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# From science to art and back again: The pendulum of an anthropologist

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**Abstract:** In this paper I look back over four decades of my career as a professional anthropologist, starting with an orientation that was heavily weighted towards the natural sciences, and ending in a project that seeks to integrate anthropology with the practices of art, architecture and design. This was also a period during which science increasingly lost its ecological bearings, while the arts increasingly gained them. Tracing the journey in my own teaching and research, I show how the literary reference points changed, from foundational texts in human and animal ecology, now largely forgotten, through attempts to marry the social and the ecological inspired by the Marxian revival, to contemporary writing on post-humanism and the conditions of the Anthropocene. For me this has been an Odyssey – a journey home – to the kind of science imbibed in childhood, as the son of a prominent mycologist. This was a science grounded in tacit wonder at the exquisite beauty of the natural world, and in silent gratitude for what we owe to this world for our existence. Today's science, however, has turned wonder and gratitude into commodities. They no longer guide its practices, but are rather invoked to advertise its results. The goals of science are modelling, prediction and control. Is that why, more and more, we turn to art to rediscover the humility that science has lost?

**Keywords:** Environmental anthropology, Natural sciences, Art, Truth, Gratitude.


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## I

Precisely forty years have passed since I began my career as a professional anthropologist. The achievement of this milestone has prompted me to reflect on what has happened to me and to anthropology over those four decades, from when I received my doctoral degree and took up my first teaching position, to today, now that I am taking my first steps towards retirement. What strikes me overall about these decades is that while I began with an anthropological orientation that was strongly inclined towards the natural sciences, I now find myself most closely aligned with the disciplines of art, architecture and design. And while my position has of course shifted over the years, it seems to me that the shift has been just as much on the sides of both the arts and the sciences. On the one hand, natural science is not where it was forty years ago – and here I am referring particularly to the fields of ecology and evolutionary biology with which I have been most closely associated in my work. But nor, on the other hand, are the arts where they were. Interpreted broadly to include architecture and design, it appears that the arts have shifted laterally to take up much of the field, and the position, from which science has abdicated. Or to put it in a nutshell, the people who are doing what I understood – forty years ago – to be science are now artists. What in the meantime has happened to science is an issue to which I will return.

It is commonly supposed that anthropology is a centrifugal discipline that discharges its practitioners into fields as remote and far away as possible, in order that they may experience ways of life as different from their own as they could hope or expect to find. Many anthropologists would agree, flaunting their encounter with "radical alterity" as a badge of honour. But for me, it has always felt the other way around. Ever since I embarked on my studies of the subject, anthropology has been about finding my way home. I had no settled point of origin from which to start. It was not as though, even before setting out, I already knew all there was to know about myself and what I was going to be. Like most apprentice anthropologists, I did go to a relatively distant place to undertake fieldwork, and in my case this involved a prolonged stay among Skolt Saami people in the far northeast of Finland. At the time, however, I had almost no idea of whom I was or where I came from, let alone of where I was going. I had a name and address, a passport, and next of kin to be contacted in case of emergency; I even had a degree from a respected university and a scholarship to support my work. But the voice with which I spoke, the hand with which I wrote, even the mind with which I thought – these were not yet me. They were but habits I had borrowed or styles that I had, at one time or another, sought or been trained to emulate.

In that sojourn in Lapland, however, and through the moral education it gave me, I took my first, tentative steps homeward. The road has been long and tortuous. I have not arrived yet, and probably never will. But I am now more confident that it is indeed my voice that speaks, my hand that writes and my mind that thinks. With voice, hand

and mind I now declare: *This is who I am*. And who is this person whom I am slowly discovering myself to be? It seems to be a child. Raised in a happy household, where his mother indulged his passion for model railways while his father pursued scientific research into the mechanisms of spore dispersal of aquatic fungi, this child would spend long hours immersed in the pages of D'Arcy Wentworth Thompson's monumental masterpiece, *On Growth and Form* (1961), of which his father possessed a copy of the original 1917 edition, or investigating the mathematics of soap bubbles and the traces of spinning tops. He would go for walks in the countryside, paying absolutely no attention as his father would identify and reel off the Latin names of every plant and fungus we would come across – he knew them all! At school, guided by inspirational teachers, he sat at the edge of his seat in wonder at the mysteries of the universe as they were being unravelled by science. He experimented with cloud chambers and grew crystals in solution. It was obvious that he was going to be a mathematician and a scientist.

What happened? A year of studying natural sciences at the University of Cambridge put paid my illusions. After the excitement of school science, lectures at Cambridge were an intense disappointment. I found much of what was taught intellectually claustrophobic, dedicated to the regimented and narrow-minded pursuit of objectives that seemed remote from experience. Unlike many of my fellow students, outraged by science's renunciation of its democratic principles and its surrender to the megamachines of industrial and military power – this was, after all, a time when the war in Vietnam was at its height – I never became radically hostile to the scientific project. But I could see no future in it for myself. I wanted to study something in which there was room to grow, where I could discover the world and myself at the same time. And that was what led to anthropology. It appealed to me (rather as D'Arcy Thompson's biology had done before) as a kind of pure mathematics of real life, where experience and imagination could come together as one. And so began my odyssey, my journey home. Proceeding on my way, far from drifting ever further from the truths I had absorbed in childhood, I found myself ever returning to them, and furthermore defending them, with all the force that I could muster, against the onslaught of adult disciplinary oppression. I have fought this campaign over the territories of biological and cultural evolution, human and animal environments, the realms of thinking and making, and the competing claims of art and science.

## II

My father, as I mentioned, was a mycologist. His was a homely science, involving walks along river banks where he would collect the scum that often accumulates in brackish pools, bringing it home in glass phials to be investigated under a microscope set up on our dining room table. He had improvised an elaborate contraption involving a pile of volumes of the *Encyclopaedia Britannica*, a glass plate, and an early version of the anglepoise lamp, which allowed him to project the forms of the fungi revealed un-

der the microscope so that they could be accurately drawn. This he did with the utmost care, using a mapping pen, Indian ink and high quality Bristol board. Though he would never admit to it, this was his way of honouring the forms of nature, of not just contemplating their beauty but knowing them from the inside; and the results were true works of art. He loved his fungi. But perhaps what I did not realise at the time was that as a field of the botanical sciences, mycology is a deeply subversive discipline. Fungi, you see, just don't behave as organisms should. We typically describe the organism as a blob-like entity with an inside and an outside, bounded by the skin, and interacting with the surrounding environment across the boundary. But fungi are not like that. They leak, they ooze, their boundaries are indefinable; they fill the air with their spores and infiltrate the ground with their meandering, ever-branching and ever-extending fibres. What we see above ground are merely fruiting bodies, like street-lamps which cast their aerial illumination only thanks to hidden, subterranean circuitry.

The mycologist Alan Rayner once remarked to me, in passing, that the whole of biology would be different had the mycelium – rather than, say, a mouse or a sea-urchin – been taken as a prototypical exemplar of the organism (Rayner 1977)[1]. Many years later, this thought would come back to haunt me, as I was developing a notion of what I called the «mycelial person» (Ingold 2003)[2]. What if we were to think of the person, like the fungal mycelium, not as a blob but as a bundle of lines, or relations, along which life is lived? What if our ecology was of lines rather than of blobs? What then can we mean by "environment"? People, after all, don't live inside their bodies, as social theorists sometimes like to claim in their clichéd appeals to the notion of embodiment. Their trails are laid out in the ground, in footprints, paths and tracks, and their breaths mingle in the air (Ingold 2015). They stay alive only as long as there is a continual interchange of materials across ever-growing and ever-shedding layers of skin. Thus, just as mycology subverts deeply held intuitions in the biological sciences, so – it now seems to me – anthropology does the same for the social sciences. Anthropologists, mycologists of the social, are the awkward squad, the jesters, the fools, who sidle up to power and chip away at its pretensions. And perhaps their awkwardness lies in precisely this: that they see a world of intricately enmeshed relations rather than one already divided into discrete and autonomous entities.

We anthropologists are predisposed, therefore, to what could be called a relational rather than a populational way of thinking, to a view of the world more topological than statistical. And if anything, this has set us ever further apart from mainstream so-

1. Our conversation took place shortly before Rayner's book was published. The extraordinary difficulties he experienced in finding a publisher for this volume says much about entrenched attitudes in biological science.

2. I first presented this idea at the 96th Annual Meeting of the American Anthropological Association, Washington DC, November 1997, and in the following month at a conference on "Nature Knowledge" hosted by the Istituto Veneto di Scienze, Lettere ed Arti, Venice. More recently, the fields of mycology and anthropology have come together in the work of Anna Tsing (2015).

cial science. Once again, this has its exact counterpart in bioscience. In the latter years of his life, my father used to rail against the way, in his view, biological science had lost touch with the reality of living organisms. He found much of the literature incomprehensible. It was produced by modellers who had never observed or handled anything that lived or grew upon this earth, and who spent their time in laboratories or in front of computers, analysing massive datasets spewed out by machines from the stuff fed into them. In the spectacular and lavishly funded rise of e-social science we have seen much of the same. Fuelled by the digital revolution, it has become an immense data-processing exercise from which the people have effectively disappeared. In the social as in the biosciences, qualitative field-based inquiries with living people or living organisms are increasingly regarded as naïve or amateurish. It is as though science had turned its back on the living, avoiding sentient involvement of any kind. In this brave new world, life is disposable, and its forms – whether human or non-human – are mere grist to the mill of data-analytics, the purpose of which is to produce results or "outputs" whose value is to be judged by measures of impact or utility rather than by any appeal to truth.

A datum is, by definition, that which is given. But what today's scientists count as data have not been bestowed as any kind of gift or offering. To collect data, in science, is not to receive what is given but to extract what is not. Whether mined, washed up, deposited or precipitated, what is extracted comes in bits, already broken off from the currents of life, from their ebbs and flows, and from their mutual entailments. For the scientist even to admit to a relationship of give and take with the things in the world with which he deals would be enough to disqualify the inquiry and any insights arising from it. Ideally he should leave it all to his recording equipment and exit the scene, only to return to register the outcomes once the job is done and to transfer them to a databank or storage facility for safe keeping. That this is impossible in practice – especially in the field sciences for which the laboratory is nothing less than the world we live in, and from which there is no escape – is often considered a shortcoming, a weak point in the methodological armoury that could compromise the objectivity of the results. For what is methodology, if not a shield to protect the researcher from direct sensory contact with materials? The prescriptions of methodology treat the researcher's own presence not as an essential prerequisite for learning *from* what the world has to offer us, but as a source of observer bias to be reduced at all cost. Any science that fails in this regard is considered to be methodologically "soft", and anthropology by that measure – and mycology too, as my father used to practise it – is positively squishy.

## III

Let us compare a hard object – say a ball – with a squishy one. The first, when it comes up against other things in the world, can have an impact. It can hit them, or even break them. In the hard sciences, every hit is a datum; if you accumulate enough data, you may achieve a breakthrough. The surface of the world has yielded under the im-

pact of your incessant blows, and having done so, yields up some of its secrets. The squishy ball, by contrast, bends and deforms when it encounters other things, taking into itself some of their characteristics while they, in turn, bend to its pressure in accordance with their own inclinations and dispositions. The ball responds to things as they respond to it. Or in a word, it enters with things into a relation of *correspondence*. In their practices of participant observation – of joining with the people among whom they work and learning from them – anthropologists become correspondents. They take into themselves something of their hosts' ways of moving, feeling and thinking, their practical skills and modes of attention. So too, my father corresponded with the fungi as he drew their forms under the microscope. His hand, along with the pen it held, was drawn into their formative processes, and as he drew the forms re-emerged on the surface of the board. Correspondence, whether with people or with other things, is a labour of love, of giving back what we owe to the human and non-human beings with which and with whom we share our world, for our own existence and formation.

Two centuries ago, in Germany, Johan Wolfgang von Goethe proposed a method of science which demanded of practitioners that they should spend time with the objects of their attention, observe closely and with all their senses, draw what they observed, and endeavour to reach a level of mutual involvement or coupling, in perception and action, such that observer and observed become all but indistinguishable. It is from this crucible of mutual involvement, Goethe argued, that all knowledge grows[3]. The parallels with the much more recent injunctions of participant observation in anthropology are striking: what we are exhorted to do with the people with whom we work – to spend time with them, join in their activities of daily life, observe closely and record – Goethe was already urging scientists to do with animals and plants, back in the eighteenth century. Yet contemporary attitudes to what is nowadays called "Goethean science", in the technoscientific mainstream, are telling. It is commonly regarded with a degree of indifference bordering on contempt; its practitioners are ridiculed and its submissions for publication systematically rejected. It has not always been thus, however. Indeed I have a strong suspicion that the virulent repudiation of what we could call the *science of correspondence* coincides in a way that is not accidental with the colossal expansion, over the last four decades, of globalisation and the political economy of neoliberalism. These, of course, were the decades of my career as a professional anthropologist. What I have witnessed, over these decades, is the surrender of science to the forces of neoliberalism. And to find a counter-movement in the contemporary world, we have to turn not to science but to art.

What might pejoratively be regarded as squishy science could, I think, be better and more positively described as the *art of inquiry* (Ingold 2013: 6-8). In this art, every work is an experiment: not in the natural scientific sense of testing a preconceived hypothesis or of engineering a confrontation between ideas "in the head" and facts "on

3. Holdrege (2005) offers an excellent summary of the Goethean way of doing science.

the ground", but in the sense of prising an opening and following where it leads. You try things out and see what happens. Thus the art of inquiry moves forward in real time along with the lives of those who are touched by it, and with the world to which both it and they belong. Far from matching up to their plans and predictions, it joins with them in their hopes and dreams. This is the very opposite of methodology. It is not to wrap method up into an impregnable shell, protecting the investigator from having to share in the suffering of those subjected to his hard-ball tactics, but rather to compare method to a way of working, akin to a craft, which opens up the world to our perception, to what is going on there, so that we in turn can answer to it. We could call it the *method of hope*[4]: the hope that by paying attention to the beings and things with which we deal, they in turn will attend to us, and respond to our overtures. Anthropology, I believe, can be an art of inquiry in this sense. We need it not to accumulate more and more data *about* the world, but to better correspond *with* it.

This, then, is where anthropology can join forces with art. But it is also to think of anthropology in a particular way which, I have to admit, is not the way in which most practising anthropologists currently think about their discipline. The majority of my colleagues would insist that the primary task of the anthropologist is *ethnographic*: that is, to give a richly detailed, accurate and nuanced account of life as it is lived for particular peoples in particular times and places[5]. There is absolutely nothing wrong with this, of course, just as there is nothing wrong with a history of art that looks back on how artworks have been made and received, again in specific times and places. For ethnography as for the history of art, understanding is about putting things in context. Yet for all its manifest scholarly virtues, to put things in context is also to lay them to rest, to silence them or neutralise their power, so that the things themselves cease to engage our attention as active and ongoing forces in the world. They are, so to speak, accounted for, ticked off, put in their place. But people don't act, nor do artists work, in order that their deeds and works may be accounted for by future historians. They act and work in order to make a difference in the world. Thus to create a work of art is to give birth to a new being, a being that will have its own life, alongside the lives of those who touch and are touched by it. The thing springs up, and like a rebellious child, refuses the efforts of its elders to put it to bed.

I too, as I mentioned earlier, have become a child. And speaking as a child, I do wonder whether, as with art, anthropology should be in the business of understanding at all, or at least of understanding *others*. The child who cries out does not want to be understood. She wants to *be*, and to have the truth of her being acknowledged. She demands to be observed and listened to. Should we not attend? Or do we tell her – as the ethnographer tells the people or the historian tells the work of art – to get back into her proper context and be understood? Could it be that understanding actually blinds us to

4. I have borrowed this expression from Miyazaki (2004).
5. On the distinction between anthropology and ethnography, see Ingold (2011: 229-43; 2013: 2-4; 2014).

the truth of what is there? Anthropology, for me, is not about describing the world, or wrapping it up. It is, in the first place, about attending to presence, about noticing, and responding in kind. It means acknowledging that persons and other things are *there*, that they have their own being and their own lives to lead, and that it behoves us, for our own good, to pay attention to their existence and to what they are telling us. Only then can we learn. The same, I think, might be said for art. It too is an opening on the world rather than an attempt at closure – an opening that exposes the practitioner to its trials and to its gifts. That is why art combines well with anthropology but not with ethnography. For what art and anthropology open up, ethnography – like art history – seeks to contain. But what, then, has happened to science? To answer this question we need to take a step back, and pick up the thread of my own anthropological travails from where I left off, having recently completed my doctoral fieldwork in Lapland.

## IV

The year is 1974 and I have just spent twelve months at the University of Helsinki, in Finland, while writing up my field material. With my dissertation almost finished, I have recently landed my first proper job as a lecturer in social anthropology at the University of Manchester, where I am tasked with teaching a course that my predecessor Basil Sansom, whose position I had replaced, introduced a couple of years previously. The course was called *Environment and Technology*, and it was basically an introduction to the sub-field of cultural ecology, at that time almost unknown in the corridors of British social anthropology. For me, at least to begin with, it was a heavily science-based course. I wanted to show that any anthropology worthy of the name would have to be at least consistent with what we know from the biological sciences about the evolution and ecology of the human species. Accordingly, we read classical ecological studies such as Charles Elton's *Animal Ecology* (1927), David Lack's *The Natural Regulation of Animal Numbers* (1954), based on studies of the breeding patterns of birds, and the masterpiece by Vero Copner Wynne-Edwards, *Animal Dispersion in Relation to Social Behaviour* (1962), in which he first proposed the idea of group selection.

At that time there was much interest in how human populations, especially of hunters and gatherers, maintained their numbers in balance with the resources of the environment, and various social institutions and cultural practices were interpreted as functioning to that end. The idea was that in the long course of evolution, any population whose practices and institutions did not function to regulate numbers would have wiped itself out through resource depletion, leaving the field free for better regulated competitors. This did of course beg the question of why, if extant regulatory mechanisms worked so well, humans should ever have transitioned from their original hunting and gathering way of life to the much more laborious business of farming. Not that this deterred ecological anthropologists from applying the model of group selection to crop growers as well, and a classic of the genre was Roy Rappaport's *Pigs for the Ancestors* (1968), a study of the relations between people, pigs and land in the Highlands of New

Guinea. Drawing on models from animal ecology, Rappaport attempted to show that a complex of belief in ancestors, periodic warfare, and the raising and sacrifice of pigs served as a an adaptive mechanism for maintaining a dynamic equilibrium, or homeostasis, in the balance of human, animal and plant populations.

For the students taking my course, *Pigs for the Ancestors* was required reading, along with much else published in its wake. My departmental colleagues, however, were suspicious. These, after all, were the days of the great sociobiology wars, and even to mention such topics as evolution, selection and population-resource balances was to risk accusations of genetic determinism or worse. The course was always considered to lie on the edge of the known continent of anthropology. Not for nothing was *Environment and Technology* abbreviated to *ET*, drawing mocking comparisons with Steven Spielberg's celebrated *Extra-Terrestrial*. However in 1975, in only the second year of my appointment at Manchester, the anthropologist Marshall Sahlins came to visit from Chicago. He was completing the book that eventually became *Culture and Practical Reason* (1976). Published in the following year, the book was an explicit critique of the so-called neofunctionalism that had taken hold in ecological anthropology. Following Rappaport's example, the neofunctionalists were determined to show how every conceivable practice or institution served to maintain not just the society or culture of which it was a part, but the entire ecosystem. Without going into the details of the argument between Rappaport and Sahlins, it turned on the issue of whether natural systems have an intrinsic drive towards equilibrium or homeostasis, to which culture contributes as an adaptive mechanism, or whether the conditions of adaptation are themselves laid down by culture, understood as an autonomous system of symbolic representations that is constituted quite independently of natural conditions. Rappaport took the first view; Sahlins the second. With no compromise in sight, anthropology was apparently left condemned to oscillate between culture and practical reason – as Sahlins famously put it – like a prisoner between the walls of his cell.

In the early 1980s, however, a possible solution arrived from another quarter. By that time, due to the departure of a colleague, I had come to assume responsibility for teaching economic as well as ecological anthropology, and the course title *ET* had morphed into *EE*: *Environment and Economy*. Suddenly, and for what turned out to be only a few years, French neo-Marxism became all the rage. Led by Maurice Godelier, the neo-Marxists led an all-out assault on what they snootily called the "vulgar materialism" of so much work in cultural ecology. I too was swept up in the tide, and it became an important part of my teaching in *EE*. The question of the relation between economy and environment was mapped onto the classic Marxian problem of the interplay between social relations and technical forces of production. And for me – following Godelier[6] – it became an inquiry into the dialectical interplay between two systems of relations, respectively social and ecological, the one dominant, in so far as it drove people's productive activities, the other determinant in that it set limits on what the en-

6. See Godelier (1978) for a useful summary of his position.

vironment could sustain which, once exceeded, would trigger a transformation on the level of social relations of production, ushering in a new historical formation.

In 1986 I put together a collection of essays, entitled *The Appropriation of Nature*, entirely devoted to the exploration of this interplay (Ingold 1986). I tried to show, for example, that human hunting can be understood both socially as a productive activity, underwritten by relations of food sharing and the division of labour between men and women, and ecologically, as an interaction between human beings as natural predators and their non-human prey. As a social being the hunter is a person, relating to other persons in society; as a predator he is an individual organism, relating to other organisms in nature. Models from evolutionary ecology and the study of animal behaviour might serve well enough to account for the interspecific dynamics of predator-prey interaction, and even for patterns of cooperation and communication among individuals of the same species which, like acrobats, can use each other's bodies as mutually supportive elements to achieve results greater than what each could achieve individually. But on their own, I argued, these models are insufficient to comprehend the transformations of human history, which require some acknowledgement of the apparently unique power of human beings, up to a point, to shape their own destiny, to determine their productive purposes, and to bring about changes not only in their relations with their environment but also in those relations among themselves constitutive of society. Yet I was increasingly troubled by this splitting of the human into personal and organic components, partitioned respectively into the separate domains of society and nature, and in 1988 it all collapsed – a moment I vividly recall as a watershed when everything I had argued until then seemed irredeemably wrong.

## V

Looking through old files I came across my introductory lecture for the course on *Environment and Economy* delivered on October 4th 1988. In it, I explained at great length about how we might describe relations on the one hand as social, between subject-persons, and on the other as ecological, between object-individuals, and how this underpinned both the difference and the complementarity between economic and ecological anthropology. The whole lecture was written out, in longhand, until page 16. Then I came across the following words:

> Ultimately, of course, the aim should be to transcend such dichotomies as economic versus ecological, social versus natural, person versus individual. Because human beings aren't really made up of two semi-independent parts, as the *Homo duplex* model has it. That's just a first approximation...

And with those words the manuscript came to an abrupt end, followed by a blank. For by that time I already knew deep down that my introduction was going nowhere, and that there would be nothing for it but to start all over again. Everything would have to be rethought. For it had finally dawned on me that the model of the human being as

one-part organism and one-part person was not even an approximation to the truth. It was simply untenable. Person and organism, I realised, were one and the same; the organism-in-its-environment *is* a being-in-the-world. And to follow this through would require a completely different kind of thinking, one that starts not from populations of individuals but from fields of relations.

In social anthropology, as I noted earlier, this kind of relational thinking was already well established. Yet it was increasingly out of kilter with mainstream biology, which remained – and indeed still remains – firmly wedded to the population model. If I was to prove that person and organism are the same, I knew I would have to extend relational thinking to the biological domain as well, and that this would mean going against the grain of what biologists call the "modern synthesis" in their discipline, a synthesis forged from the combination of Darwin's theory of variation under natural selection with the mathematical theory of population genetics. In 1989, in a lecture presented to the Royal Anthropological Institute entitled *An anthropologist looks at biology*, I presented my first attempt along these lines (Ingold 1990). My aim was to restore the person to the continuum of organic life, not in the reductionist fashion of sociobiology, by putting it all down to genes, but by repositioning the organism as a locus of growth within a continuous field, and by thinking of evolution not statistically but topologically, as the unfolding of that field. Life, I insisted, is not *in* organisms; rather organisms are *in* life. Or in other words, living things are both generated and held in place within the ever-unfolding matrix of relations to which they contribute in their activity. This meant giving a central place to growth and development in the constitution of life-forms, and here my inspiration came from the work of D'Arcy Thompson, *On Growth and Form*, that had so inspired me as a child[7]. I was, at last, coming full circle.

Over the next decade, of the 1990s, I devoted myself to working out this way of thinking and exploring its implications. By that stage, my teaching for *Environment and Economy* had reached an impasse, and 1990-91 was the last year in which the course was taught, never to be revived again. In its place I developed two other courses, which I taught in alternate years. They were *Culture, Perception and Cognition*, and *Anthropology of Art and Technology*. In the first, I set my sights against the view, supported by an alliance between cognitive science and neo-Darwinian evolutionary biology – more recently popularised under the brand-name of evolutionary psychology – that culture is a kind of add-on, a supplementary programme acquired by a being that is biologically programmed from the start, and that as such, culture undergoes its own evolution in parallel with the evolution of the species. According to this view, to every human individual is transmitted one package of traits at the point of conception, coded in the genes, and another package on growing up, packaged in analogous particles of culture. Once again, it was the child in me that rebelled against what I saw as an adultocentric vision that casts the child as a creature of lesser worth by comparison to the more en-

7. An abridged edition of this work, with an introduction by John Tyler Bonner, is available as Thompson (1961).

cultured adult, much as in an earlier era of anthropology, the primitive was ranked below the civilised. It is to view children in their "early years", like the "early man" of textbooks in human evolution, as more biological in proportion, as closer to their origins in nature, than the people of "later" times who, in turn, have more of culture. And it is to put scientists, who can allegedly "see through" culture to the reality of human nature, at the top.

This cannot be right. The child is an organism through and through, no more, no less. But at no point, from cradle to grave, does this child either begin or cease to thread its life together with other lives, from which those patterns we call "culture" are continually woven. And if this is true of particular lives, it must be true of human history as well. Just as there is no breakthrough from biology to culture in the life of the child, so there can be no breakthrough in the life of the species from evolution to history. We are all, and have always been, organism-persons (Ingold 2004). Why then did I find myself writing about these organism-persons not as bounded entities but as sites of binding, formed of knotted trails whose loose ends spread in all directions, tangling with other trails in other knots to form an ever-extending meshwork? It was, of course, because of what I had absorbed, as a child, from my father's researches in mycology. As I have already shown, this description of the organism-person would serve just as well for the fungal mycelium. And for this reason I have come to question what we mean by "the environment", and eventually to see it not as what surrounds – what is "out there" rather than "in here" – but as a zone of interpenetration in which our own and others' lives are comprehensively entangled (Ingold 2006). This puts paid, once and for all, to the idea, still earnestly promulgated by many biologists and psychologists, that the child is a product of "nature" and "nurture", or of the interaction of genes and environment, in varying and often contested proportions. For children are not products, period. They are the producers of their lives with others, including grown-ups.

And that, too, is why, in my course on *Anthropology of Art and Technology*, I sought to erase the dichotomy between the two terms by appealing to classical notions of *ars* (from Latin) and *tekhnē* (from Greek), both of which carried the primary connotation of *skill*. All knowledge, I argued, is founded in skill, in the improvisatory exploration of ways of doing things, under the watchful eye of more experienced hands. This is how children learn: not through having knowledge first socially transmitted to them, and then enacting in practice what they each have individually acquired, but by growing in knowledge, as they do in strength and stature, by following the same paths as their predecessors and under their direction. It is a process, if you will, of guided rediscovery, in which every generation stands to find out for itself much of what its forbears already knew, and possibly much else besides. Learning, as children know very well but as their teachers so often do not, is a creative process in which knowledge is not so much passed on as perpetually grown and regrown (Ingold 2007). And if people differ in what or how they know, it is not because they have inherited different "packages" of transmitted representations, but because their lives have been entangled in environ-

ments, and in communities of practice, that differ in what they afford, in the kinds of attention they demand, and the responses that these demands call forth. Skill, in essence, inheres in the coordination of perception and action, attention and response. What we are used to calling cultural variation, then, consists in the first place in variations of skill. And to account for this variation we have to attend not to the content of inherited tradition but to the dynamics of ontogenetic development.

## VI

All that rethinking, with which I had been preoccupied throughout the 1990s, culminated in a volume of essays entitled *The Perception of the Environment* (Ingold 2000). Throughout these essays I tried to develop a new synthesis, alternative to the mainstream alliance of cognitive science and neo-Darwinism, which would draw together insights from developmental biology, ecological psychology and phenomenology, starting from the premise that the organism-person is not a bounded, self-contained entity, set over against the world, but a knot that is perpetually ravelling and unravelling within an unbounded matrix of relations. I was still adding finishing touches to the volume in the autumn of 1999 when, after 25 years at the University of Manchester, I left to take up a new position at the University of Aberdeen, where I have remained ever since. And it was here that my pendulum finally swung to the pole of art. In fact the swing had already begin before I left Manchester, when I and a few others founded a seminar to explore the relations between art, architecture and anthropology. It was a rather remarkable seminar, distinguished by our practice of grounding discussions in practical activity, ranging from making string to repairing a dry-stone wall, and on moving to Aberdeen I was determined to follow it up. One way in which I did this was through teaching a new course on *Anthropology, Archaeology Art and Architecture*, known for short as "the 4As". I taught the course intermittently from 2004 to 2011, and finally converted it into a book, entitled *Making* (Ingold 2013).

Once again, in this book, I found myself returning to childhood, this time in arguing against the notion of material culture, and against the idea that it is in what they do with objects that human beings make meaning for themselves. For me, there are no objects. Child as I am, I see a world in the making, not a world already made. Making things is not an imposition of form on matter, as though the end were already settled before the task began. For how can form precede the processes that give rise to it? How can a known and determined future precede the present and the past? In my childish eyes, not knowing what the future holds, making is a never-ending task of world-weaving, a correspondence of material movement and ambient vision. The model railway I built when I was young was never finished: it was always work in progress, just as real railways are, right up to the time it was abandoned when other things in life took over. Only occasionally, and not without hazard, did trains run on my line. The greatest pleasure came not from that but from placing my eye at the level of the layout and allowing my vision to enter into the little world I had created, to roam around the station

buildings and on through the trees and meadows beside the tracks. The ground of my landscape was *papier mâché* laid on chicken wire, the grass was cotton floss, and the trees were lichens I had collected from the woods. No objects here! Just an assemblage of materials whose pathways are as diverse as those we weave in in our quotidian lives as we read our newspapers, sew our clothes, feed the hens and wander in the forest.

Whilst writing the first chapter of *Making*, in the spring of 2012, I was also preparing an application to the European Research Council for what was to become a major project. The chapter and the project both had the same title, *Knowing From the Inside*. And thanks to funding from the Council, that is where I am now, once more trying to understand what it means to pursue an art of inquiry from within the very world we seek to know, and in doing so, to draw anthropology into conversation with the disciplines of art, architecture and design[8]. This is not, I should stress, to embark on an anthropological study *of* these disciplines or their practitioners. We have had quite enough of that! It is to study *with* them, or even *by means* of them. It is to think of the practice of art as a way of doing anthropology, a speculative exploration that would open up to possibilities of being and knowing that might otherwise go unheeded (Sansi 2015). It is to think of architecture as an anthropological exploration of the creative processes wherein people shape environments, and environments people. Its questions concern the generation of form, the energetics of force and flow, the properties of materials, the weave of surfaces, the atmospheres of volumes, and the dynamics of activity and of rest (Pallasmaa 1996; Spuybroek 2011; Bille, Sorensen 2016). And in the emerging field of "design anthropology", it is to think of design as an aspect of a process of life whose primary characteristic is not that it is heading to a predetermined target but that it *carries on.* An anthropology by means of design is precisely this: about how anthropology, through experimental design practice, can help pave the way for sustainable futures (Gunn, Donovan 2012; Gunn *et al.* 2013).

In all this I seem to have come a long way from exploring the mechanisms of regulation in populations of humans and non-human animals! But looking back, I'm not sure that I have shifted my position that much. After all, it was only because I failed in my attempts to hive off the social from the ecological, to place it beyond the bounds of nature, that I ended up returning knowing to where it belongs, on the inside of being, and returning being itself to the world (Ingold 1997). The pioneers of ecology whose work we read in the early days of my course on *Environment and Technology* would have considered it self-evident that we human beings are part of the "household of nature" from which the field of ecology takes its name. They would be appalled – as my father latterly was – by the narrowly gene-centric perspective of contemporary bioscience, by its disregard for organic life, and by its obsession with data at the expense of a more holistic understanding of environmental relations and processes. And

8. Much of the inspiration for this approach comes from science studies scholar Karen Barad (2003, 2007): «We do not obtain knowledge by standing outside of the world», Barad writes; «we know because "we" are of the world. We are part of the world in its differential becoming» (Barad 2007: 185).

they would probably find themselves much in sympathy with contemporary environmental artists, architects and designers who are struggling to break down the boundaries between the human and the non-human, to foreground lived experience, and to highlight the sheer richness and complexity of a world which human beings have irrevocably altered through their activities and yet in which they are puny by comparison to the forces they have unleashed. Welcome to the Anthropocene[9]! Revisiting science and art: which is more ecological now? Why is art leading the way in promoting radical ecological awareness? The goals of today's science are modelling, prediction and control. Is that why we turn to art to rediscover the humility that science has lost?

## VII

I remember the science of my childhood, grounded in tacit wonder at the exquisite beauty of the natural world, in care, attentiveness, and in silent gratitude for what we owe the world for our existence. Much of today's science, however, has turned wonder and gratitude into commodities. They no longer guide its practices but are rather invoked to advertise its results. Science has even enlisted art to promote its hard-sell, to offer images that beautify its results, soften its impact and mask its collusion with corporations whose only interest in research is that it should "drive innovation". For in the neoliberal economy of knowledge, only what is new sells. True, much scientific research, in what is nowadays known as "academia", lacks immediate application. It is said to be curiosity-driven, or "blue sky". Scientists have been vociferous in defending their right to undertake blue-sky research. But in the land of academia, curiosity has been divorced from care, freedom from responsibility. Academia's income comes from its exports of knowledge, but it is left to those who buy the knowledge to determine how it should be applied, whether to build bombs, cure disease, or rig markets. Why should scientists care? This attitude reveals the lofty appeal to blue skies to be little more than a self-serving defence of special interests increasingly concentrated in the hands of a global scientific elite which, in collusion with the corporations it serves, treats the rest of the world – including the vast majority of its increasingly impoverished and apparently disposable human population – as a standing reserve of data to feed the insatiable appetite of the knowledge economy.

We should care, of course, because *truth matters*. And the responsible search for truth demands that care and curiosity go together. They are really two sides of the same coin. We are curious about the well-being of people we know and love, and never miss an opportunity to ask them how they are doing. That is because we care about them. Should it not be the same for the world around us? Is not curiosity a way of caring? Not, it must be said, according to the protocols of normal science which require, in the

9. Much has been written on this controversial concept, and the roll-call of artists, architects and designers who are addressing its challenges would be far too long to list here. But to get a flavour of it, see the selection in Klingan *et al.* (2015).

name of objectivity, that we sever all personal relations with the things we study, and remain unmoved and unperturbed by their condition. We owe them nothing, according to these protocols, and they offer us nothing in return. It is a great mistake, however, to equate the pursuit of objectivity with the pursuit of truth. For if the former prescribes that we cut all ties with the world, the latter demands our full and unqualified participation. I may be being childish or naïve, but in my innocence I still believe in science as the pursuit not of innovation but of truth. And by truth I do not mean fact rather than fantasy, but the unison of experience and imagination in a world to which we are alive and that is alive to us. It is a truth that comes not *after* science, in its proud record of discoveries and achievements, but *before* science, in the more humble recognition that we are ourselves beholden, for our very existence, to the world we seek to know. Thus the movement from science to art, in my thinking and in my teaching, did not take me further away from science but further into it, into the very conditions of its possibility. I have gone from science to art and back again.

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