

Does Design stack up? Rethinking ground, generation and education

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I

Let me begin by reading short excerpts from the works of two very different authors. The first is the Scottish author Nan Shepherd, a native of the city of Aberdeen, where I also live. Shepherd was a teacher by profession, but also a keen walker, who spent many long days roaming the Cairngorm Mountains. During the 1940s she wrote a little book in praise of the Cairngorms. Entitled *The Living Mountain*, it was left in a desk drawer and not published until 1977. Even then, few knew of the book, and only in the last few years has it emerged as a classic of Scottish literature – so celebrated, indeed, that Shepherd's portrait now appears on £5 banknotes issued by the Bank of Scotland! Here she is, describing what it feels like to stretch out on the mountain-top:

So there I lie on the plateau, under me the central core of fire from which was thrust this grumbling grinding mass of plutonic rock, over me the blue air, and between the fire of the rock and the fire of the sun, scree, soil and water, moss, grass, flower and tree, insect, bird and beast, wind, rain and snow – the total mountain. Slowly, I have found my way in.

My second author is the ecological psychologist James Gibson, whose classic monograph, *The Ecological Approach to Visual Perception*, was first published in 1979. Gibson begins by setting out the key constituents of the terrestrial environment, as they would manifest themselves to a perceiver placed within it. The environment consists, he says, of three components, namely a *medium*, *substances*, and the *surfaces* that separate substances from the medium. To continue in his words:

Our planet consists mainly of earth, water, and air – a solid, a liquid, and a gas. The earth forms a substratum; the water is formed by the substratum into oceans, lakes, and streams; and the formless gases of the air make a layer of atmosphere above the earth and the water. The interface between any two of these three states of matter – solid, liquid, and gas – constitutes a surface. The earth-water interface at the bottom of a lake is one such, the water-air interface at the top is another, and the earth-air interface is a third – the most important of all surfaces for terrestrial animals. This is the *ground*. It is the ground of their perception and behaviour, both literally and figuratively. It is their surface of support.

Let's compare these passages. For both Shepherd and Gibson, atmospheric air is up above, and the earth is deep down below. But what lies between sky and earth? For Gibson, it is the *ground*, conceived as a solid platform of support that separates the air above from the earth below. But for Shepherd,

what lies between is – well – *everything*, the ‘total mountain’. What’s going on here? How can there be such different views? And which is right (Image 1)?

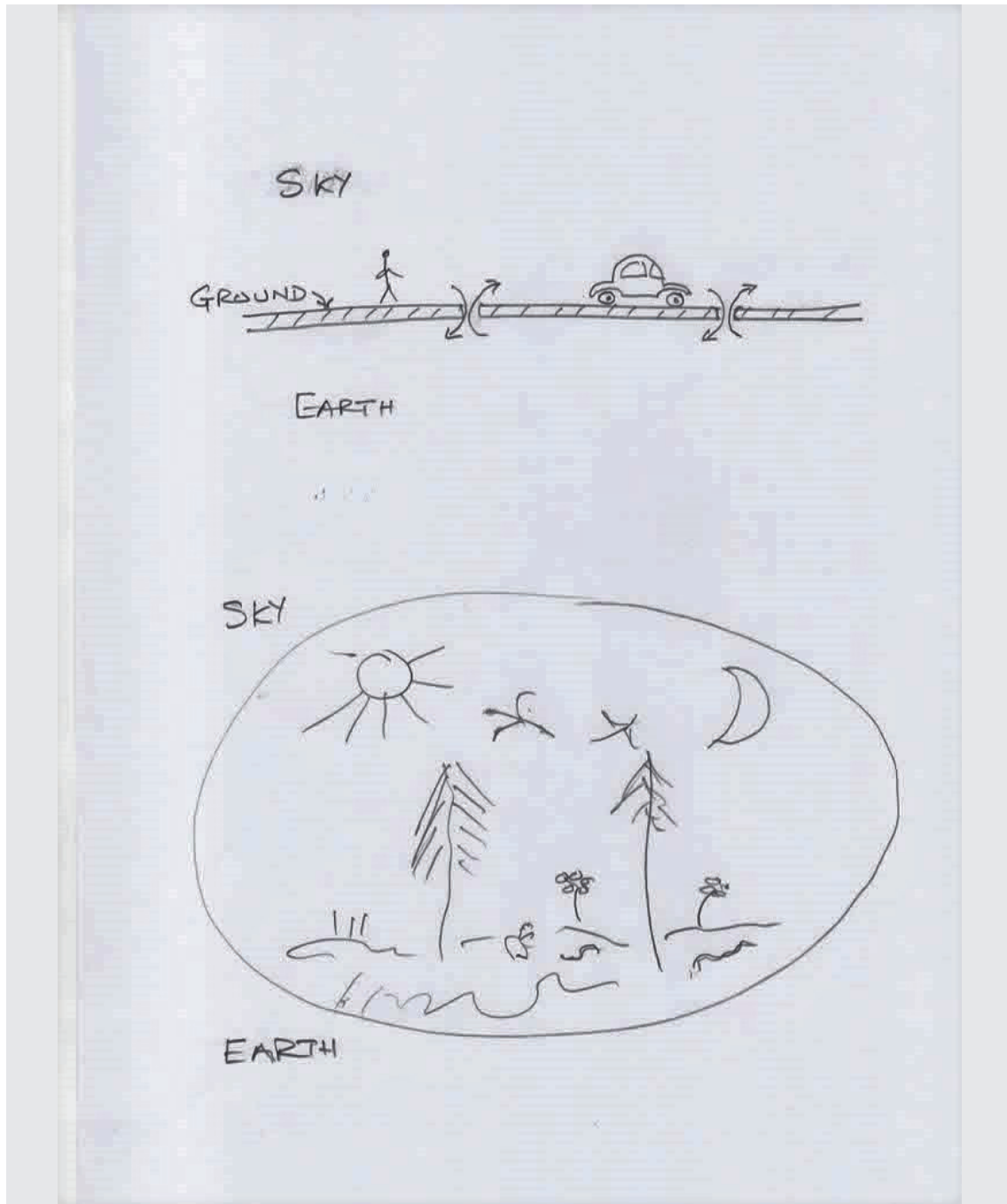


IMAGE 1

In Gibson’s characterisation, as we’ve seen, the ground is an ‘earth-air interface’. Now by definition, an interface has two sides: whether topside and underside, or outside and inside. While the interface serves to keep the two

sides separate, confined to their respective domains, it is also perforated by holes or keys that allow information, and sometimes materials, to pass from one side to the other. A metalled road or pavement, for example, may be perforated by drains that allow rainwater through to underground channels, or manholes that allow human access to subsurface infrastructure. The paved surfaces of the city, of course, also provide support for its inhabitants. Indeed, the campaign to pave the urban environment, in the modern era, was driven above all by its twin functions of support and separation. On the one hand, the paved surface provided a secure foundation for fast and efficient transport, above all by means of wheeled vehicles, which might otherwise become stuck in mud, or be overturned by surface irregularities. On the other hand, paving was considered of benefit to public health, since it sealed the ground, preventing the stench of the earth from rising into the air, where it was believed to cause illness among those who breathed it. Yet on a paved surface, nothing can grow. For growth to occur, earth and air must meet and mingle. Where the ground has been paved, growth is only possible through cracks in the pavement – that is, until the surface itself, overwhelmed by the elemental forces of earth and air, eventually crumbles.

Let's now leave the city for the countryside, or join with Shepherd in the mountains. Here, the ground is not paved. And its surface has only one side, not two. It is not an interface, it is not hard, and for plants at least, it is not a surface of support but a medium. Plants grow *in* the ground; they don't rest *upon* it. From the plant's point of view, indeed, the ground is not really a coherent foundation at all, but an indistinct and permeable limit of illumination, above which it shoots out green leaves, but below which it adopts the different habit of root growth. How can we describe this kind of surface?

To answer this question, I would like to compare the ground of habitation to the page of writing. It is an ancient analogy, that can even be traced etymologically to the origin of the English word 'page', which comes from the Latin word *pagus*, meaning an area of inhabited countryside with its farms and fields (from which are also derived English word 'peasant', for the farmer, and the French word 'paysage' for the landscape he tends). The act of writing, with pen on parchment, would then be likened to that of tilling the fields with the plough. In the days when almost everyone knew how to handle a plough but few could write, it was a natural comparison to make. Now, of course, the situation is reversed. Almost everyone can write, but how many still know how to handle a plough?

Now the parchment that medieval scribes used for their principal writing material was highly absorbent. It was also very expensive. For that reason, the same material was commonly used over and over again. To reuse a

parchment that has already been written upon, you have first to scrape the surface with a knife, so as to remove as much of the original traces as possible. You can then write again. In principle, you can repeat this operation until eventually, the parchment is scraped so thin that it is no longer usable. However, since the material is so absorbent, the traces of previous writing can never be completely removed. Thus, on a parchment that has been used several times, recent inscriptions appear to cut through the ever-fainter traces of earlier ones, giving rise to what students of writing call a *palimpsest*.

Modern readers, conditioned by their familiarity with the printed word, can all too easily jump to the conclusion that the formation of the palimpsest is equivalent to overprinting, in which one layer of inscription is simply added over another. But a closer look at how the palimpsest is formed reveals it to be precisely the opposite. Let me explain by means of a diagram (Image 2). This shows a parchment in an exaggerated cross section, such that a line of ink appears as a vertical mark, as wide as the line is thick and as deep as the ink sinks into the fabric of the parchment. In the diagram I have indicated two lines inscribed at time T_0 . Later, at time T_1 , the surface is scraped, and two new lines are inscribed close to the old ones. The same is done again at time T_2 . Now, looking at the surface at T_2 , observe what has happened to the traces. The original traces from T_0 are only just visible right at the surface, and will surely disappear if the parchment is used again. The traces from T_1 are shallower than they were, but still clear. Deepest of all are the most recent traces, from T_2 . Thus, far from past inscriptions sinking ever further down as new ones are added on top, quite the reverse occurs: it is the past that rises, even as it is undercut by the present.



IMAGE 2

It is just the same with the ground. Archaeologists, in particular, have seized upon the metaphor of the palimpsest to refer to a ground that, over the ages, has been repeatedly used, eroded and used again. One of the originators of the analogy, the archaeologist Osbert Crawford, writing in the early 1950s, expressed it thus:

The surface of England is like a palimpsest, a document that has been written on and erased over and over again; and it is the business of the field of archaeology to decipher it. The features concerned are of course the roads and field boundaries, the woods, the farms and other habitations, and the other products of human labour; these are the letters and words inscribed on the land.

Setting aside the nationalist tenor of his remarks, I would like to draw attention to the paradox they embody, namely that it sets archaeologists to work in deciphering traces of a past that, by rights, should have already been erased by the present. That there is something left for them to work on is an index of the fact that the erasure is never complete, that something always remains. Suppose, for example, that you are surveying a landscape for evidence of ancient trackways. The most ancient tracks, worn by feet from centuries past, are now barely visible traces on the surface, on the point of vanishing. It may take a specialist eye to see them. Unless artificially preserved, the weather will soon wipe them out altogether. By contrast, the newest incisions, recently cut in the landscape and not yet subject to significant erosion, are strongly marked. In between are historic traces that, while manifestly

weather-beaten and sometimes obscured, are still easy to recognise. Thus, in the land just as on parchment, the past is not buried under the present but actually closest to the surface, while the present, undercutting the past, digs deepest. The past comes up as the present goes down. This is not a layering so much as a *turning over*. Keep this idea in mind, I shall return to it!

Now were the ground an interface between the substances of the ground and the atmospheric medium, as Gibson imagined it, then it would look in cross section something like this (Image 3).

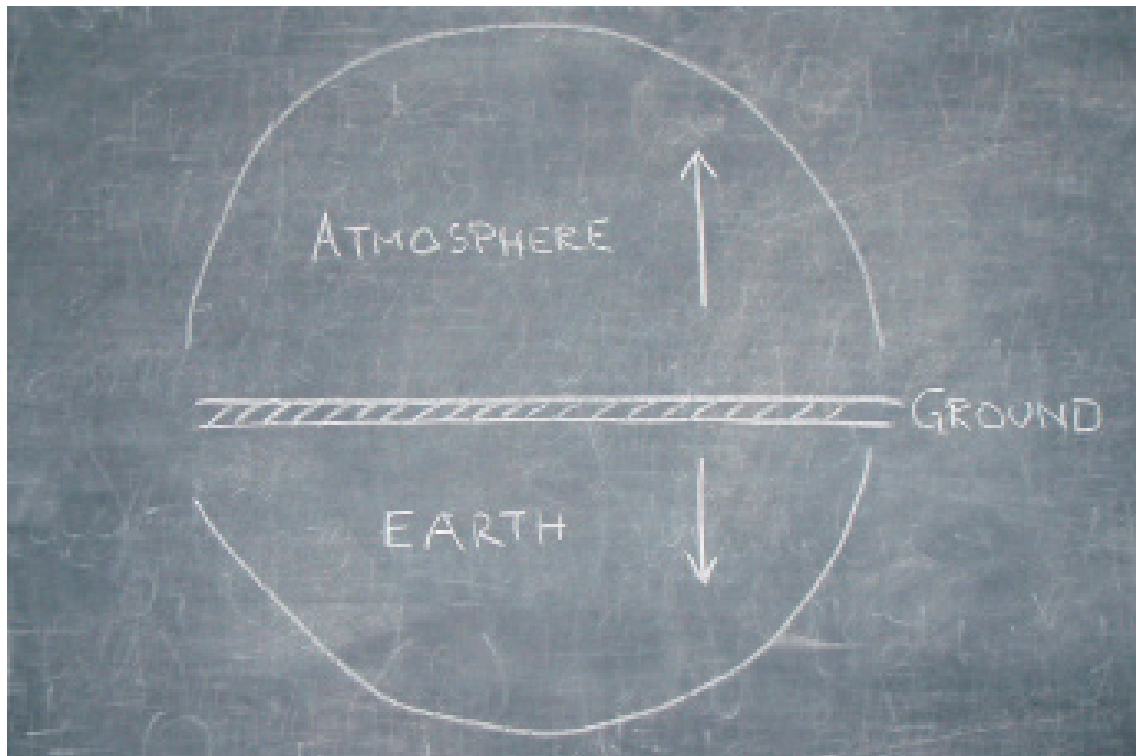


IMAGE 3

Outside the paved environment of the city, however, the ground has no topside or underside. It doesn't hold earth and atmosphere apart. On the contrary, as Shepherd understood, it is the zone of their interpenetration. It is a palimpsest. The ground as palimpsest doesn't separate the earth from the sky, or serve as an interface mediating exchanges between the two. It is rather where earth and sky are rolled into one – where rain meets soil and turns it to mud, where wind meets sand and blows it into dunes, where snow meets ice and coats the surface in a blanket of white. Here, to recall Shepherd's words, between blue sky and bedrock, are 'scree, soil and water, moss, grass, flower and tree, insect, bird and beast, wind, rain and snow'. The ground, thus understood, exemplifies what I want to call a *deep surface*. Formed as the earth's 'rising up', or eruption, meets the atmosphere's

‘beating down,’ or erosion, this ground has depth, but is of no measurable thickness. Should we attempt to measure it, we would find that starting from the lower, atmospheric horizon, there is no limit to how far up we could go and that, conversely, starting from the upper, earthly one, we could keep on going down without ever reaching rock bottom. This diagram shows what I mean (Image 4).

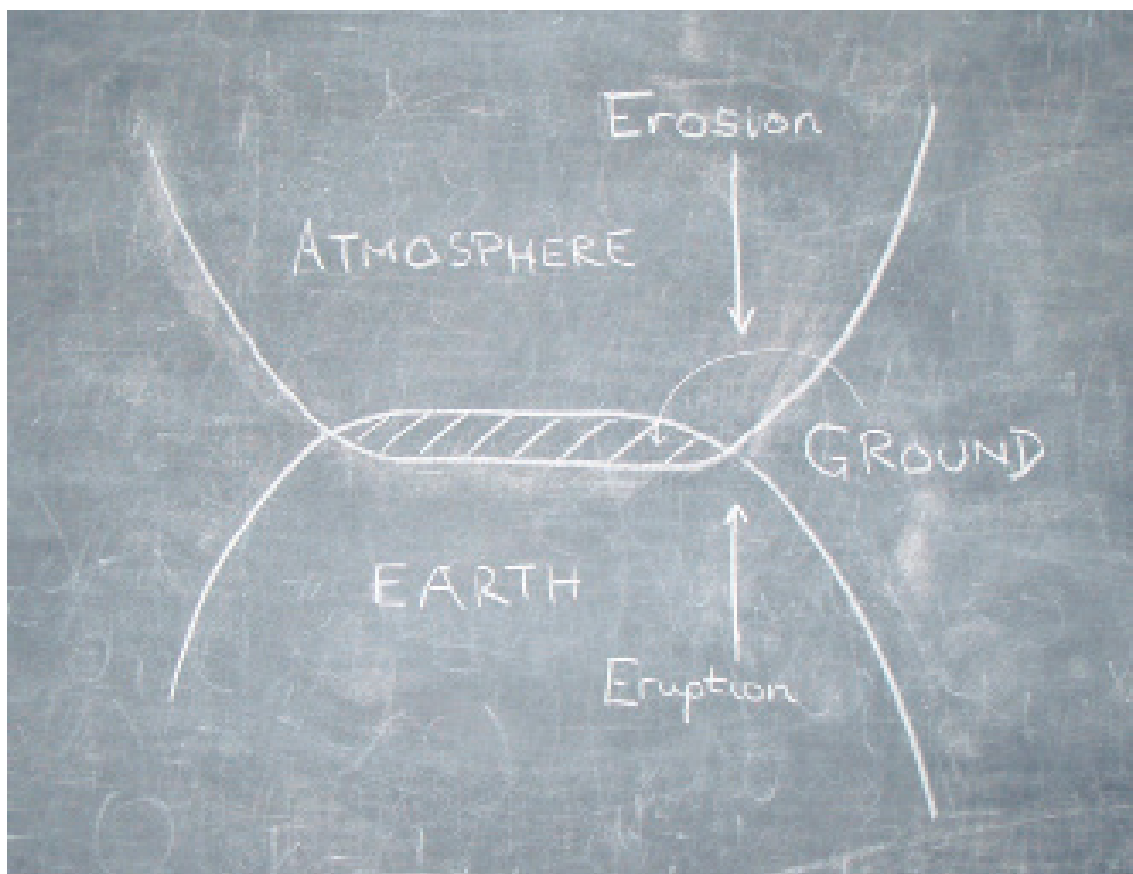


IMAGE 4

The double meaning of the English verb ‘to wear’ aptly illustrates this understanding of the ground as a deep surface. The word can mean to ‘put on,’ as in wearing clothes, but it can also mean to ‘strip off,’ as a surface that is worn by use or by exposure to the elements. Were the surface an interface, then these meanings would directly contradict one another. But with the palimpsest, they are one and the same, for it is in the very process of erosion that depth comes to the surface. This is a surface that covers, but doesn’t cover *up*. Such, indeed, is the surface of the ground.

I want to loop back, now, to the idea of turning, by bringing in another concept, namely *volume*. The word comes from the Latin *volvere*, ‘to roll’. Thus, it is cognate with such words as ‘evolution’ and ‘revolution’. The

original volume was a scroll of papyrus or parchment, usually inscribed with writing. To read it, the scroll had to be unrolled, or *evolved*, after which it would be rolled up again, or *revolved*. But later, as the scroll gave way to the manuscript book, or codex, the continuous roll would be folded into sheets, like a concertina, so that the reader, rather than unrolling the volume, would turn its pages, opening up each fold only to close its predecessor behind. On turning the page, *recto* to *verso*, what was once over goes under, and what was under goes over. But there was no going through. For although every sheet had two sides, *it was not an interface*. Rather, like the mythical Janus, the page was two-faced. And the only way to get from one face or side to the other was by the simultaneous folding and unfolding of the turn. But the codex was always open, regardless of the particular page to which it was turned. Not until the manuscript was replaced by the printed word was the book finally closed. For in the printed book, the pages are laid one over another to form a stack. Although you still have to turn the pages to read it, the book itself is now perceived as a thing of layered sheets to be worked *through*, top to bottom as beginning to end. That's why we typically think of the volume these days as a three-dimensional box or container, to be filled with contents (Image 5).

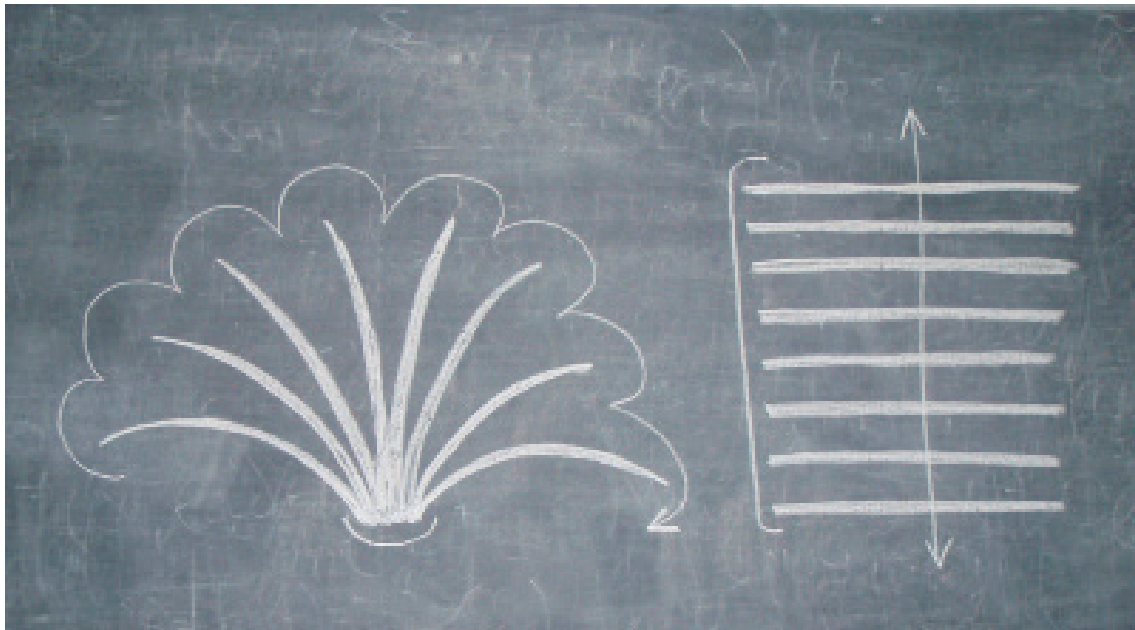


IMAGE 5

I've already compared the page and the ground. Has the ground, then, undergone a parallel transformation, from turnover to stack? It's true that you cannot exactly roll up the ground like a scroll. But you can turn it. Put

yourself into the shoes of the medieval ploughman, who would turn the ground with every turn of the seasons in the agricultural calendar. The purpose of ploughing is to bring to the surface nutrient-rich soil from deep down, while burying soil already drained of nutrients by previous cropping, along with any remaining weeds and stubble. Thanks to this continual turnover, the ground will continue to yield, year after year. It is repeatedly renewed, not by adding layer upon layer as in a stack, but by breaking it, cutting through with the share so as to raise the deep and bury the shallow. That's what makes the ground surface – like the scroll and the codex – into a volume. It's a surface that turns with the seasonal passage of time, with the alternations of weather and the husbandry of crops, wherein the past rises up even as the present sinks below. This is a ground not just of cultivation but of memory. For with its turning, memories of persons that lived or events that happened long ago are brought to the surface so that inhabitants can engage with them directly, as if present in the here and now.

But with the volume reconceived as a box or container, with contents layered in a stack, time no longer rolls, folds or turns the ground. It rather pierces through successive grounds like an arrow, pointing either upwards from past to present, or downwards from present to past. Here every ground, every layer, establishes its own plane of synchrony, while layer succeeds layer in a diachronic sequence. To reach the past, as in archaeological excavation, you have to dig down. Memory here is like an archive, deposited in stacks with the oldest records furthest down. There they stay, sinking ever deeper as time moves on. As a deposit, the past contains no potential for renewal. It is over. Renewal can come only from superimposition, by adding another layer to the stack, and then another, and another. Each successive layer is understood to be a fundamental platform – level, void and hard – upon which everything stands, each in its proper location.

The ground of turning, we could say, is *soft*. We leave footprints in soft ground, whether in wet mud, sand, snow, or moss; for the same reason, footprints are impermanent, and readily eroded by the weather. Prints are temporal things, held within the seasonal round. But the ground of layering, by contrast, is *hard*. Whereas we leave footprints in the soft earth, on the hard surface of the pavement we can only stamp. Paving, as we've seen, has upper and lower sides; it is interfacial. It has a measured depth, and its support is conditional on the strength or load-bearing capacity of its materials. But the immeasurable depth of soft earth is felt in its embrace of the atmosphere. And this embrace is unconditional. You can fall onto or into the earth, but you cannot fall *through* it. There can be gaps or holes in a pavement, but in the earth, there are neither gaps nor holes. There are only pits.

The final pit, of course, in which we end our lives, is the grave. Yet it is normal, after burial, for the pit to be covered over with a slab. And the slab, like a paving stone, *does* have a topside and an underside. Once put in place, it covers up and conceals the body laid below. Over time, earth and vegetation will grow over the burial site, leaving it virtually indistinguishable from its surroundings, pending possible ‘rediscovery’ through archaeological investigation. Is the earth, then, open or closed? Perhaps, as the practice of burial suggests, it is both. As generations come and go, the earth alternately opens to the sky and turns against it. Maybe, in a way, both Shepherd and Gibson were right, even though each told only half the story. What does this tell us, then, about past and future?

II

That every one of us will eventually die is of course the one and only thing about the future of which we can be certain. Should we not, then, welcome uncertainty as we welcome life? You wouldn’t think so, from the tone of regret with which we are so often told, these days, that we face an uncertain future. If only we could be more certain, if only we knew what fate awaits us, then we could plan ahead, prepare ourselves, perhaps even change things to weed out aspects of the future we don’t like, and choose those we do. To confess that the future is uncertain is to admit that we are still far from being able to do so, that life is not yet fully destined, and that there is still work to be done to determine where it will finally lead. The word conveys a sense of incompleteness, of unfinished business, of having not yet gained the full measure of the world that would yield to total predictive confidence. There are still gaps in our knowledge, missing pieces that remain to be inserted.

Nowadays we look to the conjunction of science, technology, engineering and mathematics, lumped together under the acronym STEM, to complete the picture. The appeal to STEM, of course, has little to do with the ways practising scientists, technologists, engineers or mathematicians actually work. The acronym serves rather as a front for the subordination of research and development to the interests of governments and corporations which claim, as they say, to ‘follow the Science’. And if the Science’s predictions look grim, as they do today, it is expected to propose mitigations to avoid complete catastrophe. Yet it admits to no future beyond the predictive horizons of the present. Perhaps that is why today’s younger generations are less inclined to see the future as a landscape extending indefinitely into the distance, than as a plateau bearing down upon them. No previous generation has been so starkly presented with the prospect of the end of history, even of life itself.

The future, to them, seems all too certain. Nor is any relief to be found in a stance of denial, through regression from certainty to uncertainty.

It is a defining characteristic of life, however, that it continually exceeds itself. Far from running from beginning to end, every ending, in life, issues into a new beginning. It is the curse of uncertainty that it presents this excess as a deficit, rendering the promise of beyond as the deficiency of not yet. To lift the curse, we need to *recast uncertainty as possibility*. For the Science, radical possibility is hard to pin down. As the philosopher Henri Bergson put it, the domain of life is characterised by ‘incommensurability between what goes before and what follows’. Science, Bergson argued, is simply unable to cope with this idea of ‘the absolute originality and unforeseeability of forms’. It can work only on what repeats. And in the language of repetition, Science can only think of possibility on a scale of risk or probability. On this scale, what cannot be determined is left to chance. Indeed, the opposition between chance and determination is deeply etched into modern thought. It is an opposition, however, that drains life of its creative impulse, reducing freedom to random variation within a phase space.

What would it take, then, to face the future as a realm not of uncertainty but of possibility? Young people, with their lives ahead of them, are often encouraged to think of the life-course as a process of ‘fulfilling their potential’, that is, as a movement of progressive closure, in which all possible paths are gradually narrowed down to the one actually taken – which itself, at life’s end, reaches its ultimate conclusion. With one’s potential fulfilled, there is nowhere further to go. But what if, instead of heading towards destinations unknown, we were to push out from places already reached, along a path of renewal that knows no end? Could this be what the Pintupi, an Aboriginal people of Western Australia, meant when they told their ethnographer, Fred Myers, that life is a ‘one-possibility thing’? This calls for some reflection.

For the Pintupi, the contours of life are those of the country in which they dwell, a country created by the ancestral beings as they moved around in the formative era known as the Dreaming. Every existing creature, as the incarnation of the ancestral power from which its vitality is derived, effectively finds itself on the inside of an eternal moment of world-creation. And where the ancestors led, life is bound to follow. But this is not a movement from A to B, from a starting-point to a destination. It rather carries on. Life is a one-possibility thing, for the Pintupi, because possibility can only ever be one. The idea that people could initially be presented with multiple possibilities, like a menu of options from which to choose, only to be narrowed down as life proceeds, would make no sense to them. For Pintupi people, as they roam their desert landscape, are not fulfilling their potential but ever

replenishing it. They may indeed have more power towards the end of life than at the beginning. How, then, can we express this difference between possibilities and possibility, between fulfilment and replenishment?

One way might be to call on a distinction between doing and undergoing, which was central to the philosophy of John Dewey, especially his essay of 1934 on *Art as Experience*. In life, as Dewey acknowledged, we do all kinds of things. We do first this, and then that, and as with this and that, there is a degree of certainty in the ends to be achieved. Yes, we know what we are doing! Every deed is an intentional act, like shooting an arrow at a target. Yet in everything we do, there is an experience we undergo. We are modified in body and mind, perhaps even transformed, by the doing of it. And the question, for Dewey, was to figure out the relation between the two – between the doing and the undergoing. Do we put undergoing inside doing, sandwiched between the original intention and its final consummation? Is undergoing something that happens to us inside the act? If undergoing were thus contained within doing, Dewey thought, there could be no continuity from one deed to the next. Life would fragment into a scatter of disconnected episodes. Blink, and they're gone.

What happens in reality, quite to the contrary, is that undergoing always *overflows* doing, to the extent that whatever you do takes into itself something of the experience of what you did before, and is in turn carried over into what you do next. With every doing, as Dewey put it in a later lecture on *Experience and Education*, you are 'a somewhat different person'. In short, undergoing lies precisely in the *excess* by which life overtakes the destinations thrown up in its wake. We could describe every act of doing, as shown here (Image 6), by a transverse connection between an intention (I) and an objective (O). But the life of undergoing carries on, in a direction orthogonal to these transverse links. In the figure, this is represented by the continuous wavy line (P). Here, P stands for possibility. Possibilities cut across, but life, as a 'one-possibility thing', is longitudinal. It goes on through. And a life tracked along this line is continually overtaking itself. It is a life of becoming rather than being, yielding up not to objective consequences – for these are but discards left along the way – but to further possibility, not just for itself but for all other lives with which it tangles, including, as we shall see, its generational offspring.

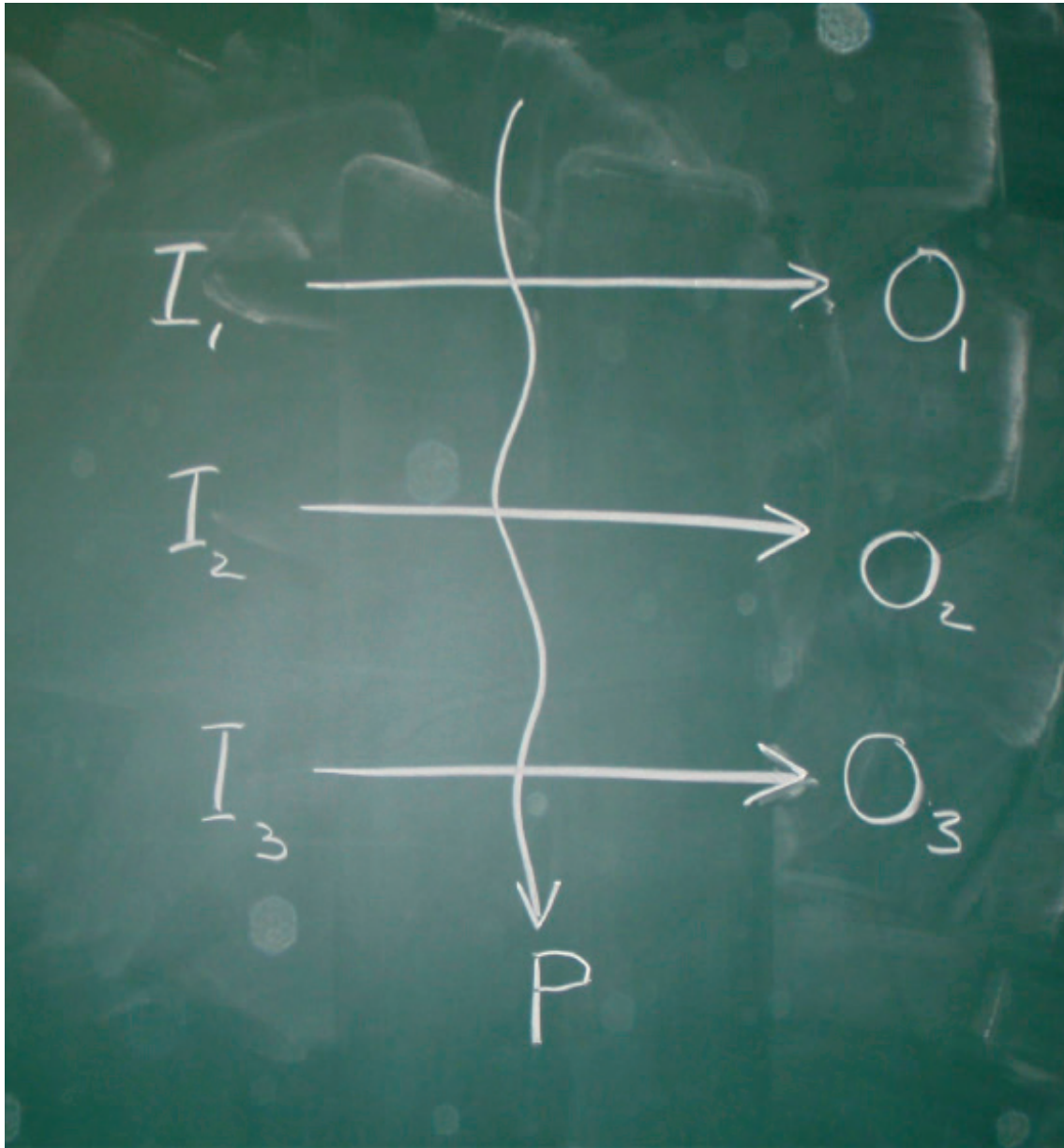


IMAGE 6

Crucially, while every transverse connection denotes a line of intention, the longitudinal trail of possibility is a line of *attention*. Now there are two sides to attention: exposure and attunement. I take the idea of attunement from the ecological approach to perception pioneered by James Gibson, to which I have already referred. For Gibson, perception is about noticing things in our surroundings that may help or hinder in the furtherance of our own activity. In a word, it is about picking up information that specifies what these things *afford*. And it can be learned. ‘One can keep on learning to perceive’, Gibson writes, ‘for as long as life goes on’. In the practice of a

craft, for example, skill lies in becoming sensitised to subtle variations in the material that a novice might miss. The carpenter attends to the grain of the wood, the smith to the ductility of iron. The skilled practitioner's perceptual system, in Gibson's terms, becomes 'attuned to information of a certain sort'. This fine-tuning of perception amounts, he says, to an 'education of attention'. Yet in this, the momentum is entirely on the side of the perceiver. It is as if the things to be perceived were already there, laid out in the environment, merely awaiting the practitioner's attention.

But what if everything is not already there? The world, after all, is not set in stone but restless and fluid, bustling with life. Think of the fluxes of the weather, the ever-changing skies, the turn of the tides, the run of the river, the movements of animals and the growth of plants. Immersed in these fluxes, it is the perceiver who must wait upon the world, attending to it in the sense of abiding with it and doing its bidding. This is attention on the side of exposure. As the philosopher of education Jan Masschelein explains, exposure (from the Latin *ex-positio*) literally means to be pulled out of position. To be or become attentive, writes Masschelein, 'is to expose oneself'. In this condition, one can no longer take anything for granted. The sense of understanding – of having solid ground beneath one's feet – is shaken, leaving one vulnerable and hyper-alert, wide-eyed in astonishment rather than narrowly focused on a target. For Masschelein, it is precisely in these moments of exposure that education occurs. It is not so much an understanding as an undergoing, that at once strips away the veneer of certainty with which we find comfort and security, and opens to pure possibility.

Yet if there are two sides to attention, of exposure and attunement, of waiting on the world and tuning to a world-in-waiting, then what is the relation between the two? Surely, to embark on any activity means placing one's existence on the line. The safe course would be to stay put. No-one can live like that, however. To live we have to get moving, to push the boat out into the current of a world-in-formation. Thus, all undergoing begins in exposure. But as it proceeds, skills of perception and action, born of practice and experience, begin to kick in. We can see this in one of the most ubiquitous of all human activities, namely, walking on two feet. Every step entails a moment of jeopardy. Falling forwards on one foot, you tumble into the void, only to regain your balance as the other foot comes to land on the ground ahead. Here, the bodily skill of footwork comes to the rescue, just before it is too late. What begins in the vulnerability of exposure ends in the mastery of attunement, providing in turn the ground from which the walker can once again submit to the hazard of exposure, in an alternation that continues for as long as the walk goes on (Image 7).

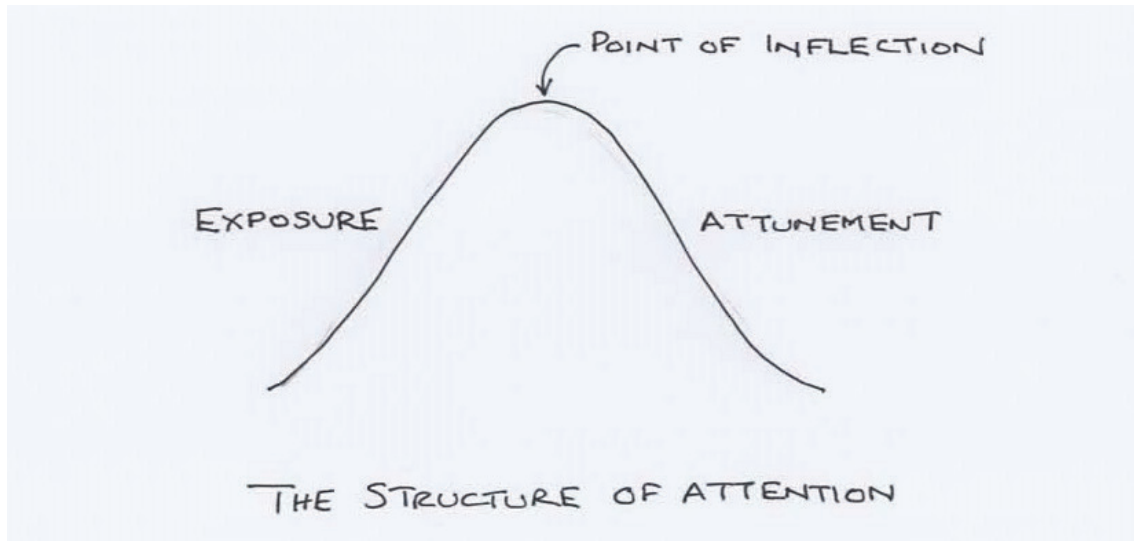


IMAGEM 7

This alternation, I believe, is fundamental to all life. Crucially, just as life is a one-possibility thing, it is also unidirectional. In real life, *submission leads and mastery follows*; never the reverse. Where submission casts off into a world in becoming, setting us loose to fall, mastery restores our grip so that we can keep on going. The first is a moment of aspiration; the second a moment of prehension. Out in front, an aspirant anticipation feels its way forward, improvising a passage through an as yet unformed world, while bringing up the rear is a prehensile perception already accustomed to the ways of the world and skilled in observing and responding to its affordances. And as submission gives way to mastery, aspiration to prehension, anticipation to perception, and exposure to attunement, there is what we could call a moment of inflection. I draw this sense of inflection from the writings of philosopher Erin Manning. Inflection is not a movement in itself but a variation in the way movement moves, coming at the point where a tentative opening matures, from within what Manning calls ‘the cleave of the event’, into a firm sense of direction. It marks the turn from undergoing into doing, at which the line of possibility discloses distinct and realisable possibilities.

I’ve just slipped in two terms, namely ‘aspiration’ and ‘anticipation’, both of which call for further explanation. Literally, to aspire is to draw breath. It is an active, animated ‘taking in’. And to take in, as Dewey observes, ‘we must summon energy and pitch it in a responsive key’. With this summoning and pitching, aspiration calls upon the past in order to cast it forward into the future, along a path of attention. Brimming with as yet undirected potential, with possibility, aspiration anticipates the future, but does not predict it. Prediction, as we have seen, belongs to the logic of certainty and

uncertainty. Depending on the level of certainty, things may be predicted with greater or lesser confidence, or judged to be more or less probable. But anticipation belongs to the register of possibility. It is the temporal overshoot of a life that always wants to run ahead of itself. Far from predetermining the final forms of things, or fixing their ultimate destinations, anticipation opens a path and improvises a passage. It is a seeing into the future, not the projection of a future state in the present; it is to look where you are going, not to fix an end point.

All life, then, is held in tension between submission and mastery, aspiration and prehension, anticipation and perception, exposure and attunement. In every case, the first leads, and the second follows. What leads is an *aspiration that wells up in attention*. What follows is a *precisely directed and skilfully executed manoeuvre*. As a one-possibility thing, moreover, this life begins nowhere, and ends nowhere, but carries on for all time – for an ‘everywhen’ that, in Australian Aboriginal cosmology, is identified with the Dreaming. Yet we know that every mortal being will certainly die. How, then, can the infinitude of life be reconciled with the finitude of individual life cycles?

To answer this question, we have to think again about generations. For there is a deeply held belief in many minds today – above all in those taught to follow the Science – that life is lived within generations, but does not flow between them. What passes between generations, often described as a heritage or inheritance, is a legacy of information and resources, which provides the capital from which successor generations can build lives in their turn. The information may be genetic or cultural, the resources material or immaterial (such as knowledge). Their sole common denominator is that they are available for transmission independently of their lifetime expression or achievement. It is easy to see, in this view, a reflection of the idea that life is lived in the fulfilment of potential. This leads, as we have observed, to a dead end. With all potential exhausted, there is no life to be continued in coming generations; only the discards left along the way remain to be passed on. The designs of each generation, occupying their own slice of time, seem fated to replace those of its predecessor, and to be replaced in their turn, rather like layers in a stack.

This, of course, is the very same stack that we have already encountered in our reflections on the page and the ground. It betrays a kind of stratigraphic thinking that is deeply seared in modern sensibilities, leading to an easy equation of generational layers with layers of sedimentation in the history of the earth, of deposits in the occupation of a site, of documents in an archive, and even of consciousness in the human mind. It is a way of thinking that feeds directly into a rhetoric of extinction that wonders whether the

coming generation, or any after that, might be the last – be it for our own or any other species. It is the reason why we feel ourselves facing a future blighted by uncertainty. To restore a sense of possibility, we need to imagine generations differently.

This is shown here (Image 8). We have seen that as a one-possibility thing, life is lived not transversally but longitudinally. Let us, then, compare every particular life to one strand of an intergenerational braid. The strand is only so long, but the braid can continue indefinitely, for even as old strands give out, new ones are paid in. Nothing, here, is inherited, nor does a break in the chain of transmission herald extinction. Rather, it is in the overlap of generations that the life process is carried on. As Bergson put it so vividly, just as the individual feels the swell of the past ‘leaning over the present that is about to join it’, so with life in general, we see ‘each generation leaning over the generation that shall follow’. This leaning over is a gesture of kinship, of care, even of love. Herein, for Bergson, lies the true mystery of life – to which we would add, its true possibility. How much are our fears of the end of history, of biodiversity loss and final extinction a function of the way we have sliced up the generations, setting them over and against one another, denying both the productivity of their collaboration and the affectivity of their care? We need to bring them together again. And with this, we turn to the question of education.

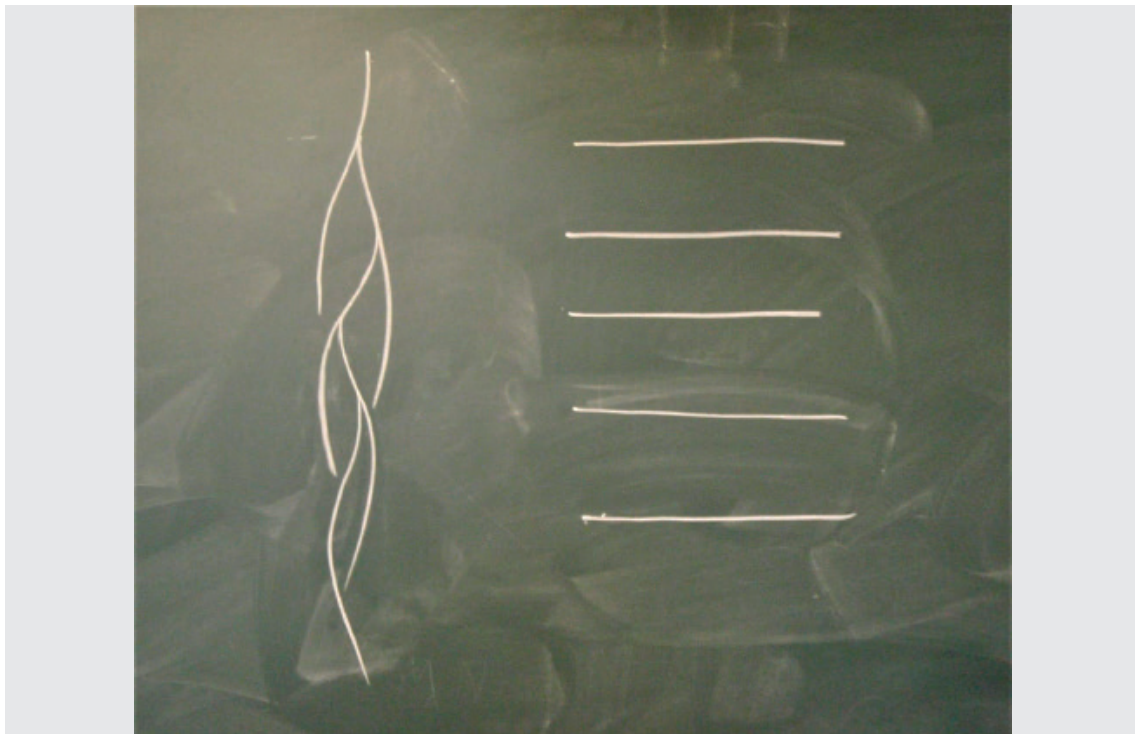


IMAGEM 8

III

For more than three centuries, in the western world, education has been regarded as the engine of social progress. It has been the means by which advances in human knowledge, forged by bringing powers of reason to bear upon the material of empirical observation, have been passed on from one generation to the next, allowing each to build upon the achievements of its predecessors, thus contributing to the cumulative advance of civilisation as a whole. An education that conforms to this progressive principle naturally gives pride of place to subjects of study that are deemed, in a modern idiom, to be *scientific*. For science, along with technology, engineering and mathematics, nowadays packaged as STEM, is founded upon a claim to superior knowledge of how the world works, at least as compared to the knowledge of so-called ‘lay practitioners’, which is so tightly bound to experience as to remain out of reach of explication and analysis. Almost by definition, the Science is situated on a higher plane, at one remove from the theatres of practice in which it might be put to use. That’s why scientific study typically separates learning from doing, the transmission of knowledge from its subsequent application.

Science’s elevation, however, has had the effect of pushing to the margins a range of subjects that appeal, as we might say in the idiom of modernity, more to sense than to reason, or to standards of judgement that are more aesthetic than logical. It is not that these subjects have no place in the curriculum. On the contrary, even in a society wedded to the ideal of progress, there is widespread recognition of the need to complement the detached objectivity, cold logic and analytic rigour of science with something more subjective, attuned to feeling, empathy and holistic understanding. This bifurcation is of course deeply sedimented in the modern constitution. We even have neuroscientists, nowadays, telling us that it is wired into the human brain, in the division between its left and right sides! An education in non-STEM subjects, such as in the arts, is supposed to help with the development of the right side, tempering the dominance of the left, and offering students a more rounded formation that enhances their abilities to relate to their surroundings.

I want to argue against this left-right complementarity, with its implied divisions between objective knowledge and subjective experience, and between reason and expression. I contend that what we may broadly call ‘the arts’ – here including architecture and design – have a far more radical role to play than merely to provide the STEM curriculum with its non-scientific complement. This role is to change the very meaning and purpose of education, across every field of study, from the efficient transfer of knowledge

from teachers of one generation to students of the next, to an endless journey of discovery on which teachers and students are embarked together, driven not by a humanistic ideal of progressive improvement but by a passion to seek the truth of what is real and present in the world. Far from opening up a space for the cultivation of subjective self-expression, alongside and as a complement to the space of knowledge transfer, this is to bring students into an ongoing dialogue with the world itself, affording the possibility to attend to the things or beings to be found there, to answer to their presence, and to explore the conditions of coexistence with them. Instead of educating students in the subjects of art, here it is the practices of art that educate. They do so by opening a path, or showing the way, guiding attention towards aspects of the world that might be worthy of further examination.

This is to foster an attitude of what I call ‘response-ability’, by which I mean a capacity and a readiness to go along with things and to answer to them. It is not a new idea. In fact, it was first introduced in 1957, in a lecture delivered by the composer John Cage. Only in the presence of things, Cage said, can we feel them, and only through feeling them can we respond. Apparently unaware of the precedent, the cultural theorist Donna Haraway has recently reinvented the term in much the same sense. Response-ability, she says, is a ‘praxis of care and response’. Yet Cage’s was not the only precedent, for just a decade before Haraway was writing, the term was used by the educational philosopher Gert Biesta. For Biesta, response-ability refers to a certain *voice*. It is a voice of one’s own that nevertheless comes forth only in its offering others the opportunity to respond in theirs. Like a line in a conversation, or in polyphonic singing, every voice continually emerges in and through its joining with, and differentiating from, the voices of others. I call this ‘correspondence’ – going along together and answering to one another as you go. And the question is: what if we were to imagine education in these terms, as a practice of correspondence rather than an engine of progress? What if we were to put the development of response-ability ahead of the cultivation of reason?

The voice of reason, of course, belongs to no-one. It transcends variations of experience. And it is this voice, both authoritative and impersonal, that scientific education aims to inculcate in students, specifically by dissociating knowledge from personal experience and making it accessible to all. In the community of reason, as the philosopher Alphonso Lingis puts it, everyone is interchangeable. Problems have their right answers, which are the same, whoever happens to come up with them. A pedagogy of response-ability, however, would reverse the priorities of the scientific model, placing attention to ever-emergent differences ahead of standardised measures

of attainment. If, in the community of reason, everyone is interchangeable, in the community of response-ability, precisely the opposite obtains. People are bound together not because of their deference to a single voice, the voice of reason, but because every voice is *different*. It is a community, as Lingis says, 'of those who have nothing in common.' Because they have nothing in common, each has something to give, something to contribute to the ongoing conversation. This is a matter not of *understanding* but of *undercommoning*. Understanding means finding support in a shared foundation, a hard ground upon which all can build. Undercommoning is just the opposite: not a reversion to what we all have in common to begin with, not a defence of shared interests, but rather a way of living together in difference, in a world where nothing is certain and everything is possible. The soft ground of undercommoning is a palimpsest, in which earth and sky intermingle.

In her essay 'The crisis of education,' first published in 1954, the philosopher Hannah Arendt saw the crisis precisely in terms of the loss of attention, born of hubris. Do we 'love the world enough,' she asked, 'to assume responsibility for it'? Only if we are, Arendt foretold, is there hope for generations to come. To love the world, in our terms, is to be response-able; in Haraway's terms it is 'a praxis of care and response.' It is, in that sense, to give back to the world what we owe for our own existence. But could not the same be said of education? Literally, 'to educate' means to 'lead out' (from *ex*, 'out' plus *ducere*, 'to lead'). Education leads us out into the world, so that we can respond to it. And as a way of leading out, it is fundamentally a practice of exposure, in precisely the sense of pulling out of position that I introduced earlier. Its purpose is not to arm ourselves with knowledge, or to shore up our defences so that we can better cope with adversity. It is rather to disarm, to relinquish the security of established standpoints and positions, and by the same token to attend more closely to the world around us, enabling us to respond with skill and sensitivity to what is going on there. In this, teachers and students go along in each other's company, fellow travellers in the undercommons.

To think of education thus, as a way of leading life in the company of others, of corresponding with them in the undercommons, of coming together in difference, is to align it not with progress but with sustainability. By sustainability I don't mean the achievement of a precarious state of balance, such that what we take from the world, for our present consumption, should not exceed its capacity for future renewal. That would be to treat the earth as a standing reserve for the benefit of a globally distributed humanity. I refer rather to the continuity of life, in a world that has room for everyone and everything else, both now and forever. But this means thinking quite

differently about generations and their passage. We've already seen how modern thought tends to imagine every generation as a layer, each adding to the one before and building up a history in their succession. For progress theorists, history stacks up. And education, they say, is the means by which the legacy of each generation is passed on to the next. But where progress builds up and up, sustainability winds on and on. It is not stacked vertically but braided longitudinally, in the turnover of generations. Through most of human history, indeed, this is how lives have been carried on: youngsters have grown up hearing the stories and observing the practices of their elders, both discovering the meanings of the stories and developing skills of practice in the passage of their own experience, and becoming storytellers and practitioners in their turn. In this lies the proper meaning of *tradition*: not a fixed body of heritable custom, but a way of life along which it is possible to move on, in continuity with the values of the past, while laying down a path for others to follow.

The reasons for the shift in the way we think about life and generations, from the longitudinal to the sequential, from braided life-lines to layers stacked up, are complex. They have much to do with capitalism's erosion of domestic modes of production, and with the redeployment of educational functions from the family to the state. For the past three centuries we have managed to persuade ourselves that progress is unstoppable, and that education, as it stacks the designs of every generation over those of the next, can lift human civilization to ever greater heights. Yet progress also carries its price, in terms of environments permanently ravaged by the extraction of the resources needed to feed it, and of the ever-growing inequalities and injustices between the beneficiaries of progress and those who have lost out. This price, as we now know only too well, has risen to the point at which the consequences of further escalation could be catastrophic. In short, progress and sustainability, like reason and responsibility, pull in different directions: one up; the other along. We cannot have both. And if we are to have a future that ever opens to new beginning, then the only option is along. This means that education, too, must shift its priorities, from reason to response-ability. It must be the way that generations, even as they overlap, contribute to each other's ongoing formation.

With this we can return, finally, to art, architecture and design. In 2010, the Rhode Island School of Design began to champion the idea of incorporating these subjects into the STEM curriculum, by adding in an A for 'arts'. Thus, STEM was converted to STEAM. The idea has since caught on, and is widely touted as the future for arts education. It is a future that, in the eyes of its advocates, has already arrived, which is why their metaphors of choice

are the 'cutting edge' and 'state of the art'. Nothing is more important, in their view, than preparing the coming generation for a world of cut-throat competition in which only the smart will survive, leaving the rest on the scrapheap of humanity rendered redundant by developments in digital technology and artificial intelligence. It would, in my view, be a gross betrayal were we to sacrifice the arts on the altar of such a dystopian and short-sighted vision. Quite to the contrary, I believe the mission of the arts is to lead a revolution in the whole way we think about education and its role in society. I want to think of them not as subjects to be taught – as supplements to a curriculum centred on the scientific model of progressive education – but as *ways of teaching in themselves*, the purpose of which is to develop precisely the opposite of the instrumental, disengaged and manipulative attitude epitomised in the word 'smart'. This is an attitude of enduring attention, responsiveness and care.

Arguably, this attitude has always been the hallmark of true scholarship, even in fields that would nowadays come under the umbrella of science. It is there in the biologist's attention to living things, in the chemist's attention to the properties of materials, in the physicist's attention to matter itself. Technology and engineering, likewise, resemble craft in the perceptual acuity and respect for materials required of their practitioners. As for mathematics, the rootedness of mathematical understanding in gesture, rhythm and trace, and its proximity to the arts of music and dance, have been evident since ancient times, notwithstanding the myths of intellectual genius that have grown up around it. For such giants of the past as Vitruvius, Alberti, Leonardo and Constable – founding figures respectively in architecture, perspective, anatomy and meteorology – science and art were never separate or even separable endeavours, but rather long standing traditions of inquiry, unified in their commitment to careful observation, patient experimentation, precise description and informed speculation. This is indeed how the real sciences – and real scientists – have always worked, and still work today, feeling their way from within, guided by genuine wonder, curiosity and care.

This calls however for an imagination wholly distinct from that of the kind coveted by STEM, or even by STEAM. It is an imagination that, far from closing in on smart solutions, opens up to the possibility of the world's ceaseless formation, drawing its creative powers from the self-same source. Could the role of design, then, be to resituate this kind of imagination at the very heart of education, of leading life? Perhaps, then, instead of immediately reaching for the Science in our deliberations about the future, we can concentrate on relearning how to live with the elements which sustain all of existence, as

our predecessors once did and as plants and animals still do. Prioritising the regeneration of human life, and its coexistence with other living beings, will mean turning our backs on the shiny corporate headquarters of STEM, and reaching once more for the time-honoured themes of kinship and descent that bind us to our fellow inhabitants of the ever-turning ground betwixt earth and atmosphere.

Como referenciar

INGOLD, Timothy. Does Design stack up? Rethinking ground, generation and education. **Arcos Design**, Rio de Janeiro, v. 16, n. 1 (Suplemento), pp. 109-133, out./2023. Disponível em: <https://www.e-publicacoes.uerj.br/index.php/arcosdesign>.

DOI: <https://www.doi.org/10.12957/arcosdesign.2023.79228>



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Recebido em 20/06/2023 | Aceito em 21/08/2023