

Architecture of the Essential: Ecological Functionalism of Animal Constructions

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“The bird nest is absolute Functionalism, because the bird is not aware of its death.”
– Sverre Fehn, Architect, Pritzker Prize Winner 1997

To a human builder, the subject matter of animal architecture may sound as a charming curiosity that does not, however, justify serious thought or research. But a deeper study of animal building behaviour reveals astonishingly refined structures and complex ‘architectural’ principles. In terms of precision, animal constructions often surpass human skills of construction. But many animal structures also surpass human structures in relative size when the body size of the builder is compared to the size of the structure. It is evident that the structures animals build for themselves and their offspring are just as essential for their existence as architecture is for us. Animal constructions serve the same fundamental purpose as human constructions; they alter the immediate world to the benefit of the species by increasing orderliness and predictability of the habitat. The constructions improve the animals’ or their offsprings’ chances of survival and reproduction. The importance of nest building becomes apparent when one compares, for instance, the different numbers of eggs various species have to lay in order to reproduce successfully, depending on whether they construct a shelter for their eggs, and how efficient this architectural protection is. Many of the structural and functional achievements of animal construction are examples of astonishing perfection. The merciless struggle for survival, through millions of years of evolutionary development and adaptation, has developed animal constructions as flawless responses to their life conditions.

Our conventional concept of architecture is restricted to the building that has taken place over roughly five thousand years of western high culture. In the past three decades, however, the attention of architects has turned towards the wisdom and beauty of the building traditions among the highly diverse indigenous human communities beyond western culture. Could we perhaps also have something to learn from the ecological adaptations of animals’ buildings? The Human art of architecture is oriented towards aesthetic communication rather than biological survival. Altogether, the ageless bio-cultural ingredients of human construction and behaviour have all but been forgotten in today’s theories of architecture.

Animal constructions meet the same kind of functional needs as human architecture. Animals have developed many inventions familiar to us from our own construction: roadways (ants), covered streets (termites), deep wells (termites), heating and moisture regulation systems (termites, bees, ants and others), stairways and ramps (termites), and hinged doors with handles (trap-door spiders).

Animal constructions open up an important window on evolution, tradition and ecological adaptation. Human behaviour and construction have become dangerously detached from their ecological context. Our architecture is always doomed to compromise in its functionality,

because we also seek to represent our world symbolically in our construction. Human architecture is always more dictated by cultural, metaphysical and aesthetic aims than by pure functionality and reason. ‘Architecture is not only about domesticating space’, writes philosopher Karsten Harries, ‘it is also a deep defence against the terror of time. The language of beauty is essentially the language of timeless reality’. Or, as the young Alvar Aalto put it: ‘Form is nothing else but a desire for eternal life on earth’. But is the human race paradoxically endangering its earthly survival by turning its subconscious interest on eternal life?

Further efficiency and sophistication are clearly the goals of the evolutionary processes of animal architecture. Animal buildings even fulfill strict criteria for economy and efficiency through minimizing the use of material and labour. Certain animals, such as spiders and some wasp species, eat their structures in order to reuse their building material. The capture net that certain spiders eat, bypasses their digestive system and re-enters directly the silk glands and spinnerets; this short-circuit prevents the unnecessary breaking down of proteins. Animal architecture teaches us that a proper way towards an ecologically sound human architecture, which is urgently called for today, is not through regressing back to primitive forms of construction, but through extreme technological sophistication. But this architectural refinement needs to be ecologically grounded, not merely aesthetic or metaphorical. Evolution works towards ever subtler refinement, not backwards. Animal architecture provides support to the functionalist belief of an interdependence between reason and beauty. More importantly, however, the unsurpassable marvels of animal construction should teach all of us a welcome sense of humility.

The development of animal constructions towards increasing efficiency reveals an evolutionary principle, the fundamental ethos of architecture, that human builders rarely consciously acknowledge. ‘Touch the earth lightly’ is the lesson of Glenn Murcutt, one of the pioneers of ecologically oriented architecture.

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