The body-plan of *Dickinsonia* and other Ediacaran organisms has been interpreted as a series of fluid-filled cavities surrounded by thin membranes D. Seilacher. This structure is equivalent to a multiple pneu (*i.e.*, a set of flexible membranes enclosing spaces kept under hydrostatic pressure). An alternative way of studying the properties of multiple pneus is by analogy with a foam, *e.g.*, a set of soap bubbles in reciprocal contact.

This analysis starts with the assumption that the optimal shape for *Dickinsonia* is flattened, with all its pneus co-planar (*i.e.*, which is reasonable for an elongated epifaunal organism lying on the seabed, and is in fact the normal morphology of fossil specimens). In this context, the simplest multi-pneu configuration has a uniserial row of bubbles strung along a straight axis. A flattened structure can be obtained by adding additional series of pneus on either side. Unfortunately, a uniserial row of pneus is a poor choice as the “vertebral column” of a flattened structure, because this configuration allows it to both bend and twist.

The next step toward complexity is a biserial row of bubbles. This can be implemented as two uniserial strings of bubbles joined side-by-side. A biserial row can have either a bilateral symmetry, or a staggered symmetry. In the former case, four bubbles share the same corner along the central axis of the organism. In the latter, only three bubbles share a corner.

By observing a foam, it is easy to see that the case of four coplanar bubbles sharing a corner cannot occur if the bubbles are free to reposition themselves. In such a case, the final configuration will be a lowest-energy, stable one, *i.e.*, one that minimizes the deviation of each bubble’s shape from spherical. Thus, 90° angles between bubble walls that share a corner are less stable than 120° ones.

Two alternative events take place in this case: (1) two of the four bubbles, on opposite sides of the cluster, lose contact with each other (*i.e.*, the configuration shifts into two separate corners, each shared by three bubbles, or (2) the four bubbles shift into a tetrahedral (*i.e.*, non-coplanar) arrangement. This configuration keeps a central corner shared by all four bubbles, but the angles between shared faces around this corner become 120°. A further analogy can be made with the sp3 orbitals of carbon, which also have a tetrahedral symmetry because the electrical charges in each orbital repel equally those of the other orbitals, and this arrangement maximizes their reciprocal distances (*i.e.*, it is a lowest-energy configuration). The latter configuration is not relevant to a coplanar structure, while the former can retain its coplanarity. By adding more bubbles to this configuration while keeping its character intact, one can indeed end up with a staggered, biserial and flat structure. Although the membranes of pneus and Ediacaran organisms have a finite elasticity and cannot be endlessly stretched and twisted like bubble walls (which are fluid, rather than solid), the above argument applies also to solid membranes, in that minimum-energy geometries impart less tension to all types of membranes.

This idea needs to be verified in *Dickinsonia*, as well as other Ediacaran organisms. This concept may prove useful, for instance, to understand the triradiate symmetry of *Tribrachidium. Charnia* appears to have implemented a similar constructional principle, but in the context of a branching, rather than bilateral geometry. One may also ask whether *Pteridinium*, with its three vanes, requires a different axial arrangement of pneus than *Dickinsonia*. Preliminary observations of *Pteridinium* do indeed show a staggered symmetry between two coplanarly preserved vanes, but it is difficult to assess how the third vane relates to these.