chen, also weder innen noch außen lokalisierbaren menschlichen Wesenheit. Das «niedere» Ich erfährt sich im Körper zentriert und erlebt das Paradoxon, das «höhere» Ich weiß: «Willst du dich selbst durchschauen, schau in die Welt.»

Georg Maier

Ervin Laszlo: The Creative Cosmos – A unified science of matter, life and mind
Floris Books, 1993. £19.99

A transdisciplinary cosmology

In his comments on the relationship of science and the «New Age» *Basfeld* identified two broad classifications of books appearing in the last two decades or so concerned with the modern need to make the sciences the basis of a more comprehensive world conception. In short, one class was seen as a combination of thermodynamics and chaos theory and the other as a blend of holistic science and mysticism (*Basfeld* 1987). Although *Laszlo* wants to avoid any mystical elements there is some justification for placing his book «The Creative Cosmos» in both of *Basfeld*'s classifications.

Without doubt, the way in which higher worlds (e.g. etheric) manifest themselves in the world of the senses is a matter of interest to scientists working with anthroposophy. This being so, they may wonder if *Laszlo*'s use of the ether idea will help them with their quest. As the title indicates, *Laszlo* sets out to develop a comprehensive transdisciplinary cosmology. There is hardly a branch of knowledge or art left untouched. The main groupings in the title are treated with equal thoroughness.

Laszlo aims for a whole-field concept of matter and mind rather than the prevalent materialistic-reductionistic approach. His method, though speculative, is based on seeking the simplest possible scheme which not only binds together the observed facts, as *Einstein* would have it, but also helps us to understand how they are generated. Though holistic in his intentions, *Laszlo* approaches the whole by way of the parts rather than vice versa.

His cosmology is built up first of all in the domain of modern physics, which already offers the basis for a broader view of matter and space than either classical physics or «classical» quantum theory alone can offer. In addition to the four fields, gravity, electromagnetism, weak and strong nuclear forces, *Laszlo* provides justification for inferring a fifth which is at the subquantum level of the quantum vacuum, the conceptual descendent of the luminiferous ether. This «psi-field» or «virtual particle ether» has quantum wave-particles embedded in it rather like solitons are in their underlying turbulent medium. Quanta are not only in-formed by the psi-field, but their histories leave a holographic imprint in it, thereby potentially influencing all other quanta.

By making communication in the psi-field nearly instantaneous throughout the

universe, *Laszlo* sweeps away most of the paradoxes of quantum physics, such as nonlocality and indeterminacy. Matter is no longer given primacy, but space itself is the eminent reality, comprising the virtual energy psi-field of the quantum vacuum and its quanta. By ascribing permanency to the information encoded in the psi-field and by adopting the cosmology of *Prigogine et al*, which envisages an infinite series of cosmic cycles, *Laszlo* postulates a basis for the evolution of precisely-tuned physical constants and matter. These he sees as essential for the appearance of life and as having come before it.

The psi-field, says *Laszlo*, not only provides cosmic evolution with the self-referential element essential for communicating the progress made in one cycle to later cycles, but also rules out evolution being determined by mere chance, a process too slow and too divergent to account for the facts. Selection still has a part to play but, as with neo-Darwinism, what drives evolution across thresholds to higher orders of complexity is not made clear. Thus, the psi-field seems analogous to a sort of nonmaterial fluid genome-like information store.

Having postulated the psi-field with reference to modern physics, it is a relatively easy step to apply it to the domain of biology, or is it? Here we come to a major lacuna in the scheme. *Laszlo* assumes, but does not account for the appearance of the domain of biology. He reminds us of the difficulty some have in conceiving life as arising from assemblages of molecules. He even reminds us of *Goethean* archetypes. But he omits to show how his cosmology gets across the threshold from the non-living to the living. The reader is not allowed to assume life is ever present, so what is ordinarily understood by life must be envisaged simply as an increment in the emergence of complexity of both the psifield and its assemblages of quanta. As the threshold from the plant to the animal kingdom is not dealt with either, it must presumably be considered in the same way.

The ongoing problem of biology concerning form, especially in ontogenesis and phylogenesis, arises because the evidence increasingly points beyond the genome as the primary determinant of form. *Laszlo* postulates that the psi-field is the source of the information which is needed in addition to that derived from DNA and physical environment. Wave patterns in the field encode not only form and organisation, but also the organism-specific environment. These patterns are not given once and for all, like *Plato*'s forms, but evolve. The organism is in-formed at the quantum level when certain organic processes enter suitably sensitive states such as those resembling chaos. The conceptual framework of neo-Darwinism is rendered superfluous. But the psifield is not deterministic and conservative like *Sheldrake*'s morphogenetic field. Instead, it permits innovation through massive coordinated mutation. Hence, the scheme accommodates the observed sudden arrival of species.

Interestingly, there do seem to be some superficial similarities between the psi-field and the etheric world. The psi-field is not only immanent within organisms, but also works in the whole cosmos. It is not sense perceptible, even with the help of instruments, but has manifestations within the sense perceptible. It is ever changing, but helps organisms hold true to type. It is not like any of the four main forces of physics, but it informs even these. It is a prerequisite for the appearance of material substance in