

Educating for Gaia

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As the ecological and social crises bite deeper and deeper into the fabric of our lives, there is an urgent need for an education that addresses the question of how we can develop lifestyles that are truly sustainable in the ecological sense of the word. Good science teaching is an essential component of this educational effort. A key idea that people will need to understand is the notion that our planet seems to have regulated its own surface conditions within the narrow limits that life can tolerate over a vast span of time thanks to tightly coupled feedbacks between life and rocks, atmosphere and water – this is the key insight of Jim Lovelock’s paradigm-shifting Gaia theory. Students need a basic understanding of how to think in terms of feedback loops and of the surprising emergent properties that often appear when many such loops are linked together. They will also need to see how these concepts can help us to understand the possible consequences of our heedless lust for material growth that is so disturbing the Earth, and they will need to use these ideas to think through possible solutions.

But this kind of educational approach on its own is, I believe, doomed to fail. By focusing only on thinking (albeit in the more enlightened mode known as ‘systems thinking’) it ignores the equally vital contributions that our sensory experience, our ethical sensibilities and our intuitive capacities can make to a more holistic understanding of the Earth and of our place within it. The problem, more succinctly put, is that our current educational paradigm emphasizes quantities at the expense of qualities, and prioritizes facts over values. The result is that we promulgate a rather dry soulless approach to the world that is inherently dualistic and which leads us to believe that our Earth is nothing more than a vast machine which we can control as we wish by using the detached, ‘God’s eye’ view of rational scientific analysis. Thus, as a society, we feel strangely disconnected from the Earth – it seems as if we were aliens from some other planet placed here to prod and poke this world with our scientific instruments whilst feeling no sense of meaning, belonging or closeness to her ancient crumpled surface or to her rich, teeming biodiversity. With this world view firmly in place in our minds, we engage in sustainable actions only out of fear, or if we are compelled to by law.

I myself experienced the immense alienating power of this approach to science during my three tortured years as a young undergraduate in zoology. For seven months before beginning my studies I had worked as a field assistant in the Sengwa Wildlife Research Area deep in the wild bush country of what was then Rhodesia. I lived in the wild essentially on my own. At night I was enveloped by the stars and by the distant sounds of lion and hyena. By day I felt myself belonging more and more to the great wild personality of the Sengwa region with its broad meandering rivers and the great flat-topped red sandstone mountains that overlooked its complex intertwining fingers of mopane woodland, miombo scrub, and riverine acacia savannah. Sengwa for me was clearly alive, a greater being imbued with a tremendous communicative power that possessed a coherent, healing intelligence that I could access only through my intuition, but which I could also come to know through the ancillary doorway of the rational scientific knowledge acquired through mapping vegetation, collecting plants and mammals, and helping with the ongoing research on the ecology of elephant and warthog.

I returned to England with an immense thirst to learn more about the natural world, and thought that my university experience would lead me further in to the rich realm of qualities that I had so deeply encountered in Africa. I hoped that somehow all the reading and studying would embed me even deeper within our living, turning world, but I was to be bitterly disappointed. Inspired by the great red Karoo sandstone cliffs that overlooked the Sengwa river, I chose geology as my subsidiary subject in my first year. One of the first classes was a field trip to an outcrop of coal in a steeply cut river valley in the north of England. Touching the black seam of rock, I sensed its immense age, its dense conglomeration of carbon atoms, and the deep meaningfulness of its very existence that seemed to be saying: “you and I are deeply connected – my presence here has contributed to the coherence of your world. I must remain here for that coherence to

continue". Our geology teacher was somehow able to bring these qualities of the coal to life in the very way in which he delivered his scientific information, and I felt a deep excitement. If this was geology, then I wanted as much of it as I could get.

But things got worse from that moment on, and I never again felt that sense of meaning and belonging to the great rocky crust of our planet. Instead, for me, geology deteriorated into nothing more than a progression of dry facts about fossils, minerals, rocks and geomorphology that had to be memorized for the exam. There seemed to be no awareness at all in our instructors about the profound, mysterious qualities of the rocks and geological formations that we studied. My situation was so dire that I began to feel a depressing and increasingly disabling doubt about my own perceptions and intuitions as I was increasingly absorbed into a world of mere facts, dry as old bones and equally as dead. The zoology course was not much better. It too reduced the teeming world of nature to a dry menagerie of deterministic theories meant to convince us that we live in a meaningless world in which selfishness and competition are the sole yardsticks of evolutionary success.

My formal doctoral research at Oxford on the behavioural ecology of the muntjac deer led me no deeper into the world of meaning that I so unconsciously craved. But the qualities of the small wild semi-natural woodland where I did my field work revealed themselves to me unbidden during many long days and nights alone within the forgotten sanctuary of its ancient hazel coppices and its dark abandoned rides. Thanks to some uncanny instinct, I interspersed periods of intense data collection with long meditative moments in which the living qualities of the wood came to the fore as I abandoned myself to the subtle messages of its criss-crossing bird song, the sound of the wind in trees, the delicate smells of its damp earth and the luscious greenness of its vegetation as it ate up the life-giving power of the sun. These were for me times of a genuine and deeply satisfying communication between a mysteriously animate enfolding world and my own sensing animal body.

The denigration of qualities such as these was deliberately built in to mainstream science at its inception some 400 years ago during the 16th and 17th centuries. The great pioneering scientific geniuses of that period such as Galileo, Bacon and Descartes convincingly argued that only quantities have validity, that nature has no intrinsic value, that the whole cosmos is in essence a vast machine, and that we have the right to use rational analysis to ruthlessly control and exploit the Earth and all her other- than-human creatures for our own ends. Is it any surprise, then, that this world view has delivered us into the maw of a planetary crisis of such massive proportions that scientists talk about us being the cause of the sixth mass extinction and of the threat posed to civilization by the looming specter of anthropogenic climate change? Is it any surprise that a culture that sees the world as no more than a dead object will eventually seriously perturb the web of life on which it depends? Modern science is perhaps the greatest cultural achievement of the Western world, but it needs to be seriously reformed and expanded if it is to contribute to solving the urgent problems of the 21st century. It is time for science to heal its self-imposed split between quantities and qualities and between facts and values if it is to become part of a tenable solution.

It was C.G. Jung who pointed out that we gain reliable knowledge by means of the four modalities we mentioned earlier, namely thinking, feeling, sensing and intuition. Perhaps the reunification we are seeking will take place when we educate our students to consciously cultivate their ability to think in tandem with their other three ways of knowing, for it is with these that we become sensitive to the qualitative aspects of our experience. But how do we know that such qualities have any 'objective' validity? How can we be certain that they are not mere projections, as Galileo and others warned so long ago? There are various lines of evidence that support the notion that qualities can indeed provide us with genuine information about the world. A case in point is the pioneering work of the animal welfare scientist, Françoise Wemelsfelder, who has explored how quantities and qualities overlap in our perceptions of the well-being of farm animals. In one of her ongoing experiments, observers are asked to watch a set of video clips of pigs from different

husbandry backgrounds as they interact with a human in a standardized environment. Each observer is asked to assign quantitative scores to their own qualitative intuitive perceptions of each pig's 'emotional' state. Multivariate statistical analyses of these data have shown over and over again that there is a high degree of agreement amongst observers with respect to their qualitative evaluations, and that these assessments correlate exceedingly well with standard physiological measures such as levels of stress hormones in the animals. In a further development of this approach, Françoise and I are about to explore to what extent her methodology can be applied to the assessment of landscape quality by naïve observers. Recently, Tom Butterworth, one of our MSc students at Schumacher College, carried out a pilot study in which he showed that qualitative assessments of different woodland ecosystems by a group of observers were well correlated statistically with standard quantitative measures of biodiversity taken within the same woodlands.

Our efforts to educate for a genuinely sustainable relationship with the Earth must therefore attempt to reunite quantities with qualities by developing the four ways of knowing in our students, an approach that we are pioneering on our MSc in holistic science at Schumacher College. When working with our students to give them the deepest possible sense of connection with Gaia, we use Lovelock's Gaia theory to teach them how to think holistically about the Earth. We explore the lessons of Daisyworld, we look at the consistencies or otherwise between Gaia theory and natural selection, we build mathematical models of the carbon cycle coupled to an active biota, and we look at how the Earth could respond to climate change as a fully integrated complex system consisting of life coupled to its abiotic 'environment'.

Then we go further. We use this rational knowledge to fuel our intuitive sense of connection to the whole of community of nature by engaging in rigorous meditative explorations and by recreating Gaia's long and complex evolutionary trajectory in our imaginations. We deliberately connect with the qualities of rocks, atmosphere, oceans, clouds, individual organisms and entire ecosystems by spending quiet time savouring their essences much as we would that of a poem or a piece of music. As we deepen our perceptual abilities, we find a remarkable degree of commonality in what we discover by means of this more phenomenological approach to nature. In addition, we work with exercises that help to shift our everyday perceptual frameworks. We lie on our backs outdoors, feeling how our planet's gravity dangles us upside down over the vastness of space, and we gain a palpable sensation of her great curving spherical body as it arches away beyond us in all directions. The deep experiences of connection and communion that arise out of this radical holistic approach lead us to conclude that the mechanistic metaphor that has so seriously misguided our culture during these past four centuries must now be replaced by the more ancient understanding of the Earth as a great psyche in which we are deeply immersed and with which we are in constant communication. This intuition enriches our sensory experiences, so that we no longer see the world around us as a set of isolated mechanical objects, but as a unified field of experiencing subjects.

Now, with our ethical sensibilities alive and awake, we see why it is wrong to seriously harm the great turning world within which we have our being and which gave us birth. Our rational minds become the servants of this deeper sensibility by helping us to articulate our deep experiences of belonging to Gaia and to tease out to what extent our lifestyles are consistent with them. External compulsion or a sense of duty are no longer necessary to make us act correctly. The integration of our reasoning, feeling, sensing and intuition fill us with an inspiring sense of the mysterious personhood of the Earth. This unleashes tremendously powerful feelings of energy and dedication that lead us spontaneously into right action, wherever our own particular paths might lead us.

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