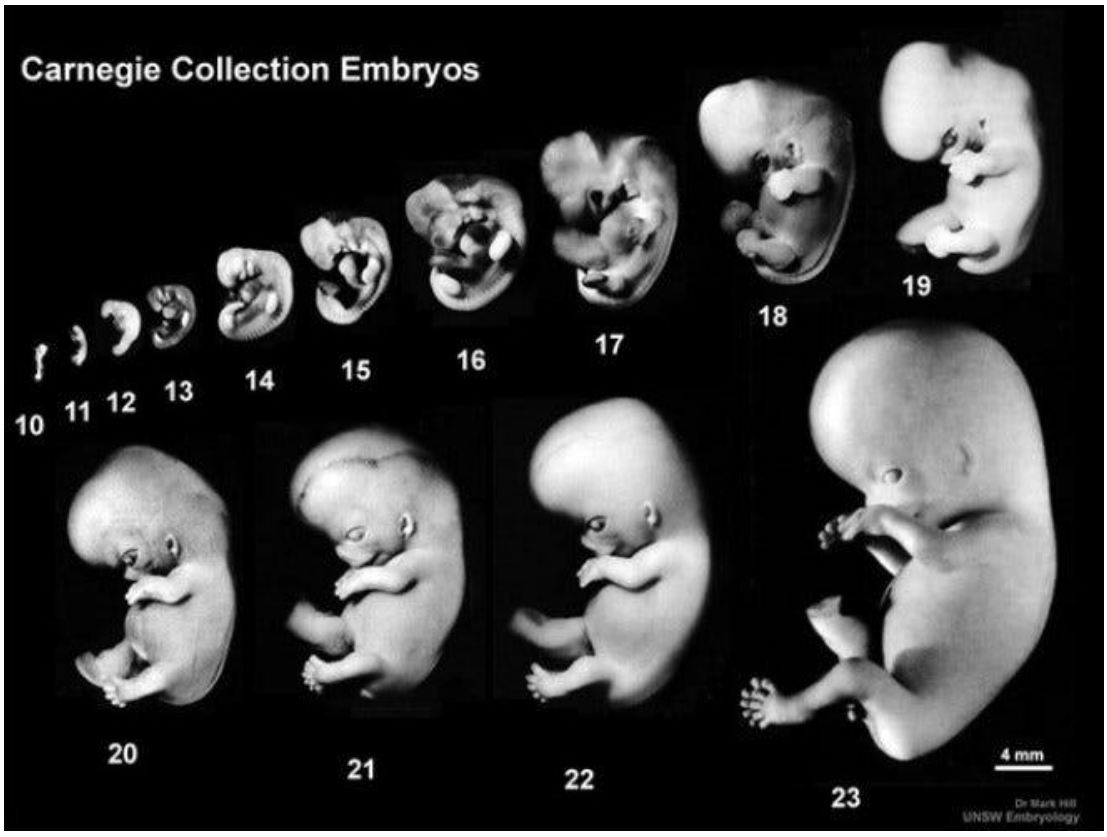
A Fresh Look at Embryology

Just as astronomers began to discover the fascinating geometries of galaxies at the end of the 19th century, parallel discoveries were being made on the microcosm with new insights into the mechanisms defining the growth of living matter. Embryology was a relatively new field as two opposing schools of thought began to clash in Europe. One school known as vitalism found its champion in the form of the great epigenesist Hans Driesch (1867-1941), the other was called the mechanistic/preformism school led by the figure of Wilhelm Roux (1850-1924).

Both schools were fascinated by the obvious directionality and design expressed by the unfolding of an organism from a fertilized single cell all the way to becoming a fully formed organism.

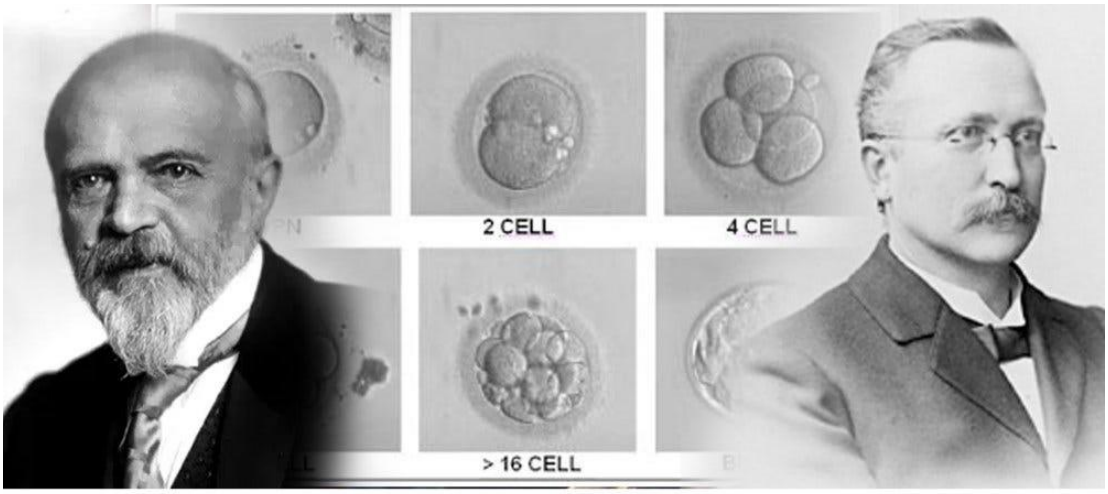


In the field of embryology, it was more obvious than any other field that randomness, chaos and chance played no role in this complex yet harmonic process of growth, multiplication and

differentiation of cells over the course of an embryo's existence. What mechanisms determined how the parts would unfold over time as the embryo grew?

An elementary question during this time was: did the parts define the whole or did the whole define the parts? How could we know at what point the undifferentiated cell's fate becomes sealed by its destiny?

The mechanist school of Roux assumed that one could know only what a cell would do a "moment" before or after one observes it, but that the pathway was assumed generally unknowable beyond this point. The vitalist school of Driesch on the other hand presumed that only the "end phase" of an embryo could be known, but nothing of its individual changes.



Hans Driesch (left) led the vitalist school while his opponent Wilhelm Roux (right) led the preformist/mechanist school

To prove his case, Roux began by burning one of the two cells making up a frog zygote which resulted in the eventual formation of a half frog. This incredible experiment implied of course that all information determining the fate of all subsequent phases of embryonic evolution were contained within each of those two original cells. If Driesch were correct, then that single cell should have grown up into a full frog. While this appeared at first to be a "win" for the mechanist school, it wasn't long enjoyed, as Driesch formulated a new experiment whereby instead of killing one of the two cells of the frog zygote, he used a four celled sea urchin embryo cut in half using a fine baby's hair which now resulted not in two half organisms as Roux and the mechanists had expected, but rather two fully formed sea urchins!

While these experiments contributed much towards answering some fundamental questions about the mechanism of creative growth, many other questions remained unanswered and still required a few decades for a new generation of scientists to tackle the problem with a fresh perspective. One of the most prominent of these scientists being a brilliant Ukrainian naturalist named Alexander Gurwitsch.

Gurwitsch Takes the Stage

Rather than simply side with the vitalists or mechanists, Gurwitsch took the best of both schools and added something extra by asking the question “how do cells communicate and harmonize their behaviour in one unifying system”?

Considering that the average human baby comprises approximately 10 trillion cells with 10 million dying and being born with every passing second, and considering that each cell has within it over one million molecular actions/second it is nothing short of a miracle that these trillions of cells can communicate and harmonize with one another, let alone “decide” when an undifferentiated cell should take on a function such as a liver cell, brain cell, heart cell, etc that will define its “destiny”.

Gurwitsch realized that the vast intercommunication of cells could not be accounted for through mere molecular activity or the motion of enzymes from one place to another in the body. Something more had to be occurring. But what?

It was in the period of rich creative development of the 1920s that Gurwitsch configured his famous “onion root experiment” which involved simply configuring two onion roots in a perpendicular set up. While one onion root grew downwards, the other was caused to grow towards it [see image]. When the stems came into close proximity, a 30% increased rate of growth was induced in the first onion stem and it was now obvious that high rate of young cell mitoses occurring at the tip of the stem were accompanied by some form of invisible energy emission inducing the increased growth rate, but what was its nature? What sort of energy was being admitted from one stem to another?

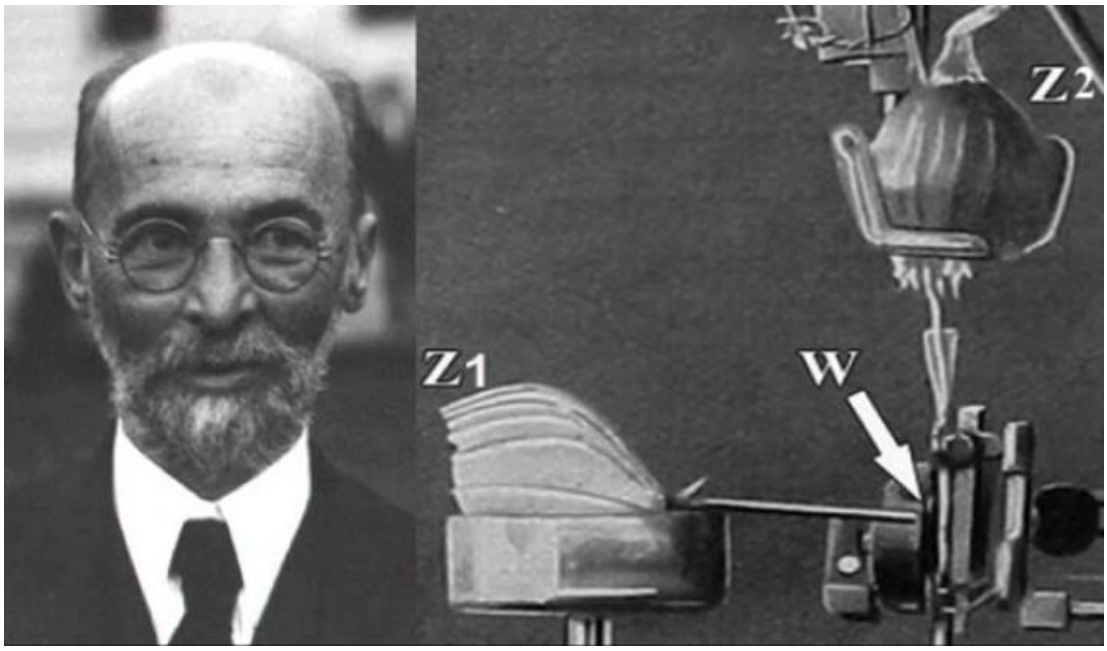


Figure 9 Alexander Gurwitsch and his original onion root experiment. Two onions (Z1 and Z2) grow perpendicularly with point W representing the point of intersection of the younger root emitted from Z1 and the older root of Z2 separated by a quartz lens blocking the emissions of ultra violet emissions from Z1 to Z2.

To answer this next question, Gurwitsch tested various quartzes that blocked all but the ultraviolet part of the electromagnetic spectrum and discovered that the increased cell growth only occurred when UV light was permitted to transmit. Even though no instrumentation would be invented for another 30 years sensitive enough to pick up these ultra weak UV photon emissions, Gurwitsch's elegant experiment demonstrated what sort of electromagnetic properties were causing living tissues to harmonize!

Gurwitsch termed this newly discovered phenomena "Mitogenetic Radiation" with this idea created several new interconnected fields of 1) molecular morphology, 2) cellular morphology and 3) organismic morphology which all encompassed the concept of Gurwitsch's "biogenic field".

Despite an intensive counter operation run by the Rockefeller Foundation which attempted to discredit Gurwitsch under the scientific hack A. Hollaender who intentionally bungled his experiments producing negative results, small networks of committed scientists continued this valuable work[5]. Several decades had to pass until A.B. Burkalov, inspired by Gurwitsch's

onion roots, set up a similar experiment using two sets of fertilized fish embryos separated by a glass divider and a small opening- one set of embryos being slightly older than the other. Burkalov discovered that as long as the age separating the two sets was not too great, placing each set into proximity caused the younger eggs to speed up in their development greatly. However when the age difference was too far removed beyond a certain bandwidth, the younger eggs grew into malformed mutants[6].

Popp, Montagnier and the Schumann Resonance

Over the years, this research continued in the fringes of the scientific community with some of the most interesting developments occurring under the guidance of Fritz Popp who discovered a wide array of ultra weak bio-photon emissions from all forms of life[7]. Popp established that coherent photon fields are emitted by all cells and molecules expressing life- each carrying unique signatures and information from that cell across the entire body triggering an intricate array of chemical reactions necessary for the functions of living matter to endure. Working with Walter Nagel, Popp additionally discovered techniques which interpreted the scattering patterns of cell photons in order to adduce information about viral and bacterial infections.

Popp claimed that *"every change in the biological field or physiological state of the living system is reflected by a corresponding change of biophoton emission".*

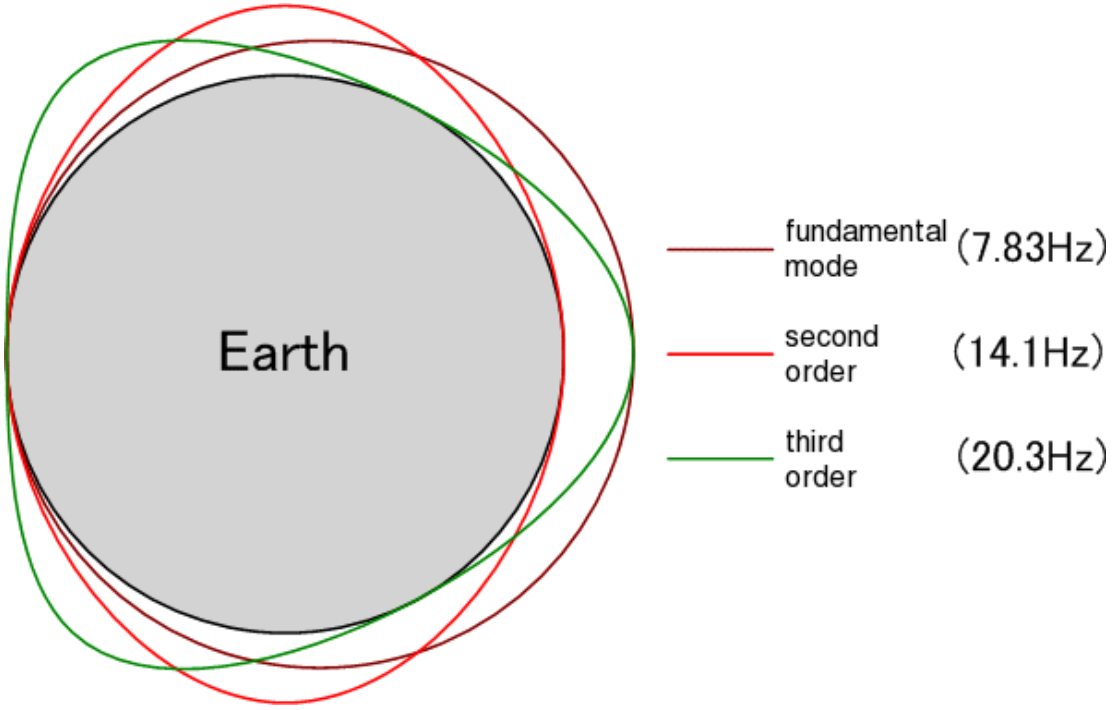
Figure 10 Fritz Popp (left) and Dr Luc Montagnier (right)

This work was amplified by the later work by the Nobel Prize winning virologist Dr. Luc Montagnier who discovered how ultra weak photon emissions were not only occurring in the UV range but also in the radio wave spectrum[8].

Montagnier went even further to measure the frequency of these emissions occurring from DNA which was placed in liquid solutions within test tubes. In these experiments which advanced the work of Jacques Benveniste on water memory, Montagnier discovered how the radio signals emitted from the DNA structured the water molecules in such a manner that even after all traces of the DNA were filtered out of the water, DNA-specific radio signatures continued to be emitted from the liquid solution and even caused a clone replica of the original DNA to be created out of random organelles, proteins and nucleotides when placed within the resonant solution. The only

caveat here was that this cloning only occurred under the singular condition that the solution were exposed to a 7.8 Hertz background radiation in the laboratory.[9]

This 7.8 Hz background radiation is of course the same frequency which characterizes the earth's natural electromagnetic environment between the ionosphere and surface of the earth itself. This phenomenon was first discovered in 1923 and was given the name Schumann Resonance for its discoverer Winfried Otto Schumann (1888-1974)[10]. As Magnetic Resonance Imaging developed in the 1970s, it was also discovered that 7.8 Hz happens to also be the same frequency that the human brain emits when in a calm meditative state. The electromagnetic environment shaped by the earth's evolving ionosphere, magnetosphere and Van Allen Belts (themselves influenced by the growth of free oxygen over long expanses of time contributing to the ozone layer) not only "tunes" but is tuned in return by the evolving systems of life on the earth leading up to the most advanced yet seen: the human brain.



Re-Uniting the Macro and Microcosmos

As you can see, the flow of these discoveries has brought us from the macrocosm of galaxies birthing seedling galaxies in the form of quasars within a dense intergalactic and interplanetary

medium of plasma (not dark matter or the nebulous dark energy which so many statistical Big Bang Cosmologists assume must exist by virtue of their denial of Arp's discoveries). We moved from the realm of galaxies into the realm of cellular evolution, and the dynamic equilibrium maintained by the space time of living organisms. We then continued our journey through the electromagnetic properties and fields of life throughout the 20th century until we arrived back at the Schumann resonance defined by the earth's Van Allen belts, magnetic field and the broader magnetic field shaped by the sun in our small corner of the Milky Way galaxy which is itself just one of billions if not trillions of suns being shaped by our galaxy.

Although it is not well understood, our solar system exists not in "empty space" with planetary bodies falling in random locations orbiting our star, but rather in a densely saturated ocean of plasma and cosmic radiations with harmonic least action pathways defining each pulsating orbit. While each revolution of our star the sun occurs every 365 days, our solar system itself is revolving around the galactic center once every 220-250 million years during which time our solar system passes through arms of the Milky Way and bobs above and below the galactic plane. These insights are inferred primarily from measuring the relative rates of radioactive decay in fossil records and the relatively cyclical mass extinction (and mass creation events) which have been archeologically uncovered in recent years.

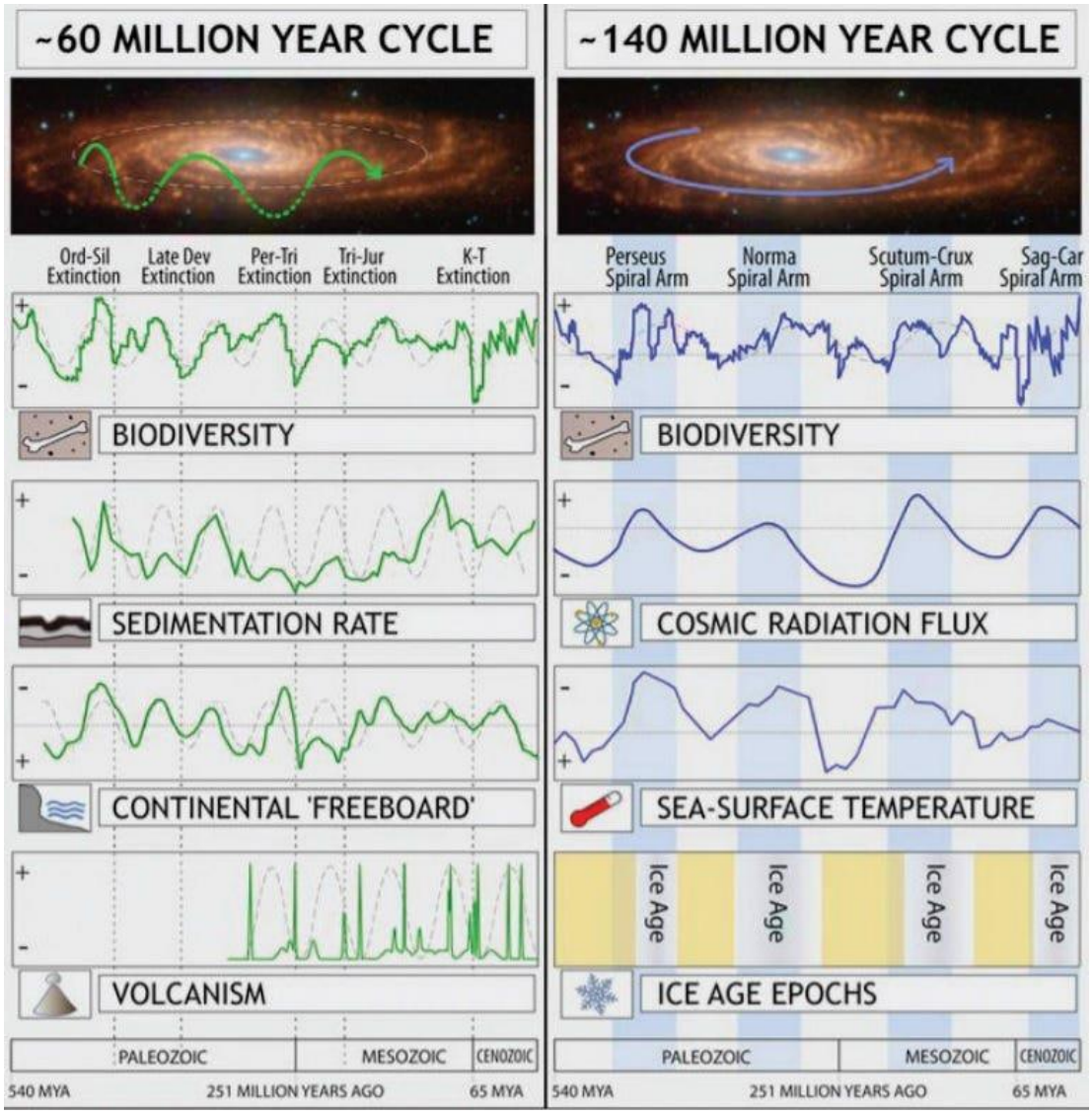


Figure 11 Various periodic activities discovered in long term activities of the earth have found a correlation to such long term periodic behaviour only occurring on the level of galactic activity illustrated above [image from the Schiller Institute]

Just as the living organism is a sort of universe unto itself defined by trillions of cellular interactions occurring throughout a life, a galactic body is made up of trillions of stars and many more planetary bodies within each system harmonized by the living space time of that particular galaxy's phase of evolution from young Quasar seedling to a more advanced mature state such as the blue-shifted Andromeda galaxy which may in fact be MUCH closer than the 2.5 million light years assumed by Big Bang theorists.

Subscribed

From this new and healthier re-framing of the forces and principles at play in our living, creative universe, Andromeda's blue shift is no longer seen as the rate at which this large galaxy is racing towards our Milky Way where we are destined to collide in 4.5 billion years… but rather becomes seen as indicative of its older, parental relationship to our younger galaxy from which it once gave birth (as well as all other galaxies within our local galactic constellation).

If you haven't realized it, the two opposing cosmologies currently at odds with each other (open vs closed systems) strike on the very nature of life vs death. Where one system assumes the principle of death to be primary in a universe of decay and entropy, the other paradigm sees life as primary within a universe of creative growth and perfectibility.

So before you find yourself agreeing to the assumption that "scarcity" and "limits to growth" are absolute laws which define our choices going into the 21st century and beyond, it were wise to look at nature itself from this standpoint and ask if it were not MORE NATURAL to leap beyond our mental and physical limits by making discoveries into our potentially unbounded, albeit finite universe and live as though we were made in the image of the creator ?

The author recently delivered a lecture on this topic which can be viewed here:

Wrong concept: the forces and principles at play in our living creative universe