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Bindings against boundaries: entanglements of life in an open world

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Abstract. In this paper I argue that to inhabit the world is to live life in the open. Yet philosophical attempts to characterise the open lead to paradox. Do we follow Heidegger in treating the open as an enclosed space cleared from within, or Kant (and, following his lead, mainstream science) in placing the open all around on the outside? One possible solution is offered by Gibson in his ecological approach to perception. The Gibsonian perceiver is supported on the ground, with the sky above and the earth below. Yet in this view, only by being furnished with objects does the earth – sky world become habitable. To progress beyond the idea that life is played out upon the surface of a furnished world, we need to attend to those fluxes of the medium we call weather. To inhabit the open is to be immersed in these fluxes. Life is lived in a zone in which earthly substances and aerial media are brought together in the constitution of beings which, in their activity, participate in weaving the textures of the land. Here, organisms figure not as externally bounded entities but as bundles of interwoven lines of growth and movement, together constituting a meshwork in fluid space. The environment, then, comprises not the surroundings of the organism but a zone of entanglement. Life in the open, far from being contained within bounded places, threads its way along paths through the weather world. Despite human attempts to hard surface this world, and to block the intermingling of substance and medium that is essential to growth and habitation, the creeping entanglements of life will always and eventually gain the upper hand.

Open and closed

I should like to begin with a simple experiment. Take a pen and a sheet of plain paper (or a piece of chalk and a blackboard) and draw a rough circle, as I have done in figure 1. How should we interpret this line? Strictly speaking, it is the trace left by the gesture of your hand as, holding the pen (or chalk), it alighted on the surface and took a turn around before continuing on its way to wherever it would go and whatever it would do next. However, viewing the line as a totality, ready drawn on the surface, we might be inclined to reinterpret it quite differently—not as a trajectory of movement but as a static perimeter, delineating the figure of the circle against the ground of an otherwise empty plane. With this figure we seem to have set up a division between what is on the 'inside' and what is on the 'outside'. Now this interpretation, I contend, results from the operation of a particular logic that has a central place in the structure of modern thought. I call it the logic of inversion (Ingold, 1993). In a nutshell, what it does is to turn the pathways along which life is lived into boundaries within which life

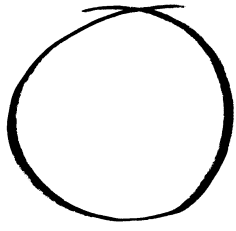

Figure 1. A drawn circle. Is the line the trajectory of a movement or the perimeter of a figure?

is contained. Life, according to this logic, is reduced to an internal property of things that *occupy* the world but do not properly *inhabit* it. A world that is occupied, I argue, is furnished with already-existing things. But one that is inhabited is woven from the strands of their continual coming-into-being.

My purpose is to recover the sense of what it means to inhabit the world. To achieve this, I propose to put the logic of inversion into reverse. Life having been, as it were, installed inside things, I now want to restore these things to life by returning to the currents of their formation. In so doing, I aim to show that to inhabit the world—rather than to occupy it—is to live life, as we say colloquially, 'in the open'. There is at first glance something oxymoronic about this phrase. To be 'in' surely implies some notion of placement within limits or bounds. Openness, on the other hand, suggests the absence of limit. Kenneth Olwig (2002) has shown how this very duplicity is inherent in the Germanic concept of *Raum*, which, though etymologically cognate with the English 'room', carries much stronger connotations both of openness and of closure, of space and place. To appreciate the difference, you have only to compare the English 'living room' with the German *Lebensraum*. For English speakers the 'room' is simply an interior compartment of a house, while 'living' comprises a suite of everyday activities that residents would undertake in it. In the notion of *Lebensraum*, by contrast, the meaning of life comes closer to what the philosopher Martin Heidegger (1971) identified as the foundational sense of dwelling: not the occupation of a world already built but the very process of inhabiting the earth.

For Heidegger the *Raum* of dwelling meant far more than an indoor space. It is, as he put it, a clearing for life that makes possible such activities as building and cultivation, making things and growing things (Heidegger, 1971, page 154). To build or to cultivate, he reasoned, one must already *be*, and to be one must stay or abide in a place. But if the place is a clearing, 'freed for settlement or lodging', then it must have a boundary. Thus a clearing in the forest stretches to the edge of the woods, and of a woodland creature that has emerged from the forest to graze in the clearing we might say that it has 'come out into the open'. As a space, the clearing is open, but as a place in the world, it is enclosed.[1] It was this duplicity, Olwig argues (2002, page 7), that allowed Nazi propagandists, in the run-up to the Second World War, to seize upon the notion of *Lebensraum* as justification at once for the unlimited expansion and for the bounded self-sufficiency of the German nation. Somewhat complicit in this enterprise himself, Heidegger was nothing if not equivocal on the matter. For having insisted that clearing, as 'making room', extends to a boundary, he promptly went on to characterise this boundary as a horizon, "not that at which something stops but ... that from which something *begins its presencing*" (1971, page 154, emphasis in original). Far from being hedged around by as yet uncleared land, the inhabitant now appears ensconced in a world that extends as far as the eye can see.

Horizons do not contain or enclose. Nor can they ever be reached or crossed since, like the rainbow's end, they move as you do. When, from where you stand, others are seen coming over the horizon or disappearing out of sight, they have not themselves crossed any boundary that is apparent on the ground, such as the edge of a clearing or a city wall. Yet if a domain that is open to the horizon is unbounded, how can it be inhabited? How can any being possibly find a place there? In a celebrated discussion, Immanuel Kant described the earth, as it would appear to his senses, "as a flat surface, with a circular horizon" (1933, page 606). As he moves, so does the circle around him.

[1] As Paul Harrison notes, the 'taking place' of dwelling, in Heidegger's thought, presupposes that a being is already *in* place, "such that the event of taking-place is itself reined in and contained" (2007, page 634). What then, Harrison asks rhetorically, "of the world and of Heidegger's words on openness?"

Thus, while he is always at the centre of his circular field of vision, that field is nowhere. He cannot position it. Were he dependent on his senses alone, he could position himself only in relation to his own body, as if to say 'I am where I am', and not in relation to the world which appears to spread without limit in all directions. That he nevertheless knows his whereabouts is, according to Kant, because his mind is able to apply to the evidence of his senses "an extended concept of the whole surface of the earth" (1970, page 262; see also Richards, 1974, page 11). This concept is of the earth as a sphere. Though he cannot know from immediate experience that the earth is spherical in form, this concept allows him to imagine the world as a totality that is at once continuous, unified, and complete. With this, rather than merely accumulating the data of sensory perception, it is possible to situate these data in relation to a coherent whole.

In this Kantian cosmology, creatures do not find themselves on the inside of a clearing that has been opened up, but on the outside of a globe that is already sealed. They do not, then, live *within* the world but *upon* its outer surface. In the words of Kant himself, "the world is the substratum and the stage on which the play of our skills proceeds" (1970, page 257). Life, then, is played out upon this stage. It seems that, whereas Heidegger can only open up the world to habitation by imagining the horizon as a boundary of enclosure, Kant—in his admission that horizons are not boundaries and do not enclose—allows beings into the open only by expelling them from the world. They are no longer inhabitants but exhabitants. It is, moreover, this Kantian view that has come to dominate the project of modern science. For science imagines a world of nature, or a material world, that is set over against the mind of the knowing subject. The global topology of the earth's surface then comes to stand for the fundamental idea, which the mind is said to bring to experience, of the unity, completeness, and continuity of nature. It is at this surface—conceived as an interface not just between the solid substance of the earth and its gaseous atmosphere but between matter and mind, and between sensation and cognition—that all knowledge is constituted (Ingold, 2000, pages 212 – 214).

Developmental psychologists have devoted some attention to the processes by which children, against the evidence of their senses, acquire what is regarded as a 'scientifically correct' concept of the shape of the earth, as a solid sphere surrounded by space. They have designed experiments in which children are asked either to draw the earth in outline, or to rank a series of preprepared picture cards according to how well they match their understanding (Nobes et al, 2005; Vosniadou and Brewer, 1992; see Ingold, 2008, pages 17 – 23). Children with the 'correct' understanding draw the earth as a ball and, if asked to add people to the picture, stick them around the circumference. Admittedly, as one pair of researchers write, "the idea that we live all around on the outside of a spherical earth is counter-intuitive, and does not agree with everyday experience" (Vosniadou and Brewer, 1992, page 541). Nowhere was this inconsistency between scientific and experiential knowledge more evident than when these researchers asked their subjects, having drawn the earth and the people, to add the sky. Children were perplexed by this, as, indeed, adults would be. For how can the sky possibly be depicted in a way that accords with the canons of 'scientific correctness'? One might, perhaps, add a halo to indicate the enveloping of the earth in its atmosphere, but the atmosphere is not what we know as the sky. Like the horizon to which it extends, the sky belongs to the phenomenal rather than the physical order of reality. And to understand this phenomenon we have to return to the perspective of inhabitants (Ingold, 2008, page 23).

Sky and earth[(2)]

In the psychology of perception, the ecological approach pioneered by James Gibson (1979) is almost unique in its attempt to offer some account of the sky. Gibson positions the inhabitant not on the outer surface of a solid sphere but at the very core of what he calls "an unbounded spherical field" (1979, page 66). This field comprises two hemispheres: of the sky above and of the earth below. At the interface between upper and lower hemispheres, and stretching out to the 'great circle' of the horizon, lies the ground upon which the inhabitant stands (page 162). The ground is a surface; indeed, for terrestrial animals it is the most important of surfaces, since it provides their basic support (pages 10, 33). But it is a surface *in* the world, not *of* it (see figure 2). With their feet planted in the ground and their lungs inhaling the air, inhabitants straddle a division not between the material world and the world of ideas, but between the more or less solid *substances* of the earth and the ambient, volatile *medium* in which they are immersed (pages 16 – 22). Every surface in the inhabited environment, according to Gibson, is established by the separation of substances from the medium. Like surfaces of all sorts, the ground has a characteristic, nonhomogeneous texture which enables us to tell what it is a surface *of*: whether, for example, it is of bare rock, sand, soil, or concrete (pages 22 – 31). We can recognise the texture visually because of the characteristic scatter pattern in the light reflected from the surface. Conversely, however, if there is no discernible pattern in the ambient light, then there is no identifiable texture, and instead of perceiving a surface we see an empty void (pages 51 – 52).

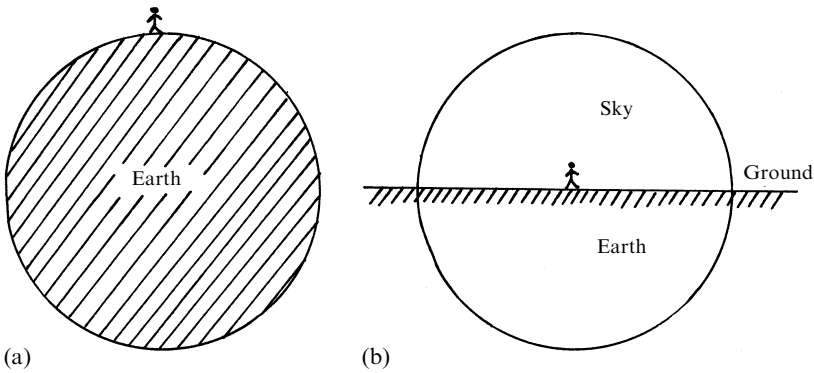

Figure 2. The world sphere according to (a) Kant and (b) Gibson.

The perception of the sky offers a case in point. Suppose that we cast our eyes upwards, from the ground on which we stand to the clear blue sky of a summer's day. As our gaze rises above the line of the horizon, it is not as though another surface hoves into view. Rather, the textureless blue of the sky signifies boundless emptiness. Nothing is there. Amidst this void, of course, there may exist textured regions that specify the surfaces, for example, of clouds *in* the sky. From a shower cloud, rain falls, leaving puddles on the ground. When the sun comes out again and the puddle dries up, the surface of water gives way to reveal another, of dry mud, in its place. But when the cloud, drained of moisture, eventually disperses, it vanishes to leave no surface at all (Gibson, 1979, page 106). For the sky has no surface. It is open. Thus, life lived under the sky is lived *in the open*, not within the confines of a hollow hemisphere with a flat base and a domed top. But having said that, Gibson goes on to acknowledge that "an open environment is seldom or never realised" and that life within such an environment would be all but impossible. Imagine an absolutely level earth, extending in

[(2)] This section partially overlaps with material presented elsewhere (Ingold, 2008, pages 23 – 26).

all directions to the horizon without any obstruction, under a cloudless sky. It would be a desolate place indeed! "It would not be quite as lifeless as geometrical space", Gibson admits, "but almost". You could stand up in it, walk, and breathe, but not much else (1979, page 78).

No ordinary environment is like that, however. Rather, it is 'cluttered' with every kind of thing, from hills and mountains to animals and plants, objects and artefacts. Or to put it another way, the environment is *furnished*. "The furniture of the earth", Gibson continues, "like the furnishings of a room, is what makes it liveable". A cloudless sky, in these terms, would be uninhabitable, and could not, therefore, form any part of the environment for a living being. Birds could not fly in it. And an empty earth provides a terrestrial animal with nothing more than basic support; "the furniture of the earth", as Gibson puts it, "affords all the rest of behaviour" (1979, page 78). Indeed, it seems that, so long as they are stranded in the open, Gibsonian perceivers are as much exhabitants of the world as is the Kantian traveller who roams its outer surface, or the figures depicted in the psychological experiments described earlier, purportedly consistent with scientific understanding, which are placed 'all around on the outside' of the spherical earth. Like actors on the stage, they can make their entrance only once the surface has been furnished with the properties and scenery that make it possible for the play to proceed. Roaming around as on a set, or like a householder in the attic, they are fated to pick their way amidst the clutter of the world. It seems that, for all his efforts to describe the world from an inhabitant's point of view, Gibson is drawn to the conclusion that the terrestrial environment becomes habitable only to the extent that it is no longer open but enclosed. Such enclosure may never be more than partial, but for just that reason the inhabitant inevitably remains, to an extent, an exile.[3]

Gibson is adamant that the inhabited environment does not comprise *just* the furniture of the world, any more than it comprises *just* earth and sky, empty of content. It must, rather, comprise both together, consisting—in his words—"of the earth and the sky with objects *on* the earth and *in* the sky, of mountains and clouds, fires and sunsets, pebbles and stars" (1979, page 66, emphasis in original). It is worth pausing to consider some of the things he takes to be objects: on the earth there are mountains, pebbles, and fires; in the sky there are clouds, sunsets, and stars. Of the things on the earth, perhaps only pebbles can be regarded as objects in any ordinary sense, and, even then, only if we consider each individual stone in isolation from its neighbours, from the ground on which it lies, and from the processes that brought it there. The hill is not an object on the earth's surface but a formation of that surface,

[3] Gibson's conclusion bears comparison with that of Gilles Deleuze, who asks us to imagine a world without others. In such a world, epitomised by Robinson Crusoe's island, "only the brutal opposition of sky and earth reigns with an unsupportable light and an obscure abyss" (Deleuze, 1984, page 56). However, for Deleuze this brutality, or desolation, is not assuaged merely by the presence of furniture. In a world that is furnished, yet devoid of others, objects rise up menacingly ahead or strike from behind. One experiences this as the force and pain of collision—of constantly bumping into things along their hard edges. When others are present, by contrast, there can be a sharing of viewpoints—a convergence of visual attention from multiple positions—that enables one to see around things, softening their outlines and allowing them "to incline towards each other" (page 56). For Gibson, however, the presence of others makes no difference: "the environment surrounds all observers in the same way that it surrounds the single observer" (1979, page 43). This is because observations are taken not from points at all, but along paths of movement. Over time, one can be in all places, just as all others can be in the place where one is now. It is the movement around, according to Gibson, and not the pooling of observations from multiple fixed points, that softens the edges of things, making possible what Deleuze (1984, page 56) calls "the margins and transitions in the world", regulating "variations of depth" and preventing "assaults from behind".

which can appear as an object only through its artificial excision from the landscape of which it is an integral part. And the fire is not an object but a manifestation of the process of combustion. To turn to the sky: stars, whatever their astronomical significance, are perceived not as objects but as points of light, and sunsets are perceived as the momentary glow of the sky as the sun vanishes beneath the horizon. Nor are clouds objects. Each is, rather, an incoherent, vaporous tumescence that swells and is carried along in the currents of the medium. To observe the clouds is not to view the furniture of the sky but to catch a fleeting glimpse of a sky-in-formation, never the same from one moment to the next.

Indeed, in a world that is truly open there are no objects as such. For the object, having closed in on itself, has turned its back on the world, cutting itself off from the paths along which it came into being and presenting only its congealed, outer surfaces for inspection. That is to say, the 'objectness' of things—or what Heidegger (1971, page 167) called their 'over-againstness'—is the result of an inversion that turns the lines of their generation into boundaries of exclusion. The open world, however, has no such boundaries, no insides or outsides, only comings and goings. Such productive movements may generate formations, swellings, growths, protuberances, and occurrences, but not objects. Thus, in the open world hills rise up, as can be experienced by climbing them or, from a distance, by following the contours with one's eyes.[4] Fires burn, as we know from their flickering flames, the swirling of smoke, and the warming of the body. And pebbles grate. It is, of course, this grating that gives rise to their rounded forms; tread on them, and that is what you hear underfoot. In the sky, the sun shines by day and the moon and stars by night, and clouds billow. They *are*, respectively, their shining and billowing, just as the hills *are* their rising, the fire *is* its burning and the pebbles *are* their grating.

In short, and contrary to Gibson's contention, it is not through being furnished with objects that the open sphere of sky and earth is turned into a habitable environment. The furnished world is a full-scale model—a world brought indoors and reconstructed within a dedicated, enclosed space. As in a stage set, hills are placed on the ground, while stars, clouds, and the sun and moon are hung from the sky. In this *as if* world, hills do not rise, nor do fires burn or pebbles grate, nor do the sun, moon, and stars shine or the clouds billow. They may be made to look as though they do, but the appearance is an illusion. Absolutely nothing is going on. Only once the stage is set, and everything made ready, can the action begin. But the open world that people inhabit is not prepared for them in advance. It is continually coming into being around them. It is a world, that is, of formative and transformative *processes*. If such processes are of the essence of perception, then they are also of the essence of what is perceived. To understand how people can inhabit this world means attending to the dynamic processes of world formation in which both perceivers and the phenomena they perceive are necessarily immersed. And, to achieve this, we must think again about the relations between surfaces, substances, and the medium.

Land and weather

To make a start, let me return to Heidegger. Like Gibson, Heidegger also recognises that people live 'on the earth' and 'under the sky'. But his description of earth and sky could hardly be more different from Gibson's. In place of nouns describing objects of furniture, Heidegger's description is replete with verbs of growth and motion. Earth, writes Heidegger, "is the serving bearer, blossoming and fruiting, spreading out in rock and water, rising up into plant and animal" (1971, page 149). And, of the sky, he writes

[4] For a vivid account of what it feels like to climb a hill, see John Wylie (2002).

that it "is the vaulting path of the sun, the course of the changing moon, the wandering glitter of the stars, the year's seasons and their changes, the light and dusk of the day, the gloom and glow of the night, the clemency and inclemency of the weather, the drifting clouds and blue depth of the ether" (page 149). Moreover, one cannot speak of the earth without already thinking also of the sky, and vice versa. But if we are to think of earth and sky thus, not as mutually exclusive domains but as manifolds of movement that are directly implicated in one another, then how should we go about it? How can we progress beyond the idea that life is played out upon the surface of a world that is already furnished with objects? It is perhaps because we are so used to thinking and writing indoors that we find it so difficult to imagine the inhabited environment as anything other than an enclosed, interior space. What would happen if, instead, we were to take our inquiry out of doors?

First and foremost, we would have to contend with those fluxes of the medium that we call weather (Ingold, 2005).[5] Compared with the amount of attention devoted to the solid forms of the landscape, the virtual absence of weather from philosophical debates about the nature and constitution of the environment is extraordinary. This absence, I believe, is the result of a logic of inversion that places occupation before habitation, closure before movement, and surface before medium. In the terms of this logic, the weather is simply unthinkable (Ingold, 2006, page 17). Between what the archaeologist Bjørnar Olsen calls "the hard physicality of the world" and the realms of abstract thought in which "all that is solid melts into air" (2003, page 88), no conceptual space remains for the circulations of the *actual* air we breathe and on which life depends. In the alternative view I propose—a view from the open—what is unthinkable is the idea that life is played out upon the inanimate surface of a ready-made world. Inhabitants, I contend, make their way *through* a world-in-formation rather than *across* its preformed surface. As they do so, and depending on the circumstances, they may experience wind and rain, sunshine and mist, frost and snow, and a host of other conditions, all of which fundamentally affect their moods and motivations, their movements, and their possibilities of subsistence, even as they sculpt and erode the plethora of surfaces upon which inhabitants tread.

Now, for Gibson (1979, page 19), the weather is simply what is going on in the medium and, beyond noting that it calls for various kinds of adaptation or behavioural adjustment on the part of inhabitants, he has no more to say about it. For the substances of the earth, in his view, are impervious to these goings on. The terrestrial surface, which is taken to be relatively rigid and nonporous, ensures that aerial medium and earthly substances keep to their respective domains and do not mix. It is as though, in the forms of the land, the earth had turned its back on the sky, refusing further intercourse with it. Thus, the weather swirls about *on top* of the land, but does not participate further in its formation. Yet, as every inhabitant knows, rainfall can turn a ploughed field into a sea of mud, frost can shatter solid rocks, lightning can ignite forest fires on land parched by summer heat, and the wind can whip sand into dunes, snow into drifts, and the water of lakes and oceans into waves. As the anthropologist Richard Nelson puts it, in his study of how Koyukon people in Alaska perceive their surroundings, "weather is the hammer and the land is the anvil" (1983, page 33). There are other, more subtle and delicate ways in which the land responds to fluxes in the medium. Think of the pearls of dew that pick out the tendrils of plants and spiders' webs on a cool summer's morning, or of the little trails left by a passing gust of wind in the dry leaves and broken twigs of a woodland floor.

[5] This, and the following four paragraphs, are reproduced in part from Ingold (2008, pages 30 – 31).

Seasoned inhabitants know how to read the land as an intimate register of wind and weather.[6] Like the Koyukon, they can sense the approach of a storm in the sudden burst of flame in a campfire, or—as the Yup'ik elder Fred George explains—they can read the direction of the prevailing wind in the orientation of tufts of frozen grass sticking out from the snow, or of snow 'waves' on icebound lakes (Bradley, 2002, page 249; Nelson, 1983, page 41). Yet the more one reads into the land, the more difficult it becomes to ascertain with any certainty where substances end and where the medium begins. For it is precisely through the *binding* of medium and substances that wind and weather leave their mark. Thus the land itself no longer appears as an interface separating the two, but as a vaguely defined zone of admixture and intermingling. Indeed, anyone who has walked through the boreal forest in summer knows that the 'ground' is not really a coherent surface at all but a more or less impenetrable mass of tangled undergrowth, leaf litter and detritus, mosses and lichens, stones and boulders, split by cracks and crevasses, threaded by tree roots, and interspersed with swamps and marshes overgrown with rafts of vegetation that are liable to give way underfoot. Somewhere beneath it all is solid rock, and somewhere above the clear sky, but it is in this intermediate zone that life is lived, at depths depending upon the scale of the creature and its capacity to penetrate an environment that is ever more tightly woven.

It is in this sense that creatures live *in* the land and not *on* it. There could be no life in a world where medium and substances do not mix, or where the earth is locked inside—and the sky locked out—of a solid sphere. Wherever there is life and habitation, the interfacial separation of substance and medium is disrupted to give way to mutual permeability and binding. For it is in the nature of living beings themselves that, by way of their own processes of respiration, of breathing in and out, they bind the medium with substances in forging their own growth and movement through the world. And in this growth and movement they contribute to its ever-evolving weave. As Heidegger noted in his description of the earth, to which I have already referred, earthly substances 'rise up' into the forms of plants and animals (1971, page 149). The land, we could say, is continually *growing over*, which is why archaeologists have to dig to recover the traces of past lives. And what hold it all together are the tangled and tangible lifelines of its inhabitants (Ingold, 2007a, pages 80 – 81). The wind, too, mingles with substance as it blows through the land, leaving traces of its passing in tracks or trails. We could say of the wind that 'it winds', wending its way along twisted paths as do terrestrial travellers. Precisely because of the indeterminacy of the interface between substances and the medium, the same line of movement can register as well on the ground as a trace as in the air as a thread, as when an animal is linked to the hunter by both its track and its scent. "The first track", explains the American tracker Tom Brown, "is the end of a string" (1978, page 1; see Ingold, 2007a, pages 50 – 51).

As this powerful metaphor suggests, the relation between land and weather does not cut across an impermeable interface between earth and sky but is rather one *between the binding and unbinding of the world*. In the open world, the task of habitation is to bind substances and the medium into living forms. But bindings are not boundaries, and they no more contain the world, or enclose it, than does a knot contain the threads from which it is tied. To inhabit the open is not, then, to be stranded on a

[6] Hayden Lorimer (2006) offers a fine account of the conjoint reading of country by reindeer and herdsmen in Scotland's Cairngorm mountains, distinguished by its attention to meteorological phenomena, and especially to the ways gusts of wind—to which the animals are supremely sensitive—are funnelled by the clefts and gullies of the landscape. "What wells up", Lorimer writes, "is a biotic account of the herd enrolling winds, stones, tors, trees and mosses into a territory of patterned ground" (2006, pages 516 – 517). The importance of wind and weather, and of the ability of both people and animals to read it, receives similar emphasis in Anna Järpe's (2007) recent study of Sámi reindeer herding in Swedish Lapland.

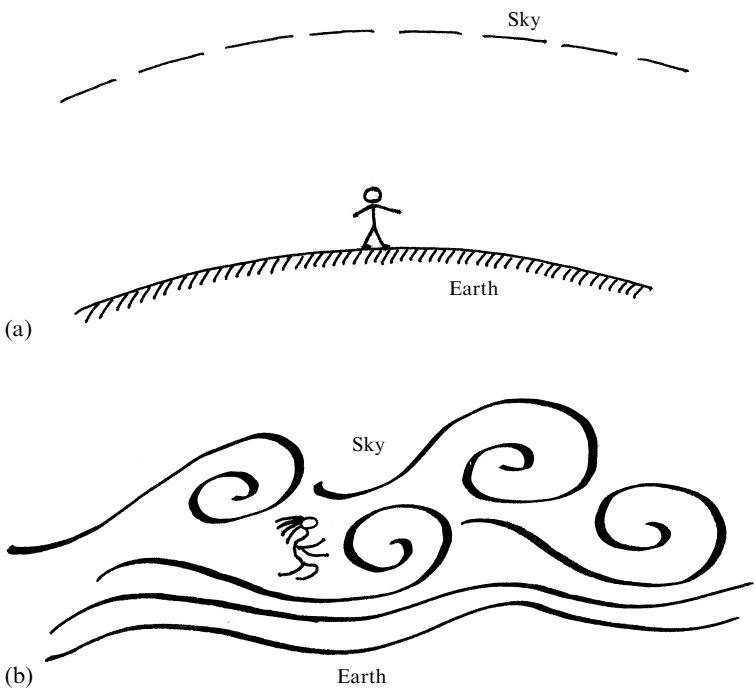

Figure 3. (a) The exhabitant of the earth and (b) the inhabitant of the weather world.

closed surface but to be immersed in the fluxes of the medium, in the incessant movements of wind and weather. In this weather world, there is no distinct surface separating earth and sky. Life is rather lived in a zone in which substance and medium are brought together in the constitution of beings which, in their activity, participate in weaving the textures of the land. In figure 3 I have sketched in a schematic way the contrast I have drawn between exhabitation and inhabitation. The next stage in the argument is to turn from the problem with which I have been preoccupied up to now, of what it means to inhabit the open, to the consider the inhabitants themselves. How should they and their lives be understood?

The eddy and the wedge

In his *Creative Evolution* of 1911, the philosopher Henri Bergson argued that every living being is cast like an eddy in the current of life. Yet, so well does it feign immobility that we are readily deceived into treating each "as a *thing* rather than as a *progress*, forgetting that the very permanence of its form is only the outline of a movement" (Bergson, 1911, page 135, emphasis in original). Indeed, Bergson's argument takes us right back to the drawing of a circle with which we began. Like the gesture of our hand, so the living being in its development, according to Bergson, describes "a kind of circle" (page 134). But just as we are tempted to reinterpret the drawn line not as the trace of a gestural movement but as the perimeter of a geometrical form, so, says Bergson, are we inclined to treat the organism that has thus turned in upon itself as an externally bounded object, or as a container for life. Yet life, Bergson insisted, is not contained in things. As with the wind, it is movement itself, wherein every organism emerges as a peculiar disturbance that interrupts the linear flow, *winding* it up into the forms we see. It would be wrong, then, to compare the living organism to an object, for "the organism that lives is a thing that *endures*" (page 16). Like a growing root or fibre, it creates itself endlessly, trailing its history behind it as the past presses against the present (page 29).

Where Bergson was comparing the organism to an eddy, Charles Darwin had earlier compared it to a wedge. Introducing his idea of the struggle for existence, in *The Origin of Species*, Darwin famously likened the face of nature to a surface riven by innumerable wedges, "packed close together and driven inward by incessant blows" (Darwin, 1950, page 58). In subsequent ecological thinking, the language of Darwin rather than that of Bergson has overwhelmingly prevailed. Living things are imagined as externally bounded, solid objects in a carpentered world, competing for limited space along the lines of their adjacency. Like a wedge, every organism—as Heidegger would say—is 'over against' its neighbours. In this image of struggle, it is the very objectness of organisms that defines their existence. Once again, the logic of inversion has turned the generative movements of life into boundaries of exclusion. The organism is depicted as externally circumscribed, set off against a surrounding world—an environment—with which it is destined to interact according to its nature. The organism is 'in here'; the environment is 'out there'. But what if, overturning this logic, we were to revert to the original line, described by a winding movement? Beginning with the line, there is initially no inside or outside, and no boundary separating the two domains. There is, rather, a trail of movement or growth.

Every such trail discloses a relation. But the relation is not *between* one thing and another—between the organism 'here' and the environment 'there'. It is, rather, a trail *along* which life is lived (Ingold, 2006, page 13). Neither beginning here and ending there nor vice versa, the trail winds through, or *amidst*, without beginning or end, as do the waters of a river whose line of flow is orthogonal to the transverse connection across its banks. It is in coursing along and amidst, as the philosophers Gilles Deleuze and Félix Guattari put it, that "things take on speed" (1983, page 58). The trail, in short, is a 'line of becoming' which, as Keith Ansell Pearson explains, "is not defined in terms of connectable points, or by the points which compose it, since it has only a 'middle'" (1999, page 169). Becoming is not a connection between this and that but follows a 'line of flight' that pulls away from both. As we have already seen, moreover, in that zone of admixture where the substances of the earth mingle with the medium this line can appear at once as a trace on the ground and a thread in the air, as track or string. Each such line, however, is but one strand in a tissue of lines that together constitute the texture of the land. This texture is what I mean when I speak of organisms being constituted within a relational field. It is a field not of connectable points but of interwoven lines, not a network but a *meshwork* (Ingold, 2007a, page 80).

The distinction is critical. Network images have become commonplace across a broad spectrum of disciplines, from the 'webs of life' of ecology, through the 'social networks' of sociology and social anthropology, to the 'agent–object' networks of material culture studies.[7] Across all these fields, proponents of network thinking

[7] I have deliberately excluded so-called actor-network theory from this list, despite its evident appeal to students of material culture. For the latter, its principal attraction lies in providing a way of describing interactions among persons and things that does not concentrate agency exclusively in human hands. Instead, agency is seen to be distributed around all the interacting elements of an assemblage. Nevertheless, as Frances Larson, Alison Petch, and David Zeitlyn point out in a recent study of connections between museum objects, collectors, and curators, the network metaphor logically entails that the elements connected (whether people or objects) are distinguished from the lines of their connection (Larson et al, 2007, pages 216–217). To the extent that actor-network theorists have repudiated this distinction, they are—by their own admission (Latour, 1999)—no longer dealing with networks at all. Latterly, Latour (2005, pages 44–46, 217) has suggested that actors are knotted from the constituent lines of their relations (or 'mediators'), and are thus networks or part-networks in themselves—each a "star-like shape with a center surrounded by many radiating lines" (page 177). This position would come close to mine were it not for the persistent confusion of knots with nodes, and hence of the meshwork with the network (Ingold, 2007a, pages 98–100).

argue that it encourages us to focus, in the first place, not on things, organisms, or persons but on the connections between them, and thereby to adopt what is often called a relational perspective. Such a perspective allows for the possibility that, with any pair of connected entities, each can play an active part in the ongoing formation of the other. Relations, it is supposed, are mutually constitutive. But there can be no mutuality without the prior separation or 'over-againstness' of the parties to the compact. That is to say, relations *between* necessarily presuppose an operation of inversion whereby every person or thing is turned in upon itself prior to the establishment of a connecting link. To undo this inversion is to adopt an alternative topology to that of the network with its bound-up elements and linear connectors. It is a topology of what Annemarie Mol and John Law (1994) have called 'fluid space'. In fluid space, there are no well-defined objects or entities. There are, rather, substances which flow, mix, and mutate as they pass through the medium, sometimes congealing into more or less ephemeral forms that can nevertheless dissolve or re-form without breach of continuity (pages 659 – 664).[8]

Every line—every relation—in fluid space is a path of flow, like the riverbed or the veins and capillaries of the body. As the sanguinary image suggests, the living organism is not just one but a whole bundle of such lines. In a quite material sense, lines are what organisms are made of. Indeed, anatomists have always known this as they have spoken of bodily 'tissues' (Ingold, 2007a, page 61). For the tissue is a texture formed of myriad fine threads tightly interlaced, presenting all the appearance, to a casual observer, of a coherent, continuous surface. To the anatomical gaze, however, the organic tissue becomes—as J Arthur Thomson wrote in 1911—"in a quite remarkable way translucent", resolving into its constituent threads of nerve, muscle, blood vessels, and so on (1911, page 27). What is the nervous system, Bergson asked (1991, page 45), if not "an enormous number of threads which stretch from the periphery to the centre, and from the centre to the periphery"? Indeed, what we have already found about the surface of the earth applies with equal force to the surface of the organism. The skin, like the land, is not an impermeable boundary but a permeable zone of intermingling and admixture, where traces can reappear as threads and vice versa (Ingold, 2007a, pages 59 – 61). It is not, then, that organisms are entangled in relations. Rather, every organism—indeed, every thing—is itself an entanglement, a tissue of knots whose constituent strands, as they become tied up with other strands, in other bundles, make up the meshwork. As Heidegger showed, through yet another excursus into the

[8] In their rush to replace the traditional idea of space as a two-dimensional tabula rasa with a more topological sensibility (Rose and Wylie, 2006, pages 475 – 476), geographers have tended to confuse these alternative topologies and to conflate their quite fundamental differences. Sarah Whatmore, for example, calls for 'hybrid geographies' that would study "the *living* ... spaces of social life, configured by numerous, interconnected agents" (2007, page 339, emphasis in original). Such geographies would be characterised, she writes, by "a shift in analytical emphasis from reiterating fixed surfaces to tracing points of connection and lines of flow" (page 343). Lines that connect points are one thing, however; lines of flow are quite another. The confusion between flowlines and network connectors is further compounded in Whatmore's assertion that people, organisms, and machines are "swept up in the volatile eddies and flows of socio-technical networks" (page 344). The lines of flow making up the meshwork of living, fluid space do not, of course, connect anything. The study of such space calls for geographies not of hybridity but of *mixture* (Mol and Law, 1994, page 660; Ingold, 2007b, page 316). As Pearson points out (after Deleuze and Guattari), "hybrids simply require a connection of points and do not facilitate a passing between them" (1999, page 197). Far from tracing the connections that link heterogeneous but nevertheless discrete material solids into networked assemblages, geographies of mixture would aim to *follow the materials* through those processes of amalgamation, distillation, coagulation, and dispersal that both give rise to things and portend their dissolution (Ingold, 2007c, page 7).

ancient meanings of words, a 'thing' was originally not an object but a *gathering*, a particular binding together of the threads of life (Heidegger, 1971, page 177).

Let us imagine the living being, then, not as a self-contained object like a ball that can propel itself from place to place, but as an ever-ramifying bundle of lines of growth. Deleuze and Guattari (1983) famously likened this bundle to a rhizome, though I prefer the image of the fungal mycelium (Ingold, 2003, pages 302 – 306). A mycologist friend once remarked to me that the whole of biology would be different had it taken the mycelium as the prototypical exemplar of a living organism.[9] For it forces us to a radical reconceptualisation of the environment. Literally, of course, an environment is that which *surrounds* the organism. But you cannot surround a bundle without drawing a boundary that would enclose it, and this would immediately be to effect an inversion, converting those relations along which a being lives its life in the world into internal properties of which its life is but the outward expression (Ingold, 2006, page 13). Such has long been the strategy of mainstream biological science, which insists that in its manifest form and behaviour, the organism lives to realise a set of genetically transmitted specifications that have been installed even before it sets out on its path through the world. According to what many students are told is the 'first law of biology', every living thing is a product of the interaction between genes and environment—that is, between a received set of interior specifications and its exterior conditions of existence.

For an alternative view, however, we can return to Darwin, who at one point imagines himself observing "the plants and bushes clothing an entangled bank" (1950, page 64). It is a compelling image. In the tangled bank, lines of growth issuing from multiple sources become comprehensively bound up with one another, just as do the vines and creepers of a dense patch of tropical forest, or the tangled root systems that you cut through with your spade every time you dig your garden. What we have been accustomed to calling 'the environment' might, then, be better envisaged as a zone of entanglement. Within this tangle of interlaced trails, continually ravelling here and unravelling there, beings grow or 'issue forth' along the lines of their relationships. This tangle is the texture of the world—the "big tapestry of Nature", as the geographer Torsten Hägerstrand prophetically put it, "which history is weaving".[10] It has no insides or outsides, only openings and 'ways through'. Scientists often stress the importance of 'carving nature at the joints', as though the world were built from solid blocks. The world we inhabit, however, is not carpentered but textured. An ecology of life, therefore, must be about the weaving and binding of lines, not the hammering of blocks. As an ecology of threads and traces, it must deal not with the relations *between* organisms and their external environments but with the relations *along* their severally enmeshed ways of life. Ecology, in short, *is the study of the life of lines* (Ingold, 2007a, page 103).

[9] I acknowledge here a conversation with Alan Rayner. In his book *Degrees of Freedom* (1997), Rayner sets out an alternative biology of life in fluid space, in which boundaries are never absolute and nothing is ever fully self-contained or modular. As Pearson has shown, there are clear parallels between Rayner's work and the rhizomatics of Deleuze and Guattari (Pearson, 1999, pages 166 – 168).

[10] Hägerstrand imagined every constituent of the environment—including "humans, plants, animals, and things all at once"—as having a continuous trajectory or line of becoming. As diverse constitutuents move through time and encounter one another, their trajectories are bundled together. "Seen from within one could think of the tips of trajectories as sometimes being pushed forward by forces behind and besides and sometimes having eyes looking around and arms reaching out, at every moment asking 'what shall I do next'?" (1976, page 332).

Boxes and creepers

With that conclusion in mind, we can return to my initial question of what it means to live 'in the open'. Time and again, philosophers have assured us that, as earthbound creatures, we can only live, and know, *in* places. Thus, according to Edward Casey, place is "at once the limit and the condition of all that exists ... . To be is to be in place" (1993, pages 15 – 16). We are in place, the argument goes, because we exist as *embodied* beings. Now embodied we may be, but that body, I contend, is not confined or bounded but rather extends as it grows along the multiple paths of its entanglement in the textured world. Thus to be, I would say, is not to be *in* place but to be *along* paths. The path, not the place, is the primary condition of being, or rather of becoming.[(11)] Places are formed through movement, when a movement *along* turns into a movement *around*, precisely as happened in our initial experiment of drawing a circle. Such movement around is place-binding, but it is not place-bound. There could be no places were it not for the comings and goings of human beings and other organisms to and from them, from and to places elsewhere. Places, then, do not so much exist as *occur*—they are topics rather than objects, stations along ways of life. Instead of saying that living beings exist in places, I would thus prefer to say that places occur along the life paths of beings. Life itself, far from being an interior property of animate objects, is an unfolding of the entire meshwork of paths in which beings are entangled (Mazzullo and Ingold, 2008).

Theodosius Dobzhansky (1965), one of the architects of the so-called new synthesis of 20th-century evolutionary biology, liked to describe life as a process of 'groping'. Literally "pervading everything so as to try everything, and trying everything so as to find everything" (page 214), life will not be contained within a boundary, but rather threads its way through the world along the myriad lines of its relations, probing every crack or crevice that might potentially afford growth and movement. Nothing, it seems, can escape its tentacles. Nevertheless, human history—and above all the history of the Western world—is studded with attempts to bring closure to life, or to 'put it inside', by means of projects of construction that would seek to convert the world we inhabit into furnished accommodation, made ready to be occupied. Under the rubric of the 'built environment', human industry has created an infrastructure of hard surfaces, fitted out with objects of all sorts, upon which the play of life is supposed to be enacted. The rigid separation of substances from the medium which Gibson took to be a natural state of affairs has, in fact, been engineered in an attempt to get the world to conform to our expectations of it, and to provide it with the coherent surface we always thought it had. Yet while designed to ease the transport of occupants across it, the hard surfacing of the earth actually blocks the very intermingling of substances with the medium that is essential to life, growth, and habitation. Earth that has been surfaced cannot 'rise up', as Heidegger put it, into the plant or animal. Nothing can grow there.

The blockage is only provisional, however. For wherever anything lives the infrastructure of the occupied world is breaking up or wearing away, ceaselessly eroded by the disorderly groping of inhabitants, both human and nonhuman, as they

[(11)] For this reason, I now prefer to speak of life in the open as a process of *inhabiting* rather than of *dwelling*, and somewhat regret my emphasis in earlier work on what I called the 'dwelling perspective' (Ingold, 2000, page 189). As Steve Hinchliffe has pointed out, this perspective "risks a rather 'earthly' romanticism by emphasizing the territorial qualities of dwelling ... . Indeed, it is the localism of these dwelt landscapes that remains problematic in this work" (2003, page 220). The criticism is not entirely just, since I have taken pains to argue that dwelling does *not* go on in places but along paths (Ingold, 2000, page 229). It is, nevertheless, true that the concept of dwelling carries a heavy connotation of snug, well-wrapped localism. The concept of habitation is not so loaded, and is therefore less liable to misinterpretation.

reincorporate and rearrange its crumbling fragments into their own ways of life (Ingold, 2007a, page 103). For me, not only the futility of hard surfacing but also the sheer irrepressibility of life have been nowhere better dramatised than in a recent work by the German artist Klaus Weber (2004, pages 45 – 63). Having acquired an allotment in Berlin, Weber persuaded the Roads Department to coat it in a thick layer of motorway-grade asphalt. But, before the machines rolled in, he sprinkled the area with the spores of a certain fungus. Once the asphalt had been laid he built a shed on one side of the plot, in which he lived as he watched what happened. After a while, bell-shaped bumps appeared, the asphalt began to crack, and eventually fungi burst forth in great white blobs. Weber collected the fungus and fried it in his shed; apparently it tasted delicious! The mycelium had triumphed. And so too, in an open world, the creeping entanglements of life will always and inevitably triumph over our attempts to box them in.

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References

Bergson H, 1911 *Creative Evolution* translated by A Mitchell (Macmillan, London)
Bergson H, 1991 *Matter and Memory* translated by N M Paul, W S Palmer (Zone Books, New York)
Bradley C, 2002, "Travelling with Fred George: the changing ways of Yup'ik star navigation in Akiachak, western Alaska", in *The Earth is Faster Now: Indigenous Observations of Arctic Environmental Change* Eds I Krupnik, D Jolly (Arctic Research Consortium of the United States, Fairbanks, AK) pp 240 – 265
Brown T, 1978 *The Tracker: The Story of Tom Brown, Jr as Told by William Jon Watkins* (Prentice-Hall, Englewood Cliffs, NJ)
Casey E S, 1993 *Getting Back into Place* (Indiana University Press, Bloomington, IN)
Darwin C, 1950 *On the Origin of Species by Means of Natural Selection, or, the Preservation of Favoured Races in the Struggle for Life* (Watts, London), originally published in 1859
Deleuze G, 1984, "Michel Tournier and the world without others" *Economy and Society* **13** 52 – 71
Deleuze G, Guattari F, 1983 *On the line* translated by J Johnston (Semiotext(e), New York)
Dobzhansky T, 1965, "Mendelism, Darwinism, and evolutionism" *Proceedings of the American Philosophical Society* **109**(4) 205 – 215
Gibson J J, 1979 *The Ecological Approach to Visual Perception* (Houghton Mifflin, Boston, MA)
Hägerstrand T, 1976, "Geography and the study of the interaction between nature and society" *Geoforum* **7** 329 – 334
Harrison P, 2007, "The space between us: opening remarks on the concept of dwelling" *Environment and Planning D: Society and Space* **25** 625 – 647
Heidegger M, 1971 *Poetry, Language, Thought* translated by A Hofstadter (Harper and Row, New York)
Hinchliffe S, 2003, " 'Inhabiting': landscapes and natures", in *Handbook of Cultural Geography* Eds K Anderson, M Domosh, S Pile, N Thrift (Sage, London) pp 207 – 225
Ingold T, 1993, "The art of translation in a continuous world", in *Beyond Boundaries: Understanding, Translation and Anthropological Discourse* Ed. G Pálsson (Berg, Oxford) pp 210 – 230
Ingold T, 2000 *The Perception of the Environment: Essays on Livelihood Dwelling and Skill* (Routledge, London)
Ingold T, 2003, "Two reflections on ecological knowledge", in *Nature Knowledge: Ethnoscience, Cognition, Identity* Eds G Sanga, G Ortalli (Berghahn, New York) pp 301 – 311
Ingold T, 2005, "The eye of the storm: visual perception and the weather" *Visual Studies* **20**(2) 97 – 104
Ingold T, 2006, "Rethinking the animate, re-animating thought" *Ethnos* **71**(1) 9 – 20
Ingold T, 2007a *Lines: A Brief History* (Routledge, London)

Ingold T, 2007b, "Comment" *Journal of Iberian Archaeology* **9/10** 313 – 317
Ingold T, 2007c, "Materials against materiality" *Archaeological Dialogues* **14**(1) 1 – 16
Ingold T, 2008, "Earth, sky, wind and weather", in *Wind, Life, Health* Eds E Hsu, C Low (Blackwell, Oxford), pp 17 – 35
Järpe A, 2007 *'Ever Against the Wind ...': Lifescapes and Environmental Perception Among Sámi Reindeer Herders in Västerbotten, Sweden* unpublished PhD thesis, Department of Anthropology, University of Aberdeen
Kant I, 1933 *Immanuel Kant's Critique of Pure Reason* translated by N K Smith (Macmillan, London)
Kant I, 1970, "Physische Geographie", in *Kant's Concept of Geography and its Relation to Recent Geographical Thought* translated by J A May (University of Toronto Press, Toronto) pp 255 – 264
Larson F, Petch A, Zeitlyn D, 2007, "Social networks and the creation of the Pitt Rivers Museum" *Journal of Material Culture* **12** 211 – 239
Latour B, 1999, "On recalling ANT", in *Actor Network Theory and After* Eds J Law, J Hassard (Blackwell, Oxford) pp 15 – 25
Latour B, 2005 *Reassembling the Social: An Introduction to Actor-network Theory* (Oxford University Press, Oxford)
Lorimer H, 2006, "Herding memories of humans and animals" *Environment and Planning D: Society and Space* **24** 497 – 518
Mazzullo N, Ingold T, 2008, "Being along: place, time and movement among Sámi people in Northern Finland", in *Mobility and Place: Enacting European Peripheries* Eds J O Baerenholdt, B Granaas (Ashgate, Aldershot, Hants) forthcoming
Mol A, Law J, 1994, "Regions, networks and fluids: anaemia and social topology" *Social Studies of Science* **24** 641 – 671
Nelson R K, 1983 *Make Prayers to the Raven: A Koyukon View of the Northern Forest* (University of Chicago Press, Chicago, IL)
Nobes G, Martin A E, Panagiotaki G, 2005, "The development of scientific knowledge of the Earth" *British Journal of Developmental Psychology* **23** 47 – 64
Olsen B, 2003, "Material culture after text: re-membering things" *Norwegian Archaeological Review* **36**(2) 87 – 104
Olwig K R, 2002, "The duplicity of space: Germanic 'raum' and Swedish 'rum' in English language geographical discourse" *Geografiska Annaler, Series B* **84**(1) 1 – 17
Pearson K A, 1999 *Germinal Life: The Difference and Repetition of Deleuze* (Routledge, London)
Rayner A D M, 1997 *Degrees of Freedom: Living in Dynamic Boundaries* (Imperial College Press, London)
Richards P, 1974, "Kant's geography and mental maps" *Transactions of the Institute of British Geographers, New Series* **11** 1 – 16
Rose N, Wylie J, 2006, "Animating landscape" *Environment and Planning D: Society and Space* **24** 475 – 479
Thomson J A, 1911 *Introduction to Science* (Williams and Norgate, London)
Vosniadou S, Brewer W F, 1992, "Mental models of the earth: a study of conceptual change in childhood" *Cognitive Psychology* **24** 535 – 585
Weber K, 2004 *Unfold! You Cul de Sac* (Revolver, Frankfurt)
Whatmore S, 2007, "Hybrid geographies: rethinking the 'human' in human geography", in *The Animals Reader* Eds L Kalof, A Fitzgerald (Berg, Oxford) pp 337 – 348
Wylie J, 2002, "An essay on ascending Glastonbury Tor" *Geoforum* **33** 441 – 454