

Wolfgang Schad

Wolfgang Schad's splendid, two-volume study *Threefoldness in Humans and Mammals; Toward a Biology of Form* (Adonis Press [2020]) is actually a greatly expanded second edition of a work (*Man and Mammals*) dating from 1977. It is a profusely illustrated text, with numerous photographs of animals in the wild.

The approach is fundamentally Goethean, in that it focuses first on the phenomena themselves, only gradually moving to conclusions based on arranging the phenomena in such a way that they "light up" and become transparent to their own theory. Schad very consciously takes Goethe as his model, quoting him often – if anything, perhaps too often.

But the approach is also anthroposophical. Following Rudolf Steiner's threefold division of human nature, Schad seeks to find the same basic threefold division within the biology of mammals: animals that have principally a nervous and sensory orientation; animals that have a predominantly rhythmical organization; and animals that have a fundamentally metabolic character. A further sub-division is into rodents, carnivores, and ungulates:

“Rodents	carnivores	ungulates
sense-nerve functions	rhythmic functions	metabolic-limb functions
predominate	predominate	predominate” [37]

Similar triads can be observed in the foods that each group favors [40] and in dentition [41]. Especially revealing are Schad's remarks on an eminently phenomenological attribute, coloration [674-676; 681].

Gradually working through the various triads, Schad arrives at a number of generalizations. For example, we can predict whether a species will be *altricial* (born in an undeveloped state and requiring much care and feeding) or *precocial* (born in an advanced state and requiring little aid):

Thus a threefold analysis easily integrates all previously unexplained exceptions. In fact, it is just these exceptions that confirm the relationship we have identified between overall constitution and specific biological details. We can formulate it as follows: Whether a newborn mammal is altricial or precocial tells us much about the fundamental characteristics of its prenatal development and its life as an adult: *Altricial species will develop sense-oriented constitutions, while precocial species will be dominated by their metabolism* [1008].

Or we can predict which species will evolve spines: “We can therefore establish a broad morphological rule that, *when a species belonging to a group that is primarily*

open to its surroundings closes itself off from its environment, it tends to develop spines” [798].

The first chapter is devoted to methodological questions, and deserves deeper attention. Here Schad is eager to differentiate his approach from two others, one older and discredited within biology, the other very much alive. He associates each of these methods with a temporality: teleological with the future, causal with the past, and the third – let us call it “phenomenological” – with the living present. Schad rightly dismisses teleological explanation in biology, pointing out that it is appropriate only for psychological phenomena such as willing, desiring, etc. Any biological explanation that seeks to explain characteristics as having future utility (e.g., sheep have wool so that we may have fine sweaters) is hopelessly naïve. Causal explanation cannot be dismissed so readily: indeed, it is the dominant mode in conventional biological research. Nevertheless, both of the first two modes of explanation are inadequate: “Causal explanation leads to a reduction of life to the physico-chemical level. Teleological interpretation tends to project psychological elements into biological phenomena and therefore easily leads to a false anthropomorphism” [711]. Only the third, the phenomenological, avoids both pitfalls: “A biology of form, however, does neither; it seeks rather to understand the phenomena and the processes of life as they express themselves” [711].

In a remarkable chapter, “Death in Mammals,” Schad carries this threefold distinction to an extraordinary conclusion. Even in their ways of dying, we discover a great polarity between the sense-oriented and the metabolic mammals, with the carnivores balanced in between. Rodents have weak constitutions and death comes easily to them, whereas the enormous vitality of ungulates leads them to resist death as long as possible. Carnivores are equally exposed to life and death; they have an active relationship to death as well as life. Moreover, especially the ungulates are overcome in the moment of death by a kind of stupor, which enables them to experience death without pain.

This perspective, which actually observes dispassionately what happens in nature, allows us to look on death in mammals without the usual anthropomorphic projection of the human fear of death and suffering. This projection of anthropomorphism is also Schad’s principal critique of Darwin.

He begins by pointing out a deep paradox in our relationship to nature. Intellectually, we are frightened and offended by the cruelty of nature, following Darwin’s lead. Yet when we seek peace and recreation, we “take refuge in pristine nature” [1144]. Clearly there is a discrepancy between our intellect and the deeper layers of our psyche that needs to be resolved.

In fact, Darwin’s interpretation of evolution as a “struggle for life” is not based on the dispassionate view of natural phenomena. It is instead a highly anthropomorphic projection, very much like the justly rejected notion that nature has a *horror vacui*. The “horribly cruel work of nature,” as Darwin called it, “is a

projection of human sentiment into the animal world" [1144]. But then the anthropomorphism was turned around, and used to justify a horribly cruel view of human nature in the twentieth century.

The profoundest aspect of this two-volume work is its discussion of mammals in relation to space.

Space is not the abstraction of an empty vessel that contains the world (Newton), nor just a subjective way of viewing things (Kant). It is the phenomenon of the natural world that mathematicians from Riemann to Weyl and physicists since Faraday and Maxwell with their field theory, and especially since Einstein, have been investigating. The approach taken in this book is that the full reality of space can only be grasped as it manifests in living organisms. Insight into the threefoldness of the organism provides a perspective from which we can begin to formulate meaningful questions regarding the relationship between life and space ... The biology of form becomes the interpretation of the way living organisms express themselves as they interact with what we call space [31].

It is particularly instructive to compare the development of animals with that of plants. "The sequential transformation of leaves along a plant's stem takes place primarily in time, but comparable phenomena in animals are much more strongly spatial" [994]. Successive vegetable forms are added in time, but the development of animal organs is intrinsic, as each individual organ remains in place and metamorphoses slightly as it develops. Thus the animal exhibits a specific spatial form that renews and adjusts itself.

The underlying three-foldness of the animal kingdom gives rise to the specific shapes one encounters:

The main function of the nerve-sense pole of any animal is attentiveness, directed toward an object in the surrounding world. It is this outward orientation of the senses that gives most animals their long, pointed muzzles. The metabolic system, by contrast, is primarily oriented not toward any outer goal but toward the expansion of its own form in space. It lives entirely within itself, physiologically creating its own substance, and morphologically shaping its own space [584].

The basic processes supported by sensory and metabolic mammals occupy space in fundamentally different ways. "*Space is not an empty vessel that can be filled arbitrarily by any kind of process. Every life process prefers, or creates for itself, its own specific kind of space*" [584-585].

And finally, mammals are inseparable from their environments. Indeed, the animal's constitution allows us to predict its environment. A long argument can be summarized as follows:

Sense-dominated mammals live at the surface of the ground –
nerve-dominated ones live in burrows and caves.

Sense-dominated central mammals live in trees or mountains –
metabolically-dominated central ones live in water and swamps.

Limb-dominated mammals live on wide open plains –
metabolically-dominated mammals live in huge bodies. [706]

This symbiotic relationship is much closer than is usually assumed [1142].

Schad writes that the biology of form is still in its early stages, and thus his volumes are not intended as a textbook, but simply as an introductory outline to be developed further [712]. Nevertheless, comparison with a conventional textbook is illuminating.

I choose quite randomly the seventh edition of the textbook *Vertebrate Life*, by Pough, Janis, and Heiser (2005). The relevant section for comparison is Part IV on mammals (pp. 486-959). After giving a highly abstract definition of “mammal,” “respiration with the diaphragm, hair that provides insulation, high metabolic rates, teeth with complex surfaces that process food efficiently” [486], the vast proportion of the text is given over to the evolution of mammals, just as one would expect given the predominantly causal explanatory paradigm that prevails. The ironic upshot of this development, however, is that an overwhelming percentage of the discussion remains hypothetical. Because of gaps in the evolutionary record, scholars can only guess at the actual processes of development. Indeed, the two most salient features of mammals, hair and mammary glands, are not recorded in the fossil record at all [501]! Or take the properties of milk, which are discussed in great detail by Schad. Instead, the textbook speculates that “the original use of milk might’ve been for protection of the eggs in a nest against microorganisms” [504] – even though there is not one bit of evidence for this to which one can point. Compared with the richness of detail, and the abundant evidence Schad gives for every conclusion, the textbook is in the end speculative and highly disappointing.

Many mammals show a high degree of specialization, and thus they might be considered more evolutionarily advanced than humans. Certain species have evolved to a high degree of perfection, as for example the bovines.

Cattle give physical expression to the importance of the nourishing, life-giving, and regulating functions of digestion. It is this power of metabolism that continually creates and sustains life on Earth. Because of the powerful, harmonious nature of their digestive system, an abundance of life and contentment emanates from these animals. Each of them protects and nurtures within itself an entire world. Secure in itself, the cow radiates security into its surroundings. Ancient cultures actually experienced these

qualities in cattle and therefore worshiped them, and some still do today. For cattle represent the peak in an evolutionary progression toward ever more fully embodied life. It is with justification, therefore, that cattle are placed today very near the end of the system of animal classification, or phylogeny, the evolutionary history of the animals. The cow, as a purely metabolic animal, so completely masters and controls the transformation of matter through its symbiotic digestion that it is able to give full expression to its own being within the material world. While rodents impress us as unfinished, somehow juvenile, animals, the ungulates, and particularly the bovines, present themselves as fully developed “adults” [375].

Yet this evolutionary perfection has been attained at great cost in relative freedom vis-à-vis humans. It is extremely important that we not engage in anthropomorphism in imagining that animals in the wild state are “free”:

We need to remind ourselves repeatedly that life “in the wild” does not constitute freedom for animals, for their behavior is based for the most part on inborn and habitual patterns. Anything unfamiliar causes a stressful degree of emotional uncertainty. Left to their own devices, many antelopes will not abandon their ancestral paths. Any deviation of more than a few meters is upsetting to them. What we sometimes mistakenly think of as the freedom of life in the wild actually consists of countless self-imposed, invisible “cages” ... [495].

Mammals have made important strides towards emancipation from their environments relative to other animals. Greater behavioral inwardness is part of the very nature of mammals, and in this they are more closely allied with humans. Birds, for example, are less separated from the external world around them; their singing is intimately linked to certain times of day and to the changing seasons. “In contrast, large mammals have evolved to the point of actually embodying their own inner subjectivity. They move about freely and bellow, bleat, moo, or screech whenever they feel inwardly moved to do so” [833].

Humans have of course taken this independence from the environment to the ultimate degree – so much so that many of us feel completely alienated from nature, bound up entirely in our subjectivities and abstract thought processes. But out of this freedom we are able to begin to find our way back – as Schopenhauer has done – towards restoring a balance with our environment. Indeed, the very survival of the human race depends upon this.