

Part III

Skill

INTRODUCTION

In Western society we tend to think of art and technology as separate fields of endeavour, and the study of each has been built on different foundations. The chapters in this part suggest ways in which this separation might be overcome, by taking as a point of departure the skilled practices of socially situated agents. The first three chapters represent successive stages in my attempts to rethink the technical. It was in drafting the essay which now appears as Chapter Fifteen that it dawned on me that the opposition between intellectual design and mechanical execution, in terms of which discussions of human and animal toolmaking and tool-using have traditionally been couched, is in fact a phenomenon of Western modernity. Instead of assuming that technical operations are, by their very nature, mechanical, I argue in this chapter that the machine is an outcome of the historical development of the forces of production accompanying the growth of industrial capitalism. In this development the relations between workers, tools and raw material have been transformed, such as to replace subject-centred skills with objective principles of mechanical functioning. It is to these principles that the modern concept of technology refers. I show how the emergence of this concept was bound up with the rise of a mechanistic cosmology that separated design from construction, and reduced skilled making to 'merely technical' execution. Thus whereas in the artisan's handling of his tools, the movements of their working points are guided by his own perception, the motions of the machine, and any tools attached to it, are predetermined.

I conclude that the transition, in the history of human technicity, from the hand-tool to the machine, is not from the simple to the complex, but is rather tantamount to the withdrawal of the producer, in person, from the centre to the periphery of the productive process. It is a history, in other words, not of complexification but of externalisation. In Chapter Sixteen I consider how this conclusion might affect our understanding of the technical capabilities of hunters and gatherers. Classically portrayed as people with the simplest of technologies, it would be closer to the mark to say that hunter-gatherers have no technology at all. That is to say, their lives are not bound, as is so often suggested, to the operational requirements of a predetermined 'techno-environmental system'. Rather, the success of their way of life depends upon their possession of acutely sensitive skills of perception and action. Yet as properties of persons, developed in the contexts of their engagement with other persons or person-like agencies in the environment, technical skills are themselves constituted within the matrix of social relations. Hence, insofar as they involve the use of tools, these must be understood as links in chains of personal rather than mechanical causation, serving to draw components of the environment into the sphere

of social relations rather than to emancipate human society from the constraints of nature. Their purpose, in short, is not to control but to reveal.

Herein lay the second step in my rethinking of the technical. Having first recognised that hunting, for example, entails the practice of a skill rather than the operation of a technology, the stage was set for my realisation that technical relations, in pre-industrial societies, are embedded in social relations. It follows that the process of externalisation is also a process of disembedding of the technical from the social, ultimately giving rise to the modern, institutionalised separation of technology and society. Returning, however, to the context of modern industrial society, I began to think that this picture of a progressive evolution from skill to technology, in which the craftsman or artisan gradually gives way to the machine operative, is too simple. In Chapter Seventeen I present an alternative to this evolutionary model, while at the same time linking the discussion of tools and technicity to the issues of time and temporality adumbrated in Chapter Eleven. Following a classic article by historian E. P. Thompson, the transition from pre-industrial to industrial society has often been depicted as one in which a task-oriented time, grounded in the rhythms of social life, has been replaced by the mechanical regimen of the clock. Drawing on ethnographic studies of locomotive drivers I show, to the contrary, that task-orientation remains central to the experience of work in industrial society, even though the reality of that experience is systematically denied by the Western discourse of freedom and necessity. Indeed, clock time is as alien to people of industrial as it is to those of pre-industrial societies: the only difference is that the former have to deal with it. Likewise the machine operative of industrial society remains a skilled practitioner: his skill, however, lies in coping with machines rather than in their operation, and what it produces is not commodities for the owner of capital but his own personal and social identity.

In Chapter Eighteen I return to a theme already introduced in Chapter Five, concerning the difference between making things and growing things. There I was concerned to show what it means to say that the herdsman's animals, or the farmer's crops, are grown rather than made. I now take up the suggestion that artefacts, too, may be grown, and that in this sense they are not so very different from living organisms. To illustrate the argument I consider the weaving of a coiled basket. Conventionally, we regard weaving as a kind of making. Could we not, however, reverse the argument, and regard making as a kind of weaving? The effect of this reversal – which is precisely equivalent to our strategy, in Part II, of regarding building as a kind of dwelling – would be to place the emphasis on the skilled character of the form-generating process rather than upon the final form of the object produced. Evidently, a basket is not made through the forcible imposition upon material substance of some pre-existent design, included among the collective representations of a cultural tradition, as the standard notion of artefacts as items of 'material culture' would lead us to believe. For in weaving, a surface is built up rather than transformed, and the spiral form of the basket emerges through the rhythmic repetition of movement in the weaving process rather than originating in the maker's mind. Indeed, despite their different geometrical properties, there is a close parallel between the generation of spirals in artefacts (such as the basket) and in living organisms (such as in the shell of a gastropod). Just as the form of the organism is not prefigured genetically but arises through a process of growth within a morphogenetic field, so the form of the artefact is not prefigured culturally but arises through the unfolding of a field of forces that cuts across its developing interface with the environment.

Chapter Nineteen takes us back to the modern dichotomy between art and technology which, I argue, stands in the way of an appreciation of the true nature of technical skill.

To specify more precisely what I mean by skill, I highlight five critical dimensions of any kind of skilled practice. First, intentionality and functionality are immanent in the practice itself, rather than being prior properties, respectively, of an agent and an instrument. Secondly, skill is not an attribute of the individual body in isolation but of the whole system of relations constituted by the presence of the artisan in his or her environment. Thirdly, rather than representing the mere application of mechanical force, skill involves qualities of care, judgement and dexterity. Fourthly, it is not through the transmission of formulae that skills are passed from generation to generation, but through practical, 'hands-on' experience. Finally, skilled workmanship serves not to execute a pre-existing design, but actually to generate the forms of artefacts. Through a comparison of the looping skills involved in making string bags among Telefolmin people of Central New Guinea and the nest-building skills of the male weaverbird, I show that these dimensions of skill are equally evident in both cases. The conventional notion that the birds' activity is due to instinct whereas humans are guided by the dictates of culture is therefore inadequate. In both cases, the pattern of regular movement generates the form. And in both, the fluency and dexterity of this movement is a function of skills that are developmentally incorporated into the *modus operandi* of the body, through practice and experience in an environment. But this leaves us with a still unanswered question. How *do* the skills of human beings differ from those of non-human animals?

In a famous footnote to *Capital*, Karl Marx compared the history of human technology to the history of organic adaptation as described by Darwin in *The Origin of Species*. The comparison suggests three further questions. First, how – if at all – can we distinguish the evolution of technology from its history? Secondly, is there anything inherently progressive about technical change? And thirdly, are there grounds for supposing that such change is governed by a mechanism analogous to that of variation under natural selection? In Chapter Twenty I address each of these three questions in turn. The first takes us back to the problem of origins, already raised in Chapter Ten. Was there some take-off point in human evolution beyond which technology acquired a dynamic of its own, and could go on developing without any further change in human capacities? On the second question, I show that estimations of technological complexity are meaningless unless account is taken not just of material toolkits but also of the knowledge and skills required to operate them. Finally, while the analogies between technical change and organic evolution are suggestive, the way in which they are commonly drawn suggests that what changes is a *design* for the technical artefact, comparable to the organic genotype, rather than the form of the object itself. Our conclusion from Chapter Eighteen, however, is that the forms of artefacts, like those of organisms, arise through processes of growth within fields of relationships. To account for change in artefactual forms, therefore, we have to understand how these fields, and their generative potentials, are constituted and transformed over time.

Now if the same logic is to be applied to organisms, then we have to think about organic evolution in general, and human evolution in particular, in a completely new way. I attempt such a rethinking in Chapter Twenty-one. It is conventional, in palaeoanthropology, to distinguish between the process of evolution, leading from ancestral pongid and hominid forms to 'anatomically modern humans', and the process of history, leading from the Palaeolithic hunter-gatherer past to modern science and civilisation. I argue that this distinction is untenable. Comparing walking and cycling, as modes of locomotion, and speech and writing, as modes of communication, I show that these capacities cannot be opposed as, respectively, biologically innate and culturally acquired. They are, in every

case, embodied skills, incorporated into the human organism through a process of development. Thus the differences we call cultural are themselves biological. The reasons for the separation of biology and culture in orthodox theory lie in the identification of the former with a formal genetic 'endowment'. But form, I argue, is not received by the organism-to-be at the point of conception, but generated within the dynamic functioning of developmental systems. And through contributing to the environmental conditions of development for successor generations, organisms – including human beings – actively participate in their own evolution.

There can, then, be no specification of the essential form of humanity independent of the relational contexts in which human beings *become*. The notion of the 'anatomically modern human' is an analytic fiction, derived through the retrojection, onto the Palaeolithic past, of a concept of recent historical provenance in the West. I suggest an alternative approach to human evolution, starting from the inescapable condition of human beings' involvement in their diverse environments. This approach is taken one step further in Chapter Twenty-two, which focuses on the controversial issue of language origins. It has been customary, in discussions of this issue, to distinguish speech, as a universal human capacity, from the manifold languages of particular communities. It is supposed that the former is a product of evolution under natural selection, and is transmitted genetically, thereby establishing the cognitive foundations, in successive generations, for the acquisition of the latter through a parallel process of cultural transmission. But this distinction between genetic and cultural transmission, I maintain, is a consequence of the attempt to treat both speech in general, and languages in particular, as formal, rule-governed systems. This, in turn, betrays the scriptist bias of modern linguistic theory: the tendency to assimilate the spoken utterance, in its pure or ideal form, to the sentence of writing.

I propose a different view. Instead of regarding speech and language, respectively, as innate capacity and acquired competence, I maintain that speaking should be treated as a variety of skilled practice, with all the generic properties of skill outlined in Chapter Nineteen. Through a focus on skill as embodied knowledge we are able to dispense with the troublesome dichotomy between innate and acquired characters. But this also has the effect of dissolving the distinction between evolution and history, and with it, the point of origin constituted by their intersection. The notion of 'language origins' is thus shown to have itself originated within the current of modern thought, alongside the rationalisation of language associated with print literacy. However this same current has also yielded the three key terms – namely 'technology', 'language' and 'intelligence' – which generally frame contemporary accounts of the evolution of human cognition. Of course, in all societies people use tools and talk to one another, and these and other activities represent creative ways of coping in the world. But to say that everyday tool-using is a behavioural instantiation of technology, or that spoken dialogue is an instantiation of language, or even that creative activity is an instantiation of intelligence, is already to make certain rather problematic assumptions.

I conclude, in Chapter Twenty-three, by spelling out what these assumptions are and by suggesting how we might construct an alternative account that would dispense with them. This we could do by examining the relation, in human evolution, not between technology, language and intelligence, but between craftsmanship, song and imagination. I argue that song, far from being put together from separate linguistic and musical components, is rather a performative unity that is decomposed into these components through the imposition of a concept of language of modern origin. In just the same way, the modern concept of technology decomposes craftsmanship into the separate components

of rational-technical operations and expressive art. To focus on song and craftsmanship rather than language and technology is to foreground the poetic and performative aspects of speech and tool-use that have been marginalised by rationalism. Neither speech nor tool-use can be understood as the mechanical output of a mental constructional or problem-solving device, such as a technological or linguistic 'intelligence'. Both, however, involve imagination, understood as the activity of a being whose verbal creativity and puzzle-solving is carried on within the context of involvement in a real world of persons, objects and relations. I am, indeed, such a being, and one of the results of my activity is this book.