

Are we in a looking glass world?

Nine tenths, or thereabouts, of people are right handed, says **S.Ananthanarayanan**.

This seems to be explained by saying that dexterity is controlled by the left-brain. But does it not suggest a basic asymmetry in the way we are made?

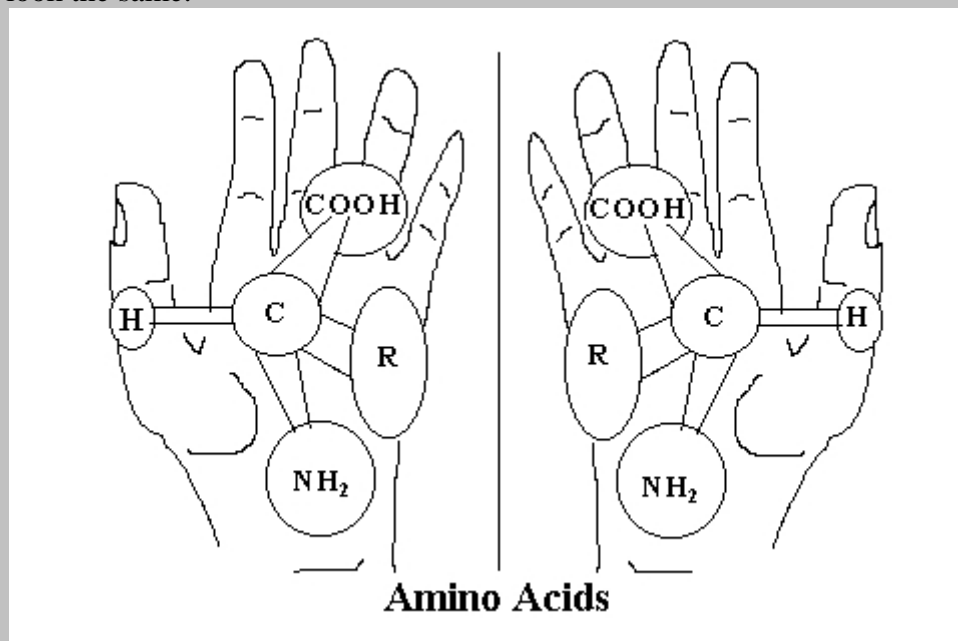
‘Handedness’ in nature

There are other instances of ‘handedness’ in the nature. The spiral motion of cyclones, for example. Cyclones in the northern hemisphere spiral anticlockwise, while cyclones in the southern hemispheres spiral clockwise. This in fact, is because of the rotation of the earth, which makes air blowing towards either of the poles drift towards the east. This makes for opposite senses of cyclones in the two hemispheres.

But other instances of ‘handedness’ are not as easily explained. It has been found that seashells are almost all formed in only one sense and even in the forms of molecules that participate in life, there is a definite orientation that is different from its mirror image.

Symmetry

‘Handedness’ has to do with symmetry. We have to be either left or right-handed because we are not the same from back to front. If we were, turn a right-handed person half way around and she would be left-handed. But because of the way we are, we need to be half-turned around twice to look the same.

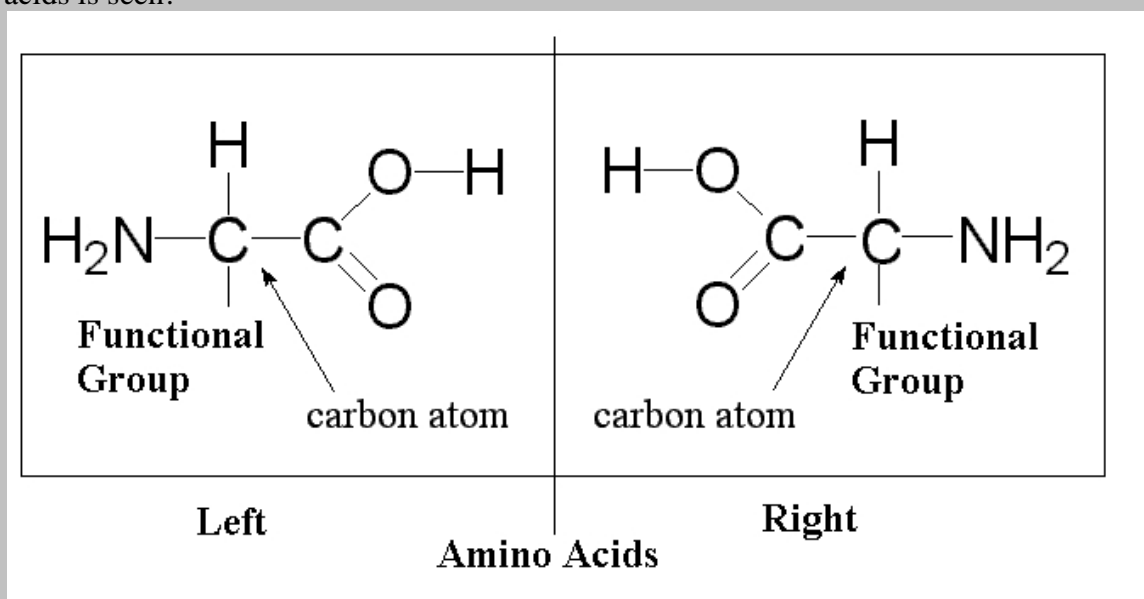


This is the reason that the reflection of a right-handed person in a mirror becomes left-handed. But the reflection of a thing that stays unchanged on being turned around does not change on reflection.

Many crystals and organic molecules also exist in both mirror image forms. But in many 'asymmetric' molecules, the two forms are distinct. It is like a pair of gloves, they are mirror images, but they cannot be interchanged. Among molecules, important examples are amino acids and sugars.

Amino acids and sugars

There are twenty of the complex amino acid molecules that form the building blocks of all the proteins found in living things. Most amino acids can exist in two forms, one left-handed and the other right-handed. When amino acids are synthesized in the laboratory, both forms are generated. But in living things, as components of protein, only the left-handed version of amino acids is seen!



Why life has evolved in this way is a mystery still. In the primordial soup, when amino acids were first generated, both right and left-handed versions must have arisen equally. One theory is that the origin of life may be extra-terrestrial, and only left-handed amino acids came in. And there are theories of how this could have happened. The two versions of chemicals have different effects on, and reaction to, a form of light called polarized light, or to light when they are under the effect of magnetic fields. The theory is that particular emission of polarised light or magnetic fields, in some distant past may be responsible.

Sugars also display 'handedness'. Both forms arise equally, but living things use only the right-handed form. The left-handed form is also sugar, and behaves chemically like any sugar, but is of no use to living things for energy. This quality finds a ready application in the use of left-handed sugar as a sweetener for diabetics and weight watchers!
