

The Physics of Organisms and the Naturalistic Ethic of Organic Wholeness - Mae-Wan Ho

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The Fall from Grace

The biblical account of our common ancestors' fall from grace has always held a special fascination for me, because it can be read in so many ways. One reading is a parable of our estrangement from nature, as the result of which, we are forever condemned to know her from the outside. Cartesian mind-matter dualism, at the basis of western science, did begin by separating mind from body and isolating observer, as disembodied mind, from 'objective' nature observed. It has resulted in a knowledge of alienation, which is reductionist, fragmented, devoid of value and meaning, and divorced from life.

Another more interesting reading is that, in the beginning, our ancestors were happy and content in the garden of Eden, i.e., nature, in a mindless, innocent sort of way, until Eve tasted the fruit of the *tree of knowledge* and discovered reason. Presumably, she began to think for herself, telling Adam he should do likewise, thus bringing upon them the wrath of God, a benevolent despot who likes to keep humanity innocent and happy. So he castigated them both, told them they were shameful, guilty and sinful, and shut them out of nature forever. He admonished them not to think for themselves, but instead, to have faith, to bear children, to atone for their sins and wait for redemption. The irony is that once Eve has tasted the forbidden fruit – knowledge – which enables her to know nature more intimately, she and her children are seduced into doing it ever since. I believe it is possible for her children to find their way back to the garden of Eden through knowledge. Perhaps, God, being really a decent sort of fellow, knows that anything forbidden is bound to be seductive, and has actually meant for us to know, to redeem ourselves through reason and imagination.

Redemption through Knowledge

So it is that the same tradition of western science, now pushed to its limits, is leading us back to a *participatory* knowledge that is probably universal to all traditional indigenous cultures worldwide. My book [1] is an attempt to outline a participatory 'indigenous western science' which is fully contemporary. It is 'participatory' because the knower places her undivided being – body and mind, intellect and feeling – squarely within the known, which is all of nature. And it is 'indigenous' because, like all knowledge gained through immersing oneself within nature, it is an unfragmented whole – encompassing science, humanities and art, ethics and religion-that we live by, that gives meaning and value to life. In these respects, I part company with perhaps the majority of scientists for whom science holds no meaning for life, and must be divorced from personal experience in any event, to maintain its 'objectivity'.

The Theory of Organisms and Organic wholeness

I take, as my starting point, Whitehead's view that we cannot understand physical reality unless

we have a theory of the organism. I draw on many areas of contemporary physics – from non-equilibrium thermodynamics, condensed matter physics to quantum optics – as well physiology and biochemistry in order to illuminate the nature of the organism. I then show how there is no separation between the so-called ‘hard’ sciences such as physics and chemistry and the ‘soft’ sciences such as psychology and philosophy, and furthermore, that understanding the organism holds the key to understanding our selves and our relationship with nature.

The theory of the organism is about perceiving *organic* wholes, perceiving ourselves as such and at the same time, an integral, inseparable part of a greater whole that is ultimately all of nature. The organic whole is something very special, as Whitehead and Bergson both tried to tell us. It is a plurality that is singular, a unity that is multiplex and diverse, an actuality that contains within it all potentials. It differs radically from the conventional notion of the ‘whole’ that belongs in the mechanical era – a collective or co-operative with a division of labour – a whole that can be taken apart, like a car-engine, and put back together again. Even the notion of nested hierarchies, or Arthur Koestler’s *holons*, fails to capture the essence of an organic whole, for nested hierarchies, like Chinese boxes, can also be neatly decomposed. More-over, hierarchies imply that the ‘higher’ controls the ‘lower’, like the line-management that the present Government has foisted on our universities, many of which are in grave danger of congealing into a solid mass of bureaucratic, apathetic immobility.

An organic whole, in contrast to a mechanical whole, has no controller nor parts which are controlled. It is dynamic and fluid, its myriad activities are self-motivated, self-organising and spontaneous, engaging all levels simultaneously from the microscopic, molecular, to the macroscopic. Instead of ‘control’, a more accurate description is ‘communication’. An organic whole is a system maximally communicative so that adjustments, responses and changes can propagate ‘upwards’, ‘downwards’, ‘sideways’ in all directions at once in the maintenance of the whole. An organism is always thick with activities at all levels – all co-ordinated and constitutive of the whole. The organism has therefore no preferred level. We may choose to define hierarchies and to restrict our description to the ‘social’, ‘behavioural’, ‘biological’, biochemical’ or ‘genetic’ level, but only with the realisation that the whole will always elude us. The organic whole has no decomposable parts or levels, it is a *coherent* whole. This does not mean we cannot break it up to study the pieces, as we have been doing for several centuries in the west. But the isolated part is a mere shadow of its life in the whole. An enzyme molecule, for example, has a rich and diverse ‘cytosocial’ microenvironment within the cell – consisting of other enzymes, proteins, ions, and metabolites – in which it expresses its full potentials. It is only within the past decade that enzymologists are realising how we have been misled by their work on single, purified enzymes in dilute solution.

The Coherent Wholeness of Being

The coherence of organisms that I am talking about has all the properties of the ordinary meaning of the word: correlation, connectedness, a consistency in the system, and so on, *and* something much more.

Think of the ‘I’ that each and everyone of us experience of our own being – a consciousness that is resolutely and concretely singular. Although we know we are made up of innumerable cells and astronomical numbers of molecules of all kinds, we never experience ourselves in the plural, nor as a mixture of separate states. This experience of a singular ‘I’ is none other than the intuition of our own organic wholeness, our inner process with its dynamic heterogeneous multiplicity of succession without separateness, a succession of qualitative changes which melt

into and permeate one another with no definite localisation or boundaries, each occupying the whole of our being within a span of feeling that Bergson refers to as 'pure duration'. The intuition of organic wholeness as pure duration is quite precisely captured by the notion of coherence within quantum theory.

The quantum coherent state is a 'pure state' – an indivisible, indecomposable unity that contains within it the potential of all states, each permeating the whole. It is a seemingly paradoxical state that maximises *both* global cohesion and local freedom. For coherence does *not* mean uniformity, or that everybody is doing the same thing all the time, quite the opposite is the case. The coherence of the organism is radically and quintessentially pluralistic and diverse, and at every level, from the structured, multi-enzyme complexes inside cells, the organisation of diverse cells into tissues and organs, the polymorphism of natural populations to the variety of species that make up natural ecological communities, and the kaleidoscopic, multicultural earth which makes life enchanting and exciting for us all.

Think of a particularly good performance of a grand ballet, or better yet, a large jazz band in which everybody, by doing his or her own thing, is perfectly in tune, in step with the whole, with the audience also participating in the occasion, becoming one with the performers in the music and the art. When we multiply such a performance as many times over as we can, increasing the number and range of performers and stretching tempo much, much further, and in both directions, we come close to imagining what happens in an organism such as ourselves. Within our body, the grandest ensemble of song and dance goes on, ranging over seventy octaves, from localised chemical bonds vibrating, molecular wheels turning, micro-cilia beating, waves propagating on all scales, to fluxes of electrons and protons, flows of metabolites and ionic currents within and between cells and tissues – activities spanning ten orders of magnitude of space, yet all constituting a coherent whole. The individual and the collective are one, with all the potentials of the pure state open to it. It is very likely that sustainable social and ecological communities function in the same way, over larger space-time domains.

The coherent state is also a state of 'non-locality' of space and time. For, within the volume in which coherence holds, there is no time-separation, so changes can 'propagate' in no time at all, and similarly, within the coherence time, there is no space-separation, so distant sites become neighbouring. This is very far removed from the ordinary commonsensical and mechanical notion – to which most of us have been thoroughly schooled – that objects are separate from one another, each of them having definite boundaries and outlines, and a *simple location* in linear, homogeneous space and time. Instead, the organic space and time of real processes are heterogeneous, non-linear, multidimensional and non-local, and hence thoroughly entangled with one another. As Whitehead says, 'each volume of space, or each lapse of time includes in its essence aspects of all volumes of space, or of all lapses of time'. It will take us a long while to recover the full intuition of non-local organic space-time, which I believe, our common ancestors used to have, and a number of traditional indigenous cultures have retained it to the present day.

The Naturalistic Ethic of Universal Mutual Entanglement

An organism is a domain of coherent activities, perceiving, generating and structuring space and time. Its boundary is dynamic and fluid, extending and contracting with the extent of coherence. An organism could be an individual, a society, or indeed, the whole earth and beyond. Each organism, in the act of becoming itself; enfolds the environment consisting of other organisms into a unity residing in a 'self', while aspects of the self are communicated to

others. The realisation of 'self' and 'other' are thus completely intertwined. The individual is a distinctive enfoldment of its environment, so each individual is unique. But it is also constituted of others in its environment and simultaneously de-localised over all individuals. The society is thus a community of organisms mutually de-localised and mutually implicated, or entangled. Individuality is relative, for an organism can be part of the life history of some larger, more complete entity. Ultimately, the entire universe is one organic whole constituted of a convocation of organisms that are mutually entangled in a multi-dimensional, non-local space-time of organic processes. That, and that alone can provide the rational basis of a naturalistic ethic: for any act against others is inevitably an act against the self. The awareness of mutual entanglement – the organic oneness of all being – is the guide to coherent, or moral action. It also defines for each and every one a unique role in a participatory universe from whom we draw comfort and strength, and to whom we direct our creative action and love, which is at the same time, the fulfilment and love of self. We are, so to speak, at home in the universe.

The naturalistic ethic is thus integral to participatory knowledge, which is a way of life. Ethics is not something separate, to be grafted on to a knowledge system divorced from life, which therefore vehemently denies there can be such a thing as a naturalistic ethic. The currently dominant ideology is neo-Darwinian sociobiology. It tells us in no uncertain terms that we are really selfish bastards even when we are apparently good. Freudian psychology dovetails neatly with that view, and both are completely in line with the usual interpretation of the biblical account of the fall from grace: we are all branded with Original Sin. So, how can we be good? We can only frighten our children into submission, into behaving *as if* they are good by threatening them with punishment from father, and ultimately, God the Father. Fortunately, people *are* really good, and even though they have been misled into evil by alienation and ignorance – and organised religions of all kinds have a lot to answer for that they can recover their indigenous 'goodness' through knowledge that they can feel and think out for themselves, and not just depend on the pronouncements of prophets or gurus.

The most significant development of contemporary western science is thus a re-affirmation of indigenous participatory knowledge at the 'fundamental' level of physical reality. It is the knowledge of universal, organic wholeness which is consonant with individual as well as collective experience, and that is how meaning is possible. Meaning depends on something deeply felt, that is communicable to other beings entangled with our own being. Words are not for naming or defining things. They are potent signs for invoking a shared reality which we never cease to participate in creating. And as reality is created and enriched, so too is meaning. A significant sign shapes and reshapes its content, which in turn conjures new signs. Reality is meaning, and meaning, reality. There is no 'objective' reality apart from us, just as we have no meaning apart from nature.

The participatory knower, therefore, acknowledges her power to shape and transform reality, and hence also her responsibility for the knowledge, always guided by an ethic of universal oneness that needs no external schooling. There is no piety involved in participatory knowledge, for it is above all, joyful, playful and spontaneous. It is always innocent, because it has no motive other than that it stems from our desire to know the breadths and depths of nature ever more intimately, and in countless ways to express the deep delight of mutual entanglement which is the well-spring of all creative action and understanding. Participatory knowledge knows no bounds nor boundaries. There is no fragmentation into disciplines, no demarcation into secular versus sacred domains: it is at once sublime and practical. It is one, and integral to life. By living our life as parent, builder, gardener, labourer, artist, scientist, all, we participate in celebrating and creating reality.

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References

- Ho, MAE-WAN (1993). *The Rainbow and the Worm – The Physics of Organisms*, World Scientific, Singapore.