships and between species. When the wolf-girl returns, momentarily, to her human family she marks her filiation by shitting on the floor.¹⁰⁹

As Badiou remarks in his discussion of ‘democratic materialism’ (his term for the underlying philosophy of Western liberalism), such an ontology of *and also* risks constructing a cosmos of endless possibilities with no way forward, no possibility making anything other than endless difference: “a democracy without a (political) subject, [that will] deliver individuals over to the serial organization of identities ... [and] ... the desolation of their enjoyment.”¹¹⁰

For Badiou the political subject is that which forces a truth into being, which, despite Badiou’s Platonism, is not an eternal *eidos* but rather the condition of an ‘except-that’, something that forces the exception to current conditions. He expresses this in saying that: “There are only bodies and languages, except that there are truths.”¹¹¹ Badiou proposes that this requires a “subjectivizable body” to produce the exception, a body that is rarely ever “an organism endowed with biological identity,” not an organic individual therefore but rather a collectivity or concentration, the examples he gives being “the army of Spartacus, the semantics of a poem, the historical state of an algebraic problem.”¹¹²

For all the distance between the conceptions of the subject in Badiou and Haraway, and the tensions between them, Badiou suggests how the sympoiesis of *and also* may create the ‘except-that’, the necessity for life in a specific historical and material context. For Johnson this concentration of

¹⁰⁹Carter 1986, for an analysis of this story see Moss 2001.

¹¹⁰Badiou 2009, p. 50.

¹¹¹Badiou 2009, p. 4.

¹¹²Badiou 2009, p. 68.

I am also coalesces around the tar sands of Alberta.¹¹³ Haraway identifies this in the concentration created through Chico Mendes between workers' unions, indigenous peoples and the Amazonian rainforest.¹¹⁴

As Badiou acknowledges, such a truth as an 'except-that' may not be defined in terms of "the limits of the human species, our 'consciousness', our 'finitude', our 'faculties',"¹¹⁵ and that we us humans may not be able to experience or imagine what this might be.¹¹⁶ Yet we may have an attentiveness towards this that does not lie within an inner-subjectivity projected onto nature.¹¹⁷ In discussing a new artwork or aesthetic as a "subjectivizable body" Badiou suggests that its force arises from our confrontation with, and attention to, a materiality that demands we make with it in exception to that which we made before and how we made before. This suggests the possibility of an aesthetic as a way of knowing, not the privileged aesthetic of the artist but rather that of a sensitivity towards everyday being as it changes, produces and is produced. Yet, as the tensions and oppositions between Badiou and Morton's thinking suggest, this opens up many questions that may have no simple resolution.¹¹⁸

In conceiving of the world as in a state of disproportion that must be brought back into harmony, existing ecologism tends to conceive of the world in terms of a classical aesthetic that mirrors that of capital's conception of the market as a self-regulating flow.¹¹⁹ This is reflected in the privileging of the "nature's measure" in terms of an able-bodied ideal that is whole, balanced and integral.¹²⁰ But we have neither a perfect, holistic

¹¹³The campaign against Exxon's oil extraction project, Johnson and Hoffner 2011.

¹¹⁴... a constitutive social relationality in which the forest is an integral partner, part of natural/social embodiment. In their claims for authority over the fate of the forest, the resident peoples are articulating a social collective entity among humans, other organisms, and other kinds of non-human actors." — Haraway 2004, p. 85.

¹¹⁵Badiou 2009, p. 71.

¹¹⁶... we cannot know if the types of truths that we experience are the only possible ones. Either other species, unknown to us, or even our own species, in another phase of its history (for instance, as transformed by genetic engineering), could perhaps have access to types of truths of which we have no idea, and not even an image." — Badiou 2009, p. 71.

¹¹⁷As Rosi Braidotti argues, the internal subjectivity of self-as-nature endemic to various ecologies of both the 19th and 20th centuries are ultimately a projection of liberal individualism onto nature: "... Næss's deep ecology does not question the structures of possessive egoism and self-interest, but merely expands them to include non-human interests. What we end of up with, therefore, is a quantitative expansion of liberal individualism, but individualism nevertheless." — Braidotti 2006, p. 116.

¹¹⁸Badiou is dismissive of ecological movements which he sees as part of the wider problem of 'democratic materialism' in general whilst Morton has challenged the mathematical framing within which Badiou's philosophy sits, see: <http://ecologywithoutnature.blogspot.co.uk/2011/09/objects-consistency-badiou.html>.

¹¹⁹This notion of capital as a self-regulating flow was appropriated from thermodynamic theory by neo-classical economists but in a way that radically misread and misrepresented the physics, see Mirowski 1989.

¹²⁰The concept of nature's measure forms a key part of the mission statement of the Founda-

planet nor a perfect able body but more of a sympoiesis of leaky disequilibria propping each other up: a “gay matter,” that “degrades and relieves at the same time.”¹²¹ There is no myth in which to ground ourselves, no archaic origins, no futural destiny, just shit and bacteria. It is here then, perhaps, in a closeness to our most basic materiality that we should be attentive and seek the point of exception to that which now confronts us.

Called by nature, I stumble across stones, wire fence and boggy moss to the edge of the woods. Here I find a point where I may relieve myself of some metabolic allowance. But the winds blow strong here and my downward trickle becomes horizontal. Caught in the eddy of a higher power, it splatters against my leg, dampening my trousers with its mordant acidity and scattering translucent yellow dimples of scent upon the grass and pines. Scant pheremonal signs that no human, unaided, could ever discern but which a ruminative badger may chance upon, breathe in the full aromatic language of its constitution, and know, for definite, that I was here, passing through the richness of its world. Unconcealed in my being, standing on the edge of a forest, fumbling in my pants and pissing down my trousers. A small, warm pond gathers by my foot, nourishing the plants.

Worldless in my own, innate ignorance of badgers, I return to the stones, waiting as they dissolve slowly under the gestations of lichen. They will be here longer than I will, but they will not be here forever, for at a certain temporality nothing is so liquid as stone.

tion for Deep Ecology (<http://www.deepecology.org/mission.htm>) which ends with the words: “... Nature provides the ultimate measure by which to judge human endeavours.” Yet how do we understand or even perceive this measure, what ‘Nature’ do we look to? Ironically, such a statement, whilst seeming to confer authority to a standard independent of human politics only embroils us deeper within its disputes. For an analysis of the reliance of environmental and ecologist culture’s reliance on the idealised able-body metaphor see Ray 2013.

¹²¹Bakhtin 1968, p. 335.

- Arendt, H. (1998). *The Human Condition* (Second ed.). Chicago: University of Chicago Press.
- Aristotle (1958). *The Politics of Aristotle*. Oxford: Oxford University Press. Translated with an introduction, notes and appendixes by Ernest Barker.
- Aristotle (1984a). Movement of Animals. In J. Barnes (Ed.), *The Complete Works of Aristotle: The Revised Oxford Translation*, Volume One, pp. 1086–1096. Princeton: Princeton University Press.
- Aristotle (1984b). *The Athenian Constitution*. London: Penguin. Translated with an introduction and notes by P.J. Rhodes.
- Badiou, A. (2009). *Logics of Worlds: Being and Event II*. Continuum: London, New York. Translated by A. Toscano.
- Bakhtin, D. (1968). *Rabelais and His World*. Cambridge, MA and London: MIT Press. Translated by H. Iswolsky.
- Bambach, C. (2003). *Heidegger's Roots: Nietzsche, National Socialism, and the Greeks*. Ithaca and London: Cornell University Press.
- Bang, P. and P. Dahlström (2001). *Animal Tracks and Signs*. Oxford: Oxford University Press.
- Barad, K. (2003, Spring). Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter. *Signs* 28(3), 801–831.
- Barad, K. (2007). *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham, NC. and London: Duke University Press.
- Beck, N. (2009). The *Origin* and Political Thought: From Liberalism to Marxism. In M. Ruse and J. Richards, Robert (Eds.), *The Cambridge Companion to the "Origin of Species"*, pp. 295–313. Cambridge: Cambridge University Press.
- Blundell, S. (1995). *Women in Ancient Greece*. Cambridge, Massachusetts: Harvard University Press.
- Bookchin, M. (1991, December). Will Ecology Become 'the Dismal Science'? *The Progressive*, 18–21.
- Braidotti, R. (2006). *Transpositions: On Nomadic Ethics*. Cambridge: Polity Press.
- Calarco, M. (2008). *Zoographies: The Question of the Animal from Heidegger to Derrida*. New York: Columbia University Press.
- Carter, A. (1986). Peter and the Wolf. In *Saints and Sinners*, pp. 57–67. Harmondsworth: Penguin.

- Cox, C. A. (1998). *Household Interests: Property, Marriage Strategies, and Family Dynamics in Ancient Athens*. Princeton: Princeton University Press.
- Darwin, C. (1972). *The Formation of Vegetable Mold Through the Action of Worms: With Observations on their Habits*. Cambridge Library Collection. Cambridge: Cambridge University Press. Facsimile of edition published in 1881.
- Evans, G. E. (2013). *The Pattern Under the Plough*. Portland: Little Toller Books.
- Fitter, R. S. R. (1984). *London's Natural History*. Collins New Naturalist Series. London: Collins. First published 1945.
- Foreman, D. (2013, Autumn). More Immigration = More Americans = Less Wilderness. *Earth Island Journal*. Available online: <http://www.earthisland.org/journal/index.php/eij/article/foreman/>.
- French, R. (1994). *Ancient Natural History: Histories of Nature*. London and New York: Routledge.
- Gasman, D. (1971). *The Scientific Origins of National Socialism: Social Darwinism in Ernst Haeckel and the German Monist League*. London and New York: Macdonald and Elsevier.
- Gilbert, O. L. (1991). *The Ecology of Urban Habitats*. London: Chapman & Hall.
- Gilbert, S. F., J. Sapp, and A. I. Tauber (2012). A symbiotic view of life: We have never been individuals. *The Quarterly Review of Biology* 87(4), 325–341.
- Goode, D. (2014). *Nature in Towns and Cities*. Collins New Naturalist Library. London: William Collins.
- Gooley, T. (2014). *The Walker's Guide to Outdoor Clues and Signs*. London: Hodder & Stoughton.
- Gregory, F. (1977). *Scientific Materialism in Nineteenth Century Germany*, Volume 1 of *Studies in the History of Modern Science*. Dordrecht and Boston: D. Reidel.
- Haeckel, E. (2000). *Art Forms in Nature*. Dover Pictorial Archive. London: Dover.
- Haraway, D., N. Ishikawa, S. F. Gilbert, K. Olwig, A. Tsing, and N. Bubandt (1991). Anthropologists Are Talking — About the Anthropocene. *Ethnos* 81(3), 535–564.
- Haraway, D. J. (2003). *The Companion Species Manifesto: Dogs, People, and Significant Otherness*. Chicago: Prickly Paradigm Press.
- Haraway, D. J. (2004). The Promises of Monsters: A Regenerative Politics for Inappropriate/d Others. In *The Haraway Reader*, pp. 63–124. New York and London: Routledge.
- Haraway, D. J. (2008). *When Species Meet*. Minnesota: University of Minnesota Press.

- Haraway, D. J. (2016). *Staying With the Trouble: Making Kin in the Chthulucene*. Durham and London: Duke University Press.
- Harvey, D. (2006). *The Limits to Capital*. London: Verso.
- Heidegger, M. (1977). The Question Concerning Technology. In W. Lovitt (Ed.), *The Question Concerning Technology and Other Essays*, pp. 3–35. New York: Harper & Row.
- Heidegger, M. (1996). *Hölderlin's Hymn "The Ister"*. Bloomington and Indianapolis: Indiana University Press. Translated by W. McNeil and J. Davis.
- Heidegger, M. (2008). *The Fundamental Concepts of Metaphysics: World, Finitude, Solitude*. Bloomington: Indiana University Press. A lecture course presented in 1929 and 1930.
- Heidegger, M. (2013). *Nature, History, State, 1933–1934*. London: Bloomsbury.
- Institute, T. R. (2012). Human Population Growth.
<http://rewilding.org/rewildit/our-programs/population-growth/>.
- Johnson, A. (2011, March). How to Queer Ecology: One Goose at a Time. *Orion Magazine* 125(2), 1–19.
- Johnson, A. and E. Hoffner (2011). How to Queer Ecology and the Environmental Movement.
<http://grist.org/article/2011-03-28-sex-geese-and-the-queering-of-ecology/>.
- Johnson, M. (1991). Dalradian. In G. Craig (Ed.), *Geology of Scotland*, pp. 125–160. London: The Geological Society.
- Kina, R. (1995). Kropotkin's Theory of Mutual Aid in Historical Context. *International Review of Social History* 40, 259–283.
- Lane, N. (2016). *The Vital Question: Why is life the way it is?* London: Profile Books.
- Laporte, D. (2002). *History of Shit*. Cambridge, MA and London: MIT Press.
- Laundon, J. R. (1980). *Lichens*. Shire Natural History. Princes Risborough: Shire.
- Lewontin, R. C. (1998). The Maturing of Capitalist Agriculture: Farmer as Proletarian. *Monthly Review*, 72–84.
- Liddel, P. (2010). *Metabole Politeion* as Universal Historiography. In P. Liddel and A. Fear (Eds.), *Historiae Mundi: Studies in Universal Historiography*, pp. 15–30. London: Duckworth.
- Linkola, P. (1989). Humanflood. Translated by Harri Heinonen and Michael Moynihan,
http://www.penttilinkola.com/pentti_linkola/ecofascism_writings/humanflood/.

- Lloyd, J. (2005, December). Redneck For Wilderness Earth First! Cofounder Dave Foreman On Being A True Conservative. *The Sun Magazine* (360), 4–13. Available online: http://thesunmagazine.org/_media/article/pdf/360_Foreman.pdf.
- Lorau, N. (2000). *Born of the Earth*. Ithaca and London: Cornell University Press.
- Lorimer, J., C. Sandom, P. Jepson, C. Doughty, M. Barua, and K. J. Kirby (2015). Rewilding: Science, Practice, and Politics. *Annual Review of Environment and Resources* 40, 39–62.
- Margulis, L. (1998). *The Symbiotic Planet: A New Look at Evolution*. London: Weidenfeld & Nicolson.
- Margulis, L., J. O. Corliss, M. Melkonian, and D. J. Chapman (Eds.) (1989). *Handbook of Protoctista: the structure, cultivation, habitats and life histories of the eukaryotic microorganisms and their descendents exclusive of animals, plants and fungi: a guide to the algae, ciliates, foraminifera, sporozoa, water molds, slime molds and the other protoctists*. Boston: Jones and Bartlett.
- Marie Leroi, A. (2014). *The Lagoon: How Aristotle Invented Science*. London: Bloomsbury.
- Marx, K. (1976). *Capital: A Critique of Political Economy, Volume I*. Harmondsworth: Penguin.
- Mirowski, P. (1989). *More heat than light: Economics as social physics: Physics as nature's economics*. Cambridge: Cambridge University Press.
- Mitropoulos, A. (2012). *Contract and Contagion: From Biopolitics to Oikonomia*. Wivenhoe: Minor Compositions.
- Morton, T. (2010, March). Queer Ecology. *Publications of the Modern Language Association* 125(2), 1–19.
- Moss, B. (2001). Desire and the Female Grotesque in Angela Carter's "Peter and the Wolf". In D. M. Roemer and C. Bacchilega (Eds.), *Angela Carter and the Fairy Tale*, pp. 187–203. Detroit: Wayne State University Press.
- Nichols, D. (2009). Antigone's Autochthonous Voice: Echoes in Sophocles, Hölderlin, and Heidegger. In S. Dempsey and D. Nichols (Eds.), *Time, Memory, and Cultural Change*, Volume 25 of *IWM Junior Visiting Fellows' Conferences*, Vienna. Institut für die Wissenschaften vom Menschen.
- Næss, A. (1984). The Arrogance of Anti-Humanism. *Ecophilosophy* (8), 8–9.
- Næss, A. (1997). Heidegger, Postmodern Theory and Deep Ecology. *The Trumpeter* 14(4).
- Parenti, C. (2011). *Tropic of Chaos: Climate Change and the New Geography of Violence*. New York: Nation Books.

- Perelman, M. (1984). *Classical Political Economy: Primitive Accumulation and the Social Division of Labour*. Totowa: Rowman and Allanheld.
- Plumwood, V. (1993). *Feminism and the Mastery of Nature*. London and New York: Routledge.
- Ray, S. J. (2013). *The Ecological Other: Environmental Exclusion in American Culture*. The University of Arizona Press: Tucson.
- Rosemont, F. (2009). Karl Marx and the Iroquois. *LibCom*. Online version: <http://libcom.org/library/karl-marx-iroquois-franklin-rosemont>.
- Ross, A. R. (2017). *Against the Fascist Creep*. AK Press: Oakland, Edinburgh.
- Saito, K. (2014). The Emergence of Marx's Critique of Modern Agriculture. *Monthly Review* 66(5). Online version: <http://monthlyreview.org/2014/10/01/the-emergence-of-marxs-critique-of-modern-agriculture/>.
- Saito, K. (2016). Marx's Ecological Notebooks. *Monthly Review* 67(9). Online version: <http://monthlyreview.org/2016/02/01/marxs-ecological-notebooks/>.
- Schabas, M. (2005). *The Natural Origins of Economics*. Chicago and London: University of Chicago Press.
- Schmidt, A. (1971). *The Concept of Nature in Marx*. London: NLB.
- Soulé, M. and R. Noss (1998). Rewilding and Biodiversity: Complementary Goals for Continental Conservation. *Wild Earth* (8), 19–28. Available online: <http://academic.evergreen.edu/curricular/MES/rewilding.pdf>.
- Stauffer, R. C. (1957). Haeckel, Darwin, and Ecology. *The Quarterly Review of Biology* 32(2), 138–144.
- Steiner, G. (1981, October 9). The House of Being. *Times Literary Supplement* 20, 1143–1144.
- Stevens, B. (2016). The Organic Critique of Modernity. <http://www.amerika.org/science/the-organic-critique-of-modernity/>.
- Stevens, B. (2017). Deep Ecology And The Alt Right. <http://www.amerika.org/politics/deep-ecology-and-the-alt-right/>.
- Stourzh, G. (1988). Constitution: Changing Meanings of the Term from the Early Seventeenth to the Late Eighteenth Century. In T. Ball and J. Pocock (Eds.), *Conceptual Change and the Consitution*, pp. 35–54. Lawrence KS: University Press of Kansas.
- Wark, M. (2016). *Molecular Red: Theory for the Anthropocene*. London: Verso.
- Wendling, A. E. (2009). *Karl Marx on Technology and Alienation*. Basingstoke: Palgrave.

- Wheater, C. P. (1999). *Urban Habitats*. London and New York: Routledge.
- Whittow, J. (1977). *Geology and Scenery in Scotland*. Harmondsworth: Penguin.
- Wilkie, Rhoda, M. (2010). *Livestock/Deadstock: Working with Farm Animals from Birth to Slaughter*. Philadelphia: Temple University Press.
- Wilson, E. A. (2015). *Gut Feminism*. Durham and London: Duke University Press.
- Woolfson, E. (2013). *Field Notes From a Hidden City: An Urban Nature Diary*. London: Granta.
- Wächtershäuser, G. (1990, January). Evolution of the First Metabolic Cycles. *Proceedings of the National Academy of Science* 87, 200–204.
- Zimmerman, M. E. (1990). *Heidegger's Confrontation with Modernity: Technology, Politics and Art*. Bloomington and Indianapolis: Indiana University Press.
- Zimmerman, M. E. (1994). *Contesting Earth's Future: Radical Ecology and Postmodernity*. Berkeley, Los angeles and London: University of California Press.

The walks were conducted at different times over a period between November 2014 and March 2017. The dates given to the walks are those on which I was accompanied by Kirsty Stansfield and Belle Yuill. I would like to thank Yvonne Billimore, Pat Dunn, Edith Petrie, and Alison Williamson for their help and history of the local area and Emma Balkind and Nuno Sacramento for their contributions to the discussion around and development of ideas in these essays.

First published 2017 by the Scottish Sculpture Workshop as part of *Frontiers in Retreat*. This edition of *On a Proletarian Soil* was originally produced for *Edge Effects*, curated by the Scottish Sculpture Workshop at CCA: Glasgow, July 2017 and revised in April 2018.

This version is the third in a series of draft essays produced for *Frontiers in Retreat*. The others in the series are *The Uncommonality of the Commons* and *The Biconditionality of Craft And Kraft* and *On a Proletarian Soil, Part II: Tree*. These have been published as a set of fascicles, a format in which a book is published as a series of instalments or extracts – the fascicles – rather than as a single volume. The page numbering of each new fascicle continues from the end of the previous one.



This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.