

Tubular, dude!

The first in a possibly brief series of metaphors drawn from biology. The only rule: that they have no conceivable practical application.

At the International Conference, Professor Maitland spoke of cylinders and their significance in human form: any twisting or bending along the circumference results in a shortening along the axial line. Enter the Rolfer.

We are all familiar with the structural image of cylinders within cylinders from Emmett's models we have used for years. But it reminded me how our entire microstructure is also built on interlocking networks of cylinders.

Consider: There are three nets inside us (and only three) which extend throughout the whole body. If we could magically extract any one of them intact, each would reveal our exact body shape in full: the network of nerves, the network of blood vessels, and the fascial network of collagen fibers.

Why these three nets? Each and every tiny area needs to be in sensory contact with the nervous system to report-in to Action Central. No cell can be more than four cells away from a blood capillary, its connection to the "internal sea". And without the set of fascial webs and sacs, we would all be a puddle at our own feet!

Note that each system is a set of cylindrical tubes. The ubiquitous neuron relies on the ionic conduction across its membrane, stretched into a long tubular shape. The blood and lymph vessels are obviously tubular, the better to keep them erythrocytes a-workin' on the straight

and narrow. Also revealed as tubes are collagen fibrils, with a hollow core that Erlingheuser suggests is filled with cerebro-spinal fluid, posing an interesting, unexplored circulatory function for connective tissue.

Note also that each set of tubes is constructed in a different way: the blood vessels are made up of many cells, the neurons are themselves cells, and the collagen fibers are a cell product; but even so, each has found the cylindrical form suited to their varied functions.

And note finally that each set of micro-cylinders is a communicating system: the nerve tubes communicate any information which can be encoded and do it on the order of seconds. The circulatory vessels communicate chemical information all around the body and works on the order of minutes to hours. The liquid crystal fibrous mesh of collagen communicates mechanical information (tension and compression), and is the slowest of any of these systems, with compensations and responses taking anywhere from days to years.

So, wherever you lay your hands, cylindrical tubes are running every which way to tell the rest of the body about it, each with their own voice. These ruminations lead us to wonder (next time) about the intrinsic advantages of cylinders, as popular in morphology as "love" is in songs.

- The Druid