

The Perception of the Environment

Essays on livelihood, dwelling and skill

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Chapter Ten

Building, dwelling, living:

How animals and people make themselves at home in the world

This chapter is partly autobiographical, and describes my own attempts over the last few years to find a satisfactory way of understanding the relationships between people and their environments. It is incomplete, in the sense that I cannot claim to have yet found, or that I will ever find, final answers to the questions that are bothering me. Indeed, if one of the main conclusions of what I have to say is that so-called ‘ends’ or ‘goals’ are but landmarks on a journey, then this must apply as much to my own thinking and writing as to everything else that people do in the world. The most fundamental thing about life is that it does not begin here or end there, but is always *going on*. And for the same reason, as we saw in Chapter One (p. 20), environments are never complete but are continually under construction. My purpose here is to consider the implications of this point with regard to our ideas about the similarities and contrasts between human beings and other animals in the ways in which they go about creating environments for themselves. I am concerned, in particular, with the meaning of architecture, or of that part of the environment which is conventionally described as ‘built’.

In recent years, my own ideas have undergone something of a sea change, which is where the autobiographical element comes in. I began with a view that was – and indeed still is – fairly conventional in anthropology, one that sets out from the premise that human beings inhabit discursive worlds of culturally constructed significance, laid out upon the substrate of a continuous and undifferentiated physical terrain. If I differed from my colleagues, at least in social anthropology, it was in my concern to spell out the implications of this premise for the distinction between human beings and non-human animals. I felt sure that the models developed by ecologists and evolutionary biologists to account for the relations between organisms and their environments must apply as well to the human as to any other species, yet it was also clear to me that these models left no space for what seemed to be the most outstanding characteristic of human activity – that it is intentionally motivated. Human intentions, I argued, are constituted in the intersubjective domain, of relationships among *persons*, as distinct from the domain in which human beings, as biological *organisms*, relate to other components of the natural environment. Human life, I therefore proposed, is conducted simultaneously in two domains – a social domain of interpersonal relations and an ecological domain of inter-organismic relations – so that the problem is to understand the interplay between them (Ingold 1986a: 9).

Starting out from two quite reasonable propositions – that human beings are organisms, and that human action is intentionally motivated – I thus ended up with what appeared to be a thoroughly *unreasonable* result: that unlike all other animals, humans live a split-level existence, half in nature, half out; half organism, half person; half body, half mind. I had come out as an unreconstructed Cartesian dualist, which is perhaps not

so surprising when you remember that the intellectual division of labour between the natural sciences and the humanities – and within anthropology between its biological and sociocultural divisions – rests on a Cartesian foundation. Something, I felt, must be wrong somewhere, if the only way to understand our own creative involvement in the world is by taking ourselves out of it. Eventually, it dawned on me that although the problem was an anthropological one, it would require more than an anthropological solution: what is needed is a completely new way of thinking about organisms and about their relations with their environments; in short, a new ecology. And it is towards this new ecology that I have been groping.

In this task, I have gained inspiration from three principal sources. The first comes from biology, and consists in the work of the handful of courageous scholars – principally developmental biologists – who have been prepared to challenge the hegemony of neo-Darwinian thinking in the discipline (e.g. Ho and Saunders 1984, see also Oyama 1985). The second lies in what is known as ‘ecological psychology’, an approach to understanding perception and action that is radically opposed to the cognitivist orientation of the psychological mainstream (Gibson 1979, Michaels and Carello 1981). And the third comes from philosophical writing of a broadly phenomenological bent, above all the works of Martin Heidegger (1971) and Maurice Merleau-Ponty (1962).¹ Although developed independently, in the different disciplinary contexts of biology, psychology and philosophy, these three approaches have much in common. Though I cannot now explore the commonalities in detail, I want to highlight just two of them that are rather central to what I shall have to say. First, all three approaches reverse the normal order of priority – normal, that is, in the history of Western thought – of form over process. Life, in this perspective, is not the revelation of pre-existent form but the very process wherein form is generated and held in place. Secondly, the three approaches adopt as their common point of departure the agent-in-its-environment, or what phenomenology calls ‘being in the world’, as opposed to the self-contained individual confronting a world ‘out there’. In short, they maintain that it is through being inhabited, rather than through its assimilation to a formal design specification, that the world becomes a meaningful environment for people.

In what follows, I refer to this position as the ‘dwelling perspective’, by contrast to the more conventional position from which I began, and which I shall call the ‘building perspective’. Thus the movement in my own thinking has been from the building perspective to the dwelling perspective. To document this movement, I shall start by spelling out the first of these perspectives, and its implications for the way we understand the construction of the built environment, in greater depth. I shall then explain what is entailed in adopting a dwelling perspective in its place. Finally, I shall consider how this shift from a building perspective to a dwelling perspective bears upon the concept and meaning of architecture.

CONSTRUCTING ENVIRONMENTS AND MAKING WORLDS

Our initial problem may be framed by juxtaposing two statements, the first of which will be familiar to anthropological readers, the second much less so. ‘Man’, Clifford Geertz has declared, ‘is an animal suspended in webs of significance he himself has spun’ (1973: 5). One is led to suppose that non-human animals are not so suspended. Spiders spin webs, and do indeed suspend themselves in them, but their webs are tangible objects – they catch flies, not thoughts. But now consider this passage from the delightful but little

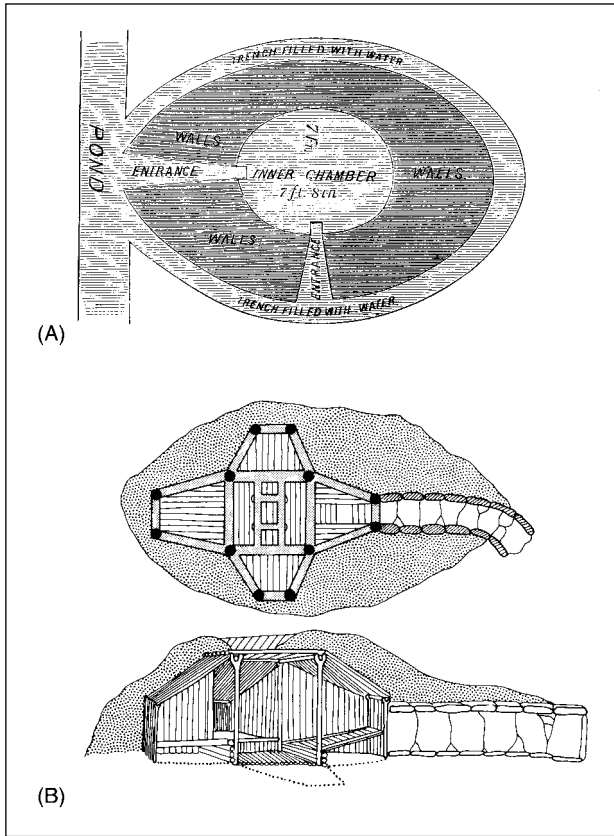


Figure 10.1 Human and animal architecture. (A) Ground plan of beaver lodge (from Morgan 1868: 142); (B) Floor plan and cross-section of Eskimo house, Mackenzie region (from Maus and Beuchat 1979: 4).

known text of Jakob von Uexküll, *A Stroll through the Worlds of Animals and Men*: ‘As the spider spins its threads, every subject spins his relations to certain characters of the things around him, and weaves them into a firm web which carries his existence’ (1957: 14). Now the subjects of which von Uexküll speaks are not merely human, nor even close to human. Indeed he begins his stroll with a particular species of parasitic tick! If, as it would seem, what Geertz says of humankind applies equally to ticks, then what – if anything – *does* distinguish human from non-human environments?

Though it might be said, with Nelson Goodman (1978), that human beings are makers of worlds, this only begs the question of how human acts of world-making differ from the processes whereby non-human animals fashion their environments. It was this question that initially led me to focus on the meaning of the built environment: not, that is, on what a built environment means, but on what it means to say that an environment is built. How can we distinguish an environment that is built from one that is not? It is all very well to define the built environment, as do Denise Lawrence and Setha Low in a recent review, to include ‘any physical alteration of the natural environment, from hearths

to cities, through construction by humans’ (1990: 454). But why should the products of human building activity be any different, in principle, from the constructions of other animals? Or to phrase the same question in another way, by what right do we conventionally identify the artificial with the ‘man-made’? And where, in an environment that bears the imprint of human activity, can we draw the line between what is, and is not, a house, or a building, or an instance of architecture (Pearson and Richards 1994: 2)?

My first efforts to deal with these questions all hinged on a crucial distinction, which I thought quite unproblematic at the time, between design and execution. The argument ran roughly as follows: imagine a mollusc shell, a beaver’s lodge and a human house. All have been regarded, at one time or another, as instances of architecture. Some authors would restrict architecture to the house, others would include the lodge – as an example of ‘animal architecture’ (von Frisch 1975) – but exclude the shell, others would include all three forms. The usual argument for excluding the shell is that it is attached to the body of the mollusc, whereas for something to count as an artefact it must be detached

from the body. The shell, it is said, ‘just grows’ – there is nothing the mollusc can or need do about it. The beaver, by contrast, works hard to put its lodge together: the lodge is a product of the beaver’s ‘beavering’, of its activity. Likewise the house is a product of the activities of its human builders. In their respective forms, and levels of complexity, they need not be that different (Figure 10.1). Should we, then, conclude that the lodge is beaver-made just as much as the house is man-made?

To this question I answered in the negative (Ingold 1986b: 345–6; 1988b: 90). Wherever they are, beavers construct the same kinds of lodges and, so far as we know, have always done so. Human beings, by contrast, build houses of very diverse kinds, and although certain house forms have persisted for long periods, there is unequivocal evidence that these forms have also undergone significant historical change. The difference between the lodge and the house lies, I argued, not in the construction of the thing itself, but in the origination of the *design* that governs the construction process. The design of the lodge is incorporated into the same programme that underwrites the development of the beaver’s own body: thus the beaver is no more the designer of the lodge than is the mollusc the designer of its shell. It is merely the *executor* of a design that has evolved, along with the morphology and behaviour of the beaver, through a process of variation under natural selection. In other words, both the beaver – in its outward, phenotypic form – and the lodge are ‘expressions’ of the same underlying genotype. Richard Dawkins (1982) has coined the term ‘extended phenotype’ to refer to genetic effects that are situated beyond the body of the organism, and in this sense, the lodge is part of the extended phenotype for the beaver.

Human beings, on the other hand, are the authors of their own designs, constructed through a self-conscious decision process – an intentional selection of ideas. As Joseph Rykwert has put it: ‘unlike even the most elaborate animal construction, human building involves decision and choice, always and inevitably; it therefore involves a project’ (1991: 56). It is to this project, I maintained, that we refer when we say that the house is *made*, rather than merely constructed. I even went so far as to extend the argument to the domain of toolmaking, criticising students of animal behaviour for their assumption that wherever objects are manifestly being modified or constructed for future use, tools are being made. They are only being made, I claimed, when they are constructed in the imagination prior to their realisation in the material (Ingold 1986a: 40–78). But if the essence of making lies in the self-conscious authorship of design, that is in the construction of a project, it follows that things can be made without undergoing any actual physical alteration at all. Suppose that you need to knock in a nail but lack a hammer. Looking around the objects in your environment, you deliberately select something best suited to your purpose: it must be hard, have a flat striking surface, fit in the hand, and so on. So you pick up an appropriate stone. In this very selection, the stone has ‘become’ a hammer in that, in your mind’s eye, a ‘hammer-quality’ has been attached to it. Without altering the stone in any way, you have made a hammer out of it.² In just the same manner, a cave may come to serve as a dwelling, a stretch of bare flat land as an airstrip, or a sheltered bay as a harbour.

To deal with situations of this kind, I chose the term *co-option*. Thus the stone was co-opted, rather than constructed, to become a hammer. It follows that there are two kinds of making: co-optive and constructive. In co-optive making an already existing object is fitted to a conceptual image of an intended future use, in the mind of a user. In constructive making this procedure is reversed, in that the object is physically remodelled to conform more closely to the pre-existing image. Indeed it seemed that the history of

things – of artefacts, architecture and landscapes – could be understood in terms of successive, alternating steps of co-option and construction. We press into service what we find around us to suit our current purposes, we proceed to modify those things to our own design so that they better serve these purposes, but at the same time our objectives – or adaptive requirements – also change so that the modified objects are subsequently co-opted to quite other projects for which they are perceived to come in handy, and so on and on. Exactly the same model has been applied to account for the evolution of organisms – Darwin himself used it in his book on orchids (1862: 348).³ To adopt terms suggested by Stephen J. Gould and Elisabeth Vrba (1982), structures *adapted* for one purpose may be *exapted* for another, subsequently undergoing further adaptation, only to be exapted for yet another purpose . . . The difference is just that in the case of organic evolution, the selection involved is natural rather than intentional (Ingold 1986b: 200–2).

It was in searching around for ways to express these ideas that I came across the writings of Jakob von Uexküll, Estonian-born aristocrat and a founding figure in the fields of both ethology and semiotics, to whose *Stroll through the Worlds of Animals and Men*, first published in 1934, I have already referred. Reacting against the mechanistic biology of the day, von Uexküll argued that to treat the animal as a mere assemblage of sensory and motor organs is to leave out the subject who uses these organs as tools, respectively, of perception and action:

We who still hold that our sense organs serve our perceptions, and our motor organs our actions, see in animals . . . not only the mechanical structure, but also the operator, who is built into their organs, as we are into our bodies. We can no longer regard animals as mere machines, but as subjects whose essential activity consists in perceiving and acting . . . All that a subject perceives becomes his *perceptual world* and all that he does, his *effector world*. Perceptual and effector worlds together form a closed unit, the *Umwelt*.

(1957: 6)

For von Uexküll, the *Umwelt* – that is, the world as constituted within the specific life activity of an animal – was to be clearly distinguished from the environment, by which he meant the surroundings of the animal as these appear to the indifferent human observer. We human beings cannot enter directly into the *Umwelten* of other creatures, but through close study we may be able to imagine what they are like. But the reverse does not hold: the non-human animal, because it cannot detach its consciousness from its own life-activity, because it is always submerged within its own *Umwelt*, cannot see objects as such, for what they are in themselves. Thus for the animal, the environment – conceived as a domain of ‘neutral objects’ – cannot exist (Ingold 1992a: 43).

Towards the end of his stroll, von Uexküll invites his readers to imagine the manifold inhabitants of an oak tree. There is the fox, who has built its lair between the roots; the owl, who perches in the crotch of its mighty limbs; the squirrel, for whom it provides a veritable maze of ladders and springboards; the ant, who forages in the furrows and crags of its bark; the wood-boring beetle who feeds and lays its eggs in passages beneath the bark, and hundreds of others (Figures 10.2 and 10.3). Each creature, through the sheer fact of its presence, confers on the tree – or on some portion of it – a particular quality or ‘functional tone’: shelter and protection for the fox, support for the owl, a thoroughfare for the squirrel, hunting grounds for the ant, egg-laying facilities for the beetle. The same tree, thus, figures quite differently within the respective *Umwelten* of its diverse

inhabitants. But for none of them does it exist *as a tree* (von Uexküll 1957: 76–9). Now consider the forester, who is measuring up the tree to estimate the volume of timber it will yield. For him, the tree figures as a potential source of valuable raw material, whereas for the little child – again to follow von Uexküll’s example (pp. 73–5) – it seems to be alive and to reveal a frightening aspect. But these different perceptions are not tied, as they are for non-human animals, to the *modus operandi* of the organism. Human beings do not construct the world in a certain way by virtue of what they are, but by virtue of their own conceptions of the possibilities of being. And these possibilities are limited only by the power of the imagination.

Herein, it seemed to me, lay the essential distinction I was seeking between the respective ways in which the subjective existence of human and non-human animals is suspended in ‘webs of significance’. For the non-human, every thread in the web is a relation between it and some object or feature of the environment, a relation that is set up through its own practical immersion in the world and the bodily orientations that this entails. For the human, by contrast, the web – and the relations of which it consists – are inscribed in a separate plane of mental representations, forming a tapestry of meaning that *covers over* the world of environmental objects. Whereas the non-human animal perceives these objects as immediately available for use, to human beings they appear initially as occurrent phenomena to which potential uses must be *affixed*, prior to any attempt at engagement. The fox discovers shelter in the roots of a tree, but the forester sees timber only in his mind’s eye, and has first to fit that image in thought to his perception of the occurrent object – the tree – before taking action. Or to take another example, suggested recently by Maurice Bloch, the ‘swidden plot’ exists as an image in the mind of the horticulturalist, who has to match that image to an observed stand of uncut forest prior to transforming it into a field (Bloch 1991: 187). As mental representations, the timber and the swidden plot belong to the ‘intentional worlds’ (cf. Shweder 1990: 2) of the forester and the farmer; as occurrent phenomena, the oak tree and the stand of forest belong to the physical environment of ‘neutral objects’. It has been conventional, in anthropological and other writings of Western academic provenance, to refer to these worlds, of human values and purposes on the one hand, and of physical objects on the other, by means of the shorthand terms, culture and nature, respectively. And in a paper written

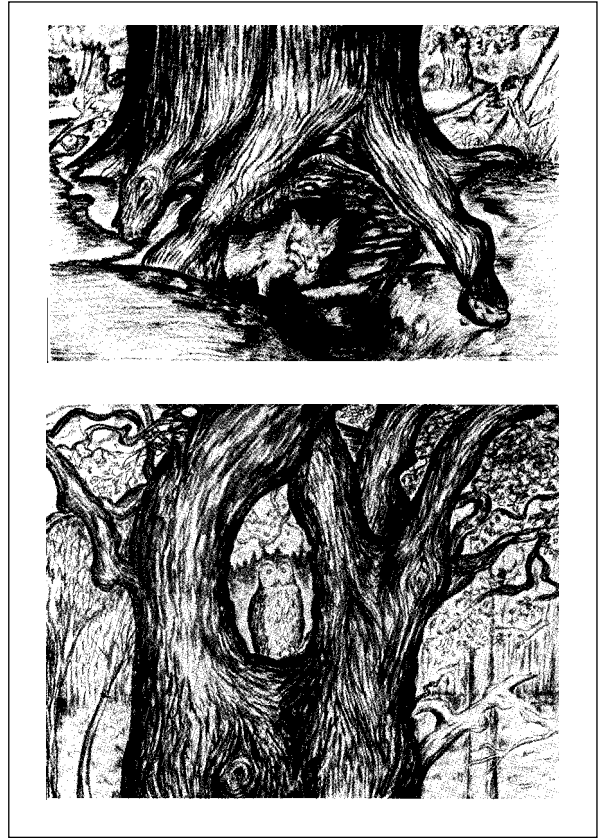


Figure 10.2 Fox, owl and oak tree

From Jakob von Uexküll ‘A Stroll through the Worlds of Animals and Men,’ in *Instinctive Behavior*, 1957, pp. 76–7, illustrations by G. Kriszat.

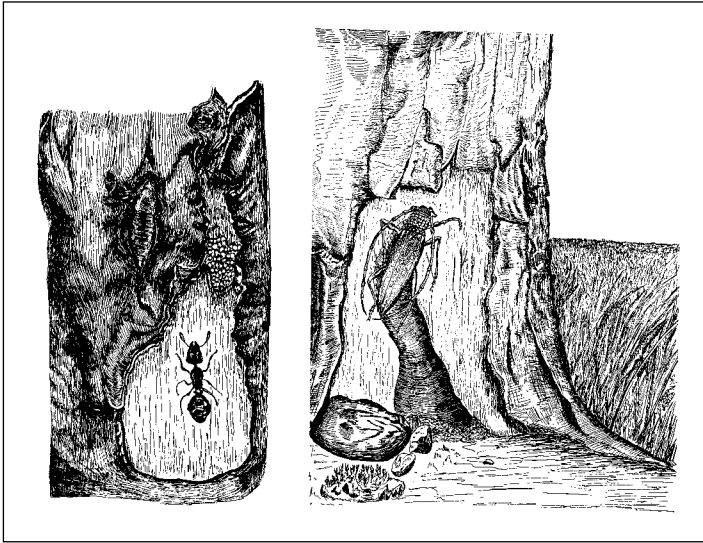


Figure 10.3 Ant, bark-boring beetle and oak tree

From Jakob von Uexküll 'A Stroll through the Worlds of Animals and Men,' in *Instinctive Behavior*, 1957, pp. 78–9, illustrations by G. Kriszat.

in 1987, I concluded that 'making is equivalent to the cultural ordering of nature – the inscription of ideal design upon the material world of things' (Ingold 1989: 506). This statement, I confess, is now a source of considerable embarrassment.

THE BUILDING PERSPECTIVE

In my defence, I can only say that I was singing a tune that has been sung by most anthropologists, in one form or another, for decades, in the context of an encounter with students of animal behaviour whose theories had no place for agency or intentionality at all, except as an epiphenomenal effect of innate predisposition.⁴ This tune is what I earlier called the 'building perspective', and I should now like to elaborate on this perspective with reference to anthropological work other than my own. For a founding statement, we could turn once again to Geertz, and to his assertion that culture – or at least that kind of culture taken to be the hallmark of humanity – consists in 'the imposition of an arbitrary framework of symbolic meaning upon reality' (1964: 39). Reality, that which is imposed upon, is envisioned here as an external world of nature, a source of raw materials and sensations for diverse projects of cultural construction. Following from this, a distinction is commonly made between the *real* environment that is given independently of the senses, and the *perceived* environment as it is reconstructed in the mind through the ordering of sense data in terms of acquired, cognitive schemata. Other conventional oppositions that encode the same distinction, and that we have already encountered (see Chapter Three, p. 41, and Chapter Nine, p. 168), are between 'etic' and 'emic', and between 'operational' and 'cognised'. The starting point in all such accounts is an imagined *separation* between the perceiver and the world, such that the perceiver has to reconstruct the world, in the mind, prior to any meaningful engagement with it.

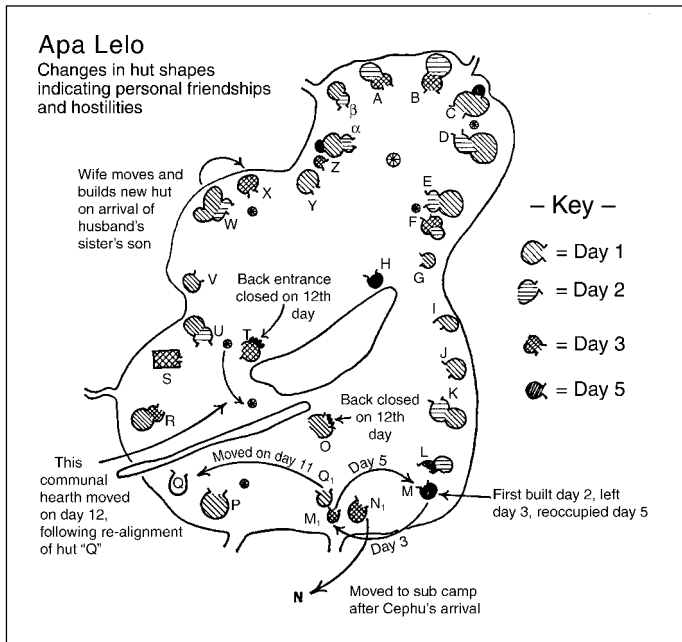


Figure 10.4 The Mbuti Pygmy camp of Apa Lelo

From C. M. Turnbull, *Wayward servants*, published by Eyre & Spottiswoode, 1965, p. 357.

Here, then, is the essence of the building perspective: that worlds are made before they are lived in; or in other words, that acts of dwelling are preceded by acts of worldmaking. A good example of this approach comes from the introduction to Maurice Godelier's book, *The mental and the material* (1986). Here, Godelier is concerned with the proper translation of the Marxian concepts *Grundlage* and *Überbau*, usually rendered in English as 'infrastructure' and 'superstructure'. He likens the *Überbau* to a building: 'The *Überbau* is a construction, an edifice which rises on foundations, *Grundlage*; and it [the *Überbau*] is the house we live in, not the foundations' (pp. 6–7). Human beings, then, inhabit the various houses of culture, pre-erected upon the universal ground of nature – including the universals of *human* nature. For another example, I would like to turn to Peter Wilson's *The domestication of the human species* (1988). In this book, Wilson argues that the most significant turning point in human social evolution came at the moment when people began to live in houses. Roughly speaking, this marks a division between hunters and gatherers, on the one hand, and agriculturalists and urban dwellers, on the other. 'Hunter-gatherers', Wilson writes, 'create for themselves only the flimsiest architectural context, and only the faintest line divides their living space from nature'. All other societies, by contrast, 'live in an architecturally modified environment', inhabiting houses and villages of a relatively enduring kind, structures that – even when abandoned – leave an almost indelible impression in the landscape. In essence, Wilson is distinguishing between societies with architecture and societies without it.

This is a bold generalisation, and like all such, it is an easy target for empirical refutation. That is not my concern, however. I am rather concerned to expose the assumptions entailed in making the distinction between an 'architecturally modified environment' and what is

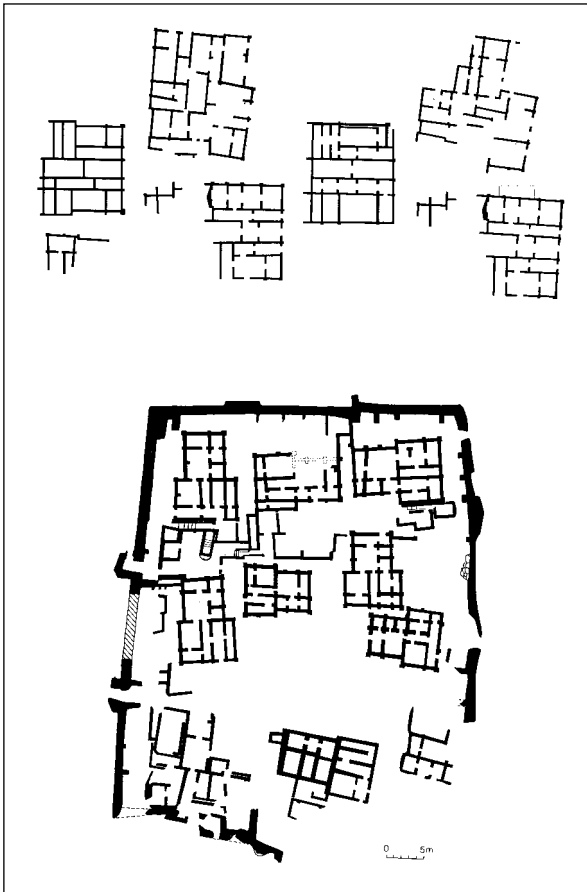


Figure 10.5 Building plans of three periods from the ancient Mesopotamian site of Tell es-Sawwan.

From J. Mellaart, *The Neolithic of the Near East*, published by Thames and Hudson, London 1975.

ties, along with food-collecting, cooking, toolmaking and repair, childminding, and so on, that constitute the daily round for these people. Thus building activity is part and parcel of life in an environment that is already *given* in nature, and that has not itself been artificially engineered. With village architecture, by contrast, nature has to a degree been covered over or transformed, so that what immediately confronts people is not a natural environment but – in Wilson’s words – ‘an environment of their own making, the cultural’ (1988: 8). If hunter-gatherers build as part of their adaptation to the given conditions of the natural environment, villagers adapt to the conditions of an environment that is already built. Either way, the environment is given in advance, as a kind of container for life to occupy. Where, as among hunter-gatherers, building is a part of everyday life, it is not supposed to have any lasting impact on the environment; where, as among villagers, the environment has been manifestly built, the buildings are apparently made before life begins in them. This, of course, is the architect’s perspective: first plan and build the houses, then import the people to occupy them.

simply called ‘nature’. For it is on this distinction that Wilson’s entire argument rests. One objection to it immediately comes to mind. To be sure, the physical arrangement and formal properties of a hunter-gatherer encampment may be very different from those of a permanent village settlement. By way of example, compare the plan, shown in Figure 10.4, of the Mbuti Pygmy camp of Apa Lelo, in the Ituri forest of Zaire, with the plans shown in Figure 10.5 of the ancient Mesopotamian village site of Tell es-Sawwan. In the first case the spatial structure of settlement is loose, informal, and sensitive to the changing state of interpersonal relations between cliques, hosts and visitors. In the second it is tightly packed, geometrically regular, and appears to impose fairly tight constraints on the disposition of people and activities. Moreover, compared with the substantial buildings of the village settlement, the constructions of the hunter-gatherers are scarcely more than shades and windbreaks. Most of life, for hunter-gatherers, goes on around dwellings rather than in them. Nevertheless, the fact remains that hunter-gatherers do build shelters of various kinds. So who are we to say that they have no architecture? And if they do not, how are we to comprehend their building activity?

The answer that emerges from Wilson’s account is that among hunter-gatherers, erecting shelters is one of a suite of activities,

What, then, of the dwellings of nomadic pastoralists? A recent study comparing pastoral tent dwellings and village houses in Turkey and Iran by the archaeologist, Roger Cribb (1991), found that despite differences in the building materials used and the flexibility they afford, the tent and the house were virtually identical in their underlying organisational templates. What really distinguished the house from the tent was the degree to which the imposed, cultural design – shared by villagers and nomads alike – is actually translated into enduring, material structures. For such structures do not get built overnight; they grow cumulatively in the course of a settlement's continuous occupation, such that 'each new alteration or addition builds on a series of existing structures'. But in the case of a pastoral nomadic camp, 'each occupation is a fresh event', so that the camp 'has no such history but remains permanently retarded in the initial stages of the normal developmental cycle [of the settlement]' (1991: 156). Thus, although pastoralists carry a basic organisational template with them, there is little opportunity for its enduring physical realisation before the camp picks up and moves off somewhere else, where the occupation process starts all over again. In such cases, building never proceeds beyond the first phase of temporary habitation (Ingold 1992c: 795–6).

In a statement that epitomises the building perspective, Amos Rapoport writes that 'the organisation of space cognitively precedes its material expression; settings and built environments are thought before they are built' (1994: 488). In the case of villagers, the environment is ready-built. In the case of nomadic pastoralists, it would seem, the environment, though thought, is never more than partially built. As for the hunter-gatherers, it appears that the building hardly gets started at all: indeed Rapoport refers to the camp sites of Aboriginal people of the Australian Central Desert as exemplars of the situation where the environment is thought but *never* built. On these grounds, as we saw in Chapter Three (pp. 56–7), they are supposed to inhabit a 'natural' rather than an 'artificial' environment.

THE SEARCH FOR ORIGINS

Having spelled out the essence of the building perspective, let me now return to my earlier observation, comparing the forms of the beaver's lodge and the human house, that the first is tied, as it were, to the nature of the beaver itself, whereas the second is both historically and regionally variable. Among non-human animals, it is widely supposed, there can be no significant change in built form that is not bound to evolutionary changes in the essential form of the species. With human beings, by contrast, built form is free to vary independently of biological constraint, and to follow developmental pathways of its own, effectively decoupled from the process of evolution. In his famous paper of 1917, on 'The Superorganic', Alfred Kroeber declared: 'Who would be so rash as to affirm that ten thousand generations of example would convert the beaver from what he is into a carpenter or a bricklayer – or, allowing for his physical deficiency in the lack of hands, into a planning engineer!' (1952: 31). Yet human beings, through practice, example and a good measure of ingenuity, coupled with their ability to transmit their acquired know-how across the generations and to preserve it in long-term memory, have learned all these trades, and many more besides.

However, this argument implies some kind of threshold in the evolution of our own kind, at which point our ancestors were sufficiently endowed with the qualities of intelligence and manual dexterity to become the authors of their own projects of building. Taking off from this point, the history of architecture must be supposed to have proceeded

from the earliest dwellings to the modern construction industry, the species-specific nature of the human organism remaining all the while unchanged. But what *was* the earliest dwelling? According to Kenneth Bock, an event in the history of architecture – such as the construction of a Gothic vault – differs from an event in the evolution of species ‘in that the former involves formation of intent or purpose on the part of an actor while the latter does not’ (1980: 182). The same idea is implied by Joseph Rykwert when he suggests that the essence of architecture lies in ‘taking thought about building’ (1991: 54). But how did it come about that, at some decisive moment, our ancestors began to think about what they built?

As Rykwert shows, in his study of the notion of the ‘primitive hut’ in the history of architecture, this is a question that has long exercised the minds of Western thinkers. And the title of his book, *On Adam’s House in Paradise* (1972), nicely conveys the mythic quality of the many speculative answers that have been proposed. Reproduced in Figure 10.6 is one of the more delightful images of ‘the first hut’, taken from the work of the great French architectural theorist, Eugène Viollet-le-Duc, *Histoire de l’habitation humaine*, published in 1875 (Viollet-le-Duc 1990: 26). Architecture began, for Viollet-le-Duc, when the problem of the need for shelter was met through the procedures of rational planning. In his tale of the building of the first hut the secret is revealed to a hapless primitive tribe, the Nairitti, by a progressive time-traveller by the name of Epergos, bestowed upon them as a gift of his superior intelligence. For Viollet-le-Duc, as for many others, Rykwert notes, it was ‘the difference of conception, the attachment of meaning to his task, that distinguishes man’s first attempts [at building] from those of the instinctually driven beasts’ (1972: 22). These attempts may have been decidedly inferior to the constructions of animals, nevertheless they marked the turning point at which humanity was set upon the road to culture and civilisation.

The search for the first building continues to this day, though it is informed by a much better knowledge both of the archaeological traces left by early human or hominid populations, and of the behaviour of those species of animals – namely the great apes – most closely related to humankind. One of the most peculiar and distinctive aspects of the behaviour of chimpanzees, gorillas and orang-utans is their habit of building so-called ‘nests’. In functional terms, they are not really nests at all: every individual animal builds its own nest afresh, each evening, and uses it for the sole purpose of sleeping. Nor does the nest site mark any kind of fixed point in the animal’s movements; it may be built anywhere, and is abandoned the next morning (Groves and Sabater Pi 1985: 23). Nevertheless, assuming that the common ancestor of apes and humans would have had a similar habit, attempts have been made to trace an evolutionary continuum from this nesting behaviour to the residential arrangements of prototypical human groups (of which the camps of contemporary hunter-gatherers have frequently been taken as the closest exemplars, on the grounds of the presumed similarity of ecological context).

Comparing the nesting patterns of apes with the camping patterns of human hunter-gatherers, Colin Groves and J. Sabater Pi note some striking differences. The human ‘nest’, if we may call it that, is a fixed point for the movements of its several occupants, and a place to which they regularly return. In other words, it has the attributes of what the ethologist, Heini Hediger, would call ‘home’: it is a ‘goal of flight’ and a ‘place of maximal security’ (Hediger 1977: 181). There is a difference, too, in the respective ways in which apes and humans go about building their accommodation. For one thing, apes use material that comes immediately to hand, normally by a skilful interweaving of growing vegetation to form an oval-shaped, concave bed; whereas humans collect suitable materials from



Figure 10.6 The first hut, as depicted by Viollet-le-Duc.

From *The architectural theory of Viollet-le-Duc: readings and commentary*, edited by M. F. Hearn, published by MIT Press, 1990, p. 26.

a distance, prior to their assembly into a convex, self-supporting structure. For another thing, the ape makes its nest by bending the vegetation around its own body; whereas the human builds a hut, and then enters it (Groves and Sabater Pi 1985: 45). There is a sense, as Hediger remarks, in which apes build from the ‘bottom up’, seeking support for rest and sleeping, whereas humans build from the ‘top down’ seeking shelter from sun, rain or wind (1977: 184). Yet there are also remarkable similarities between ape and human living arrangements, in the overall number and layout of nests or huts and in the underlying social organisation, and on the grounds of these similarities, Groves and Sabater Pi feel justified in arguing that human campsites are but elaborations of a generalised ape pattern. All the critical differences – the functioning of the site as a home-base, the collection of material prior to construction, the technique of building from the outside – can be put down, they think, to one factor, namely the human ability ‘to visualise objects in new configurations, and to bring these configurations into being on the basis of that mental picture’ (1985: 45).

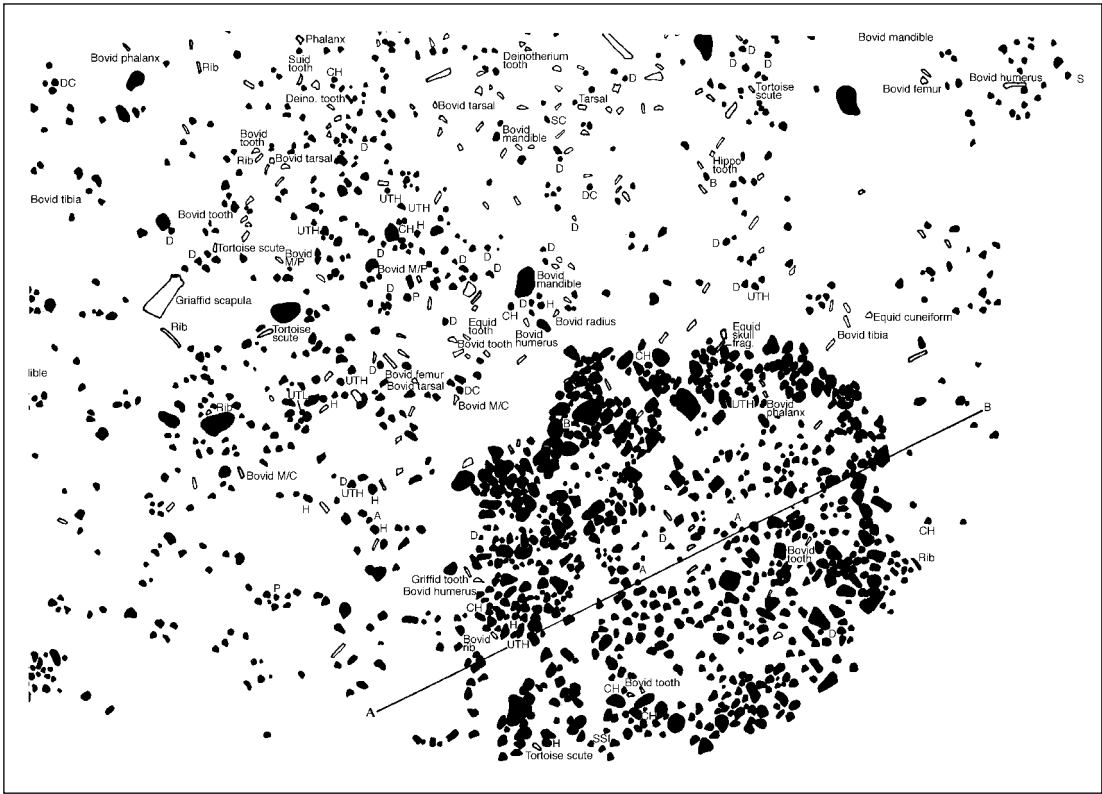


Figure 10.7 The 'stone circle' from Bed I of Olduvai Gorge.

From M. D. Leakey, *Olduvai Gorge* (volume three), published by Cambridge University Press, 1971.

Though in substance based on fact rather than fantasy, the form in which this argument is cast is virtually identical to that of Viollet-le-Duc's tale of the building of the first hut. Equipped, albeit by natural selection rather than providential intervention, with foresight and intelligence, the first builders set to work to execute a plan that was already formed as a picture in their imagination. They had solved the problem of shelter in their minds, prior to putting the solution into practical effect. It is in this light that we can understand the extraordinary significance that has been attached to the so-called 'stone circle' discovered at the famous site of Olduvai Gorge in Tanzania, and dated to some 1.75 million years ago (Figure 10.7). In her interpretation of the circle, Mary Leakey writes that in its general appearance, it 'resembles temporary structures often made by present-day nomadic peoples who build a low stone wall round their dwellings to serve either as a windbreak or as a base to support upright branches which are bent over and covered with either skins or grass' (1971: 24). A photograph of such a dwelling, from the Okombambi people of Southwest Africa, is provided to substantiate the comparison. As always in these matters, the specific interpretation has been challenged. What has not been challenged, however, is the frame of mind that leads us to suppose that if the interpretation were correct, we would have at last discovered the *real* 'first hut', and with it not just the origins of architecture, but the point of transition to true humanity.

For it is the structure of our thought, not the patterning of the archaeological record, that sets up a point of origin at the intersection of two axes, one of evolutionary change – leading from ancestral pongids and hominids to human beings, the other of historical change – leading from Palaeolithic hunting and gathering to modern industry. (Why this should be so is a matter to which I return in Chapter Twenty-one, pp. 388–90.) To explode the myth of the first hut thus requires nothing less than the dissolution of the dichotomy, which in modern scholarship separates the biological sciences from the humanities, between evolution and history, or between the temporal processes of nature and culture. Before indicating how this might be done, I need to introduce what I have called the ‘dwelling perspective’.

THE DWELLING PERSPECTIVE

For this purpose I turn to Martin Heidegger’s evocative essay, ‘Building Dwelling Thinking’, on which I have drawn for my title (Heidegger 1971: 145–61). In this essay, Heidegger asks what it means to build and to dwell, and what the relation is between these two – between building and dwelling. He begins with what might be taken as the hegemonic view, as enshrined in the discourse of Western modernity. This is that building and dwelling are separable but complementary activities, related as means to ends. We build houses so that we may dwell in them (or, as is usual in industrial society, some people build houses for other people to live in). To dwell, in this sense, means merely ‘to occupy a house, a dwelling place’. The building is a *container* for life activities, or more strictly for certain life activities, since there are other kinds of activity that go on outside houses, or in the open air. Yet, Heidegger asks, ‘do the houses in themselves hold any guarantee that *dwelling* occurs in them?’ (1971: 146). To clarify matters, let us call the physical structure, the building in itself, the *house*; and the setting within which people dwell the *home* (Lawrence 1987). Heidegger’s question can then be rephrased as follows: what does it take for a house to be a home (Pearson and Richards 1994: 6)? Merely to pose the question in this form suggests that there must be more to dwelling than the mere fact of occupation. What, then, does it mean, ‘to dwell’?

Heidegger tackles the issue through an exercise in etymology. The current German word for the verb ‘to build’, *bauen*, comes from the Old English and High German *buan*, meaning ‘to dwell’. Though this original meaning has been lost, it is preserved in such compounds as the English ‘neighbour’, meaning one who dwells nearby. Moreover, this sense of dwelling was not limited to one sphere of activity among many – to domestic life, say, as opposed to work or travel. Rather it encompassed the whole manner in which one lives one’s life on the earth; thus ‘I dwell, you dwell’ is identical to ‘I am, you are’. Yet *bauen* has another sense: to preserve, to care for, or more specifically to cultivate or to till the soil. And then there is the third sense: to construct, to make something, to raise up an edifice. Both these modern senses of building – as cultivation and as construction – are thus shown to be encompassed within the more fundamental sense of dwelling. In the course of time, however, this underlying sense has fallen into disuse, such that *bauen* has come to be reserved exclusively for cultivation and construction. Having forgotten how the latter activities are grounded in dwelling, modern thought then *rediscovers* dwelling as the occupation of a world already built.

In short, where before, building was circumscribed within dwelling, the position now appears reversed, with dwelling circumscribed within building. Heidegger’s concern is to regain that original perspective, so that we can once again understand how the activities of building – of cultivation and construction – belong to our dwelling in the world, to the

way we are. 'We do not dwell because we have built, but we build and have built because we dwell, that is because we are dwellers . . . To build is in itself already to dwell . . . *Only if we are capable of dwelling, only then can we build*' (Heidegger 1971: 148, 146, 160, original emphases). I take this to be the founding statement of the dwelling perspective.⁵ What it means is that the forms people build, whether in the imagination or on the ground, arise within the current of their involved activity, in the specific relational contexts of their practical engagement with their surroundings. Building, then, cannot be understood as a simple process of transcription, of a pre-existing design of the final product onto a raw material substrate. It is true that human beings – perhaps uniquely among animals – have the capacity to envision forms in advance of their implementation, but this envisioning is itself an activity carried on by real people in a real-world environment, rather than by a disembodied intellect moving in a subjective space in which are represented the problems it seeks to solve (see Chapter Twenty-three, pp. 418–19). In short, people do not import their ideas, plans or mental representations into the world, since that very world, to borrow a phrase from Merleau-Ponty (1962: 24), is the homeland of their thoughts. Only because they already dwell therein can they think the thoughts they do.

To argue that the forms of buildings arise as a kind of crystallisation of human activity within an environment clearly puts paid to my initial dichotomy between design and execution. No longer can we assume, with Christopher Alexander, that form is 'the ultimate object of design' (1964: 15), as though the one issued quite automatically and unproblematically from the other. To the contrary, a dwelling perspective ascribes the generation of form to those very processes whose creativity is denied by that perspective which sees in every form the concrete realisation of an intellectual solution to a design problem. Where, then, does this leave the constructions of non-human animals? The argument is equally damaging to the conventional biological account, which holds that the outward, phenotypic form – not just of the animal itself, but of the constructions making up its 'extended phenotype' – is the expression of a solution to some specific problem of adaptation, already reached by natural selection, and transferred to the animal at the point of conception, encrypted in the materials of heredity – the genes. That design is thus imported into the organism, as a kind of 'evolved architecture' (Tooby and Cosmides 1992), prior to the organism's development within an environmental context, is indeed one of the great delusions of modern biology. For as I shall show in Chapter Twenty-one, the forms of organisms are in no way prefigured in their genes but are the emergent outcomes of environmentally situated development processes.

For any animal, the environmental conditions of development are liable to be shaped by the activities of predecessors. The beaver, for example, inhabits an environment that has been decisively modified by the labours of its forbears, in building dams and lodges, and will in turn contribute to the fashioning of an environment for its progeny. It is in such a modified environment that the beaver's own bodily orientations and patterns of activity undergo development. The same goes for human beings. Human children, like the young of many other species, grow up in environments furnished by the work of previous generations, and as they do so they come literally to carry the forms of their dwelling in their bodies – in specific skills, sensibilities and dispositions. But they do not carry them in their genes, nor is it necessary to invoke some other kind of vehicle for the inter-generational transmission of information – cultural rather than genetic – to account for the diversity of human living arrangements.

We can now see how, by adopting a dwelling perspective – that is, by taking the animal-in-its-environment rather than the self-contained individual as our point of

departure – it is possible to dissolve the orthodox dichotomies between evolution and history, and between biology and culture. For if, by evolution, we mean differentiation over time in the forms and capacities of organisms, then we would have to admit that changes in the bodily orientations and skills of human beings, insofar as they are historically conditioned by the work of predecessors (along with the enduring products of that work, such as buildings), must themselves be evolutionary. And if, by cultural variation, we mean those differences of embodied knowledge that stem from the diversity of local developmental contexts, then far from being superimposed upon a substrate of evolved human universals, such variation must be part and parcel of the variation of all living things, which has its source in their enmeshment within an all-encompassing field of relations. It is not necessary, then, to invoke one kind of theory, of biological evolution, to account for the transition from nest to hut, and another kind, of cultural history, to account for the transition from hut to skyscraper. For once history is itself recognised as an evolutionary process, the point of origin constituted by the intersection of evolutionary and historical continua disappears, and the search for the first hut – for the beginnings of architecture, history and true humanity – becomes a quest after an illusion.⁶

THE HOUSE AS ORGANISM

Let me conclude by returning to von Uexküll's oak tree. Suppose that it stands, not in the forest, but in the precincts of a house. Now at first glance we might have no hesitation in regarding the house, but not the tree, as a building, or an instance of architecture. For surely the house, as Godelier puts it, belongs to 'that part of nature which is transformed by human action and thought [and] owes its existence to conscious human action on nature' (1986: 5, see also Chapter Five p. 79). The tree, on the other hand, has no such debt to humanity, for it has grown there, rooted to the spot, entirely of its own accord. On closer inspection, however, this distinction between those parts of the environment that are, respectively, built and unbuilt seems far less clear. For the form of the tree is no more given, as an immutable fact of nature, than is the form of the house an imposition of the human mind. Recall the many inhabitants of the tree: the fox, the owl, the squirrel, the ant, the beetle, among countless others. All, through their various activities of dwelling, have played their part in creating the conditions under which the tree, over the centuries, has grown to assume its particular form and proportions. And so, too, have human beings, in tending the tree's surroundings.

But the house also has many and diverse animal inhabitants – more, perhaps, than we are inclined to recognise. Sometimes special provision is made for them, such as the kennel, stable or dovecote. Others find shelter and sustenance in its nooks and crannies, or even build there. And all, in their various ways, contribute to its evolving form, as do the house's human inhabitants in keeping it under repair, decorating it, or making structural alterations in response to their changing domestic circumstances. Thus the distinction between the house and the tree is not an absolute but a relative one – relative, that is, to the scope of human involvement in the form-generating process.⁷ Houses, as Suzanne Blier notes (1987: 2), are living organisms. Like trees, they have life-histories, which consist in the unfolding of their relations with both human and non-human components of their environments. To the extent that the influence of the human component prevails, any feature of the environment will seem more like a building; to the extent that the non-human component prevails, it will seem less so.

Building, then, is a process that is continually going on, for as long as people dwell in an environment. It does not begin here, with a pre-formed plan, and end there, with a finished artefact. The 'final form' is but a fleeting moment in the life of any feature, when it is matched to a human purpose, likewise cut out from the flow of intentional activity. As the philosopher Alfred North Whitehead once remarked, 'from the moment of birth we are immersed in action, and can only fitfully guide it by taking thought' (1938: 217). And this applies, with equal force, to 'taking thought about building', the definitive characteristic of the architectural attitude. We may indeed describe the forms in our environment as instances of architecture, but for the most part we are not architects. For it is in the very process of dwelling that we build.

Chapter Thirteen

To journey along a way of life

Maps, wayfinding and navigation

INTRODUCTION

Everyone has probably had the experience, at some time or other, of feeling lost, or of not knowing in which way to turn in order to reach a desired destination. Yet for most of the time we know where we are, and how to get to where we want to go. Ordinary life would be well-nigh impossible if we did not. It remains a challenge, however, to account for everyday skills of orientation and wayfinding. This challenge is compounded by the considerable potential for misunderstanding surrounding the question of what it actually *means* to know where one is, or the way to go. For the map-using stranger, making his way in unfamiliar country, 'being here' or 'going there' generally entails the ability to identify one's current or intended future position with a certain spatial or geographic location, defined by the intersection of particular coordinates on the map. But a person who has grown up in a country and is conversant with its ways knows quite well where he is, or in what direction to go, without having to consult an artefactual map. What, then, does he have that the stranger lacks? According to a view that has found wide support in the literatures of geography and psychology, there is no difference in principle between them. Both are map-users. For both, knowing where one is means identifying one's position in the world with a location on the map. The difference is just that the native inhabitant's map is held not in the hand but in the head, preserved not on paper but in memory, in the form of a comprehensive spatial representation of his usual surroundings. At any moment, it is supposed, he can access this mental or 'cognitive' map, and determine his location in terms of it.

In this chapter I shall argue, to the contrary, that there is no such map, and that the belief in its existence is a consequence of the mistaken attribution to native people of a sense of what it means to know one's whereabouts that effectively treats them as strangers in their own country. Indeed the native inhabitant may be unable to specify his location in space, in terms of any independent system of coordinates, and yet will still insist with good cause that he knows where he is. This, as I shall show, is because places do not have locations but histories. Bound together by the itineraries of their inhabitants, places exist not in space but as nodes in a matrix of movement. I shall call this matrix a 'region'. It is the knowledge of the region, and with it the ability to situate one's current position within the historical context of journeys previously made – journeys to, from and around places – that distinguishes the countryman from the stranger. Ordinary wayfinding, then, more closely resembles storytelling than map-using. To use a map is to navigate by means of it: that is, to plot a course from one *location* to another in *space*. Wayfinding, by contrast, is a matter of moving from one *place* to another in a *region*. But while it would

be wrong, or at least misleading, to liken the countryman's knowledge to a map, there is a certain parallel to be drawn between the processes of knowing and mapping. Both are environmentally situated activities, both are carried out along paths of travel, and both unfold over time. Just as wayfinding has to be distinguished from navigation, however, so also mapping must be distinguished from mapmaking. For the designs to which mapping gives rise – including what have been variously categorised as 'native maps' and 'sketch maps' – are not so much representations of space as condensed histories. Thus, to put my thesis in a nutshell, knowing is like mapping, not because knowledge is like a map, but because the products of mapping (graphic inscriptions), as those of knowing (stories), are fundamentally *un-maplike*. What follows is an elaboration of this argument.

COGNITIVE MAPS

At the most general level, the question of how people find their way around may be posed in terms of two alternative metaphors. Following David Rubin (1988: 375), I call the first a complex-structure metaphor, and the second a complex-process metaphor. The former, which has long been dominant in cognitive psychology, holds that even before the individual steps forth into the environment, he has already had copied into his mind – through some mechanism of replication – a comprehensive description of its objects, features and locations, and the relations between them. This, of course, is the cognitive map. Having determined his current whereabouts and desired destination within the map, and having plotted the route between them, his actual movement from place to place is a perfectly straightforward, indeed almost mechanical matter of executing the prescribed course. Getting from A to B, in short, is explained through the harnessing of a simple process, of bodily locomotion, to a complex structure, the mental map. With a complex-process metaphor, on the other hand, little or no pre-structured content is imputed to the mind. Instead, wayfinding is understood as a skilled performance in which the traveller, whose powers of perception and action have been fine-tuned through previous experience, 'feels his way' towards his goal, continually adjusting his movements in response to an ongoing perceptual monitoring of his surroundings. What the first approach explains through positing an isomorphism between structures in the world and structures in the mind, the second explains as the unfolding of a field of relations established through the immersion of the actor-perceiver within a given environmental context. This is the approach favoured by ecological psychology, and it is the one I follow here.

Before pursuing an ecological approach to wayfinding, however, it is worth reflecting on the circumstances in which the notion of the cognitive map came to be introduced in the first place. At that time, some half a century ago, psychology was still in the grip of the behaviourist paradigm. Animals, including human beings, were supposed to respond more or less automatically, in ways conditioned by previous experience, to particular environmental stimuli. Seeking to verify this simple model, psychologists devised numerous experiments in which their star laboratory animal – the humble rat – was induced to run through a variety of mazes. Starved at the outset, having successfully negotiated the maze the rat would be rewarded with food from a box. The idea was that through repeated trials, the animal would learn to take one particular path rather than another at each successive 'choice-point' along the route. The whole route would then be remembered as a chain of conditioned responses, such as right or left turns, triggered by the successive appearance of particular stimuli in the form of gateways in the maze. But rats are enterprising creatures, and they often found ways of subverting the experimenters' intentions.

They would, for example, manage to climb out of the maze near the start by pushing back the cover and then run directly over the top to the food box, where they would climb back down and eat. This caused some consternation in the behaviourist camp, since according to the stimulus–response model they should have had no idea of the direction in which to head off in search of food, knowing no other way than the familiar route through the maze, with all its twists and turns.

To further test the rats' abilities, psychologist Edward C. Tolman and his collaborators devised what they called a 'spatial orientation' experiment (Tolman, Ritchie and Kalish 1946). A maze was first set up as shown in Figure 13.1. Starting at A, the animals had to run across an open circular table, then through the alley CD, and finally along the roundabout route through E and F to reach the food box at G. Once they were accustomed to this, the original maze was replaced with the apparatus shown in Figure 13.2. Starting again at A, the animals ran across the circular table and down the alley, only to find it blocked at one end. After returning to the table and exploring a little way down the other radiating paths, each rat would eventually choose to run all the way out along one of them. The overwhelming majority opted for path number 6 – the path that would take them to precisely the same spot where, in the original set-up, the food box had been located. This experiment seemed to provide convincing evidence that in their training for the first maze, the rats had not merely learned a fixed sequence of steps that would lead them reliably towards their goal. Rather, as Tolman hypothesised, they must have built up 'something like a field map of the environment', upon which could be traced all possible routes and paths and their relationships.

Having located their own position and that of the food box in terms of this map, the rats were able to select the path, in the second maze, that led directly from the one to the other. In light of this ability it was clearly inadequate, Tolman reasoned, to liken the animal's central nervous system – as the behaviourists had done – to a telephone switchboard such that every incoming stimulus simply 'dials up' the appropriate response. The brain was to be compared, instead, to a 'map control room' where stimulus-based information would be collected and collated, and where the routes would be plotted that would finally determine the animal's overt behavioural responses (Tolman 1948: 192).

Despite its provocative title, Tolman's 1948 paper – 'Cognitive maps in rats and men' – had much to say about rats but virtually nothing about human beings. Ironically, what little Tolman *did* have to say about humans had nothing to do with their abilities of orientation and wayfinding, but with certain psychopathologies which, he thought, could be attributed to regimes of child training that blocked the development of properly comprehensive cognitive maps. Ending on a high moral tone, Tolman preached that only by inculcating the paramount virtues of reason and tolerance could our

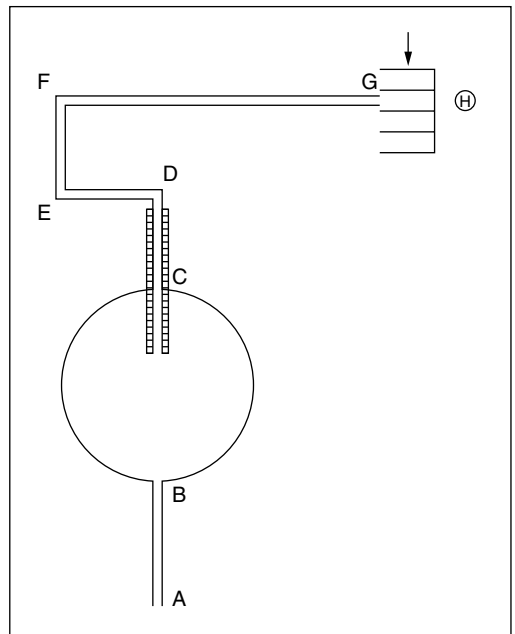


Figure 13.1 The spatial orientation experiment: the original maze.

After Tolman, Ritchie and Kalish, *Studies in spatial learning I*, *Journal of Experimental Psychology*, 36, 1946.

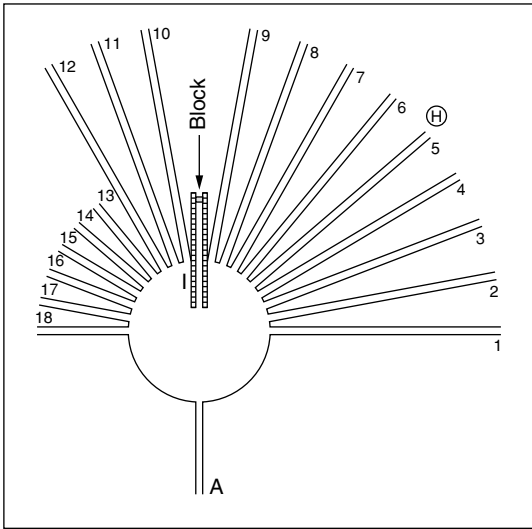


Figure 13.2 The spatial orientation experiment: the replacement maze.

After Tolman, Ritchie and Kalish, *Studies in spacial learning I*, *Journal of Experimental Psychology*, 36, 1946.

children be furnished with maps sufficiently broad and comprehensive to cope with 'that great God-given maze which is our human world' (1948: 208). It is hard to know what the rats would have made of this! Be that as it may, more recent work by James and Carol Gould on the wayfinding abilities of honey bees helps to put the rats' capacities in perspective. For it turns out that what rats can do, bees can do too: namely, make their way directly to a food source, along a course never taken before. And they can do this without involving anything that we might dignify by terms like 'thought', 'reason' or 'imagination'. The Goulds sound an appropriate note of scepticism when they remark that the calculation a bee would have to undertake in order to plan an optimal route would not be beyond a simple computer. There is no obvious reason why the bee, or for that matter the rat, should have any more of an understanding of the task before it than the computer, or why its solution should call for any intelligence whatsoever (Gould and Gould 1988: 224–5).

Here is what the Goulds did with their bees. First, a group of foragers were trained to fly to a feeding station in some woods out of sight of the hive. Later, individuals about to set off from the hive to the feeder were captured and transported, in an opaque container, to another location well off from their regular route and from which the feeder, likewise, was hidden from view. Here they were released. It was found that the bees flew straight from this location to the feeder, along what can only have been an entirely novel route for them. There is no way in which they could have done this, had they been constrained to follow a fixed sequence of steps between accustomed landmarks – as stipulated by the stimulus-response model. Instead, the Goulds suggest, the bee does what we would do under similar circumstances: 'she would use nearby landmarks to figure out where she is, determine in which direction her goal lies, and then depart directly towards it' (Gould and Gould 1988: 109). She navigates, in other words, in terms of a cognitive map. That humans do likewise was suggested by experiments conducted by Worchel (cited by Oatley 1977: 539–40), who led his subjects blindfold along two sides of a right-angled triangle and then told them to make their way back along the hypotenuse – a task they completed with considerable accuracy. The ability to update one's position on the cognitive map, and thereby to keep on target despite twists and turns, is – according to Keith Oatley – the basis for any kind of navigation, whether on land or at sea. But whatever the conditions under which it is carried out, navigation 'is a complex cognitive skill' (Oatley 1977: 537).

Comparing what the Goulds say about bees with what Oatley says about humans, we find more than a hint of double standards. Confronted with essentially the same task, its successful accomplishment by humans is attributed to complex skills whereas bees apparently do it on autopilot. I do not mean to deny that human wayfinding is a highly complex, skilled process. But there seems good reason to suppose that it is skilled precisely

to the extent that it goes *beyond* the simple computational operations described by cognitive map theorists. For the environment within which people find their way about is not, as Tolman would have it, a 'great God-given maze', with all its landmarks, routes, openings and obstructions already laid out in advance. It is rather an immensely variegated terrain of comings and goings, which is continually taking shape around the traveller even as the latter's movements contribute to its formation. To hold a course in such an environment is to be attentive at all times to what is going on around you, and to respond in ways that answer to your purpose. This is probably as true of rats, in their ordinary environment, as it is of human beings in theirs. Rats are sensitive and intelligent creatures, and if their performance in experimental mazes manifests a basic computational capacity but no real skill, this is only because the artificial set-up in which they find themselves is a highly impoverished one that deprives them of any opportunity for the exercise of normal powers of discrimination and judgement.

WHAT IS A MAP ANYWAY?

The core assumption of the cognitive approach to orientation and wayfinding is, as we have seen, that perceptually salient aspects of the structure of the world are copied into an analogous structure in the mind (Rubin 1988: 375). This copy is said to be a map, or at least to be maplike in form. But why should this particular metaphor have been adopted, rather than some other? Why maps rather than, say, pictures or images? What is the difference between a map of the world and a picture or image of the world? Any general definition of a map, say Arthur Robinson and Barbara Petchenik, 'must be based on its being simply a representation of things in space' (1976: 15). Yet a perspective drawing would satisfy this criterion, and we would surely not describe such a drawing as a map. One possible approach to defining a map, in contradistinction to the perspectival image, is suggested by Alfred Gell (1985). The approach rests on the idea that maps encode beliefs or propositions about the locations of places and objects that are true (or taken to be true) independently of where one is currently positioned in the world. An example of such a proposition might be that 'Edinburgh is north of London'. One could issue statements to this effect whether one was in London, Edinburgh, or anywhere else for that matter, and they would all be equally valid. In Gell's terms, these statements – each of which is a *token* of the proposition in question – are *non-indexical*, in that their truth conditions are not bound to the place where they are made.

Accordingly, Gell proceeds to define the map as 'any system of spatial knowledge and/or beliefs which takes the form of non-token-indexical statements about the spatial locations of places and objects' (1985: 278–9). Now a person equipped with knowledge in this form ought, in principle, to be able to figure out just how the world should look from any selected point of observation. If I were hiking in the mountains, for example, I should be able to state how the various peaks would appear arrayed before me, were I standing on a particular summit. Such statements, however, since they hold good only for the view from that summit, and none other, are *indexical* of the place. Any set of beliefs and propositions whose tokens are indexical in this sense, having regard for what is where for a subject positioned at a certain location, comprises what Gell calls an *image* (1985: 280). Thus the difference between the image and the map comes to hinge on the criterion of the indexicality or non-indexicality of its tokens. If our knowledge consisted only of images – that is, of token-indexical spatial propositions – then, to follow Gell's argument, we would never be able to hold any coherent idea about our own location in space, or about

the locations of other places relative to ourselves. We know where we are, not because what we see around us matches to a certain mental image, but because this image has itself been uniquely derived from an underlying map, at a point defined by a given set of spatial coordinates that are indifferent to our own movement. As we travel from one place to another, we pass through a sequence of images, each of which is specific to – and in turn permits us to identify – a particular location along the way. But the map, from which all these images are generated, remains the same wherever we are.

I shall return in due course to what Gell has to say about the nature of navigation and wayfinding. For the moment I want to focus on the implications of this way of distinguishing between the map and the image. It is certainly true, as Gell intimates, that the mere possession of a map, whether mental or artefactual, will not help you to find your way around unless you can use it to generate location-specific images for comparison with immediate perceptual experience. It is also true that no map will do the work that cognitive theorists expect of it unless the information it encodes is invariant with respect to the location of the percipient. Consider Oatley's assertion, for example, that the essence of navigation lies in the 'ability to update one's position within the cognitive map while travelling' (1977: 539). How could this possibly be done if the map keeps changing as one goes along? Oatley himself confuses the issue, when he speaks of the navigator's cognitive map as 'a process, not just a picture' (p. 546). For if the navigator is to look to the map for directions, it can be neither process nor picture, neither embodying his own movement nor representing any particular scenes along the route. 'We only update maps', as Gell observes, 'when the geography of the world changes, not whenever we move about ourselves' (1985: 274). Ultimately, the justification for extending the map metaphor into the domain of cognition must lie in the assumption, more often than not unstated, that what the map affords is a representation of things in space that is independent of any particular point of view.

This assumption, however, raises problems of its own. One of the difficulties that cartographers often face in their attempts to explain the nature of maps is that the very fields, of cognition and communication, from which they might find appropriate analogues have already seized upon the map as an analogue from cartography. 'When non-cartographic writers use the term "map"', as Robinson and Petchenik say, 'they seem to mean that it is possible to take isolated incidents, experiences, and so on, and arrange them intellectually so that there is some coherence, some total relation, instead of individual isolation' (1976: 4). Thus scientists refer to their theories as maps, into which can be fitted the data of observation, while anthropologists are inclined to attribute a similar maplike quality to culture and society (for example, Leach 1976: 51), on the grounds that it furnishes an overarching framework of concepts and categories for the organisation of otherwise fragmentary sensory experience. These, and many other similar metaphorical usages make it appear natural and self-evident that *actual* maps should function in the same way, as schematic representations of the real world, which do not index any position but upon which it should be possible to plot the position of everything in relation to everything else. Now most people in Western societies, educated since their schooldays in the conventions of modern cartography, probably do tend to think of maps as representations of this kind. But whether the artefacts and inscriptions that have at one time or another been designated as maps actually satisfy the requirement of non-indexicality, is moot. The question, in short, is: are maps maplike?

David Turnbull, arguing from the perspective of a sociologist of science, makes a compelling case to the effect that they are not. The idea that maps are independent of

any point of view, that the propositions they encode are equally valid wherever one stands in the world, is, Turnbull contends, a myth – though it is one that has been avidly cultivated in the name of science and objectivity (Turnbull 1989: 15). The reality is that no map, however ‘modern’ or sophisticated the techniques of its production, can be wholly divorced from the practices, interests and understandings of its makers and users. Or to put it another way, every map is necessarily embedded in a ‘form of life’. And to the extent that it is so embedded, it must fail on the criterion of non-indexicality. As Turnbull explains, ‘all maps are in some measure indexical, because no map, representation or theory can be independent of a form of life’ (1989: 20). At first glance, this argument seems to run directly counter to Gell’s insistence that a representation can only be a map insofar as the propositions encoded therein are *non*-indexical. Closer examination, however, reveals a certain slippage in the meaning of indexicality. Is indexing a place the same as indexing a form of life? If the map discloses a perspective or ‘point of view’, is this a view *in* the world, as it appears from a particular place, or a view *of* the world, filtered through the concepts, categories and schemata of a received cultural tradition? Could a map be non-indexical in the first sense and indexical in the second?

Consider an example to which both Gell and Turnbull refer. Micronesian mariners,¹ who are used to voyaging across hundreds of miles of open sea between often tiny islands, know the bearing of any island from any other by its so-called ‘star course’ – that is, by a list of stars whose successive rising or setting points, during the night, indicate the direction in question. The expert mariner has committed to memory an entire compendium of star courses, each unique to a particular pair of islands, and it is in this compendium, according to Gell, that his ‘map’ consists. Now it is clearly the case that any statement of the course between one island A, and another island B, will not depend for its validity on one’s current position at sea. Thus star courses ‘have the essential map property of non-token-indexicality; they do not change truth value according to where they are uttered’ (Gell 1985: 284). Yet it is also fair to say, with Turnbull, that the principles upon which the Micronesian mariner’s map is constructed are securely embedded within the percepts and practices of traditional seafaring, and therefore that it requires a knowledge of this cultural context to be able to ‘read’ and understand the map. It would appear, in short, that while the map indexes a tradition, it is non-indexical with regard to location. The same, moreover, could be said of ‘modern’ maps, constructed on scientific principles with the aid of sophisticated technological gadgetry. Modern science and technology, as Turnbull remarks (1991: 36), are as dependent on tradition for their successful transmission as is Micronesian seafaring lore. And no more than Micronesian maps can modern maps be understood without taking into account ‘the world view, cognitive schema or the culture of the mapmaker’ (Turnbull 1989: 20).

There is, however, something deeply paradoxical about this argument. For to separate tradition from locality, or culture from place, is also to divorce traditional knowledge from the contexts of its production in the environmentally situated experience of practitioners. Thus the form of life is reduced to a ‘world view’ or ‘cognitive schema’ – a set of rules and representations for the organisation of sensory experience that individuals carry in their heads and that are available for transmission independently of their bodily activity in the world. It is as though culture were *received* along lines of traditional transmission from ancestors, and *imported* into the sites of its practical application. But this is to fall right back into the classical view of culture as a map, the analogy – as Bourdieu (1977: 2) points out – ‘which occurs to an outsider who has to find his way around in a foreign landscape and who compensates for his lack of practical mastery, the prerogative of the

native, by the use of a model of all possible routes'. So here is the paradox: actual maps are made to appear indexical with regard to cultural tradition only by a rendering of culture as non-indexical with regard to locality. The placing of maps within their cultural context is paralleled by the *displacing* of culture from its context in the lifeworld. How, then, are we to resolve this dilemma? How can we hold on to the commonsense notion that maps retain a certain invariance as we move about, that they do not continually recompose themselves to reflect the particularities of wherever we happen to be, while yet recognising their embeddedness in locally situated practices? My answer, in brief, will be that what maps index is *movement*, that the vision they embody is not local but *regional*, but that the ambition of modern cartography has been to convert this regional vision into a *global* one, as though it issued from a point of view above and beyond the world.

HOW TO SEE THE WORLD FROM EVERYWHERE AT ONCE

When you stand at a particular spot, everything appears from a certain angle, while much of the environment will likely be hidden from view behind prominent foreground features. Stand at another spot, and things will appear differently. In order to have any conception of the overall configuration of one's environment, it would seem necessary to be in possession of some kind of totalising scheme into which every one of these location-specific perceptual images could be integrated. This, as we have seen, is an argument commonly adduced to justify positing the existence of cognitive maps. It is an argument, however, that assumes a snapshot theory of vision, as if one could only ever see, in perspective, from a fixed point of observation. 'Is not to see', as Merleau-Ponty asks rhetorically, 'always to see from somewhere?' He proceeds to answer, however, in the negative (Merleau-Ponty 1962: 67). To take up his own example, the house next door may be viewed from this side or that, from inside or outside, or even from up above if one were to fly overhead. But what I see is none of these appearances; it is the house *itself*, in all its concrete actuality. The form of the house is progressively disclosed to me as I move around and about, and in and out, not as the sum of a very large number of images, arrayed in memory like frames on a reel of film, but as the envelope of a continually changing perspectival structure. Observation, Merleau-Ponty claims, consists not in having a fixed point of view on the object, but 'in varying the point of view while keeping the object fixed' (1962: 91). Thus the house is not seen from somewhere but from nowhere – or rather from everywhere (pp. 67–9).

In keeping with his ecological approach to visual perception, James Gibson presents an argument along very similar lines. Animals and people, Gibson writes, see as they move, not just in the intervals between movements. Such ambulatory vision takes place along what he calls a 'path of observation'. A path is to be understood not as an infinite series of discrete points, occupied at successive instants, but as a continuous itinerary of movement. Thus the environment one sees is neither 'seen-at-this-moment' nor 'seen-from-this-point'. On the contrary, 'what one perceives is an environment that surrounds one, that is everywhere equally clear, that is in-the-round or solid, and that is all-of-a-piece' (Gibson 1979: 195–7). But if the features of this environment are revealed as one travels along paths of view, rather than projected from a sequence of points of view, where do these paths begin, and where do they end? And if we see not at this moment in time, but over a certain period, how long is this period? Such questions cannot be precisely answered. Of a minor feature we might say, after only cursory exploration, that we have seen it all. But of a complex, varied and extensive terrain, although we may have criss-crossed it along innumerable paths,

we may still feel there is more to be discovered. As for our perception of the environment as a whole, what else can this be than the outcome of a lifetime's observation, along all the paths we have ever taken? This is what Gibson means when he asserts that perceiving the world over a sufficient length of time, and along a sufficiently extended set of paths, is tantamount to perceiving it 'as if one could be everywhere at once' (p. 197).

It is critically important to distinguish this sense of omnipresence from that implied by the conventional notion of the 'bird's-eye view' (Gibson 1979: 198–9). The latter, of course, has nothing to do with the way birds in flight actually see, but rather describes how we imagine the world would look from a point of observation so far above the earth's surface that the entire territory with which we are familiar from journeys made at ground level could be taken in at a glance. The higher one goes, it is supposed, the more one's vision transcends the locational constraints and narrow horizons of the view from the ground. And by the same token, the more apparently maplike it becomes. Robinson and Petchenik are right to point out that the analogy between the map and the bird's eye view is potentially misleading, not only because of their different geometries of projection, but also because the map is 'a construction, an abstraction, an arrangement of markings that relates to spatial "reality" only by agreement, not by sensory testability' (1976: 53). Nevertheless, anyone who has flown over familiar country by plane will have been astonished, on the one hand, by how strange it looks, and on the other, by how closely the view from the window resembles a topographic map of the same territory. There is nothing strange, however, about the environment perceived from everywhere, in the sense adduced by Merleau-Ponty and Gibson, nor do you have to leave the ground to perceive it in this way. It is not a view from 'up there' rather than 'down here', but one taken *along* the multiple paths that make up a country, and along which people come and go in the practical conduct of life. Our perception of the environment as a whole, in short, is forged not in the ascent from a myopic, local perspective to a panoptic, global one, but in the passage from place to place, and in histories of movement and changing horizons along the way.

The same point could be made, following Edward Casey (1996: 30), through a contrast between *vertical* and *lateral* modes of integration. In the vertical mode, embraced by modern cartography as well as by cognitive map theorists, local particulars obtained by observation on the ground are fitted within an abstract conception of space so as to form a representation of the world as though one were looking down upon it from 'up above'. While the eyes of the body remain close to the ground, the mind's eye – which is witness to this maplike representation – is up with the birds. The lateral mode of integration, by contrast, presupposes no such division between mind and body. For the work of integration is performed by the organism as a whole as it moves around, purposefully and attentively, from place to place. Such movements do not merely connect places that are already located in terms of an independent framework of spatial coordinates. Rather, they bring these places into being as nodes within a wider network of coming and going. Casey refers to this network of interplace movement as a *region* – that is, 'an area concatenated by peregrinations between the places it connects' (1996: 24). Evidently, when Gibson speaks of perceiving the environment from everywhere at once, that 'everywhere' is neither space, nor a portion of space, but a region in this sense. Likewise, every 'somewhere' is not a location in space but a position on a path of movement, one of the matrix of paths comprising the region as a whole. In short, whereas everywhere-as-space is the world as it is imagined from a point of view above and beyond, everywhere-as-region is the world as it is experienced by an inhabitant journeying from place to place along a way of life.

This idea of the region may be illustrated by means of three ethnographic examples. Among the Walbiri, an Aboriginal people of western central Australia, the entire country is perceived 'in terms of networks of places linked by paths' (Munn 1973a: 215). Originally laid down through the movements of ancestral beings in that formative era known as the Dreaming, these paths are continually retraced in the journeys of the living people who take after them. As they relate the stories of these journeys, Walbiri men and women may draw web-like figures in the sand whose basic components are lines and circles. Every line conveys a journey to or from camp, while every circle conveys the act of making camp by walking all around it. Rather similarly for the Ongees, a group of hunter-gatherers inhabiting the island of Little Andaman in the Bay of Bengal, places are brought into being at the confluences of the paths of movement of humans, animals and spirits. Asked by the ethnographer, Vishvajit Pandya, to draw the places where humans and spirits live, Ongee informants responded by sketching lines of movement (straight for humans, wavy for spirits), leading to the demarcation of the various places at their intersections.² The world of the Ongees, Pandya concludes, 'is not a preconstituted stage on which things happen, but rather an area or region created and constructed by the ongoing practice of movement' (Pandya 1990: 777). My third example is taken from A. Irving Hallowell's study of the *Saulteaux* (Ojibwa), hunters and trappers of the Berens River district near Lake Winnipeg in Canada. In *Saulteaux* experience, to move in a certain direction is always to travel from place to place. This is so not only for human persons, but also for the sun, the moon and the winds, all of which are held to be persons of a kind. Thus 'what we refer to abstractly as cardinal directions are to them the *homes* of the winds, the places they come from. Similarly, east is thought of as the place where the sun rises; west, the place where it sets; south is the place to which the souls of the dead travel, and the place from which the summer birds come' (Hallowell 1955: 191). For the *Saulteaux*, then, as indeed for the Ongee and the Walbiri, 'everywhere' is not a space but a region concatenated by the place-to-place movements of humans, animals, spirits, winds, celestial bodies, and so on.

KNOWING AS YOU GO

We can now return to the paradox I introduced earlier. If our knowledge of the environment is embedded in locally situated practices, how come that it retains a certain constancy as we move about? If all knowledge is context-dependent, how can people take their knowledge with them from one context to another? For clues towards a resolution I turn once again to the work of David Turnbull. One of Turnbull's aims is to break down the conventional distinction between so-called indigenous knowledge and Western science. He does so by emphasising that *all* knowledge, of whatever kind and historical provenance, is generated within a 'field of practices' (1989: 61). And since practices must be carried out by particular people in particular places, all knowledge – including that which we call science – must be inherently local. Let me set aside for the time being the contrary thesis, which Turnbull confusingly appears to entertain at the same time, that the context for both indigenous and scientific knowledge is something like a worldview or cognitive schema, by nature detached from the local sites of its practical expression. I have already drawn attention to the dangers of falling back on a concept of culture that divorces knowledge and its transmission from environmentally situated experience. My present concern is with another difficulty in Turnbull's argument. For while on the one hand, he insists that a common characteristic of all knowledge systems is their 'localness', he also argues,

on the other, that what is critical to the growth and reproduction of any knowledge system is the work that goes into moving its diverse components – including practitioners, their know-how and skills, technical devices and standards of evaluation – from one local site of knowledge production to another (Turnbull 1993a: 30).

Consider the case of Western science. According to what might be called the ‘official’ view of science, data recorded by means of standardised procedures in diverse locations are fitted into a framework of theory consisting of propositions that are strictly non-indexical with regard to place. What happens in practice, however, is a good deal more messy. Not only is it unclear where data collection ends and theory building begins, but also there is no unified body of theory under which all of experience can be subsumed. Rather, there are as many theoretical growth-points as there are sites of practical investigation, and the character of each is conditioned by circumstances peculiar to each place. Much of the labour of science, Turnbull argues, lies in attempts to establish the connectivity and equivalence that would render procedures developed and results obtained in one local context applicable in another (1993a: 37). But if science calls for the constant movement of personnel, knowledge and techniques from place to place, and the assemblage, in each, of inputs of heterogeneous provenance, how can it also share the characteristic of localness? As a system of knowledge, science cannot be rooted in any particular place or places, but must rather emerge from the total network of interplace relations constituting its field of practice. Furthermore, if that is so for science, then it should be equally so for any other knowledge system. As Turnbull himself puts it, ‘all knowing is like travelling, like a journey between the parts of a matrix’ (1991: 35). So what is this matrix? It is, of course, a *region* in the sense defined above – that is, as the sum of journeys made.

My point is that knowing, like the perception of the environment in general, proceeds along paths of observation. One can no more know *in* places than travel in them. Rather, knowledge is regional: it is to be cultivated by moving along paths that lead around, towards or away from places, from or to places elsewhere. Conceived as the ensemble of such place-to-place movements, the notion of region, far from denoting a level of generalisation intermediate between local particulars and global universals, offers a way out of this kind of dichotomous and hierarchical thinking. As every place, through the movements that give rise to it, enfolds its relations to all others, to be somewhere *is* to be everywhere at once. Rephrased in our terms, what Turnbull proposes is a compelling argument to the effect that all knowledge systems, including science, are integrated laterally rather than vertically. The philosopher Joseph Rouse makes much the same point in arguing that ‘we go from one local knowledge to another rather than from universal theories to their particular instantiations’ (Rouse 1987: 72). In light of the foregoing considerations, I would prefer to say that we *know as we go*, from place to place. This does not, however, alter the basic point, which is that science is distinguished from other systems of knowledge by the lengths to which it goes to present itself *as if* it were vertically integrated, as if the scientist’s task were to fit data to theory rather than to put the knowledge that has brought him to one place to work in setting off towards another. To create this illusion, science has to suppress, or to hide from view, the social labour involved in establishing equivalences and connections across places (Turnbull 1996: 62). In this, moreover, it is aided and abetted by modern cartography, which has been similarly concerned to establish its scientific credentials through its claim to produce accurate and objective representations of a world ‘out there’.

Cartographers, like scientists, and indeed like practitioners of any other knowledge system, draw their material from all manner of sources, through both direct observation

and inquiry into local tradition. The collection and collation of this material may take them – or agents operating on their behalf – on innumerable and often lengthy journeys. None of this, however, appears in the final form of the modern, ‘scientific’ map. To the contrary, one of the most striking characteristics of the modern map is its elimination, or erasure, of the practices and itineraries that contributed to its production (Turnbull 1996: 62). In the words of Michel de Certeau, ‘the map, a totalising stage on which elements of diverse origin are brought together to form a tableau of a “state” of geographical knowledge, pushes away into its prehistory or into its posterity, as if into the wings, the operations of which it is the result or the necessary condition’ (1984: 121). Just as science, in the official view, is charged with the task of integrating site-specific data into an overarching, unified framework of theory, so the mission of cartography is ostensibly one of representing the ‘geographic facts’ on the ground within a single, universal system of spatial coordinates (Edney 1993: 55). The ideal is a perfect congruence between the world and its representation, and progress is measured by the degree of approximation towards it. Thus in the work of the modern cartographer, knowledge generated through movement from place to place within a region is presented *as if* it issued from a totalising vision above and beyond the world. In short, cartography transforms everywhere-as-region, the world as experienced by a mobile inhabitant, into everywhere-as-space, the imaginary ‘bird’s-eye view’ of a transcendent consciousness.

The same transformation, of course, is worked on the ordinary perception of the environment by the theory of cognitive maps. As in the modern artefactual map, so too in its ‘mental’ analogue, all those movements of coming and going through which people develop a knowledge of their environment are pushed into the wings, to recall de Certeau’s phrase, leaving the map as a *fait accompli*, final and complete, the product of a process of making that begins with the layout of the world and ends with that layout copied into the mind. Any journeys undertaken beyond that point are supposed to belong to the phase of map-using rather than mapmaking, and therefore to play no further part in the formation of the map itself. The traditional Micronesian seafarer, in this view, is just as much a map-user as is the modern marine navigator with his charts and compass, even though his skill ‘is entirely mental and perceptual, using no instruments of any kind’ (Oatley 1977: 537). But whereas modern artefactual maps have their authors, designers or manufacturers, the origins of traditional mental maps appear lost in the mists of time. Indeed to say of such maps that they are ‘traditional’ is virtually tantamount to an admission that they have no maker or makers, but rather that they ‘make themselves’ – or that like myths, following Lévi-Strauss’s celebrated aphorism, they ‘think themselves out’ through the medium of men’s minds and without their knowledge (Lévi-Strauss 1966a: 56). In any case the assumption is that the map is made before it is used, that it already exists as a structure in the mind, handed down as part of a received tradition, prior to the traveller’s venturing forth into the world.

My contention, to the contrary, is that people’s knowledge of the environment undergoes continuous formation in the very course of their moving about in it. To return to a distinction which I introduced at the outset, this is to account for such knowledge in terms of the generative potentials of a complex process rather than the replication of a complex structure. That process consists in the engagement of the mobile actor-perceiver with his or her environment. As I have already suggested, we know *as we go*, not *before we go*. Such ambulatory knowing – or knowledgeable ambulating – cannot be accommodated within the terms of the conventional dichotomy between mapmaking and map-using. The traveller or storyteller who knows as he goes is neither making a map

nor using one. He is, quite simply, *mapping*. And the forms or patterns that arise from this mapping process, whether in the imagination or materialised as artefacts, are but stepping stones along the way, punctuating the process rather than initiating it or bringing it to a close. My perspective, in short, accords with what Robert Rundstrom has called ‘process cartography’, in which mapping is seen as ‘open-ended, ongoing, always leading to the next instance of mapping, the next map’ (Rundstrom 1993: 21). In what follows, I first show in more detail how mapping differs from mapmaking. I then turn to the distinction between mapping and map-using. All wayfinding, I argue, is mapping; all navigation map-using. Thus mapping is to map-using as wayfinding to navigation. The overall structure of the argument is summarised in Figure 13.3.

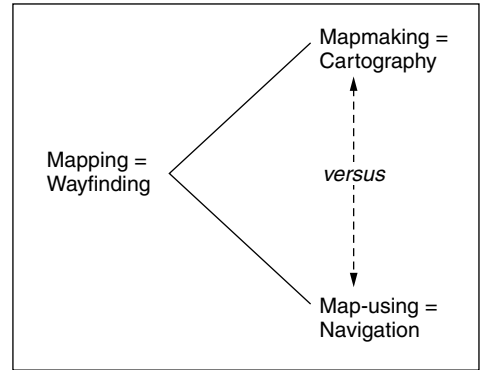


Figure 13.3 The relations between mapping, mapmaking and map-using: a summary.

MAPPING IS NOT MAPMAKING

‘Mapping’ and ‘mapmaking’, according to Denis Wood, ‘do not mean the same thing’ (1992: 32). The difference, in his view, is akin to that between speaking and writing. Wood thinks of mapping as a *capacity* universal to humans, established along with other capacities of the human mind-brain through a process of evolution under natural selection. But the fact that all human beings are capable of mapping does not mean that they all make maps. Likewise, just because all humans can speak does not mean they all write. Whereas mapping, like speaking, might be regarded as a ‘universal expression of individual existence’, mapmaking, like writing, has to be seen as ‘an unusual function of specifiable social circumstances arising only within certain social structures’ (Wood 1993a: 50). In other words, the emergence of mapmaking belongs not to the evolution of humanity but to its history. Yet the difference between mapping and mapmaking, just as that between speaking and writing, is for Wood a very fine one. It is not the difference between outwardly expressing an idea and ‘capturing’ that expression in an alternative medium. For one thing, mapping is no more the externalisation of a map that already exists in the mapper’s head than is speaking the externalisation of a thought. Rather, both mapping and speaking are genres of performance that draw their meanings from the communicative contexts of their enactment. It follows, for another thing, that neither mapmaking nor writing can serve to transcribe pre-existent thoughts or mental representations onto paper. The map, like the written word, is not, in the first place, the transcription of anything, but rather an *inscription*. Thus mapping gives way to mapmaking at the point, not where mental imagery yields an external representation, but where the performative gesture becomes an inscriptive practice (Wood 1993a: 53).

Wood illustrates his argument with a nice example. Two boys have been playing rollerblade hockey. At home over dinner, one explains the layout of the court by gesturing with his hands and fingers over a place mat. The other does the same at school, to impress a friend, but in this case (it is during an art class) he gestures with pencil in hand, over a sheet of paper. Whereas nothing remains of the first boy’s gestures on the mat, those of the second leave a trace in the form of an inscription, a sketch-map, that can be preserved and reproduced indefinitely beyond the context of its production. We may

suppose that the two boys were of equal ability, and moreover that the first would have had ready access to pencil and paper had he needed it. So why did the second make a map and the first not? The answer, for Wood, lies in the nature of the communicative situation. In general, just as much as in this exemplary instance, it is the situation – at once social and political – that calls for the map. And while the difference between gesturing with an inscribing tool and gesturing without might seem slight, the socio-political consequences are immense. It is the ‘fine line of . . . inscription’, Wood concludes, ‘that differentiates . . . mapping . . . from mapmaking, and mapping *societies* from mapmaking *societies*, in the latter of which it is the inscriptive property of the artefactual map that permits it to serve the interests of the power elites who control the mapmaking process (as well as those who would contest them)’ (1993a: 53).

Now while I agree with Wood that there is an important distinction to be made between mapping and mapmaking, I would draw it along different lines. Before doing so, however, we need to be more precise about the meaning of mapping. Wood himself seems unable to make up his mind whether the term refers to a cognitive capacity, to actual movement in the environment, or to the narrative reenactment of journeys made. At one point he tells us that mapping ‘is the way we humans make and deploy mental maps’ (1992: 32), while at another he dismisses the concept of the mental map only to declare that mapping ‘is really just . . . getting around’ (1993a: 53). Yet in his example of the two boys, mapping appears to consist neither in having a pre-existent ‘map in the head’, nor in bodily movement on the ground, but in a kind of retrospective storytelling. It seems to me that the notion of an evolved capacity for mental mapping is deeply flawed. One could hardly expect any such capacity to spring, fully formed, from an individual’s genetic make-up, in advance of his or her entry into the lifeworld. It would rather have to undergo development in the very unfolding of the individual’s life within an environment. Thus the life-historical process of ‘getting around’ – or in a word, wayfinding – would appear to be a condition for the emergence of a ‘mapping capacity’, rather than a consequence of its application. This leaves us with the third sense of mapping – the retelling of journeys made (or possibly the rehearsal for journeys to be made) – as perhaps the most appropriate. I admit, however, that the distinction between wayfinding and mapping is not hard and fast. For one way of retelling the story of a journey is to retrace one’s steps, or the steps of ancestors who made the journey in the past. In effect, since travelling from one place to another means remembering the way, all wayfinding is mapping, though not all mapping is wayfinding. I return to this point below.

For the time being, let us continue to regard mapping as the re-enactment, in narrative gesture, of the experience of moving from place to place within a region. In this sense, both boys in Wood’s example were engaged in mapping. The fact that one left no trace whereas the other produced a lasting inscription has no appreciable bearing on the nature of the activity as such. The sketch-map that emerged, as the trace of the second boy’s gestures, was a more or less incidental by-product of the mapping process, not its ultimate goal. Rundstrom makes much the same point in his account of mapping among Inuit of the central and eastern Canadian Arctic. An Inuit traveller, returning from a trip, could recount every detail of the environment encountered along the way, miming with his hands the forms of specific land and sea features. Such gestural performance, after a long journey, could last many hours. It could also, given appropriate tools and materials, generate an inscription. Many of these inscriptions were produced at the instigation of Western explorers who made contact with the Inuit. They were often astonished at the accuracy of what they regarded as ‘native maps’. But for Inuit mappers it was the performance that mattered

– ‘the recapitulation of environmental features’ – rather than any material artefacts or inscriptions to which it gave rise (Rundstrom 1990: 165). Undoubtedly the vast majority of maps that have ever been produced in human societies, like those of the Inuit, have been improvised on the spot within a particular dialogic or storytelling context, and without any intention for their preservation or use beyond that context. This applies, for example, to the web-like sand drawings of the Walbiri, to which I have already referred (Munn 1973b: 196). ‘Most maps for most of the time’, as Wood observes, ‘have probably been ephemeral, scratched in sand or snow, or, if committed to a more permanent medium, immediately crunched up and thrown away’ (1993b: 83, see Lewis 1993: 99).

In the course of producing such a map, the mapper takes his interlocutors on a tour of the country, and as he does so his moving hand, which may or may not hold an inscribing implement, traces out the paths taken and the sights or landmarks encountered along the way. Of the maps produced in aboriginal times by the Saukteaux, Hallowell notes that ‘their purpose was not to delineate a section of the country as such, but to indicate a route to be followed, and the emphasis was upon a succession of landmarks roughly indicated in their relations to one another’ (Hallowell 1955: 195). Malcolm Lewis’s studies of native North American and Inuit maps have shown that they invariably rest on deictic principles: that is, they *point* to things, revealing aspects of how they look as one proceeds along a path of observation from ‘here’ to ‘there’ (Lewis 1993: 102). Even in contemporary Western societies, whose inhabitants are bombarded on a daily basis with images founded upon cartographic geometries of plane projection – where they live, as Wood puts it, ‘map-immersed in the world’ (1992: 34) – people continue to describe their environment, to themselves and others, by retracing the paths of movement they customarily take through it rather than by assigning each of its features to a fixed location in space. ‘When we are asked for directions’, as Barbara Belyea notes, ‘few of us can resist pointing and waving our arms, or tracing the traveller’s route over the surface of his map. *The gesture becomes a part of the map*, a feature of its reception’ (Belyea 1996: 11, my emphasis). It may be misleading, Belyea suggests, to liken the inscriptive process to writing, as though the purpose of the exercise were to represent the features of the landscape in the same way that writing is supposed to represent the spoken word. For the graphs on the map are not representations of anything. Every line is rather the trace of a gesture, which itself retraces an actual movement in the world. To read the map is therefore to follow the trace as one would the path of the hand that made it.³

The analogy between mapping and writing, however, may be closer than Belyea thinks. For much of its history, at least in the Western world, writing was understood not as the representation of speech but as a means by which what has been said or told could be committed to memory (Carruthers 1990). Throughout the Middle Ages, as David Olson notes, ‘written records were thought of and treated as reminders rather than representations’ (Olson 1994: 180). And the same was true of medieval maps, which served as memoranda of itineraries, providing directions and advice to the traveller who would undertake the same journey (de Certeau 1984: 120). In the history of writing as in that of mapping, remembering gradually gave way to representation over the same period – from the fifteenth to the seventeenth century – that also saw the rise of modern scientific discourse. De Certeau has shown how, in the course of this transition, the map ‘slowly disengaged itself from the itineraries that were the conditions of its possibility’. For some time, maps would continue to be illustrated with pictures of ships, landforms, people and beasts of various descriptions, winds and currents, and the like. Subsequently dismissed as quaint decorations, these figures were really fragments of stories, telling of the journeys,

and the incidents that took place along them, from which the map resulted. But eventually, the map won out over these pictorial figurations, eliminating all remaining traces of the practices that produced it (de Certeau 1984: 120–1). Thus the making of maps came to be divorced from the experience of bodily movement in the world.⁴ The cartographer has no need to travel, indeed he may have no experience whatever of the territory he so painstakingly seeks to represent. His task is rather to assemble, off-site, the information provided to him – already shorn of the particular circumstances of its collection – into a comprehensive spatial representation. It is of course no accident that precisely the same task is assigned, by cognitive map theorists, to the mind in operating upon the data of sense.

It is at the point where maps cease to be generated as by-products of story-telling, and are created instead as end-products of projects of spatial representation, that I draw the line between mapping and mapmaking. In effect, mapmaking suppresses, or ‘brackets out’, both the movements of people as they come and go between places (wayfinding), and the re-enactment of those movements in inscriptive gesture (mapping). It thereby creates the appearance that the structure of the map springs directly from the structure of the world, as though the mapmaker served merely to mediate a transcription from one to the other. I call this the cartographic illusion (see Figure 13.4). One aspect of this illusion lies in the assumption that the structure of the world, and so also that of the map which purports to represent it, is fixed without regard to the movement of its inhabitants. Like a theatrical stage from which all the actors have mysteriously disappeared, the world – as it is represented in the map – appears deserted, devoid of life. No-one is there; nothing is going on. Suppose, for example, that I describe a journey I have made by tracing a path with my finger over the surface of a topographic map. Once the map has

been folded and put away, nothing of this would remain. So far as the map’s representation of the world is concerned, I may as well have never made the trip. Had I, alternatively, traced my path with a pencil, the resulting lines would be deemed to have added nothing to the map, but rather to have defaced it. To restore the map, they would have to be rubbed out! Either way, *my gesture does not become part of the map* but is excluded from it, as is my original movement from the world it represents.⁵ This is in marked contrast to the maps of native North American Indians and Inuit, as described by such scholars as Lewis, Rundstrom and Belyea, which actually *grow*, line by line, with every additional gesture. So do the charts used by Micronesian seafarers, which ‘literally get larger, coconut-palm rib by cowrie shell, and stick by stone’

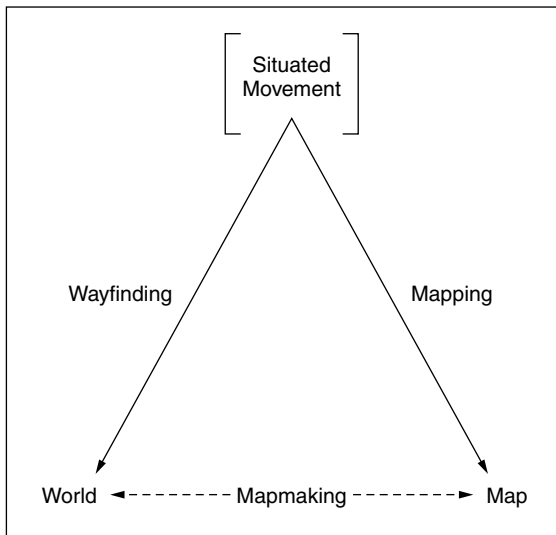


Figure 13.4 The cartographic illusion. The environmentally situated movement entailed in both wayfinding and its narrative re-enactment (mapping) is bracketed out to create the illusion that the form of the map arises, in mapmaking, as a direct transcription of the layout of the world.

(Wood 1992: 31). And so, too, do our own sketch-maps. In these instances the development of the map, as a 'pattern of interconnected lines' (Belyea 1996: 6), parallels that of the region, as a network of coming and going. But the modern topographic map does not grow or develop, it is *made*. And just as the process of its production is eliminated from the final form of the product, so the world it describes is not a world in the making, but one ready-made for life to occupy.

It is this, finally, that lies behind the distinction between the map and the picture, as alternative descriptions of the same country. For those of us schooled in the conventions of modern cartography, the distinction may seem obvious enough. Maps are supposed to furnish an objective record of the disposition of things in space, that is strictly independent of any point of view, whereas pictures show how these things might be experienced by a subject positioned somewhere in that space, or moving through it (Turnbull 1989: 15). It is widely believed, as Svetlana Alpers observes, that 'maps give us the measure of a place and the relationship between places, quantifiable data, while landscape pictures are evocative, and aim rather to give us some quality of a place or the viewer's sense of it. One is closer to science, the other is art'. Anything on the map that evokes the experience of place or movement is dismissed by the scientific cartographer as 'mere decoration'; anything in the picture that conveys factual information about spatial location is dismissed by the artist as 'mere topography' (Alpers 1983: 124–6). But for the Dutch painters and draughtsmen of the seventeenth century, who are the subjects of Alpers's study, these boundaries between maps and pictures, and between science and art, would have made little sense. Mapping and picturing were, for them, one and the same, having as their common aim 'to capture on a surface a great range of knowledge and information about the world' (1983: 122). As mapmaking triumphed over mapping, however, and as cartographers sought to dissociate themselves professionally from artists, so maps were stripped of their pictorial attributes. Thus historians of cartography, viewing the development of mapmaking in retrospect, are able to present it as having progressed from being an 'art' to being a 'science', replacing subjective fancy with hardwon and independently verifiable factual information (Edney 1993: 56). Art, in the words of Brian Harley, was gradually 'edged off the map' (Harley 1989: 4). But to edge art off the map is also to edge human actor-perceivers off the world, to push their direct, sensory experience into the wings, and to consign their narratives of movement and travel to the realms of fable, fantasy and hallucination.

WAYFINDING IS NOT NAVIGATION

'Navigation', writes Edwin Hutchins, 'is a collection of techniques for answering a small number of questions, perhaps the most central of which is "Where am I?"' (Hutchins 1995: 12). So – to return to a question I raised at the outset – what does it mean to know where one is? What would one need to know in order to feel that the question has been satisfactorily answered? First of all, according to Hutchins, one must possess some representation of space – a map – whether internal or external, inscribed in the mind or on a sheet of paper, within which every object or feature in one's environment is assigned a determinate location. One has then to be able to establish a coherent set of correspondences between what is depicted on the map and what is visible in one's surroundings. From these it should be possible to identify one's current position in the world with a specific location on the map. Only then has the question of where one is been answered (Hutchins 1995: 12–13). Alfred Gell, in an article to which I have already referred, argues

along much the same lines. To know where one is, in Gell's view, it is not enough to have formed a perceptual image of the environment as seen from some place. This image has to be matched to that generated from the map (mental or artefactual) at a particular spatial location. 'Navigation', according to Gell, 'consists of a cyclic process whereby images generated from maps are matched up against perceptual information, and perceptual images are identified with equivalent coordinates on a map' (1985: 280). This process of matching is essentially the same as what Hutchins means by 'establishing correspondences', such as, for example, when we say 'this here' (pointing to contours on the map) corresponds to 'that there' (pointing to the outline of a hill on the horizon).

Now while Gell takes as his principal ethnographic example the classic case of Micronesian seafaring, Hutchins chose to study the practices of nautical navigation on board a large modern naval vessel. Both writers insist, however, that reduced to its bare essentials, navigation is a cognitive task that all of us face all the time as we find our way about, whether at sea or on land. Navigational techniques may of course be distinguished, as Gell admits, both in terms of their complexity and the volume of information handled, and in terms of the extent to which this information is published or transmitted by rote memorisation. But none of this, he claims, alters the fact that 'the essential logical processes involved in all way-finding, from the most elementary and subliminal, to the most complex and laborious, are identical' (Gell 1985: 286). For Hutchins, likewise, we are all navigators in our everyday lives, as the following passage reveals:

When the navigator is satisfied that he has arrived at a coherent set of correspondences, he might look to the chart and say 'Ah, yes; I am here, off this point of land.' *And it is in this sense that most of us feel we know where we are.* We feel that we have achieved reconciliation between the features we see in our world and a representation of that world.

(1995: 13, my emphasis)

Yet as soon as Hutchins takes us on board ship, and introduces us to the work of the navigators on the bridge, things look rather different. For it turns out that establishing correspondences between features on the chart and features in the environment is extremely difficult, and calls for specialised skills that can only be acquired through lengthy training and hands-on experience. To reconcile the chart with the territory, as Hutchins explains, one has to imagine how the world would look from a point of view – that of the 'bird's eye' – from which it is never actually seen, save from an aircraft or satellite. The ordinary passenger, untutored in the techniques of navigation, is quite unable to do this, and may confess to being baffled by maps and charts. He cannot, in other words, translate from his on-board experience of motion as 'moving through a surrounding space' to the depiction of motion on the chart as 'that of an object moving across a space'. Navigators, on the other hand, become so used to thinking of the movement of the ship from this peculiar perspective – as if they were manoeuvring it about like a counter on a game-board – that they find it difficult to imagine this movement, any more, from the ordinary passenger's perspective (Hutchins 1995: 62).

I intend to argue, in accord with Hutchins's ethnography but contrary to his general claim, that we are no more navigators in our everyday lives – in finding our way around in a familiar environment – than we are cartographers when we retrace these movements in narrative. Navigation (or map-*using*) is, I contend, as strange to the ordinary practices of wayfinding as is cartography (or map-*making*) to ordinary practices of mapping. It would be

hard to imagine why we should find the navigator's charts so baffling, or why his skills should be so specialised, if they were but analogues of cognitive structures and capacities that we use all the time. Thus Gell, along with others who have had resort to the notion of cognitive maps, is surely wrong to regard wayfinding and navigation as processes of a similar or even identical kind. For when we move about, we do not normally think of ourselves as piloting our bodies across the surface of the earth, as the navigator pilots his ship across the ocean. Nor do we have to think in this way in order to know, at any moment, where we are. This is because the question 'Where am I?' is not ordinarily answered in terms of a location in space, determined by the intersection of an independent set of coordinates. Hutchins to the contrary, it is *not* in this sense that most of us feel we know where we are. Indeed I may know precisely where I am and yet have no idea of my geographic location. For it is not by assigning the position where I currently stand to certain spatial coordinates that an answer to the 'where' question is arrived at, but rather by situating that position within the matrix of movement constitutive of a region.

To amplify this point, let me compare two, admittedly fictional, scenarios. In the first you are walking with a friend through unfamiliar terrain, equipped with a topographic map. Arriving at a place that affords a good panoramic view, your friend stops to ask, 'Where are we?' You look around, pointing to various landmarks which you proceed to correlate with markings on the map. Finally, indicating with a finger a particular spot on the map's paper surface, you declare 'We are here'. In the second scenario, you are walking in familiar country around your home, with a companion who is a stranger to the area. Once again, on arrival at a certain place, your companion puts the same question, 'Where are we?' You may respond in the first instance with a place-name. But then, realising that the name alone leaves him none the wiser, you might go on to tell a story about the place – about your own association with it, about other people who have lived and visited there, and about the things that happened to them. Now in the second case you have no need to consult an artefactual map, nor would it be of any avail to you, not because you have resort instead to a map inside your head, but because knowing your present whereabouts has nothing to do with fixing your location in space. As someone who has lived in a country, and is used to its ways, knowing where you are lies not in the establishment of a point-to-point correspondence between the world and its representation, but in the remembering of journeys previously made, and that brought you to the place along the same or different paths. In the first scenario, of course, you have no knowledge of this kind. Having never visited the country before you do not know where you are, in the sense you do when on home ground, even though you may be able to locate your own position, and that of everything else, with pin-point accuracy on your map.

For those who know a country, in short, the answers to such basic questions as 'Where am I?' and 'Which way should I go?' are found in narratives of past movement. It is in this respect, as noted earlier, that wayfinding and mapping become one and the same: to follow a path is also to retrace one's steps, or the steps of one's predecessors. And in this respect, too, wayfinding differs fundamentally from navigation, just as mapping differs from map-using. For when navigating in a strange country by means of a topographic map, the relation between one's position on the ground and one's location in space, as defined by particular map coordinates, is strictly synchronic, and divorced from any narrative context. It is possible to specify where one is – one's current location – without regard to where one has been, or where one is going. In ordinary wayfinding, by contrast, every place holds within it memories of previous arrivals and departures, as well as expectations of how one may reach it, or reach other places from it. Thus do places enfold the passage

of time: they are neither of the past, present or future but all three rolled into one. Endlessly generated through the comings and goings of their inhabitants, they figure not as locations in space but as specific vortices in a current of movement, of innumerable journeys actually made. Taking this view of place as my starting point, I now want to show how wayfinding might be understood not as following a course from one spatial location to another, but as a movement in *time*, more akin to playing music or story-telling than to reading a map.

PATHS, FLOWS AND THE PASSAGE OF TIME

The inspiration for this move comes from Gibson, and follows from his insight – which I explored in an earlier section – that the environment is perceived not from multiple points of view but along a path of observation. Rejecting both of the dominant psychological approaches to wayfinding, as chains of conditioned responses to environmental stimuli and as navigation by means of cognitive maps, Gibson proposes an alternative, ‘the theory of reversible occlusion’ (1979: 198). In brief, the theory states that one knows the way in terms of the specific order in which the surfaces of the environment come into or pass out of sight as one proceeds along a path. Suppose, for example, that you are walking along a street in town, or through a valley in the countryside. The surfaces you can see – the facades of buildings in the one case, or the ground rising on either side in the other – comprise a *vista*. As Gibson explains, a vista is ‘a semienclosure, a set of unhidden surfaces, . . . what is seen from here, with the proviso that “here” is not a point but an extended region’. But now, as you turn the corner into another street, or reach the brow of the ridge at the head of the valley, a new set of surfaces, previously hidden, looms into view, while those of the original vista disappear from sight. The passage from one vista to another, during which the former is gradually occluded while the latter opens up, constitutes a *transition*. Thus to travel from place to place involves the opening up and closing off of vistas, in a particular order, through a continuous series of reversible transitions. It is through this ordering of vistas, Gibson maintains, that the structure of the environment is progressively disclosed to the moving observer, such that he or she can eventually perceive it from everywhere at once (Gibson 1979: 198–9).

Gibson’s notion of wayfinding through reversible occlusion has been further developed in recent work by psychologist Harry Heft (1996). We have already seen how the forms of environmental features are revealed as the envelopes of a continually modulating perspective structure along a path of observation. Now this flow of perspective structure, as Heft points out, also specifies the observer’s own movements relative to the layout of the environment. As every path of travel gives rise to its own distinctive flow pattern, so every such pattern uniquely specifies a certain path. To find one’s way, Heft argues, means to travel along a particular route so as to generate or recreate the flow of perspective structure peculiar to the path leading to one’s destination (1996: 122). One remembers the route as a succession of vistas connected by transitions, rather as one might remember a piece of music as a series of thematic sections linked by bridge passages. Just as with musical performance, wayfinding has an essentially *temporal* character (1996: 112): the path, like the musical melody, unfolds over time rather than across space. In this connection, it is important to remind ourselves of Gibson’s contention that every path should be conceived as a unitary movement, and not as a potentially infinite set of adjacent points (Gibson 1979: 197). In music, a melodic phrase is not just a sequence of discrete tones; what counts is the rising or falling of pitch that gives shape to the phrase as a whole. Likewise in wayfinding,

the path is specified not as a sequence of point-indexical images, but as the coming-into-sight and passing-out-of-sight of variously contoured and textured surfaces.

In this respect, too, the theory of wayfinding advanced here differs profoundly from that which Gell has caricatured under the rubric of ‘mapless practical mastery’, and which he attributes, *inter alia*, to Bourdieu (Gell 1985; see Bourdieu 1977: 2). ‘We can suppose’, writes Gell, ‘that practical mastery of the environment consists of possessing complete knowledge of what the environment looks like from all practically-available points of view’. The master traveller, equipped with such knowledge, remembers the journey from A to B as a ‘chain of linked landscape images’, each particular to a certain point along the route, selected from the total stock of images filed in memory. As he proceeds on his way he will pause, every so often, to check that what he sees from the spot where he stands corresponds to the image he has on file (Gell 1985: 274–5). Our argument, to the contrary, is that mastery consists in knowing what the environment looks like from all practically available *paths* of view, that what the traveller remembers are vistas and transitions rather than location-specific images, and that keeping track is a matter of regenerating the flow of perspective structure over time. Now for Gell the theory of mapless practical mastery, taken on its own, could not possibly work, since it would leave the traveller bereft of any means to formulate navigational decisions. It is all very well to know that you are currently where you ought to be – that what you see around you matches your expectations for a certain stage in your journey. But this alone will not tell you in which direction to go to reach the next checkpoint. Nor, if what you see does *not* match any of the images in the chain for the particular journey you are making, do you have any way of working out how to get back on track. In short, to go from A to B, or from any point to any other along the way, you need to be able to ascertain their relative locations in space. And this, Gell reasons, requires a map.

If it were true that all wayfinding consisted of navigation between fixed points, Gell’s argument would be unassailable. But it is not. Ordinary movement in a familiar environment lacks the stop-go character of navigation, in which every physical or bodily manoeuvre (displacement in space) is preceded by a mental or calculative one (fixing the course). ‘Finding one’s way’ is not a computational operation carried out prior to departure from a place, but is tantamount to one’s own movement through the world. To recapitulate my earlier point, we know *as* we go, not *before* we go. Thus the operation is not complete until one has reached one’s final destination: only then can the traveller truly claim to have found his way. The notion of ‘finding’ has here to be understood in its original sense of exploratory movement, at once improvisatory and assured, guided by past experience and by a continual monitoring of fluctuations not only in the pattern of reflected light but also in the sounds and ‘feel’ of the environment. There is no better illustration of this than the example that Gell himself uses in an attempt to prove, to the contrary, that wayfinding is based on the execution of pre-formulated ‘navigational decisions’ (1985: 282). This is the case of Micronesian seafaring. In a classic paper on the subject, Thomas Gladwin describes how, at every moment during a voyage, the mariner is attentive to ‘a combination of motion, sound, feel of the wind, wave patterns, star relationships, etc.’, all of which – through comparison with remembered observations from past experience – translates into ‘a slight increase or decrease in pressure on the steering paddle, or a grunted instruction to slack off the sail a trifle’ (Gladwin 1964: 171–2). Quite unlike the European navigator, with his charts and compass, the Micronesian seafarer feels his way towards his destination by continually adjusting his movements in relation to the *flow* of waves, wind, current and stars.⁶ In this respect his activity does not differ in principle

from that of the terrestrial traveller who responds to the flow of perspective structure as he journeys through a landscape. Both are essentially engaged in projects of wayfinding rather than navigation: thus Hallowell's observation that for the Saulteaux, direction always has the meaning of 'toward such-and-such a place', is paralleled by Gladwin's that the Micronesian mariner proceeds as if he were constantly within sight of land (Hallowell 1955: 190–1, Gladwin 1964: 173). And once it is recognised that the wayfinder's multi-sensory monitoring is of flows, not images, and that flows specify paths and not spatial locations, Gell's objections to the idea of mapless practical mastery fall away.

Micronesian seafaring resembles terrestrial wayfinding in one other critical respect: every journey is apprehended and remembered as a movement through time rather than across space. Islands, for the mariner, are not pinned down to specific spatial or geographic locations, nor does he imagine his craft to be covering the distance over a planar surface from one such location to another. Throughout the voyage he remains, apparently stationary, at the centre of a world that stretches around as far as the horizon, with the great dome of the heavens above. But as the journey proceeds the island of embarkation slips ever farther astern while the destination island draws ever closer. At the same time an island off to one side, selected as a point of reference for the voyage, is supposed to swing past the boat, falling as it does so under the rising or setting positions of a series of stars. The fact that the reference island (*etak*) is normally invisible below the horizon, and may not even exist at all, has been a source of puzzlement to many interpreters who – assuming that the mariner's task is to navigate from one spatial location to another – have proposed that the *etak* is used to obtain a locational fix. Nothing in what the mariners themselves have to say, however, suggests that it serves any such purpose. The alleged bearing of the *etak* does not enter into any numerical computation. Rather, pointing to the *etak* is the mariner's way of indicating where he is in terms of the temporal unfolding of the voyage as a whole (Hutchins 1995: 87–8). We have already seen how, in terrestrial wayfinding, a route from one place to another is remembered as a temporally ordered sequence of vistas. In much the same way, the Micronesian mariner remembers an inter-island voyage as a sequence of *etak* segments, each of which begins as the reference island falls under one particular star and ends as it falls under the next in line. At any movement, the mariner will know what segment he is in. As it swings beneath the horizon, from segment to segment, the *etak* island marks in its movement the passage of time, just as do the sun, moon and stars overhead, in theirs. Completion of the penultimate segment should bring the mariner, at length, to the final '*etak* of sighting', as the island for which he is bound hoves into view.

THE WORLD HAS NO SURFACE

One further contrast remains to be drawn between wayfinding and navigation, and it takes us back to the cartographic notion of the map as a representation of some portion of the earth's surface. The following 'official' definition of the map, issued by the International Cartographic Association, is exemplary:

A map is a representation normally to scale and on a flat medium, of a selection of material or abstract features on, or in relation to, the surface of the Earth or of a celestial body.

(cited in Robinson and Petchenik 1976: 17)

Now the idea that the world is presented to the traveller as a surface to be traversed presupposes the specialised, 'bird's-eye view' of the cartographer or navigator. Indeed the world can only be perceived to have an exterior surface by a mind that is situated above and beyond it. In ordinary wayfinding however, whether on land or at sea, the world is apprehended from within. One makes one's way *through* it, not over or across it. Of course the traveller encounters surfaces of diverse kinds – of solid ground, water, vegetation, buildings, and so on – and it is largely thanks to the responses of these surfaces to light, sound and the pressure of touch that he perceives the environment in the way he does. For the mariner the ocean, with its subtle differences of tint and colour, sculpted by the wind into waves and ripples, and breaking up around the boat into foam and spray, presents an infinitely variegated and ever changing surface. Likewise for the pedestrian, making his way along a forest track, the surface of the ground is a patchwork of mud, furrowed by the imprint of previous journeys, puddles, fallen leaves, broken boughs, and outcropping rocks and stones. These are surfaces, however, *in* the world, not *of* the world. That is to say, they are formed on the interface, not between matter and mind, but between solid or liquid substance and the gaseous medium (air) in which humans live and breathe, and which affords movement and sensory perception.⁷ In short for its manifold inhabitants, journeying along their respective ways of life, the world itself *has no surface*.

I noted earlier the parallel between the tracing of paths on the ground in wayfinding and the tracing of lines on paper (or in sand, snow, etc.) in mapping: indeed to the extent that all wayfinding is mapping, these are one and the same. Our conclusion, however, that for the mapper or wayfinder the world has no surface, calls for some qualification of the view, for which I argued above, that mapping is an inscriptive process. This need not be so. If a map consists of a network of interconnected lines, each corresponding to a path of movement through the world, there is no necessary reason why these lines should be inscribed on a surface. One could think of the gesturing hand, in mapping, as a weaving hand rather than a drawing hand, and of the result as something more akin to a cat's cradle than a graph. The lines of the map could be threads, wires or sticks. Micronesian mariners used coconut leaf ribs to map the intersecting courses of ocean swells (Turnbull 1991: 24). Or to take a familiar example from a contemporary urban context, one could construct a route map for the London Underground out of stiff wire, soldered at the intersections, and it would serve just as well as the conventional printed versions. The fact that the map is generally reproduced on paper is a matter of obvious practical convenience, but not of logical necessity. The meaning of the map lies entirely in its routes and intersections, whereas the paper surface has no significance whatsoever. To read the map is to trace a continuous path from one station to another, without regard to their respective locations on the surface. With the modern topographic map it is quite otherwise, for in this case the paper surface of the map stands for nothing less than the *surface of the earth*. One of the most revealing indicators of this change in the significance of the map-surface, corresponding to the transition from mapping to mapmaking, lies in the appearance of frame boundaries. Native maps, as Belyea points out (1996: 6), are never framed. A line or border drawn around and enclosing such a map would have no meaning. The frame of the topographic map, by contrast, defines the portion of the earth's surface that the map purports to represent. Thus the appearance of borders around the map corresponds to the disappearance of the itineraries and practices that give rise to it.

CONCLUSION

There is a paradox at the heart of modern cartography. The more it aims to furnish a precise and comprehensive representation of reality, the less true to life this representation appears. 'To present a useful and truthful picture', as Mark Monmonier writes, 'an accurate map must tell white lies' (Monmonier 1991: 1). But the reason for the discrepancy between truth and accuracy is not quite what Monmonier claims it to be. It is not that the map must leave things out if critical information is not to be drowned in a welter of ever finer particulars. It is rather that the world of our experience is a world suspended in movement, that is continually coming into being as we – through our own movement – contribute to its formation. In the cartographic world, by contrast, all is still and silent. There is neither sunlight nor moonlight; there are no variations of light or shade, no clouds, no shadows or reflections. The wind does not blow, neither disturbing the trees nor whipping water into waves. No birds fly in the sky, or sing in the woods; forests and pastures are devoid of animal life; houses and streets are empty of people and traffic. To dismiss all this – to suggest that what is excluded in the cartographic reduction amounts, in Monmonier's words, to a 'fog of detail' – is perverse, to say the least (Wood 1992: 76). For it is no less than the stuff of life itself. Were one magically transported into the looking-glass world behind the map, one would indeed feel lost and disoriented, as in a fog. But the fogginess is a function not of the amount or density of detail but of the arrestation of movement. Detached from the flow of which each is but a moment, details settle like an opaque precipitate upon the surface of the earth. Little wonder, then, that the cartographer feels the need to sweep them up, or that the navigator prefers to brush them aside in plotting a course!

The ordinary wayfinder, on the other hand, is not generally troubled by detail. Quite to the contrary, the richer and more varied the texture of the environment, the easier it is to find one's way about. But above all, wayfinding depends upon the attunement of the traveller's movements in response to the movements, in his or her surroundings, of other people, animals, the wind, celestial bodies, and so on. Where nothing moves there is nothing to which one can respond: at such times – as before a storm, or during an eclipse – the experienced traveller can lose his bearings even in familiar terrain. These observations should finally lay to rest the cartographic illusion, namely that the world is pre-prepared as a stage upon which living things propel themselves about, from one location to another. Life, in this view, is an internal property of objects, transported upon the exterior surface of a lifeless earth. In the view I have set forth here, by contrast, the world is *not* ready-made for life to occupy. Contrary to the assumptions of cartographers and cognitive map theorists, life is not contained within things, nor is it transported about. It is rather laid down along paths of movement, of action and perception. Every living being, accordingly, grows and reaches out into the environment along the sum of its paths. To find one's way is to advance along a line of growth, in a world which is never quite the same from one moment to the next, and whose future configuration can never be fully known. Ways of life are not therefore determined in advance, as routes to be followed, but have continually to be worked out anew. And these ways, far from being inscribed upon the surface of an inanimate world, are the very threads from which the living world is woven.