

RELEASED TO DR HARALD GAIER

PLATO SYMPOSIUM

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## What is 'natural'?

*The following essay represents a personal perspective by ANH - Intl's executive and scientific director, Robert Verkerk PhD, on what makes things 'natural'. The essay represents a multidisciplinary journey, one that perhaps raises more questions than it answers.*

Things are not what they seem. Whether we believe the world is flat, or that there are parallel universes and realities as proposed by the current M-theory supported by acclaimed physicist Stephen Hawking, drastically alters our perception of reality. In exploring the meaning of the term 'natural', we need to fully recognise our limitations. Our limitations include our knowledge base, the information received by our various senses as well as our language (and the author's use of it). We also have such an elevated view of ideas that hold a robust scientific base, while rejecting ideas that don't. While it might be just as appropriate to use a metaphysical or even spiritual or religious approach to investigate the subject matter, a more broadly scientific approach will be used here, if for no other reason than this approach befits the multidisciplinary scientific background of the author.

### **Natural: an anthropocentric concept**

In the barest of terms, I would like to propose that natural means that which exists without intervention of the human species. But categorisation between natural and unnatural will often be blurred, given that the extent and type of human intervention will need to be considered. As such, we must accept that the concept of 'natural' is in itself anthropocentric, meaning our perception of it is seen exclusively from the perspective of our own species, and typical human values and experience. Reductionism and categorisation are among the tools humans have used to better understand the world around us. The distinct disciplines of science are examples of this. Their very segregation has been as much a hindrance as it has been a help to our mission to better understand the workings of the ecological systems that surround us, including the ways in which our activities interfere with them. How might we categorise substances or processes in relation to their degree of naturalness? If being fully natural means no intervention by humans, all the food we eat, especially that which has been technologically altered or processed, could not be regarded as fully natural. But we might argue that if food is unprocessed, or if it is grown organically without the use of synthetic pesticides and fertilizers, it is more natural than a genetically modified (GM) crop variety that has been sustained by artificial means.

But what if the chemical structure of a molecule that exists naturally in the

environment is faithfully reproduced by humans in a laboratory? Should we regard

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such nature-identical chemicals as natural? Or should we give them a special classification, such as 'nature-identical synthetic', that tells us that humans have had a hand in their production? It probably makes sense to do so, especially as we are beginning to understand more about the way in which our bodies respond to the matrix of natural and synthetic substances that we find in our food or those that we inhale in the air. While we might identify specific substances that may be particularly beneficial, or indeed harmful, to our health, it is the context of their exposure, with other substances or cofactors, within a range of environmental and genetic variables, that becomes so important to our evaluation of their interaction with our bodies.

The same categorisation rationale can be applied to an F1 hybrid of dahlia that you may have cultivated in your garden. It could equally be applied to a variety of apple that doesn't readily go brown after being bitten or cut. In the latter case, plant breeders have selected apples that produce less of the peroxidase that produces the browning reaction. The browning reaction also protects the apples from opportunistic pathogens. This worries most conventional growers little as they are ready with their arsenal of agrochemicals. But could we consider these apples to be less natural than the ones you remember from your grandmother's backgarden? Do you remember how rapidly these browned after the first bite?

In considering the concept of 'natural', we need to distinguish between the substance or entity, and the process responsible for its generation. A chemical or radiation source might 'occur naturally', but, we should ask, is its existence, form, type or level of exposure within the ranges we might expect if humans had not intervened in any way? Alternatively, should the *process* by which a substance, entity or organism is produced be regarded as natural or unnatural (artificial), according to the extent of human intervention? Organic farming, like any form of farming, requires that humans intervene in the production of our food. Yet most regard it as natural, given that it is a system of agriculture that relies largely on natural, ecological principles while minimising reliance on synthetically-produced inputs.

The simple distinction between natural and unnatural, or natural and synthetic (artificial), is necessarily crude. It may even be less than accurate. A continuum between that which exists both with and without the intervention of our species may offer us a helpful way of avoiding the narrow constrictions of discrete categories. The continuum stretches, at one extreme, from that which occurs naturally in the absence of any interaction with the human species, to the other extreme, where things are generated through the activity of humans, where the outputs are at odds with anything that might exist in our absence. Most substances

to which we are exposed, whether they are present in our food, our water or in the air we breathe, exist somewhere between these two extremes. Such a simple, twodimensional, unidirectional model might appeal to the principle of Occam's razor, which proposes the simplest possible model to explain a given phenomenon, but it is still imperfect.

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As representatives of the species responsible for such profound environmental change within our recent history, many of us are, not surprisingly, concerned deeply about what we are doing to the planet. Not all of us are able to interpret the relevance of M-theory, or even understand how parallel universes or realities might exist. But most are guided by an innate and intuitive 'feel' which dictates that the more natural something is, the more acceptable it is to them.

Most of us also have accepted that 'natural' doesn't necessarily mean 'safe'. We have after all had more than 450 years to get used to the notion that it is the dose that makes the poison. But our recent studies of hormetic processes tell us that we shouldn't wed ourselves blindly to overly-simplistic notions of typical dose-response relationships. As a society, we can also no longer ignore the effects on our bodies of mixtures of chemicals and radiation sources to which we are exposed daily.

We have, literally, only just began scraping the surface of what is likely to really be going on. After building understanding from within the artificially-imposed constraints of the scientific compartments created to increase our understanding of natural phenomena, we now need to remove the compartments to achieve higher awareness. To push forward our awareness of our situation, we need to keep returning to the widest, most 'macro', unreduced and non-compartmentalised perspective we can find. M-theory provides us with one such perspective.

Our suspicion over processes, chemicals or forms of radiation that are not viewed as being natural is perhaps little more than a reflection of our need to impart a sense of responsibility over that which we are accountable. By definition, we have no control over that which exists independently of humans. However, we can choose either to create or not create those things we view as synthetic, semi-synthetic, bio-synthetic or even nature-identical. In this way, we are therefore able to act as arbiters over those human-created elements of our perceived existence.

Long may such responsibility continue, on the grounds that it is coupled with the highest level of awareness and understanding that we can muster.