

## ECOLOGY.

Comments on Goldsmith.

(Goldsmith, E. "The way: An ecological world-view". *The Ecologist*.18, 4/5, 1988, pp 160-185).

*(Looks unfinished, but included because ecology is now an extremely useful approach to many subjects, not just physical, ME)*

Fred Emery 1990

Goldsmith's 67 theses represents, for him, "a summary of a book I have been writing (on and off) for some decades."p161. He founded the journal, *The Ecologist*, in 1970 and has edited it ever since. We can take it that his theses represent his editorial policy as it has emerged over that period.

Theses 1 & 2. Following the Gaian hypothesis the biosphere AND its atmosphere constitute the ecosphere. He proposes that the study of the structure and function of the ecosphere is the proper unit of study for ecology, not just "the relationship of organisms with their environment". This seems entirely appropriate. Our concern must be with the co-evolution of organisms and their environments and the ecosphere is the common point of reference.

Theses 2 & 3. That ecology is holistic and non-disciplinary. It is clear that ecological studies cannot be pursued within a Formist or Mechanistic World Hypothesis. It does not follow, as Goldsmith suggests, that they can be encompassed within the organicist world hypothesis as represented by Bertalanffy's General Systems Theory. Contextualism shares with organicism an anti-analytical bias without presuming a degree of integration for which we have inadequate evidence.

Theses 5,6,7,8. Ecological knowledge is subjective, subconscious, intuitive and emotional. It is true that ecology must define organism- environment relations in functional terms of what the environment affords to the organisms under consideration and the effectivities of that organism, or class of organisms. It is not enough to describe the environment in the 'objective' terms of physics and chemistry. At the same time our knowledge of affordances and effectivities is objective, not subjective. Adaptive behaviour is mostly subconscious, even with human beings. Neither induction nor deduction adequately describe how knowledge in general, not just ecological knowledge, is gained. Retroduction is a better description than 'intuition'. There is a logic in retroduction; there is only mystery in intuition. Human ecological is emotional in that it deals with the patterning of affordances and effectivities- the emotions signal this pattern before an individual engages in any rational conscious activity. It is most likely the same for any animal that shows emotions. EG's thinking on these matters lack the concepts of affordances, direct perception, retroduction and Tomkin's theory of the affects. As a result, his opposition to what are inappropriate epistemological stances appears to place him with an indefensible mystic/ animistic world hypothesis.

Theses 9,10,11,12. Ecology cannot be established on a cause-effect model; it cannot be established by the study of isolates; it cannot be reduced to linear quantitative equations and its propositions cannot be verified nor falsified. It can readily be granted that ecology must seek to identify the necessary and sufficient conditions for ecological phenomena, not for causes as such. It can also be granted that the study of ecological phenomena in their natural habitat is essential. Thus, for instance, laboratory and test tube studies are necessary to determine how cellulose is broken down within the body of a cow and plot experiments to determine the effect of fertilisers on pasture growth. In the last analysis, however, the feeding behaviour of cattle

grazing in herds on open pasture must be studied and understood. It can be granted that the mathematics applicable to closed mechanical systems is inappropriate to the study of open, goal-directed systems. This does exclude the emergence of concrete logics for the latter (eg Feibleman 1946, 1979) and hence the probable emergence of appropriate mathematics. Fractals, fuzzy set theory and catastrophe theory are clearly inadequate but they indicate a timely and appropriate response by mathematicians to the challenge. As long ago as 1950 Sommerhoff showed that mathematical formalization of goal-directed behaviour was possible. The last matter, that of verification or falsification, is more difficult: whatever we conclude on this matter applies to the total scientific endeavour. EG is correct in stating that, in effect, "truth-seeking science is a delusional enterprise" (Chein, 1972, p329). The scientific enterprise creates a map of our world, and the universe, and it is the utility of this map that we judge. At no point do we enter truths into this map. We only enter the best beliefs we can come to - accepting the possibility that tomorrow may turn up a better truth. "The validity of the map is therefore tested, not merely by its pragmatic utility, but by its internal coherence, implicative structure, freedom from clutter, and comprehensiveness" (Chein,1972,p334). This is close to EG's rejection of traditional scientific beliefs but it is not to say that the fit to an existing paradigm, eg an ecological paradigm, is the ONLY criteria. Despite EG's avowal it is not impossible to ask that a map helps one to get from here to there, with minimal fuel consumption. We do it all the time, and quickly note the ambiguities, lacunae ?????? eps from closed systems to open systems and to ecological representation can be set forth quite si his "Instincts of the Herd in Peace and War", namely, that A and B are of the same species and hence are:

a) specially sensitive to the behaviour of their fellows, and b) they will tend to resist separation from their fellows. Interest does not necessarily imply anything about physiological drives.

A time ordered series of four properties emerge within an ABX setting:-

1. The ABX setting presents an objectively ordered field open to both participants.

(Emery