

Swedenborg, Still , Jello and the Tides

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Part of a series of essays on the human body-mind, available at
<http://www.hummingbird-one.co.uk/resources2.html>

This essay is partly a review of three books and two authors, and partly a small amount of dot joining with regard to the cranial rhythms. The first book is "Cells Gels and the Engines of Life" by Gerald H Pollack (2001) ISBN 0962689521. This book, written over 10 years ago, is literally the biological science of the future. It will totally change your world view of how cells and the whole of life function. Like every new scientific paradigm, it seems to be taking a while to reach out into the world. And although the XVIVO "Inner life of the cell" animations¹ are wonderful, Pollack's work shows that much of the action in these animations is fantastical rather than real. When we get down to the size of cells and proteins, water molecules are large enough to be equivalent to, say, ping pong balls in a large room. And the ratio of organelles and associated molecules to water within a typical cell is about 1:1, so it is very difficult for water *not* to interact with neighbouring molecules.

I don't know if you have seen the YouTube presentations by Pollack of the "fourth state of water"?² Well, this book clearly outlines at least some of the implications of structured water in living organisms. The first one is that - *cells do not need a membrane*. Water binds with proteins in such a way as to make the cell capable of self-supporting and self-organising without a lipid outer shell. Cells are not a bag of water, but rather, a lump of very well organised jello. With a large dollop of hindsight, this can be observed by just watching cells in motion - if they depended on the integrity of a lipid membrane, then it would be almost impossible for them to change shape, due to the changes to the volume-surface area ratio that would imply. Well, hindsight is a great thing.

Pollack started to look at this topic in detail because the energy demand (and requirement for specialised membrane gates) of proton pumping through membranes is just ridiculously high - and life does not unnecessarily choose complexity and it certainly doesn't like expending a picojoule more energy than it absolutely has to. In fact (Pollack is a world expert on muscle cells) he found that something of the order of 10% of all cells in a typical body have a damaged lipid membrane! But the cells still live and repair themselves. If they were literally a bag of water, they would pop, burst and die at the slightest pinhole. So on the surface of the cell is a lipid protective layer, but up to 50% of the cell surface is taken up by folded proteins that are capable of unfolding to take up or give more slack as the cell moves and changes shape, absorbs and releases material in its metabolic cycle. In fact, this latter process is another example of why (from a surface area : volume ratio point of view) the usual lipid bilayer model clearly doesn't stand up to close inspection.

1 <http://www.xvivo.net/>

2 <http://www.youtube.com/watch?v=kd614bK3WZc>

These surface proteins also represent large cracks in the cell membrane. Furthermore, the way that proteins and water combine in the cell leads to a gel-like material in which the water is ordered like rows of soldiers in a quasi-crystalline structure. In this ordered state it is bound to charged hydrophilic surfaces and is *not* free to flow out if the lipid membrane ceases to exist. And neither is most of it (if any at all) free to flow within the cell. The charge density on proteins alters the way that the water stacks up. Taken to its extreme, "antifreeze proteins" (particularly the ubiquitous Actin) create a rigidly ordered array of water that is even capable of withstanding freezing in the presence of liquid nitrogen! This comes about because the water is held firmly in structure by the proteins and so cannot reorganise itself into the crystalline structure that would be ice. The formation of ice requires a translational shift sideways (accompanied by a vertical expansion) of the structured water crystal, and a close actin network inhibits these translational movements.

The action potential is also now seen to originate in the peripheral cytoskeleton rather than the cell membrane. And (to a Craniosacral Therapist) here comes the interesting bit, folks - this action potential is generated by means of a fairly large *volume change* (re-ordering/re-structuring) *of this cytoskeletal matrix, accompanied by a volume change of the cell without the need to add or remove any other molecules*. In fact, water and the cell proteins and other components are so much a totality that the cell manipulates its state by altering the water state via the cytoskeleton. And as the water changes from ordered/structured to a more familiar random arrangement, it too undergoes a volume change, just as water does when it changes between water and ice. This mainly occurs during Mitosis, where the cell water has to be capable of flowing so that *all* of the cell organelles can duplicate, divide and reorganise themselves into two new cells³. Furthermore, as the water volume changes, so too does the stored electrical charge⁴. Therefore, *changes in volume are accompanied by a substantial change in electrical potential*, which may express as a flow of charge (electrical current).

One of the most difficult aspects of medical descriptions of the craniosacral rhythm has been to account for cellular breathing in scientific terms. When looked at with a conventional view of water and cells, then this "breath of life" expressed as expansion/contraction is impossible, because water just moves from one enclosure to another and there is no possibility of net volume change. However, taking the principle of structured water, the water itself changes volume and the organic materials it binds to (through electrical charge) has such fine detail relative to the water molecule that the molecular density in a given area can change quite substantially. Proteins and water structuring itself can exclude water from some areas of the cell, protein molecules can engorge and then shrink, and volume changes *which conserve mass* are in fact commonplace within the normal metabolic processes of all cells. And possibly most importantly, the cranial rhythm is now seen to represent at least two parallel processes – the coordinated phase change (structuring/destructuring = extension/flexion) of water, and large shifts in both pH electrical charge throughout the body.

3 See <http://www.hummingbird-one.co.uk/pdf/MTubes.pdf>

4 Shklier TF, Safronov AP, Kliuzhin IS, Pollack GH, Bliakhman FA (2008) article in Russian. English abstract at : <http://www.ncbi.nlm.nih.gov/pubmed/19137684>

Furthermore, the way that water, positively charged particles and various proteins interact goes way beyond the normal way we think of them. Both (cross-linked) collagen and elastin can contract when exposed to an increase in local sodium concentration and re-expand as the available sodium concentration decreases. *This implies that fascia itself (collagen – including tendons and ligaments) is capable of contraction in the same way that muscles contract.* Although the potential degree of contraction is less than that of muscle. This feature of connective tissue was hypothesised by Schliep et al (2005)⁵, but the fascial contractility described was assumed to be attributable to embedded muscle fibers rather than being an intrinsic potential property of collagen and elastin.

Another way that ordered water is not like ordinary water is that it does not dissolve ions, but rather moves them in between absorption sites, thus allowing large local changes in ionic composition (whilst the average composition remains constant). This is “streaming” (maybe well known in the cranial world through a video of slime mold!) - where a front of fluid (rather than organised) water is transported by a cascade of reactions passing through the cross-linked actin cytoskeleton. Pollack describes it far better than I do. I was again struck by the implications here for the working of the reciprocal tension membrane and in fact, the fascial system in general.

All this is very technical and heady stuff. But Pollacks book leads you through the logic of all these startling new ideas in a way that is accessible to a moderately intelligent layman - he has chosen to write in a pedagogical style, and although describing quite complex interactions, the book is immensely readable. Whilst “Cells & Gels” focussed on structured (“exclusion zone” or EZ) water in living tissue⁶, his most recent book – “the Fourth Phase of Water” focusses on the broader properties of EZ water and its implications for understanding the behaviour of water in the environment⁷.

There is necessarily a balance in the body between volumes of water that are structured vs. water which is fluid. A comparison of their different properties is given below.

5 Schliep R, Klingler W, Lehmann-Horn F (2005) Active fascial contractility: Fascia may be able to contract in a smooth muscle-like manner and thereby influence musculoskeletal dynamics. *Medical Hypotheses* 65(2):273-7

6 Gerald H Pollack (2001) *Cells Gels and the Engines of Life* ISBN 0962689521

7 Gerald H Pollack (2012) *The Fourth Phase of Water – beyond solid, liquid and vapour*. Publ Ebner & Sons, Seattle ISBN 9780962689536

Fluid water	Structured (EZ) water
Low viscosity	High to very high viscosity – particularly in the presence of collagen, in which case it can turn into a gel with a bound (immobile) water content of up to 99.9%
Density ~1 (higher volume)	Density ~1.05 (lower volume)
Contains solutes (water is the “universal solvent”) and suspended particles	Excludes solutes and particles – a pure zone extending some 100,000 water molecules or more from the boundary, with extremely concentrated zones of solute next to the EZ. Addition of salts reduces the ability of an EZ to form.
Random-ish arrangement of H ₂ O molecules – in fact, free water arranges itself into loosely bound pentagonal structures of up to a few thousand molecules at a time, but the persistence of these structures is usually of the order of microseconds	Quasi-crystalline in well ordered and relatively stable layers of hexagonally connected water molecule triplets (chemical formula H _{1.5} O)
Stores energy as heat, straightforward absorption and conduction/convection of infra-red (heat)	Stores energy as order, and absorbs more energy to maintain and increase the volume of ordering through exposure to ultraviolet light
Bulk water	Surface effects – EZ water's presence depends on the availability of hydrophilic surfaces
Moderate/mid-range pH values (“neutral”)	pH is high (alkaline) in the EZ and may drop locally <i>in surrounding free water</i> to as low as pH 2 or 3 (acid)
Water molecules are dipoles; but bulk water expresses an effectively neutral charge over any non-negligible distance or timescale.	Maintains a charge relative to surfaces of up to 200mV with EZ water being negatively charged through loss of 25% of bulk hydrogen (protons) to surrounding free water. If light or infra red (heat) is available, the EZ fringe can extend hundreds of microns or more.
Poor conductor, increasing as salinity increases	Semiconductor, and its quasi-crystalline state and other lattice effects suggest that it is a very effective electronic medium.
Transition (Water ⇒ EZ) may result in cooling (storage of energy), solidification, increased density, reduction in flow, addition of crystalline volume to body. But if protons are mobilised during any part of that process, the effect is an increase in temperature – which does not literally have to be a release of energy, but rather, is a release of the capacity of the water molecules to express the energy they hold as heat.	Transition (EZ ⇒ Water) results in release of heat (ordered energy converts to brownian motion), free flow (improved circulation), decreased density, decreased volume of crystalline state of body

Although structured water is absolutely necessary for all cells to function properly, one question not clearly answered by Pollack in his books is how the body maintains its fluidity in the face of the ubiquity of collagen and other hydrophilic molecules. He also mentions the pentagonal arrangements of water that are particularly prevalent against *hydrophobic* surfaces, but does not seem to have investigated the properties of this pentagonal arrangement, having restricted his research to EZ water (formed against hydrophilic boundaries).

In response to an email I sent, he kindly answered this by stating that living organisms are *full* of structured water. This is made particularly clear by the final chapter in his second book (Ref 7) in

which he points out how structuring is actually present throughout the entire environment in both air and water. The implications of this are huge. Put simply, almost every statement about physiology, every fundamental experiment and assumption, will have to be revisited and reconceptualised. However, the phenomenology of this new physics of water is much closer to the body as experienced in CST and the energy therapies. Meanwhile it might take medical science a few decades to swallow the pill and start to re-examine body physiology. Until then, if what you feel doesn't match what you read in physiology textbooks, then trust your hands! Also, beware of theories of bodywork and techniques based on physiology – they may be red herrings.

The properties of EZ water have many interesting implications for bodywork.

Firstly, looking at the table above, if water has structured *where it should not be* structured, then that will be perceived as an area of increased density, reduced flow, adhesion, and maybe some kind of electrical/ electronic short-circuit. Surrounding tissues will tend to be acidified, and there will be a local (battery-like) charge that is not properly integrated into the rest of the body's electrical field. There may also be local inflammation of tissue, as a surface begins to accumulate EZ water in an uncontrolled manner. One starts to wonder how blood might flow.

On release, normal interstitial flow will be more available, there may be a temperature increase as stored energy is released, there may be an appreciable flow as the volume of the contained water increases and expands, and any local excess charge will dissipate. *(Although I'm a lot less certain of the physics of this... if the stored energy in the EZ had already discharged, then the return to normal Brownian motion could conceivably result in a fall in temperature. However, whenever protons are released from an EZ there is always a perceived release of energy because the stored energy once more can express itself as "Brownian Motion". Pollack also points out that Brownian Motion is also an incorrect description of the state of matter, but maybe we'd better stop there, and if you're interested you can read the books.)*

On the other hand, if EZ water is not present where it *should* be, then cells will tend to break down (i.e. there will be a high rate of apoptosis and/or cell damage) and most cellular functions (including the processing of ATP) will be compromised. A closer look at what drives the formation of EZ water and its movement is to be found in Ref #7.

The effects described above have a very high correlation with subjective observations of the behaviour of body tissue during the practice of CST and other similar bodywork modalities. So, clearly the topic of EZ water (both how it forms and how it does *not* form) requires a lot more consideration, because it is highly relevant to health.

EZ water also explains interesting aspects of blood circulation. A hydraulic analysis of the vascular circuit (as if it were a series of man-made branching pipes of varying diameter with the usually expected hydraulic properties of those pipes) throws up the peculiar challenge that – it would take a pump generating far greater pressure than the heart is capable of to maintain any significant flow. And associated with this conundrum is the rather peculiar and difficult to explain (for “normal” flow) fact that blood capillaries are often smaller than the blood cells that move through them.

However, if we invoke structured water on the internal surface of capillaries, then a very tight fit of blood cell would induce a monolayer of structured water which would in turn create a virtually frictionless contact between the blood cell and the capillary wall. In other words, the tubes of the capillary bed *have to be* too small for the blood cells so that this negligible friction contact becomes possible. And then, the structured water in the capillary bed would be pushed by electrostatic forces operating on the blood. Thus, we are starting to approach a physiology in which the heart no longer is a pumping organ, but is “something else” - a regulating valve of sorts⁸.

The second book is not a book - but rather a paper by David B Fuller DO FAAO entitled “*Swedenborg's brain and Sutherland's Cranial Concept*” (July 2011). This is available online as a PDF file, and published in pages 619-649 of *The New Philosophy*, a journal of the Swedenborg Scientific Association.

Emanuel Swedenborg (1688-1772) was, in the words of wikipedia a “Mining engineer, anatomist, astronomer, nobleman, author”. In fact he was much more than this. As well as being chief mining adviser to the King of Sweden at a time when the Swedish empires wealth depended on mining, Swedenborg was probably the last living person to be intellectually capable of encompassing, mastering and expanding the *entire* range of scientific knowledge of his time⁹.

He was master of optics (he ground his own lenses for telescopes), astronomy, mathematics, biology, just to name a few of the fields he excelled in. He was also a deeply spiritual person, and the whole of his life was taken up investigating how the spiritual world manifested into the material world. When he had taken the scientific road as far as it could be taken during the first half of his life, he then asked the King's permission to resign his post at the Mining Board, and spent the next forty years praying, meditating and exploring the spiritual world as it manifested in himself.



It is impossible in retrospect to really know how much help he received on this journey from the Secret Doctrine¹⁰. But the likelihood is that the vast majority of meditation, psychotherapeutic, psychoanalytical and esoteric practices he developed and used came through his own extraordinary and capable mind rather than from external human sources. Some of them appear quite similar to Buddhist Tantra and others similar to Jungian analysis or even 20th century developments such as

8 Ralph Marinelli, Branko Fuerst, Hoyte van der Zee, Andrew McGinn, William Marinelli (1995) *The Heart Is Not A Pump: A Refutation Of The Pressure Propulsion Premise Of Heart Function*. published in the Fall-Winter 1995 issue [Volume 5, #1] of "Frontier Perspectives," the journal of the Center for Frontier Sciences at Temple University in Philadelphia, Pa, USA. Available online at <http://www.rsarchive.org/RelArtic/Marinelli/index.html>

9 Wilson van Dusen (1974) *The Presence of Other Worlds*. Swedenborg Foundation, Inc., New York, Harper & Row. ISBN 0-87785-166-2

10 e.g. see Johnathan Black (2010) *The Secret History of the World*. Publ Quercus. ISBN 0857380974

Psychosynthesis.

Fuller has read Swedenborg's works on the Brain (translated into English – Swedenborg wrote almost exclusively in Latin), compared them to Sutherland's writings, and found that Sutherland more or less obtained all of his ideas from exposure to Swedenborg! One of the last scientific books written by Swedenborg, in 1744, was his treatise on The Brain, which for its medical scientific content was considered to be state-of-the-art until the first decades of the 20th century. So – in addition to the contacts (described by Fuller) that Sutherland might have had to the New (Swedenborgian) Church, it is also possible that Sutherland referred to Tafel's 1886-7 translation as a source of medical information in the 1920's. Ida Rolf has also indicated that she heard Sutherland referring to Swedenborg¹¹.

To cut to the chase – Fullers paper is readily available and easy to read – Sutherland made the mistake of referring to modern early to mid 20th century human anatomy and physiology rather than completely trusting Swedenborg. And startlingly, ALL of the descriptions that Swedenborg gave for the motion of the brain and movement of cerebrospinal fluid have been demonstrated in the past few years by the most sophisticated of tomographic medical scanning techniques. The one modern discovery not mentioned in Fuller's précis is the 85% re-absorption of CSF within the brain by perivascular lymphatic channels. Hindsight is a wonderful thing, and I am saying this in the fullness of Sutherland's aphorism “Dig On!” rather than as a criticism of the man.

[Swedenborg's] *paradigm is an organic, fluidic model which involves constant intelligent motion originating from the soul, flowing into the brain and cerebrospinal fluid activity, manifesting in secondary motions throughout the body, including the cranial bones, dural membranes, heart, lungs, blood, lymphatics, nervous system, and all the viscera.*¹²

First it is important to note that Swedenborg considered all forces in the world to be manifestations of spiritual forces, and these manifestations occur in triplets or “*Discrete Degrees*”. Using his terminology, the highest is the *End*, which then brings about the *Cause*, which then brings about the *Effect*. And there is not just one of these, but many different ways that this cascade takes effect in the human body, as the soul weaves its way into the material plane. One of the most fundamental triplets is the progression from Soul → Mind (and in particular the mind that rests within the brain) → Body. Thus the mind, specifically through the medium of its organ, the brain, is the conduit through which the soul animates the body. This downward progression is termed *influx*, but there is also a counter or reciprocal progression back upwards (*reflux*), where the living matter informs the higher aspects. Central to this relationship is Swedenborg's concept of “*Use*”, which can be fairly exactly translated as the more familiar “*Form Follows Function, Function Follows Form*”.

Hence, looking at Swedenborg's schema from a therapeutic perspective, the descending chain is more powerful, since the spiritual pattern and “will” informs both the *Cause* and *Effect*. However,

11 <http://rolfingjourney.com/history-of-rolfing%C2%AE-si/more-connections-between-emanuel-swedenborg-ida-rolf-william-sutherland-do/>

12 Fuller (2011) op cit p621

there is also the reciprocal pathway, and this is also an observation in clinical practice that working on a more *Causal* or *Effect* level brings them more into order and thus allows the *End* to inflow more powerfully. A bootstrapping process that is very familiar to students of Yoga.

This reciprocal relationship between Spirit and Matter is well captured by Torako Yui¹³:

Now, I have mentioned that, when some kind of trauma or unbalanced belief system is embedded in our minds or bodies, the flow of life force is decayed, the blood circulation gets stagnated, the blood becomes contaminated. However, this murkiness of blood is not caused only by trauma or unbalanced belief system. Impurity of blood is also caused by artificial foreign substances entering the body, such as dioxin, formaldehyde, chlorine, heavy metals, pesticide, insecticide, food additives, vitamin & mineral tablets, dietary tablets, etc When those unnatural agents are [introduced into the body in any way], the blood becomes murky and the flow of life force is caused to decay.

The cloudiness of the life force is connected in one with the unbalanced belief system of the mind, and they can't be separated from each other. By taking unnatural materials into the body, the flow of life force becomes cloudy, which simultaneously forms an unnatural mind, and such an unnatural mind produces unnatural materials.

In short, artificial and unnatural chemical materials that are overflowing in the world are connected in one with our unnatural mind.... (p. 49)

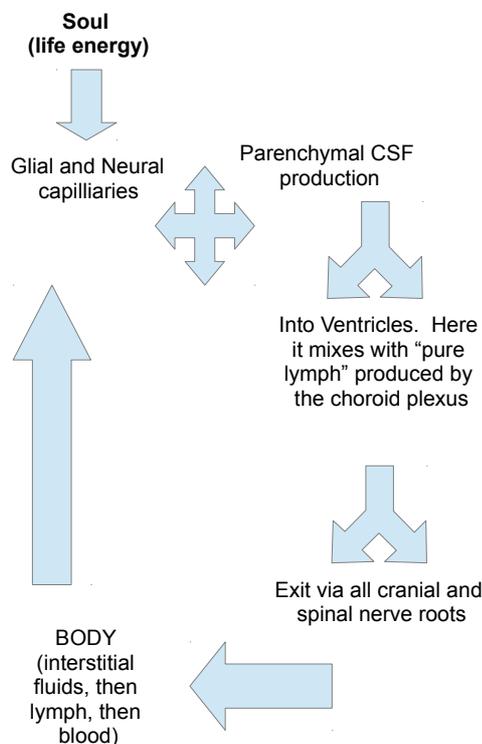
Taking (Fullers description of) Swedenborg to modern anatomy and physiology, we have several interesting comparisons with modern physiological knowledge and/or cranial experience.

The brain makes spiral movements as it contracts (downwards) and expands (upwards), and the spinal cord also takes part in this motion. This has been observed using time-lapse MRI (e.g. Enzmann & Pelc, 1993¹⁴). Reading Fullers article, Swedenborg also appeared to consider this motion to apply to tides, and this is typical of his multidimensional view of the body. The principle of spiral motion of the brain this occurs in multiple *Degrees* and thus from multiple *Causes* and with multiple *Effects* (i.e. in this case periodicity).

13 Torako Yui (2008) *The Thesis of Immunization Impossible*. Pathogens are grateful beings! Childhood illnesses are blessing! Vol 1 of the Homoeopathic Life Series, Homoeopathic Publishing Ltd, Tokyo. ISBN 9784863470033

14 Enzmann DR & Pelc NJ (1993) Cerebrospinal fluid flow measured by phase-contrast cine MR. *Am J Neuroradiol* 14 Nov/Dec pp1301-1307. This paper describes both the flow of CSF and the motion of the brain in response to the (cardiac) pulsatile expansion of cranial arteries, mainly in the circle of Willis. Also see Enzmann DR & Pelc NJ (1992) Brain motion : measurement with phase contrast MR imaging. *Radiology* Dec 185:3 pp653-660

Brain motion is primary to lung motion, and these two motions are often coincident. Again a case of respiration occurring in different Degrees, and a mainstay of cranial courses. On a personal note, I once took part in a Vipassana retreat, and at one point (i) experienced a really deep sense of breathing that seemed to permeate my whole body; (ii) that then decoupled its timing from my lung breathing. This was highly disorienting until I let go of thinking that they were both one and the same phenomenon. The way that Swedenborg describes these parallel step-down processes it becomes quite easy to see how confusion might arise if the usual Aristotlean plain vanilla principle



of “what you see is what you get” is applied along with Occam's Razor (keep it simple, don't use two processes when you can get by with one). Especially since they are often co-incident in physical location and motion or synchronous in rhythm; *but sometimes not*. In other words, according to Swedenborg (and to any open minded analysis of evidence) this pair of logical principles is fallacious when applied to nature (!) - but particularly when applied to living things.

Brain motion drives motion of all contiguous structures both membranous and bony, and is thereby also transmitted to the rest of the body via the dura. Swedenborg also says that the Dura/ Falx/ Tentorium move reciprocally “by virtue of its elasticity and in its capacity as a muscular tendon, it contributes in a general way to the reciprocal expansive motion of the brain”. There we have it – yes the brain drives the palpated CRI, but the membranous structure also has a motion of its own. Again this is in line with Swedenborg's general principle of multiple parallel and similar processes (Effects) emanating from a higher End, with one Effect being the End of the next process in the cascade. Cranial bone motion is considered passive and secondary to brain motion, with the sutures demonstrating this motion.

Cerebellula (i.e. neurons) extend throughout the brain and connect the cortex to the rest of the body. They also excrete a “spirituous essence”. It is interesting that he considers this essence to *both* be spiritual *and* have a physical fluid correlate on a lower *Degree*, and those two to have more or less the same flow path (in a similar manner to how the lung and primary respirations often fall in synch and have a cycle of inhalation and exhalation). i.e. they are linked, *but not necessarily*. This is the cycle of life. I am particularly struck by the role of blood, and the way that AT Still considered it to be primary and how it also appears in other spiritual descriptions as the vessel of the soul.

His description of the cycle of life is in line with modern understanding of the relationship between lymph and blood. Perhaps more interestingly, the latest research into CSF production suggests that Swedenborg was also correct in this regard – that most CSF production is parenchymal, with some supplemental influx from the Choroid; and that the CSF then exits via nerve roots to the rest of the body.

The multiple parallel and stepped down processes unfolding are quite obvious from the principles described by Swedenborg, and I suspect have caused a lot of argument at various times as they have been assumed to be just a single force, phenomenon or cause. This is particularly evident to me as a CST practitioner with respect to the spirituous force vs CSF and the fact that although the membranes follow the motion of the cortex (and the higher forces driving its spiralling motion), they also have a propulsive force of their own. i.e. the CRI is most probably driven by the dural membranes including the falx, tentorium; and there is a parallel and *usually* synchronous brain motion; and there may be further parallel motions or gestures that express different *Degrees*.

As a final note, I find that the principle of *Life* entering the body via the nervous system has some resonance with the Bose Einstein condensate model of consciousness developed originally by Dana Zohar¹⁵ and expanded as the Orch-OR model by Penrose and Hameroff¹⁶. These models specify microtubules as the site of quantum processes associated with consciousness, and neural cells have a far greater density of microtubules than other types of cell. Pollack's cellular Jello paradigm described above also brings some more life and possibility to these physical models of consciousness, as the structured water is an ideal substrate for Bose-Einstein coherence over large volumes of tissue. And Swedenborg points out to us that when we describe these physical processes, then by necessity, by the principle of “*as above, so below*” we are also describing processes of some transcendent fluid and mind that is both beyond the physical and embedded deep within its workings¹⁷.

To place this in a larger context, we come to book number three. Fuller's “Sutherland” paper is just a highly distilled extract of his book about the relationship between Swedenborg's writings and the philosophy of AT Still¹⁸. *Osteopathy and Swedenborg* is a remarkable read, though occasionally

15 Dana Zohar (1990) *The Quantum Self*. Publ Flamingo / Bloomsbury ISBN 0747502714

16 <http://www.quantumconsciousness.org/penrose-hameroff/consciousevents.html>

17 Also see <http://www.hummingbird-one.co.uk/pdf/MTubes.pdf>

18 David B. Fuller (2012) *Osteopathy and Swedenborg*. The influence of Emanuel Swedenborg on the genesis and development of Osteopathy, specifically on Andrew Taylor Still and William Garner Sutherland. 624 pp. Hardback,

heavy going due to the sheer quantity of documented material and level of historical scholarship. Fuller writes superb brief biographies of Swedenborg, Sutherland, and places them firmly in their historical framework. Ridiculously in hindsight, I had not fully grasped how the 18th century would influence the ideas of the 19th century nor the extent of the anarchic carnage of the American Civil war that AT Still was caught up in. Fuller draws a well documented, straight, yet multidimensional line directly from Swedenborg through to 19th century spiritualism, through to Still, Sutherland and modern day Osteopathic and Cranial practice and philosophy. If you are interested in the formative forces that have shaped Craniosacral practice, this book is fascinating reading. It also complements the most recent biography of AT Still written by John Lewis¹⁹.

Swedenborg derived his ideas by assimilating the very best science of his time, and then going through some kind of meditation process, at the end of which he would know that the interpretation he was considering was correct because he felt “at peace”. Throughout this short essay I have endeavoured to not ascribe the concepts or ideas to directly to Swedenborg's inventiveness.

The description he gave of the working of the human mind and thoughts was that all things – including even belief – are directly from God and that it is a fundamental mistake to personify them as if we had those thoughts ourselves. He was, despite the vast talents he expressed, a man of great humility and simplicity. Comparing Swedenborg's attitude with that of Sutherland²⁰...

As Sutherland developed his ideas further, he also reminisced about how he had felt inspired by the seemingly irrational thought that had struck him in 1898 when he first considered the idea of cranial bone motion as part of an underlying respiratory mechanism. Looking back from the perspective of 1949 Sutherland also remembered how he felt that;

There seemed to be a Presence near by, the Creator of the cranial mechanism, whom one might think of with the endearing term “Dad”. To me, “Dad” is not irrelevant, but tends to bring one into a closer understanding of a Heavenly Father. I like to think of the thought of a cranial articular mobility as coming from “Dad”.

ISBN: 978-0-910557-82-5 available from <http://swedenborg-philosophy.org/publication/index.php?page=1001#Osteopathy>

19 John Lewis (2012) AT Still : From the dry bone to the living man. Publ Dry Bone Press, Blaenau Ffestiniog. ISBN 978-0-9572927-0-3. hardback, 424pp

20 Fuller (2012) op cit p. 298