

## Up, Across and Along

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### The trace and the connector

*Whilst a man is free - cried the Corporal, giving a flourish with his stick thus -*

Here is the line traced in the air by the Corporal, as depicted in Laurence Sterne's narrative of 1762, *The Life and Opinions of Tristram Shandy, Gentleman*.

Like any other gesture, the Corporal's flourish embodies a certain duration. The line to which it gives rise is, therefore, intrinsically dynamic and temporal. When, pen in hand, Sterne recreated the flourish on the page, his gesture left an enduring trace that we can still read. The painter Paul Klee described this kind of line as the most active and authentic. Whether traced in the air or on paper, whether by the tip of the stick or the pen, it arises from the movement of a point that - just as the Corporal intended - is free to go where it will, for movement's sake. As Klee memorably put it, the line that develops freely, and in its own time, 'goes out for a walk' (1961: 105). And in reading it, the eyes follow the same path as did the hand in drawing it.

Another kind of line, however, is in a hurry. It wants to get from one location to another, and then to another, but has little time to do so. The appearance of this line, says Klee, is 'more like a series of appointments than a walk'. It goes from point to point, in sequence, as quickly as possible, and in principle in no time at all. For every successive destination is already fixed prior to setting out, and each segment of the line is predetermined by the points it connects. Whereas the active line on a walk is dynamic, the line that connects adjacent points in series is, according to Klee, 'the quintessence of the static' (1961: 109). If the former takes us on a journey that has no obvious beginning or end, the latter presents us with an array of interconnected destinations that can, as on a route-map, be viewed all at once.

Retracing the Corporal's stick-waving gesture, Sterne evidently took his line for a walk. But now let me suggest a simple experiment. Take this line, and cut it up into short segments of roughly equal length. Now imagine that every segment could be wound up like a thread, and packed into the confines of a spot located around the mid-point of the original segment. The result would be a scatter of dots, as shown below.

I have in fact drawn each dot by hand. To do this I had to bring the tip of my pencil into contact with the paper at a predetermined point, and then to jiggle it about on that point so as to form the dot. All the energy, and all the movement, was focused there. In the spaces between the dots, however, there remains no trace of movement. Although the dots are located on the path of the original gesture they are not connected by its trace, since what is left of the trace and of the movement that gave rise to it is wound up in the dots. Each appears as an isolated and compact moment, broken off from those preceding and following. To be sure, in order to proceed from the execution of one dot to the next I had to lift my pencil and shift my hand a little, before returning the tip to the paper surface. But this transverse movement plays no part in the process of inscription itself

which, as we have seen, is wholly confined to drawing the dots. Had I wished, I could have withdrawn my hand altogether from the work and laid down my pencil, only to resume the task at a later time.

Where then, in this scatter of dots, is the line? It can only exist as a chain of connections between fixed points. To recover the original trajectory of the Corporal's stick, we have to join them up. This I have done below.

Although the connecting lines have to be executed in a determinate sequence, the pattern they eventually comprise - much as in a child's join-the-dots puzzle - is already given as a virtual object from the outset. To complete the pattern is not to take a line for a walk but rather to engage in a process of construction or assembly, in which every linear segment serves as a joint, welding together the elements of the pattern into a totality of a higher order. Once the construction is complete there is nowhere further for the line to go. What we see is no longer the trace of a gesture but an assembly of point-to-point connectors. The composition stands as a finished object, an artefact. Its constituent lines join things up, but they do not grow or develop.

This distinction between the walk and the assembly underlies everything I have to say. I aim to show how the line, in the course of its history, has been gradually shorn of the movement that gave rise to it. Once the trace of a continuous gesture, the line has been fragmented - under the sway of modernity - into a succession of points or dots. This fragmentation, as I shall explain, has taken place in the related fields of travel, where wayfaring is replaced by destination-oriented transport, mapping, where the drawn sketch is replaced by the route-plan, and textuality, where storytelling is replaced by the pre-composed plot. To an ever-increasing extent, people in modern metropolitan societies find themselves in environments built as assemblies of connected elements. Yet in practice they continue to thread their own ways through these environments, tracing paths as they go. I suggest that to understand how people do not just occupy but inhabit the environments in which they dwell, we might do better to revert from the paradigm of the assembly to that of the walk.

### **Trails and routes**

It is not the harnessing of sources of energy beyond the human body that turns wayfaring into transport, but rather the dissolution of the intimate bond that, in wayfaring, couples locomotion and perception. The transported traveller becomes a passenger, who does not himself move but is rather moved from place to place. The sights, sounds and feelings that accost him during the passage have absolutely no bearing on the motion that carries him forth. Only upon arrival at each stop, and when his means of transport come to a halt, does he begin to move. Thus the very places where the wayfarer pauses for rest are, for the transported passenger, sites of activity. But this activity, confined within a place, is all concentrated on one spot. In between sites he barely skims the surface of the world, leaving no trace of having passed by or even any recollection of the journey. In effect, the practice of transport converts every trail into the equivalent of a dotted line. Just as in drawing the dotted line I lower my pencil onto the paper and jiggle its tip on the spot, so the tourist alights at each destination on his itinerary and casts around from where he stands, before taking off for the next. The lines that link successive destinations, like those that join the dots, are not traces of movement but point-to-point connectors. These are the lines of transport. They differ from lines of wayfaring in precisely the same way

that the connector differs from the gestural trace. They are not trails but routes.

Drawing freehand, I take my line for a walk. Likewise the wayfarer, in his perambulations, lays a trail on the ground in the form of footprints, paths and tracks. Every such trail is tantamount to a way of life. Taken together, these lines might be taken to comprise a network. I think it would be better, however, to regard the tangle of trails as a meshwork. To be sure, the tangle resembles a net in its original sense of an open-work fabric of entwined threads or cords. But through its metaphorical extension to the realms of modern transport and communications, and especially information technology, the meaning of 'the net' has changed. We are now more inclined to think of it as a complex of interconnected points than of interwoven lines. The lines of the network, in this contemporary sense, join the dots. They are connectors. The lines of the meshwork, by contrast, are the trails along which life is lived. And it is in the entanglement of lines, not in the connecting of points, that the mesh is constituted.

Wayfaring, I believe, is the most fundamental mode by which living beings, both human and non-human, inhabit the earth. By habitation I do not mean taking one's place in a world that has been prepared in advance for the populations that arrive to reside there. The inhabitant is rather one who participates from within in the very process of the world's continual coming into being and who, in laying a trail of life, contributes to its weave and texture. These lines are typically winding and irregular, yet comprehensively entangled into a close-knit tissue. From time to time in the course of history, however, imperial powers have sought to occupy the inhabited world, throwing a network of connections across what appears, in their eyes, to be not a tissue of trails but a bare surface. These connections are lines of occupation. They facilitate the outward passage of personnel and equipment to sites of settlement and extraction, and the return of the riches drawn therefrom. Unlike paths formed through the practices of wayfaring, such lines are surveyed and built in advance of the traffic that comes to pass up and down them. They are typically straight and regular, and intersect only at nodal points of power. Drawn cross country, they are inclined to ride roughshod over the lines of habitation that are woven into it, cutting them as, for example, a trunk road, railway or pipeline cuts the byways frequented by humans and animals in the vicinity through which it passes.

To sum up so far: I have established a contrast between two modalities of travel, namely wayfaring and transport. Like the line that goes out for a walk, the path of the wayfarer wends hither and thither, and may even pause here and there before moving on. But it has no beginning or end. While on the trail the wayfarer is always somewhere, yet every 'somewhere' is on the way to somewhere else. The inhabited world is a reticulate meshwork of such trails, that is continually being woven as life goes on along them. Transport, by contrast, is tied to specific locations. Every move serves the purpose of relocating persons and their effects, and is oriented to a specific destination. The traveller who departs from one location and arrives at another is, in between, nowhere at all. Taken together, the lines of transport comprise a network of point-to-point connections. In the colonial project of occupation, this network spreads across the territory, overriding the tangled trails of inhabitants. I shall now go on to show how the distinction between the walk and the connector underlies a fundamental difference not only in the dynamics of movement but also in the integration of knowledge. I begin with a discussion of the ways in which lines may be drawn on maps.

### Mapping and knowing

The vast majority of maps that have ever been drawn by human beings have scarcely survived the immediate contexts of their production. These are usually contexts of storytelling in which people describe the journeys they have made, or that have been made by characters of legend or myth, often with the purpose of providing directions so that others can follow along the same paths. As he retraces his steps in narrative, the storyteller may also gesture with his hands and fingers, and these gestures may in turn give rise to lines. These lines are formed through the gestural re-enactment of journeys actually made, to and from places that are already known for their histories of previous comings and goings. The joins, splits and intersections of these lines indicate which paths to follow, and which can lead you astray, depending on where you want to go. They are lines of movement. In effect, the 'walk' of the line retraces your own 'walk' through the terrain.

For this reason sketch maps are not generally surrounded by frames or borders. The map makes no claim to represent a certain territory, or to mark the spatial locations of features included within its frontiers. What count are the lines, not the spaces around them. Just as the country through which the wayfarer passes is comprised by the meshwork of paths of travel, so the sketch map consists - no more and no less - of the lines that make it up. They are drawn along, in the evolution of a gesture, rather than across the surfaces on which they are traced. Modern cartographic maps, however, are quite different. Such maps always have borders separating the space inside, which is part of the map, from the space outside which is not. Of course there are many lines on the map, representing such things as roads and railways, as well as administrative boundaries. But these lines, drawn across the surface of the cartographic map, signify occupation, not habitation. They betoken as appropriation of the space surrounding the points that the lines connect or - if they are frontier lines - that they enclose.

Michel de Certeau has shown how the maps of medieval times, which were really illustrated stories telling of journeys made and of memorable encounters along the way, were gradually supplanted during the early history of modernity by spatial representations of the earth's surface (de Certeau 1984: 120-1). In this process the original tales were broken into iconic fragments that, in turn, were reduced to mere decorative embellishments included, alongside place-names, among the contents of particular sites. The fragmentation of the narrative, and the compression of each piece within the confines of a marked location, strikingly parallel the impact of destination-oriented transport on earlier practices of wayfaring. In mapping as in travel, the trail left as the trace of a gesture is converted into the equivalent of a dotted line. Drawing a line on a cartographic map is like joining the dots. Such lines, as on a marine navigation chart or an air traffic route map, comprise a network of point-to-point connections. They enable the prospective traveller to assemble a route-plan, in the form of a chain of connections, and thereby virtually to reach his destination even before setting out. As a cognitive artefact or assembly, the plan pre-exists its enactment 'on the ground'.

The same principle applies in the making of the map itself. An example comes from Charles Goodwin's (1994) account of the map-making practices of archaeologists. In this case the map is of a profile, that is, of a vertical section cut through the earth at a site of excavation. In the following extract, Goodwin describes the procedure involved:

To demarcate what the archaeologist believes are two different layers of dirt, a line is drawn between them with a trowel. The line and the ground surface

above it are then transferred to a piece of graph paper. This is a task that involves two people. One measures the length and depth co-ordinates of the points to be mapped, using a ruler and tape measure. He or she reports the measurements as pairs of numbers, such as “At forty, plus eleven point five”... A second archaeologist transfers the numbers provided by the measurer to a piece of graph paper. After plotting a set of points, he or she makes the map by drawing the lines between them.

*Goodwin 1994: 612*

The line drawn with a trowel in the earth is of course the trace of a movement. But the line on graph paper is a chain of point-to-point connections. These lines are distinguished precisely as Laurence Sterne’s tracing of the Corporal’s flourish, with which I began, is distinguished from my ‘join the dots’ reconstruction of it. Both kinds of line embody in their formation a certain way of knowing. But these ways, as I shall now show, are fundamentally different.

When, drawing a sketch map for a friend, I take my line for a walk, I retrace in gesture the walk that I made in the countryside and that was originally traced out as a trail along the ground. Telling the story of the journey as I draw, I weave a narrative thread that wanders from topic to topic, just as in my walk I wandered from place to place. This story recounts just one chapter in the never-ending journey that is life itself, and it is through this journey - with all its twists and turns - that we grow into a knowledge of the world about us. As James Gibson argued, in his groundbreaking work on the ecology of visual perception, we perceive the world along a ‘path of observation’ (1979: 197). Proceeding on our way things fall into and out of sight, as new vistas open up and others are closed off. By way of these modulations in the array of reflected light reaching the eyes, the structure of our environment is progressively disclosed. It is no different, in principle, with the senses of touch and hearing, for together with vision these are but aspects of a total system of bodily orientation. Thus the knowledge we have of our surroundings is forged in the very course of our moving through them, in the passage from place to place and the changing horizons along the way (Ingold 2000: 227). As wayfarers we experience what Robin Jarvis (1997: 69) has called a ‘progressional ordering of reality’, or the integration of knowledge along a path of travel.

That is not, however, how the matter is understood within the dominant framework of modern thought. It is rather supposed that knowledge is assembled by joining up, into a complete picture, observations taken from a number of fixed points. As we have seen, this is how the surveyor proceeds in the construction of a cartographic map. Many geographers and psychologists have argued that we are all surveyors in our everyday lives, and that we use our bodies, as the surveyor uses his instruments, to obtain data from multiple points of observation that are then passed to the mind, and from which it assembles a comprehensive representation of the world - the so-called cognitive map. According to this view, knowledge is integrated not by going along but by building up, that is by fitting site-specific data into structures of progressively greater inclusiveness. In effect the surveyor’s walk (if indeed he does walk, rather than take a vehicle) is broken up and reduced to the geographical counterpart of the dotted line. Just as in drawing the dotted line the pencil tip has to be carried across from one point to the next, so to obtain his data the surveyor has to be transported from site to site. But if the transverse movements of the hand, in the former case, are ancillary to the process of inscription, so those of the surveyor, in the latter, are ancillary to the process of observation. Serving merely to relocate the agent

and his equipment - or the mind and its body - from one stationary locus of observation to another, they play no part in the integration of the information obtained.

I have argued that it is fundamentally through the practices of wayfaring that beings inhabit the world. By the same token, the ways of knowing of inhabitants go along, and not up. Or in a word, inhabitant knowledge - as I shall call it - is alongly integrated. Occupant knowledge, by contrast, is upwardly integrated. And this finally brings us to the crux of the difference between these two knowledge systems, of habitation and occupation respectively. In the first, a way of knowing is itself a path of movement through the world: the wayfarer literally 'knows as he goes' (Ingold 2000: 229-30), along a line of travel. The second, by contrast, is founded upon a categorical distinction between the mechanics of movement and the formation of knowledge, or between locomotion and cognition. Whereas locomotion cuts from point to point across the world, cognition builds up, from the array of points and the materials collected therefrom, into an integrated assembly.

### **Storylines and plots**

I have suggested that drawing a line on a sketch map is much like telling a story. Indeed the two commonly proceed in tandem as complementary strands of one and the same performance. Thus the storyline goes along, as does the line on the map. The things of which the story tells, let us say, do not so much exist as occur; each is a moment of ongoing activity. These things, in a word, are not objects but topics. Lying at the confluence of actions and responses, every topic is identified by its relations to the things that paved the way for it, that presently concur with it, and that follow it into the world. Here the meaning of the 'relation' has to be understood quite literally, not as a connection between pre-located entities but as a path traced through the terrain of lived experience. Far from connecting points in a network, every relation is one line in a meshwork of interwoven trails. To tell a story, then, is to relate, in narrative, the occurrences of the past, retracing a path through the world that others, recursively picking up the threads of past lives, can follow in the process of spinning out their own. But rather as in looping or knitting, the thread being spun now and the thread picked up from the past are both of the same yarn. There is no point at which the story ends and life begins. Stories should not end for the same reason that life should not. As with the line that goes out for a walk, in the story as in life there is always somewhere further one can go. And in storytelling as in wayfaring, it is in the movement from place to place - or from topic to topic - that knowledge is integrated.

But now let us suppose that the story is told not with the voice but in writing. Instead of a stream of vocal sound we have a line of handwritten text. Does not this line, too, go out for a walk, continually advancing from the tip as the story proceeds? To readers of medieval Europe, the analogy between reading and travelling would have been self-evident. Time and again, commentators from the period would compare reading to wayfaring, and the surface of the page to an inhabited landscape in which one finds one's way about, following the script as the traveller follows footsteps in the terrain. Allusions abound to hunting and fishing, and to tracking down prey (Carruthers 1990: 247). As André Leroi-Gourhan put it, in his massive treatise on Gesture and Speech, readers would stalk the pages of manuscripts 'like primitive hunters - by following a trail rather than by studying a plan' (1993: 261).

The method of reading, in medieval times, was quite different from what we are accus-

tomed to today. For writing was understood not as something made, like a composition or work, but as something that speaks (de Certeau 1984: 137). Thus the task of the reader was to listen. In effect, reading was a practice of remembering, of bringing back the voices of the past. Just as to travel is to remember the path, or to tell a story is to remember how it goes, so to read, in this fashion, was to retrace a trail through the text. One remembered the text in much the same way as one would remember a story or a journey. The reader, in short, would inhabit the world of the page, proceeding from word to word as the storyteller proceeds from topic to topic, or the traveller from place to place. We have seen that for the inhabitant, the line of his walking is a way of knowing. Likewise the line of writing is, for him, a way of remembering. In both cases, knowledge is integrated along a path of movement. And in this respect, there is no difference in principle between the handwritten manuscript and the story voiced in speech or song. There is however, as I shall now show, a fundamental difference between the line that is written or voiced and that of a modern typed or printed composition. It is not, then, writing itself that makes the difference. It is rather what happens to writing when the flowing letterline of the manuscript is replaced by the connecting lines of a pre-composed plot.

Writing as conceived in the modern project is not a practice of inscription or line-making. It has little if anything to do with the craft of the scribe. The modern writer, according to de Certeau, confronts the blank surface of the page much as a conquering, colonial power confronts the surface of the earth, as an empty space awaiting the imposition of a construction of his own making (de Certeau 1984: 134). Upon this space he lays out linguistic fragments - letters, words, sentences - which, nesting hierarchically, can be integrated to form a complete composition. Indeed his practice is not unlike that of the cartographer who likewise positions iconic fragments on the paper surface to mark the locations of objects in the world. Neither on the page of the book nor on the surface of the map do the gestures of the author leave any trace beyond these discrete and compacted marks. They are all that is left of the original lines, respectively, of the manuscript and the sketch map.

For modern readers the text appears imprinted upon the blank page much as the world appears imprinted upon the paper surface of the cartographic map, ready-made and complete. The elements of the page may be joined in the imagination so as to form a plot - the literary equivalent of the scientist's graph or the tourist's route-plan. But the lines of the plot are not traced by the reader as he moves through the text. They are rather supposed to be laid out already before the journey begins. These lines are connectors. To read them, as Leroi-Gourhan realised, is to study a plan rather than to follow a trail. Unlike his medieval predecessor - an inhabitant of the page myopically entangled in its inky traces - the modern reader surveys the page as if from a great height. Routing across it from point to point, as the Royal Navy on the high seas, he moves in terms of area. In so doing he occupies the page and asserts his mastery over it. But he does not inhabit it.

Though I have drawn inspiration from de Certeau's account of the transformation of writing that accompanied the onset of modernity, he is wrong about one thing. Depositing verbal fragments at points across the space of the page, de Certeau tells us, the writer performs 'an itinerant, progressive, and regulated practice - a "walk"' (1984: 134). But that is precisely what he does not do. Even if he writes with a pen, he inscribes each letter by causing the tip of the pen to perform a miniature pirouette on one spot, before shifting his hand a little to the right in order to form the next. These transverse movements of the hand are no part of the act of writing; they serve only to transport the pen from spot to spot. The typewriter works on the same principle: the keys, tapped with the fingers,

deliver ready-made letter forms to the page, but the machine takes care of the lateral displacement. Here the original connection between the manual gesture and its graphic trace is finally broken altogether, for the punctual movements of the digits on the keys bear absolutely no relation to the shapes of the marks they serve to deliver. In the typed or printed text, every letter or punctuation mark is wrapped up in itself, totally detached from its neighbours to left and right. Thus the letterline of print or typescript does not go out for a walk. Indeed it does not go out at all, but remains confined to its point of origin.

Now if the modern writer does not lay a trail, neither does the modern reader follow it. Scanning the page, his cognitive task is rather to reassemble the fragments he finds there into larger wholes - letters into words, words into sentences, and sentences into the complete composition. Reading across the page rather than along its lines, he joins up the components distributed on its surface through a hierarchy of levels of integration. The procedure is formally equivalent to that of the assembly line in industrial manufacture, where the transverse motion of the conveyor belt allows for the piecing together of components added at fixed intervals to the finished product. In both cases, integration proceeds not alongly but upwards. And so the line of print, which has the appearance of a string of letters, interrupted at intervals by spaces and punctuation marks, can never even get underway. It is not a movement along a path but an immobile chain of connectors.

The distinction between these two kinds of line finally allows us to resolve what I shall call Leroi-Gourhan's paradox. In his *Gesture and Speech*, Leroi-Gourhan argues that for as long as human beings have been talking and telling stories, they have also been drawing lines. These lines are traces, left by the manual gestures that routinely accompany the flow of spoken narrative. Leroi-Gourhan calls this kind of line-making 'graphism'. Since the oral contexts of early graphic performance are now irretrievably lost, we can only guess at the significance of its surviving traces. However one striking feature that Leroi-Gourhan claims to find in prehistoric graphism is that its basic geometry is radial, 'like the body of the sea-urchin or starfish' (Leroi-Gourhan 1993: 211). Every graph spirals out from a centre, with its rhythmically repeated elements - or ideograms, in Leroi-Gourhan's terminology - arranged in concentric rings. Only much later do we find the graphs being stretched out into lines. Graphism became linear, according to Leroi-Gourhan's account, to the extent that it was released from the contexts of oral narrative, only to be subordinated to the demands of representing the sounds of speech. It was with the establishment of alphabetic writing, Leroi-Gourhan thinks, that linearisation was taken to its fullest extent. Thenceforth the rounded cosmos of human dwelling with the figure of man at the centre, and from which all lines radiate around and away, was replaced 'by an intellectual process which letters have strung out in a needle-sharp, needle-thin line' (Leroi-Gourhan 1993: 200).

Whether it was really the alphabet itself that made the difference or - as is more likely - the separation of letters in print, need not detain us further here. The paradox is this. Surely every trace left by a dextrous movement of the hand is itself a line. How, then, can the lines of prehistoric graphism be non-linear? How could it be that the storytellers and readers of old, as they traced their lines, followed a non-linear trail? And how, conversely, can graphism be linear when it leaves no trail to follow at all? In short, how can the line be non-linear and the non-line linear? The key to the solution lies in the phenomenon of the dotted line. Recall that in the evolution of the dotted line an original trace is broken into segments, each of which is then compressed into a point. It is in precisely this fragmentation and compression, in the reduction of a flowing movement to a succession of



moments, that the process of linearisation consists. No wonder that the resulting line, as Leroi-Gourhan put it, is both needle-sharp and needle-thin. It is sharp because it goes to a point. And it is thin since it exists only as a virtual connector rather than a physical trace. Understood in a purely geometrical sense, it has length but no width at all. Fully linearised, the line is no longer the trace of a gesture but a chain of point-to-point connections. In these connections there is neither life nor movement. Linearisation, in short, marks not the birth but the death of the line.

## Conclusion

Perhaps what truly distinguishes the predicament of people in modern metropolitan societies is the extent to which they are compelled to inhabit an environment that has been planned and built expressly for the purposes of occupation. The architecture and public spaces of the built environment enclose and contain; its roads and highways connect. Transport systems nowadays span the globe in a vast network of destination-to-destination links. For passengers, strapped to their seats, travel is no longer an experience of movement in which action and perception are intimately coupled, but has become one of enforced immobility and sensory deprivation. On arrival, the traveller is released from his bonds only to find that his freedom of movement is circumscribed within the limits of the site. Yet the structures that confine, channel and contain are not immutable. They are ceaselessly eroded by the tactical manoeuvring of inhabitants whose 'wandering lines' (de Certeau 1984: xviii) undercut the strategic designs of society's master-builders, causing them gradually to wear out and disintegrate. Quite apart from human beings who may or may not respect the rules of play, these inhabitants include countless non-humans that have no heed for them at all. Flying, crawling, wriggling and burrowing all over and under the regular, linearised infrastructure of the occupied world, creatures of every sort continually reincorporate and rearrange its crumbling fragments into their own ways of life.

Indeed nothing can escape the tentacles of the meshwork of habitation as its ever-extending lines probe every crack or crevice that might potentially afford growth and movement. Life will not be contained, but rather threads its way through the world along the myriad lines of its relations. But if life is not enclosed within a boundary, neither can it be surrounded. What then becomes of our concept of environment? Literally an environment is that which surrounds. For inhabitants, however, the environment comprises not the surroundings of a bounded place but a zone in which their several pathways are thoroughly entangled. In this zone of entanglement - this meshwork of interwoven lines - there are no insides or outsides, only openings and ways through. An ecology of life, in short, must be one of threads and traces, not of nodes and connectors. And its subject of inquiry must consist not of the relations between organisms and their external environments but of the relations along their severally enmeshed ways of life. Ecology, in short, is the study of the life of lines.

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