Where Do Bodies Come From?

By S. Lee

Human ontogeny (the development of our bodies as a time sequence) is an extremely complex and specialized study. However, when looked at in terms of general principle it is childishly simple.

Man's earthly body is a unity. Like all unities it has a drive to realize the possibilities inherent within it. It therefore reveals itself in diversity. The one becomes many. The zygote (fertilized ovum) becomes a body. This developmental process can be analysed into three sub-processes: multiplication/division, differentiation/separation and interaction/structure.

The first sub-process is one of growth whereby one unity becomes many unities. This process is one of multiplication - one cell giving rise to the ten billion or so of the adult body. This occurs by a process of division within the initial cell. By a process known as differentiation the cells take on their various specialized functions and migrate to their separate locations. Interaction between different cell types generates an increasingly complex yet integrated structure. The precise details of all this are of course extremely complicated.

In Saros Philosophy we have chosen to formulate the three sub-processes as simply as possible using straight-forward number sequences. Multiplication/division can be symbolized 1, 2, 4, 8, 16 ... This is the simplest form of replication imaginable. One splits to become two. These two each split in their turn giving four and so on. Interaction can be symbolized by the sequence of numbers one to ten since our counting system is a decimal one involving interaction between ten basic entitles. The generation of levels of structure can be symbolized by arranging the ten in a diagram popular with certain ancient Greek philosophers (the tetraktys). This shows four levels arising out of a pattern of ten entities:

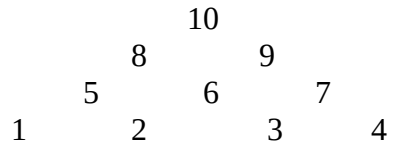

Fig. 1: The Tetraktys

Differentiation/separation can be symbolized 1, 3, 6, 12. One is the initial unity. The simplest form of differentiation imaginable is into two types, there will of necessity be a relationship between the two since they share a common origin. This is the level of three: Relationship between two principles. These three "forces" can be arranged in six permutations. These permutations or "orders of action" represent the next stage of differentiation. A further stage can be represented by plotting the six as points equidistant on the circumference of a circle. There are twelve ways of joining the six points.

It so happens that the actual process of division in human development follows the same numerical pattern as our symbolism. One cell splits into two. These two each divide in turn giving a total of four cells. This process continues until a hollow ball of cells is formed like a

ripe blackberry (the Morula). At this stage the process of cell differentiation becomes apparent. The cells become sorted into three “germ layers” - an outer ectoderm, an inner endoderm and between the two a mesoderm. From these three layers all the structures of the adult body will be derived. From the ectoderm the skin and nervous system. From the endoderm the gut. From the mesoderm the skeleton, muscle and blood etc.

All these structures are composed of a number of basic cell types. The body contains a huge variety of cells and any classification is to a certain extent arbitrary. The usual classification is into four groups: neurons, muscle, epithelium and connective tissue. The last category is something of a rag-bag consisting of anything that can’t be put into the first three specialized groups. I therefore feel quite justified in subdividing it into three giving an overall sixfold system.

The six categories I suggest are nervous tissue, muscle, epithelium, diffuse tissue, gametes and connective tissue. All six I hope to argue are structurally and functionally distinct cell types specialized in different directions.

Nervous tissue is specialized for the transmission of signals. Structurally by being elongated into long cell processes analogous to telephone wires. Functionally by having variable electrical potentials across the cell membrane which carry the message.

Muscle is specialized for movement. Cells are elongated and consist of fibres which are capable of contraction and expansion.

Epithelial tissue is specialized for forming the surface of the body. It forms the skin and lines the nose, throat and guts etc. This type of cell is typically oblong in shape. Cells occur side by side resting on a thin “basement membrane”. Some epithelial cells found in the glands of the body are modified to manufacture secretions.

As its name implies connective tissue fills in regions of the body between the other specialized tissues. Cells of this tissue come in a variety of shapes and sizes. Some are long and fibrous and play a structural role. Some are round and oval and store fat. Others undergo mineralisation and form bone.

Diffuse tissue differs from the other types mentioned so far in that the cells are free to move independently rather than being aggregated together (hence the term “diffuse”). Into this category can be placed the red and white blood cells. The former are specialized for carrying oxygen to other tissues. The latter are concerned with the body’s defence mechanisms.

The sixth category is that of the gametes. These are cells which are specialized for reproduction. There are two types. The female ovum is spherical and contains a food supply of yolk. The male sperm is provided with a tail which enables it to seek out the ovum and fuse with it.

In Saros Philosophy terms the tissues can be seen as six orders of action: bounding (epithelium), joining/supporting (connective tissue), expanding/contracting (muscle), transmitting (neurons), translocating (diffuse tissue), and perpetuating (gametes).

Tissues may be aggregated into organs (eg the heart, lung, brain etc.). An organ may be composed of more than one tissue. Tissues and organs comprise the functional systems of the

body. One possible twelvefold classification would be: support, movement, digestion, respiratory, waste disposal, storage, internal transport, internal coordination, manufacturing, interaction with the external environment, defence and reproduction (see fig. 2).

Figure 3 shows the process of interaction/structure in the developing embryo. The first level is that of individual cells (I). These differentiate and interact (E) according to an instinctive pattern. The developing complex is modulated by conditioning from external factors (C). Thus the body as a whole functioning system (A) is a product of both the pattern instinct in the first cell and external conditioning. IE, EC, EA indicate that interaction, conditioning and the ability to function as a complex system are inherent in the single cell.

In Saros Philosophy we have attempted to formulate in the simplest way possible the main principles inherent in any universe perceived by a human observer. In this brief essay I hope to have demonstrated that the results of this intellectual and intuitive experiment can be related to the development of our own bodies. Indeed, it could be argued that in rationalizing our experience we project our own internal structure. If one wishes to orientate oneself in an age which has seen an unprecedented increase in information this ability to formulate general principles which accord with our own nature will be of increasing value.