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Evolution and Spatial Symbolic Behavior

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It is clear that something occurred along our ancestral line which distinguished us from other animals. Hominids became capable of more than just animal-like reactions to circumstances. The faculties of intuition, creativity, consciousness, symbolism, abstraction, and knowledge representation that sets our genera and species in a class apart from all others in the animal world emerged. This paper suggests that conscious concerns with location and the symbolic representation and communication of spatial knowledge are fundamental to the dispersal and development of the human line.

Spatial knowledge involves a complex set of sensory data, consciousness, and analysis of spatial information. Both a sense of 'locational awareness' and of 'self positional awareness' are necessary. One possessing acute spatial knowledge can recognize certain landmarks or features which indicate to them a given location (locational awareness) and they are aware of where they are relative to that location (self positional awareness).

The level of complexity increases when a person is cognizant not only of their location but of other locations. Initially, this information is stored internally in their memory but later, if circumstances warrant it, it can be stored in external symbolic systems. One form is a map. The negative of this is also important. Humans can differentiate the locations and landmarks of where they are from where they are not. They retain this awareness even when they are no longer in direct contact. For the purposes of brevity, the terms 'other locational awareness' and 'other positional awareness' describe these concepts.

One of the most common human traits is the attempt to communicate spatial knowledge to another person. For this to fully occur the previous concepts have to be expanded. Other person locational awareness' and 'other person positional awareness' are necessary additions to the previous concepts of 'other locational awareness,' 'other awareness', 'self locational awareness', and 'self awareness'. For one to be able to convey direction, one must be able to perceive not only where one is but where the other is and their destination. The communicator provides new symbolic spatial information about landmarks and coordinates that hopefully helps the receiver along the way.

Hominids recognized this type interaction during a very early period. By the early Paleolithic, the record shows that they were able to use such complex spatial knowledge and their symbolic representations relatively easily. The evidence is embedded in early tools and early sites. The process of getting a flint cobble from a riverbed, placing it in a position

where it may be hit with a hammerstone, hitting it with a hammerstone, keeping and using the tool and discarding the debitage is a basic but important example of hominid manipulation of causality. Causal sequences have spatial dimensions. When people use these causal systems they make abstract and conscious use of spatial concepts. Early hominid tool making required an understanding of location and time. The fact that, prehistorically, there are stylistic similarities spanning extended time and distance is a clear indication that hominids did successfully communicate spatial information.

For early hominids, the conscious knowledge of location and the ability to represent and communicate spatial information was advantageous for the predators in predator/prey relationships. By putting oneself in the place of the prey one can predict and give oneself advantages over it. Therefore, a conscious ability to manipulate location may very well be a predator/prey advantage for human predators, even when the prey was ourselves (same genera-same species) or variations of ourselves.

For our remote ancestors the specific ability to analyze sophisticated spatial data was a selective advantage. This ability to understand locational phenomena might have been originally site specific. The more spatially and geographically generalized it became, the more evolutionary and culturally advantageous. There is considerable advantage to move from the step of taking shelter in a particular area to knowing that one may take shelter in any location that has similar characteristics. Building shelters, making tools, following game, moving on paths, or gatherings on an annual round are each improved by the process of generalizing location.

It could (and has been) be argued that hominids possessed no major physical advantages which allowed them to contend with their physical environment and competitors. In spite of this, hominids have not only survived, but they have thrived. In the case of human ancestry, this has been mainly attributed to a level of cognitive development well above that of other species. This development has allowed us to rise above all other competitor species and to manipulate our environmental situations towards our suitability. We are suggesting that one of the most fundamental manifestations of this cognitive development is the human ability to recognize, process, and communicate complicated spatial information. This spatial ability allowed humans to enact advanced casual sequences which have led to a tremendous increase in technologies. This has also allowed human to achieve the broadest spatial adaptive radiation of any species.