Letter from the Embryo

My Circular Life

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ABSTRACT *The article provides a biodynamic account of embryology with specific focus on polarities such as the relation between the embryo and its environment and that between process and form in organ development.*

In the very beginning, I, the ovum, accept an impulse, the sperm, and then together we ride out our developmental wave to the shore. From deep down we access a memory bank called DNA that allows us to apply quite amazing skills. And with this metabolic fulcrum we just swim along, observing metabolic gradients and obeying physical reality, responding in our own way to every external demand and question we encounter with our whole being by orienting ourselves to the guidance of the environment.

As a unified cell I ride out a circular life on circulating fluids.

Let us begin with principles.

The amazing molecular stability of our nucleus-DNA provides 'stored' biological information (*genetics*). When this genetic information is expressed and externalized it is transformed into applied in-formation, initiating and guiding directed, fluidic cellular processes (*microbiology*). When the results of these informed activities are externalized onto cellular surfaces (*physiology*) they meet our immediate environment (*epigenetics*).

The cellular surface is the manifold where directed metabolic processes meet the external world:

Genetics > Microbiology > Physiology > Environment.

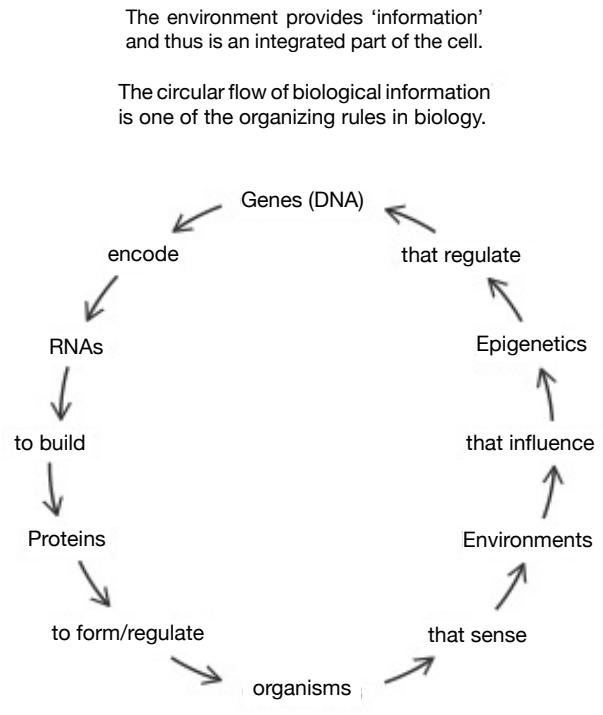

Figure 1: My simple life is embedded in circular processes. The environment provides 'information' and thus is an integrated part of the cell. The circular flow of biological information is one of the organizing rules in biology. Image by the author.

This directional movement can be looked at from the other side as well.

The world as *environmental field* is a flow of unending questions that importunately press upon the cell from its periphery. The cellular membrane is thus 'im-pressed' by all kind of questions (temperature, tension, pressure, molecules, radiation, any kind of information or 'energy'), which it relays, as 'in-formation,' inwardly to the cytoplasm. The cytoplasm is a *relational field,* translating and transferring the external questions to the nucleus by way of integrins and other kind of cytoplasmatic makeup. The nucleus then 'ex-presses' an answer, originating and pulled from a stunningly stable memory-bank (DNA).

In this way directed metabolic processes are described the other way around:

Environment > Physiology > Microbiology > Genetics.

My simple life is embedded in circular processes (see Figure 1).

The simple life of me, the embryo, in my individual developmental movement, also obeys and applies primary circulatory principles – I just raise them to another level of organization. Manifesting form into a body-structure is essentially dependent on circular processes.

The development of the embryo is composed of growth, differentiation, and maintenance of the structural components at all times. As the molecular substances needed for this constructive building activity are provided by the body of the maternal 'host', they need to be transferred over to the embryo and then transported to the areas of actual growth. In a cooperative way 'host' and embryo establish reciprocal metabolic processes that are often based on metabolic gradients.

Figure 2: Embryo with placenta, about week three. Embryological images and illustrations are originals from different publications by Dr. Erich Blechschmidt, used with permission from the author of this article and Kiener Verlag, Munich.

On a microscopic, cellular level simple transfer of molecules generally happens through diffusion, which applies these metabolic gradients. The transfer from mother to embryo manifests on the membranous interface where the two bodies actually meet – the placenta. Initially, after implantation, the placenta enters a phase of burgeoning growth. It is exclusively the embryo that is developing and preserving its structure.

When you imagine an embryo, make sure your imagination includes the placenta (see Figures 2 and 3). The placenta is an externalized but fully integrated aspect of the early body — from conception to birth. Indeed, the placenta can be understood as a pluripotent unity of lungs, kidneys, and digestive system, provided that the organs are grasped as functions and not exclusively as forms.

Evidently, the placenta manifests a structure of primary importance, where the metabolic surface of the embryo literally contacts the external world.

On a macroscopic, 'long-distance' tissue level, molecular transport engages special structures – vessels**.** All structures serving long-distance transport are aspects of the circulatory system. From the placenta to the embryonic body, the molecules required for growth, differentiation, and maintenance are transported through

Figure 3: Embryo with placenta, about week five. Embryological images and illustrations are originals from different publications by Dr. Erich Blechschmidt, used with permission from the author of this article and Kiener Verlag, Munich.

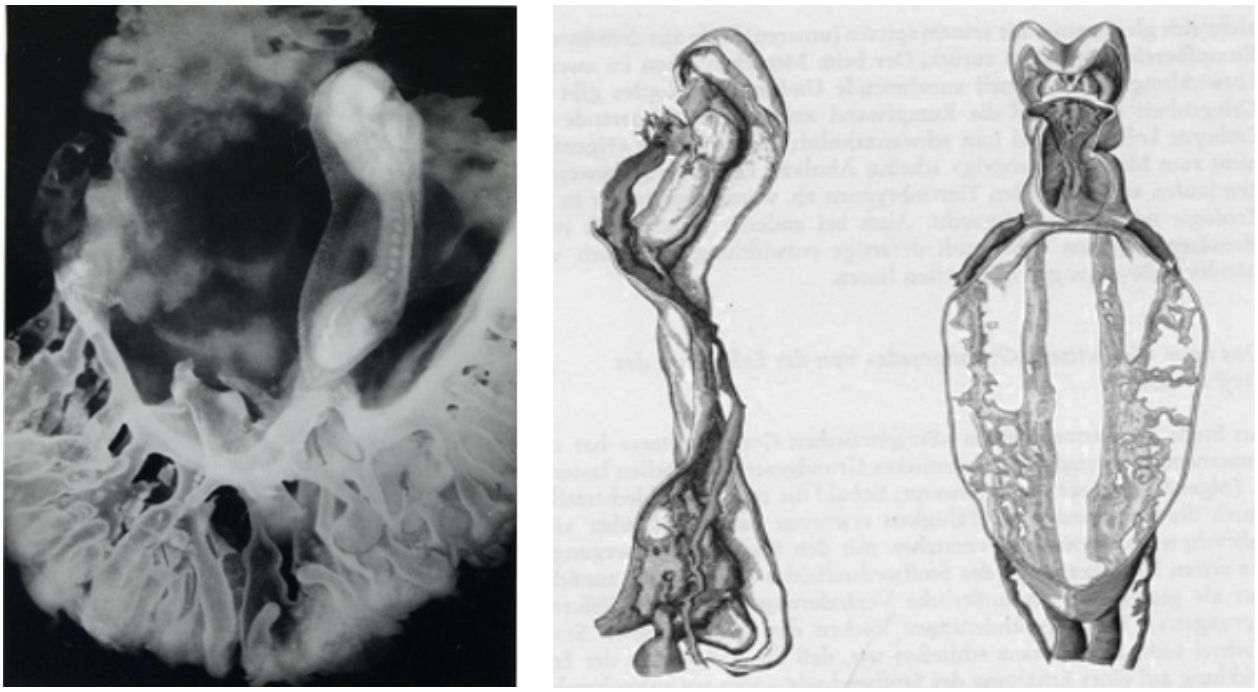

Figure 4: Early circulatory system. Embryological images and illustrations are originals from different publications by Dr. Erich Blechschmidt, used with permission from the author of this article and Kiener Verlag, Munich.

vessels in the umbilical cord. Allow me to emphasize here the physiological fact that the circulatory system is fully functioning prior to the manifestation of the heart!

The graphic representation in Figure 4 depicts the already existing circulatory system, prior to and during cardiac development. The heart does not initiate the circulation of blood. On the contrary, the development of the heart is an answer to increased metabolic activity and rising blood pressure that results from an increase of fluid volume – expansion and growth. And growth depends on fluid-based circular processes with bidirectional metabolic movements as a precondition.

Circulatory processes are primary; the manifestation of the heart, with its pumping function, follows circulation and is thus a secondary process. We understand that the placenta is a completely integrated aspect of the embryonic circulatory system. The heart comes in and manifests structurally as a (neuro-myo-fascial) compensation to rising blood pressure.

In early stages of development, the heart primarily serves the growth and development of the brain. We can see this in the close association and topographic relationship of heart and cranio-facial structures in Figure 5. The heart-liver complex is massive, early arms and legs appear almost 'pumped up' by fluids, the brain growing so ferociously that the arteries — visible on the lateral cranium — can hardly keep up with the pace of expansion.

All of life, not just the embryo, is fluid-based.

Fluids have to move to keep life going. Circulation means life moving fluids and fluids generating forces of pressure. Tensional forces manifest when fluids are contained and compartmentalized. The containment of fluids creates forces of pressure and tension — these are the twins of life.

Sometimes I, the embryo, wonder why everybody speaks about tension and pressure gets so little attention. Maybe just a habit — who knows? Then I remember what the old Doctor said a long time ago:

The rule of the artery is supreme.

A. T. Still

Figure 5: Embryo, 11.4mm, week six. Embryological images and illustrations are originals from different publications by Dr. Erich Blechschmidt, used with permission from the author of this article and Kiener Verlag, Munich.

Konrad Obermeier holds a degree in communications from the University of Munich and has been a Rolfer since 1991. Currently, he serves as chair of the Anatomy faculty for the European Rolfing® Association. He is the editor of a series of books on the biodynamic embryology of Erich Blechschmidt.