

SWEDENBORG'S BRAIN AND SUTHERLAND'S CRANIAL CONCEPT*

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We may sweat a thousand years and only scratch the surface of knowledge about the brain and how it works¹

INTRODUCTION

In the middle eighteenth century Emanuel Swedenborg developed and described a sophisticated and unique model of brain and body function. While Swedenborg referenced many anatomic works of his day, his paradigm of the brain and body was unique and comprehensive. This involved much of his work during his scientific, philosophic period. One of the last major writings of this era was his work later published as *The Brain*, written in 1743–1744.

Two hundred years later, William Garner Sutherland, D.O. developed a distinctive osteopathic cranial concept during the first half of the twentieth century. Sutherland's cranial concept is also known as Osteopathy in the Cranial Field, a system of diagnosis and treatment within the osteopathic profession. Sutherland was familiar with Swedenborg's works and made several passing references to Swedenborg. However, his use of Swedenborg's ideas was much more than passing.

* Annual Address delivered at the Annual Meeting of the Swedenborg Scientific Association on April 26, 2008.

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I want to thank Carroll Odhner, Director of the Swedenborg Library and Cindy Walker, Archivist of the Swedenborg Library in Bryn Athyn, Pennsylvania. Both helped significantly with the Acton research. I also want to thank the American Academy of Osteopathy for allowing me to use material from my Fellowship Thesis, "A Comparison of Swedenborg's and Sutherland's Descriptions of Brain, Dural Membrane and Cranial Bone Motion" (2006) in this publication.

¹ Swedenborg, *Brain*, Vol. 1, § 104k.

This paper will provide an overview of Swedenborg's paradigm of the brain and nervous system as described in his scientific works, particularly *The Brain*. It will examine Swedenborg's description of the function of the brain serving as the medium between soul and body, the inherent rhythmic motion of the brain and spinal cord, the reciprocal motion of the dura mater, cranial bone motion, and Swedenborg's concepts of spirituous fluid and cerebrospinal fluid.

These concepts will then be compared to William Garner Sutherland's cranial concept as described in his own writings. Historical connections between Sutherland and Swedenborg's ideas will also be explored.

Biography of Swedenborg

Emanuel Swedenborg (1688–1772) was an eighteenth-century Swedish scientist and philosopher who later developed into a theologian. He wrote on a wide range of topics during his long and productive life, culminating in over 40,000 pages. Today Swedenborg is most remembered for his later writings, which were predominantly theological. However, much of his pre-theological, scientific and philosophical writings were far ahead of his time, containing concepts not recognized until centuries later. His scientific and philosophical writings, particularly his works relating to anatomy and physiology, also contained ideas that later became fundamental to his theological works.²

Swedenborg was initially a scientist who became a philosopher in search of the soul. He studied anatomy extensively trying to discover further the soul's manifestation in the body. His studies of human anatomy were exhaustive and led to a focus on the brain and its influence throughout the body. During his anatomical studies from the late 1730s to the middle 1740s he described, in great detail, the structure, function, and motion of the brain. During 1738–1740 he wrote a preliminary work on the brain titled, *The Cerebrum*. His most comprehensive work on the subject was also one of his last scientific works, titled *The Brain*. It was written in 1743–1744, although left unpublished during his lifetime. Starting around

² Rose, *Emanuel Swedenborg: Essays*, 388.

1745, Swedenborg underwent a series of profound and on-going spiritual experiences. He dropped all of his scientific writings and moved on to a study of the Bible and a new interpretation of the scriptures. He developed a unique, comprehensive cosmology and theology. He wrote on theological topics for the next three decades until his death in 1772. Interestingly, many of the ideas developed in his scientific works permeate his theological writings.

Swedenborg's search to unite science and spirit

One of the primary motives guiding all of Swedenborg's scientific works was the exploration and demonstration of the integral, underlying unity of science and spirit. Throughout his scientific works there is an underlying effort to demonstrate the structure and form originating from God, descending through the spiritual realm into the natural form. Swedenborg recognized that God was Infinite Wisdom and that this wisdom was manifest in all His creation. He endeavored to explore and understand the laws and principles inherent in God's creation. Swedenborg believed that studying nature, particularly the human form, would help to develop an understanding of the Creator.

Swedenborg's paradigm of brain as part of soul—body interaction

One of the last and most original of Swedenborg's scientific works was *The Brain*. It is in this work that his efforts to explore and discover the manifestation of the soul in the body are most clearly evident. His doctrine of discrete degrees uniting soul, mind, and body, clearly guided many of his anatomic studies, searching for the soul-body interaction. He viewed God, the Creator, as creating mankind in His image, both spiritually and naturally. Swedenborg's search for the mechanisms allowing soul-body interaction led him to the study of the brain in the greatest detail possible, and to develop a sophisticated paradigm of brain activity throughout the body. He recognized the brain as the vessel that holds the mind and allows close interaction with the soul. His 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.

Swedenborg's paradigm of the brain is nothing less than an effort to explore the soul's manifestation in the body. It helped to guide Swedenborg down another path soon thereafter, when he dropped his scientific work and went on to explore the science of the spirit for the rest of his life. Yet, Swedenborg's organic paradigms have tremendous worth on their own merits as well as laying a foundation for his organic theology which followed.³

History of osteopathy

Osteopathy was first discovered and established by Dr. Andrew Taylor Still (1828–1917), an American frontier physician in Kansas and Missouri in the middle of the nineteenth century. He became disillusioned with the largely unsuccessful "heroic" medicine of his day with its use of ineffective dangerous drugs and invasive practices. In 1874 Still started down a new path that he later named "Osteopathy." Still's Osteopathy involved an emphasis on the inherent ability of the body to heal itself and the role of the physician to assist structure and function so that health might reign in each individual. Still rejected the toxic drugs of his day and focused on the hands-on techniques of osteopathic manipulative medicine within a context of a comprehensive medical practice. He was very successful and eventually started a school in Missouri in 1892. This grew into the osteopathic profession which now is part of established American medicine with over twenty osteopathic medical schools in the United States alone.

Cranial osteopathy and Sutherland

William Garner Sutherland, D.O. (1873–1954), a student under Dr. Still, developed a system of diagnosis and treatment known as cranial

³ Swedenborg, *Cerebrum*, vol. I, § 1202, vol. II, § 156.

osteopathy, now formally titled "Osteopathy in the Cranial Field." Sutherland gave credit to Still for discovering and developing the philosophy, principles, and practice of Osteopathy. Sutherland applied them in a new and sophisticated fashion to the head and rest of the body utilizing this new cranial concept. Sutherland taught fellow osteopathic physicians this new system of cranial diagnoses and treatment from the 1930s until his death in the middle 1950s.⁴

Osteopathy in the Cranial Field, along with other types of osteopathic manipulative medicine, is taught in all osteopathic medical schools in the United States and in many other countries throughout the world. It is used to help many patients worldwide. The Cranial Academy, a component organization of the American Academy of Osteopathy, is one organization that exists to continue the teaching and practice of cranial osteopathy by physicians (and dentists). It has a current membership of about 1200.

SWEDENBORG'S PARADIGM OF THE BRAIN

Introduction

There are many important concepts that are fundamental to Swedenborg's development of ideas in *The Brain* and elsewhere. While some of his ideas relating to the brain have been discussed over the years, there has not been any summary of his paradigm of the brain. The majority of references to Swedenborg in this study are from his book, *The Brain*, although other scientific works are also cited, especially *The Cerebrum*. The following summarizes the majority of Swedenborg's ideas related to his paradigm of the brain. It is beyond the scope of this study to include all of Swedenborg's ideas related to the brain.⁵

Swedenborg went on to develop his ideas concerning soul-body interaction in his theological writings. However, this discussion will deliberately focus on his scientific works as these seemed to have the most

⁴ Sutherland, *Contributions of Thought*, 143, 188, 214.

⁵ Woofenden, *Swedenborg Explorer's Guidebook*, 196–237.

obvious influence on Sutherland. Following the custom of Swedenborgian scholars, all references to Swedenborg's works are by paragraph number rather than by page number.

Series of degree

The first important concept in Swedenborg's *The Brain* is that of series of degrees. This concept permeates his anatomical works, especially in regard to the brain, and helped Swedenborg to develop his unique insights. Later it also became a key concept in his theological writings.

In *The Brain* Swedenborg described each great series of degrees as having three levels, consisting of a higher, a middle, and a lower degree. Swedenborg termed the highest degree in a series as the "end," the middle degree as the "cause," and the lowest degree as the "effect." Thus, every series of degrees contains an end, a cause, and an effect. From the highest degree, the highest, most universal ideals or things flow into the lower degrees. The lower degrees are in turn representations of the higher degrees.⁶

Correspondence and co-established Harmony

An important corollary to this concept is that of co-response or correspondence. The highest degree in any series contains the principle, or end, which has respect to those things that are below it in that series of degrees. It disposes into action the lower degrees which in turn represent the principles contained within it. While these degrees are discrete, there is an influx from the higher degrees into the lower ones. There is also a reciprocation or reflux from the lower degrees up to the higher ones. Swedenborg names this as "co-established harmony," or correspondence, which exists simultaneously between these degrees of end, cause, and effect. Therefore the third degree consists of effects that are a "type and image" representing the corresponding things contained in the highest degree of principles. One important series is that of soul, mind, and body.⁷

⁶ Swedenborg, *Brain*, Vol. 1, § 1–2.

⁷ *Ibid.*

Use

Another fundamental approach of Swedenborg is the focus on use. The use, or function, of anything is of great importance, for that is why it exists. Anatomically this is clearly seen in Swedenborg's focus on structure and function as being two aspects of a single entity. However, Swedenborg believed that it is only by a study of function that we truly come to understand the anatomical structures of the human body. The use of something determines its degree location in a series with others and reflects the end or principle made manifest in its use. All ultimates in the body eventually originate from and reflect back to the soul. "Thus all things that belong to the body, and that flow forth into act from the body, manifest to the life the quality of the soul."⁸

Body and soul

One of Swedenborg's goals in much of his writing was to discover more about the soul-body interaction. This theme runs throughout his scientific and theological writings and is fundamental to his view of the brain. He describes body and soul in the paradigm of discrete degrees. The soul is the end or highest principle in a series in which the body is the effect, ultimate, or final form. Consequently, the human body is the image of the soul and is organically formed in accord with its principle. He goes on to write, "wherefore by the one [the human body] we are able to behold what is contained in the soul, and from the soul what is contained in the body." He describes soul and body as an organic unity separated by discrete degrees. While the soul may not be detectable by natural senses or instruments, it nonetheless corresponds with the body; it forms the body, and the body is a vessel for the soul. The intrinsic order and wisdom of the soul guides the influx, structure, and function of its vessel, the body, via correspondence. The inherent wisdom of the structure and function of the body originates from the soul. This single unity of the human form is an image of the Creator who is Divine Wisdom itself.⁹

⁸ Swedenborg, *Animal Kingdom*, § 32.

⁹ Swedenborg, *Brain*, Vol. 1, §§ 2, 65, 104q, 195.

Soul, brain, and body

Swedenborg recognized the brain in general, and the cerebrum in particular, as that which “institutes the intercourse between the soul and the body.” He recognized degrees of end, cause, and effect applied to this series. Just as the end is the purpose, the cause is the means by which the purpose is carried forth, and the effect is the final result, then so the soul is the sphere of purpose, the cerebrum is the sphere of causes, and the body is the sphere of effects. He understood the body to be intricately connected through anatomy and function at many levels including neurologic, musculoskeletal, visceral, and fascial levels. All these levels are interconnected, but the underlying uniting force is the soul’s presence in the body. The major mechanism for this to take place is through the brain and its animation of the body.¹⁰

Brain motion

Swedenborg described brain motion as a subtle alternating expansion and contraction of the brain. He often referred to this motion as an alternating diastaltic and systaltic motion, or as animation of the brain. He clearly believed that knowledge of the motion of the brain is necessary to understand its structure and function.¹¹

Swedenborg saw evidence for brain motion throughout the anatomy of the brain, spinal cord, and nervous system. He saw evidence of this intrinsic brain motion in the structures of the dural and other intracranial membranes, as well as the cranial bones and the sutures uniting them. He stated that this animatory motion is found throughout the entire nervous system and in fact the whole body. Swedenborg described every artery, vein, and nerve fiber as “in the very current of motion of the brain.” This motion is perpetual throughout the life of the body.¹²

¹⁰ Ibid, § 80.

¹¹ Ibid, § 59.

¹² Ibid, §§ 43, 59, 260, 277.

Characteristics of brain motion

Swedenborg described the subtle alternate expansion and contraction of the brain as a global movement occurring throughout the brain. He stated that there is animatory motion of the individual parts of the different areas of the brain, however, these different structures move together in a "harmonious variation" so that the brain contracts and expands in a simultaneous fashion. This is accomplished by a spiral quality to the movement of discrete areas of the brain, which can be described as a "spiral fluxion." This spiral fluxion allows each part to move without obstruction of contiguous structures. This activity helps to explain the structure and shape of the cortical gyri. He stated that this motion is subtle and not obvious to the senses.¹³

Spinal cord motion

Swedenborg described brain motion as extending through the brainstem to the spinal cord. The spinal cord and brainstem extend and contract, expand and constrict, in conjunction with the motion of the brain.¹⁴

Brain motion is primary to lung motion, "respiration" of the brain

Swedenborg described the animation, or expansion and contraction, of the brain as usually coinciding with the ventilation of the lungs. However, this motion is primary to lung motion.¹⁵

Swedenborg also makes reference to the animation and "respiration" of the cerebrum. At one point he even writes, "The cerebrum alternates its motions and breathes and respire with the lungs." This is primary to respiratory motion.¹⁶

¹³ Ibid, §§ 43, 46, 48, 104r, 350.

¹⁴ Ibid, § 51; 1887, 708.

¹⁵ Ibid. 1, § 53.

¹⁶ Swedenborg, *Brain*, Vol. 1, § 41; Swedenborg, *Cerebrum*, vol. I, § 213.

Origin of brain motion/animation

Swedenborg wrote that while the principles of brain motion are hidden deeply, the source of brain motion is the cortex of the brain, particularly the cerebral cortex. Brain motion is also tied in with the spirituous fluid arising from the cells of this cortex (spirituous fluid concepts are discussed later in this article). However, the primary origin of brain motion is from the source of the spirituous fluid essence which is the soul. Swedenborg viewed brain motion as a manifestation of the soul's presence within the body. Thus, his use of the word "animation" can be understood as simultaneously the vivification of the natural body, and as the rhythmic motion of the brain permeating the entire body that makes this possible. Swedenborg viewed this activity as uniting the discrete degrees of soul, mind, and body, allowing influx and correspondence between these levels. He saw human life as a triunity of soul, mind, and body, united by influx and correspondence. Swedenborg recognized the rhythms of organic motion permeating our natural bodies as also playing an important role uniting soul, mind, and body. Life is motion; rhythmic, coordinated organic motion occurring at all levels.¹⁷

Brain, intracranial membrane, and cranial bone motion

Swedenborg described the motion of the brain as part of a complex system of inter-related systems. Not only does brain motion affect all structures of the body that are continuous with the brain, it also interacts with contiguous structures in a very sophisticated and complex fashion. Brain motion is intimately tied in with the structure and function of its surrounding membranes and the cranial bones.

Reciprocal dura mater motion

Swedenborg described the dural motion as reciprocal with brain motion. Dural motion is passive, following the motion of the brain, yet also,

¹⁷ Swedenborg, *Brain*, Vol. 1, §§ 58, 56.

“that 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.” When the brain is in the expansion phase, the dura mater is stretched, when the brain contracts the dura is “unstrung.” From this alternating stretch and recoil results a “reciprocal action.” This reciprocal stretch and recoil is rhythmic, having a “reactive power” responding to and affecting the alternating cycle of brain motion expansion and contraction.¹⁸

Dura, pleura, peritoneum communication and whole body connection

Swedenborg described the dura mater as enclosing the brain, regulating brain motion, and communicating this animatory motion not only to the cranium, but also to the rest of the body. He stated that this is accomplished by the dura enveloping nerves communicating to pleura, peritoneum and into the “sphere of the body.” He recognized that this covering of the nerves continues to all muscles, sense organs, and viscera. In this manner the influence of the brain, via the general membranes of the dura, continues into the pleura and peritoneum, thus the whole body. In summary, brain motion, transmitted by the dura mater, extends throughout the body.¹⁹

Cranial bone motion

Swedenborg recognized cranial bone motion as passive and secondary to the primary active motion of the brain. He stated that the structure of the individual bones of the head reflected the motion of the brain. He described these bones as moving in a cycle of expansion and contraction in harmony with the motion of the brain.²⁰

¹⁸ Ibid, §§ 250, 286c, 353.

¹⁹ Ibid, §§ 59, 78, 104o, 272.

²⁰ Ibid, § 196.

Cranial sutures

Swedenborg stated that the cranial bone sutures demonstrate the motion and “sphere of activity” of each individual bone. He recognized that the details of the interdigitations and articulations of various sutures reflect the many different motions of the cranial bones.²¹

Individual motion of the frontal, parietal, and occipital bones

Swedenborg describes the movement of the cranial bones in general terms. These movements accompany the rhythmic cycle of brain motion. He describes the movements of only three bones in particular; the frontal, the paired parietal and the occipital bones.

Swedenborg described the frontal bone, with its bilateral anterior bosses, expanding anteriorly during the expansion phase of brain motion, in correspondence with the frontal lobe of the brain. He described the paired parietal bones as elevating and moving laterally with the expansion of the parietal areas of the brain. He also described the occipital bone moving with the cerebellum, elevating at the middle.²²

Swedenborg does mention that while the movement of this system extends throughout the body, it is subtle and not obvious to the senses.²³

Spirituos fluid/spirituous essence/animal spirits

Swedenborg described the finest structures of the cerebral and cerebellar cortex as cerebellula with fibers extending throughout the brain connecting the cortex to the rest of the body. This is clearly similar to the structures in the modern concept of cell theory in the form of neurons and nerve fibers. However, he described a function that is not clearly recognized today. He described the individual cerebellula as producing a most refined fluidic substance he termed the spirituous essence or spirituous

²¹ Swedenborg, *Brain*, Vol. 1, §§ 191, 198; Swedenborg, *Cerebrum*, vol. I, §§ 170, 736, Vol II §9.

²² Swedenborg, *Brain*, Vol. 1, § 198.

²³ *Ibid*, § 350.

fluid (also called the animal spirit). The terms are sometimes used with different shades of meaning, but in general he refers to a special fluid-like substance arising from the cells of the brain cortex that travel through and around connected nerve fibers and so throughout the entire body. Swedenborg also described the spirituous fluid as traveling from the cortex through and around nerve fibers into the ventricles where it mixes with a "purer lymph" or fluid from the choroid plexus to form the cerebrospinal fluid.²⁴

Characteristics of spirituous fluid

Swedenborg described the spirituous fluid as being more subtle and more refined than other fluids found in the body. He stated that the character of spirituous fluid is different from regular fluids in that it is volatile, highly elastic, expansile, compressible, and yielding. It can flash through the interstices and pores of the medullary substance.²⁵

Swedenborg stated that this special character or "moisture" of spirituous fluid imparts fluidity to body fluids, including the cerebrospinal fluid and the blood. This spirituous fluid is "utterly beyond the ken of the senses" and is a "first determining force, however light." He describes spirituous fluids as penetrating into the cortical fibers and being secreted into ventricles as well as the glands of the body in ways that no eye is able ever to perceive. This spiritual essence, or fluid, infills other fluids while still retaining its unique character. This spirituous fluid is intimately tied in with brain motion. Both brain motion and spirituous fluid derive their force and power from the same origin, which is the soul.²⁶

Swedenborg also mentions that the soul pours in, that is breathes into (or inspires), the spirituous fluid thus animating the cerebrum. The soul is the "veriest cause of the animation of the cerebrum."²⁷

²⁴ Ibid, §§ 58, 104n.

²⁵ Ibid, § 577.

²⁶ Swedenborg, *Brain*, Vol. 1, §58; Swedenborg, *Cerebrum*, vol. I, §214. Swedenborg, *Brain*, Vol. 2, § 518f, 577.

²⁷ Swedenborg, *Cerebrum*, vol. I, § 214.

Cerebrospinal fluid animated by spirituous fluid

Swedenborg described the cerebrospinal fluid as being animated by the spirituous fluid, which originates from the cerebrum. This spirituous element vivifies the cerebrospinal fluid. It is the fluid within the fluid that gives it a special character. The cerebrospinal fluid eventually mixes into the blood stream giving the blood some of its own special character.²⁸

Pulsation of cerebrospinal fluid

Swedenborg described the cerebrospinal fluid as being moved by the animatory force and motion of the cerebrum and cerebellum. He described its flow from the brain cortices, to the lateral ventricles, to the third and fourth ventricles and to the spinal cord in a pulsatile fashion synchronously with brain motion. He also described the cerebrospinal fluid as traveling between and through the roots and fascicles of nerves, and along and around them, to the rest of the body.²⁹

The circle of life

Swedenborg described a circulation of the spirituous fluid. This circulation starts with the production of the spirituous fluid in the brain cortex where it is transmitted by nerve fibers and cerebrospinal fluid to the rest of the body, eventually terminating in the bloodstream. The blood then completes the circulation returning the spirituous fluid back into contact with the cortex of the brain where it is extracted and rejuvenated by influx from the soul. Thus it completes “the circle of life” that is animated by the expansion and contraction of the brain, contributing a universal motion to the spirituous fluid and the entire body.³⁰

²⁸ Swedenborg, *Brain*, Vol. 1, §§ 104, 90; Swedenborg, *Brain*, Vol. 2, § 715n.

²⁹ Swedenborg, *Brain*, Vol. 1, §§ 104v, 471, 473, 527; Swedenborg, *Brain*, Vol. 2, § 715n.

³⁰ Swedenborg, *Brain*, Vol. 1, § 75, 78.

Ventricular motion

Swedenborg describes the ventricles of the brain undergoing a similar phasic motion with the cerebrum, cerebellum, and brainstem. During the contraction phase of brain motion, each lateral ventricle lengthens and narrows, and the brainstem lengthens. The posterior and descending cornua of the lateral ventricles subside and close up with the upper, broader parts of the lateral ventricles becoming narrow and contracted. This overall brain and ventricular motion correlates with a subtle narrowing and lengthening of the cranium during the contraction phase of cranial motion. Therefore, the opposite is true during the expansion phase with a subtle widening and shortening of the cranium taking place.³¹

Summary of Swedenborg's description of the brain

While difficult to summarize such a complex paradigm, some of Swedenborg's ideas do stand out:

1. The concept of series of discrete degrees illustrated by the example of soul, mind, and body and their correspondence and interaction in an organic whole.
2. The focus on structure and function with an emphasis on use.
3. The primary importance of inherent brain motion, in a subtle alternating expansion and contraction, which originates in the cortex and is transmitted throughout the body, serving as a means for soul-body interaction as well as rhythmic animation of the entire body.
4. The reciprocal motion of the dural membranes (accompanying the rhythmic motion of the brain) transmitted by dural connections to the cranial bones as well as the pleura, peritoneum, and nerve supply to the rest of the body.
5. The specific motions of individual cranial bones determined by cranial sutures and the motions of the corresponding dura and brain.

³¹ Swedenborg, *Brain*, Vol. 1, §§ 466, 469.

6. The role of spirituous fluidic essence transmitted from the cerebral cortex to the nervous system, the cerebrospinal fluid, and eventually the blood and other body fluids.
7. The pulsatile nature of the distribution of the animated cerebrospinal fluid throughout the nervous system and entire body and its return to the brain by the “circle of life.”

Swedenborg’s organic paradigm is inherently holistic, integrating brain function and motion, neurologic, skeletal, fascial, respiratory, and cardiovascular systems as well as soul, mind, and body into a rhythmic unity. His organic paradigm is not simply a philosophy of ideas, but is based on detailed anatomic study, with an emphasis on structure and function, and is consistent throughout his writings.

WILLIAM GARNER SUTHERLAND, D.O. AND THE CRANIAL CONCEPT

Biography of Sutherland

William Garner Sutherland was born in Wisconsin in 1873. He entered the American School of Osteopathy, the first osteopathic medical school, in 1898. He studied under the early faculty which included Andrew Taylor Still, the founder of osteopathy and the president of the school. While a student in 1898, Sutherland had an insight about the bones of the cranium that would later change his life and lead to the development of a new application of osteopathic manipulative medicine. This insight came like a bolt from the blue that the sutures of the cranial bones were, “Beveled like the gills of a fish; indicating articular mobility for a respiratory mechanism.” It was taught at that time that there was no movement between the bones of the cranium. Sutherland let this novel idea sit until about twenty years later when he picked it up again and began to seriously explore this concept and its ramifications.³²

³² Sutherland, *Contributions of Thought*, 146, 214, 228; Sutherland, *With Thinking Fingers*, 5, 18.

During the 1920s Sutherland developed his initial understanding of the cranial concept. He applied the principles and practice of Dr. Andrew Taylor Still's osteopathy to this emerging cranial concept, experimenting with diagnosis and treatment of cranial dysfunctions on himself and his patients. By 1929 he introduced his concept with its osteopathic manipulative application to the osteopathic profession. He taught to small groups of osteopathic physicians during the 1930s. In the 1940s he started teaching organized courses with detailed curricula to groups of osteopathic physicians that traveled across the country to study with him and his faculty. He continued to teach and develop his cranial concept until his death in 1954.³³

Sutherland's references to Swedenborg

Sutherland did make three recorded references to Swedenborg. Two references were published from 1944. The first compared the founder of osteopathy to Swedenborg.

Like Swedenborg who studied anatomy two hundred years ago, in search of the soul, Dr. Andrew Taylor Still studied the handiwork of his Maker—the human body.³⁴

The second reference commented on Swedenborg's descriptions of brain motion.

If you become a mechanic of the cranial mechanism by correcting a cranial lesion, you then become the pharmacist. There is no end to this thought. It is not a new thought. Swedenborg, 200 years ago, said there is movement of the brain. Have we anything totally new? No.³⁵

³³ Sutherland, *Contributions of Thought*, 41, 46, 51, 74, 142, 147; Sutherland, *With Thinking Fingers*, 76, 77.

³⁴ Sutherland, *Cranial Bowl*, 4.

³⁵ Sutherland, *Contributions of Thought*, 163.

While Sutherland never wrote any detailed analysis of Swedenborg's ideas, it is interesting that in these brief comments he makes several very important statements. Sutherland compares Andrew Taylor Still, the founder of osteopathy, (whom he held in the highest regard) to Swedenborg and his search for soul-body unity through the study of the human form and anatomy. Sutherland also mentions that the thought of motion of the brain is not new and credits Swedenborg for his studies 200 years earlier (*The Brain* was written exactly 200 years earlier, in 1744). Sutherland even states that his own ideas are not new, implying that Swedenborg did indeed describe important ideas related to brain motion. In these statements it is obvious that Sutherland shows tremendous respect for Swedenborg by tying him in with several of the most important things in his professional life; osteopathy and its founder, and the cranial concept.

Sutherland did make a third reference that involved Swedenborg and one of the translators of Swedenborg's scientific writings, Rev. Alfred Acton, PhD. This will be discussed under the section "Acton and the Lippincotts."

Overview of Sutherland's cranial concept

Over his long professional life, Sutherland wrote many articles and gave many lectures that were recorded, transcribed, and later published. He described the cranial concept in many ways, but five points are well recognized as fundamental to the cranial concept which he termed the Primary Respiratory Mechanism.

1. Inherent motility of brain and spinal cord
2. Fluctuation of the cerebrospinal fluid
3. Mobility of intracranial and intraspinal membranes
4. Articular mobility of cranial bones
5. Involuntary motion of the sacrum between the iliac bones ³⁶

³⁶ Ibid.

Inherent motility of the brain and spinal cord

Sutherland described a subtle, powerful rhythmic motion of the brain, as it expands and contracts, which serves as the motor force that drives the motion of the intracranial membranes and cranial bones. He was very specific in his terminology and described brain motion as an intrinsic motility, and intracranial membrane and cranial bone motion as mobility. This motion originates in the cerebrum and cerebellum, but also involves the spinal cord and related structures. In fact, this motion is continuous throughout the body, and perpetual throughout life. All animate tissues are in constant rhythmic motion, the most primary rhythm being that of the Primary Respiratory Mechanism.³⁷

Characteristics of brain motility

Sutherland described an alternating coiling and uncoiling of the convolutions, or gyri, of the brain. He named the expansion phase the inhalation, or flexion phase of the cycle. He termed the constriction phase the exhalation, or extension phase of this cycling of the Primary Respiratory Mechanism. Sutherland recognized the convolutions and fissures of the brain as being designed to accommodate the intrinsic rhythmical activity of the brain, coiling and uncoiling in a spiral form. This spiral form of the structures of the brain allows motion to take place in a synchronous fashion, fitting into the structures of the dura mater and cranium. This motion is very subtle and also includes the brainstem and spinal cord.³⁸

Primary respiratory mechanism is primary to lung motion

Sutherland made it clear that the Primary Respiratory Mechanism involves a cyclic movement of the brain and fluctuation of the cerebrospinal fluid that is primary to the motion of the diaphragm and lungs. However, the two often move synchronously. Both motions can even be

³⁷ Sutherland, *Contributions of Thought*, 74–75, 97–98, 119, 129, 161; Sutherland, *Teachings in the Science*, 19.

³⁸ Sutherland, *Contributions of Thought*, 74–75, 119, 129; Sutherland, *Teachings in the Science*, 19, 63, 64, 172.

described as respiratory (in different ways), however, the brain motion is primary and the lung motion is secondary. These are not always synchronous. Sutherland did use the patient's breathing as a respiratory assistance in some osteopathic cranial treatment techniques.³⁹

Fluctuation of the cerebrospinal fluid

Sutherland emphasized the fluctuation of the cerebrospinal fluid, synchronously with the motility of the brain, as a key component of the Primary Respiratory Mechanism. He recognized that this fluid moves in a pulsatile fashion that affects, and is affected by, the brain, dural membranes and cranial bones. Sutherland emphasized the fluctuation of the cerebrospinal fluid within a semi-closed system, rather than a circulation from origin to end, or as cycle of circulation.⁴⁰

Mobility of intracranial and intraspinal membranes

Sutherland described the membranes within the cranium and spine as being moved in a reciprocal fashion following the rhythmic motility of the brain and spinal cord. He named this the Reciprocal Tension Membrane. He emphasized the inner layer of the dura, particularly the falx cerebri, falx cerebelli and tentorium cerebelli, as well as the intraspinal dural membranes. The dura in particular keeps a tension in the system, moving reciprocally with the brain, serving as a check ligament aiding, controlling and limiting brain motion, encouraging fluctuation of the cerebrospinal fluid, and connecting the brain and the cranial bones. It also travels within the spine, attaching at the occiput and again at the sacrum, serving as a core link between the cranium and the pelvis.⁴¹

³⁹ Sutherland, *Contributions of Thought*, 42, 49, 148, 298.

⁴⁰ Sutherland, *Contributions of Thought*, 201, 273, 336, 348; Sutherland, *Teachings in the Science*, 176; Magoun, *Osteopathy in the Cranial Field*, 16, 17.

⁴¹ Sutherland, *Contributions of Thought*, 74, 97-98, 143, 149; Sutherland, *Teachings in the Science*, 42; Magoun, *Osteopathy in the Cranial Field*, 17.

Articular mobility of cranial bones

Sutherland described all cranial bones as moving in a subtle rhythmical fashion with the Primary Respiratory Mechanism. He described the two phases of this mechanism as flexion (a.k.a. inhalation) and extension (a.k.a. exhalation). In general, the flexion, or inhalation, phase of the head involves an increase in the lateral width of the skull, a shortening of the anterior-posterior dimension of the cranium, with an elevation of the junction between the occiput and the sphenoid. During this flexion phase the paired bones of the skull go into external rotation. During the extension, or exhalation, phase of this cycle the opposite takes place, with the cranium narrowing in lateral width, lengthening in an anterior-posterior dimension, accompanied by a lowering of the sphenoid-occiput junction and paired cranial bones going into internal rotation.⁴²

Individual motion of the frontal, parietal, and occipital bones

While Sutherland described the motion of each cranial bone in detail, only three bones will be considered in this paper because Swedenborg made mention of the particular motions of only three bones; the frontal, parietal and occipital bones. During the inhalation phase of the Primary Respiratory Mechanism, Sutherland described the frontal bone as moving forward anteriorly as if hinged at the coronal suture that it shares with the parietal bones.

Also during the inhalation phase the parietals, which are hinged to each other, at the shared sagittal suture, move outward, laterally. The anterior basilar portion of the occiput moves upward during inhalation. During the exhalation, or extension, phase the frontal moves inward posteriorly, the parietals move inward medially, and the basilar portion of the occiput moves inferiorly.⁴³

⁴² Sutherland, *Contributions of Thought*, 152–156.

⁴³ Sutherland, *Contributions of Thought*, 152, 193; Sutherland, *Teachings in the Science*, 73.

Involuntary motion of the sacrum between the iliac bones

Sutherland described an involuntary movement of the sacrum that corresponds with the sphenobasilar motion of the Primary Respiratory Mechanism. This motion is transmitted from the cranium by means of the intraspinal dural meninges to the sacrum. This motion has important therapeutic application.

The breath of life

In addition to the five components of the cranial concept, another important concept of Sutherland's was the Breath of Life. Sutherland did not give a strict definition of the term "the Breath of Life," but he did refer to it many times, especially later in his life. It became extremely important in interpreting his cranial concept, especially during the last ten years of his life.

Sutherland described the Breath of Life as not the breath of air, rather as something invisible that dwells within the cerebrospinal fluid, something primary to the breath of air. It has a fluid nature that manifests a potency that has an Intelligence "with a capital I." The potency and Intelligence of the Breath of Life are manifested particularly in the fluctuation of the cerebrospinal fluid. It contains a tendency towards normal function of the body that can be used therapeutically in cranial osteopathy. Its origins are unknown, but the fact that it is there is enough. This Breath of Life serves as the spark of ignition to the motor of the human brain. It is not material. It cannot be seen. Sutherland described this Breath of Life as a "liquid-within-a-liquid" and as a "fluid within this fluid" which is an intelligent potency contained within the cerebrospinal fluid yet which does not mix with it. He visualized this "fluid within a fluid" as "the highest known element" that nourished the nerve cells and traveled along the nerve fibers by a transmutation.⁴⁴

⁴⁴ Sutherland, *Contributions of Thought*, 147, 191, 201, 204, 216, 299; Sutherland, *Teachings in the Science*, 14, 31, 63, 147, 166, 169, 168, 176.

**SIMILARITIES BETWEEN SWEDENBORG'S AND
SUTHERLAND'S PARADIGMS**

Intrinsic brain motion

Both Swedenborg and Sutherland describe a subtle cyclic expansion and contraction of the brain. Both describe a spiral quality of motion of the different gyri of the brain.

Brain motion primary to lung motion

Swedenborg and Sutherland both view the inherent motion of the brain and related structures as primary to lung respiratory motion, although the two are often synchronous.

Reciprocal dural membrane motion

Swedenborg and Sutherland shared a similar view of the dural membranes moving reciprocally in response to the motion of the brain and transmitting this motion to the cranial bones.

Cranial bone motion

Swedenborg and Sutherland seemed to share the concept of cranial bones moving in a rhythmic fashion, following the motion of the brain and dura, according to the structure of the cranial sutures. Both men described similar changes in the shape of the head, accompanying the alternate motion of the brain, dura, cranial bones, with the lateral widening and longitudinal shortening associated with the expansion/inhalation phase and the opposite with the constriction/exhalation phase.

Similarities between Sutherland’s breath of life and Swedenborg’s spirituous fluid

While Sutherland’s Breath of Life does not appear to be identical to Swedenborg’s concept of spirituous fluid, there are some very interesting similarities between the two. Both are fluid models, but containing something more than mere physical liquids. Both contain a motive force that helps to drive the cranial system. Both give special quality to the cerebrospinal fluid yet do not mix with it. Both share a higher origin than simple cerebrospinal fluid or even the rest of the body. Both are beyond detection with the simple senses. Both nourish the nerves and eventually the rest of the body. Both play key roles in the cranial system and throughout the body that are not easily understood.

DIFFERENCES BETWEEN SWEDENBORG’S AND SUTHERLAND’S PARADIGMS

Cerebrospinal fluid circulation vs. fluctuation

Swedenborg described a “circle of life” which involved the circulation of spiritual fluid, which was produced in the brain cortex, permeating and vivifying the cerebrospinal fluid, eventually passing into the blood stream and coming full circle to the cortex of the brain where it could be extracted and recirculated. He viewed a fluid pump function of the brain as similar to the heart with its own systolic and diastolic motion.

Sutherland viewed a special principle or potency of the cerebrospinal fluid as flowing forth from the brain to the periphery of the nervous system and body in a fluctuating manner; however, he did not emphasize any return circulation. Sutherland emphasized fluctuation in a semi-closed system, rather than circulation of the cerebrospinal fluid.

Involuntary motion of the sacrum between the iliac bones

Sutherland describes an involuntary movement of the sacrum that corresponds with the sphenobasilar motion of the Primary Respiratory Mechanism. While Swedenborg does mention that the motion of the brain

is transmitted to the rest of the body, he does not make mention of specific motion of the sacrum. Sutherland's description of sacral motion is not found in Swedenborg's writings.

Therapeutic application

Swedenborg worked diligently over years to better understand the human body and how its structure and function are inter-related and expressed in use. He wrote extensively to share his perspective and discoveries with others. He did not develop any specific therapeutic application of his work.

Sutherland also dedicated himself to developing a similar extensive understanding of human structure and function. However, he applied this understanding in the context of the osteopathic tradition and philosophy of Andrew Taylor Still. He developed a sophisticated and effective system of osteopathic manipulative diagnosis and treatment, based on the cranial concept, for the entire body.

SWEDENBORG FIRST DESCRIBED FOUR OUT OF FIVE COMPONENTS OF SUTHERLAND'S CRANIAL CONCEPT

As mentioned earlier, Sutherland's cranial concept has five fundamental components:

1. Inherent motility of brain and spinal cord
2. Fluctuation of the cerebrospinal fluid
3. Mobility of intracranial and intraspinal membranes
4. Articular mobility of cranial bones
5. Involuntary motion of the sacrum between the iliac bones

As reviewed so far, it is clear that Swedenborg described ideas similar to the first four of the five components of Sutherland's cranial concept. Swedenborg described brain and spinal motion, often synchronous with lung motion, as did Sutherland. Swedenborg described a synchronous pulsation of the cerebrospinal fluid containing a higher principle that gave it more significance and ability than just a simple fluid, similar to

Sutherland's description of the fluctuation of the cerebrospinal fluid with its potency, Intelligence, and Breath of Life. Swedenborg and Sutherland's description of the reciprocal tension membrane are essentially the same. Swedenborg and Sutherland both describe cranial bone motion in response to brain motion. Sutherland's descriptions of cranial bone motion were more detailed and sophisticated than Swedenborg's descriptions; however, they were very similar in principle.

In contrast, Swedenborg's descriptions of brain motion are much more detailed than Sutherland's, yet they are also harmonious with Sutherland's cranial concept.

Sutherland's first four components of his cranial concept are similar to, and harmonious with, Swedenborg's descriptions written two hundred years earlier.

HISTORICAL CONNECTIONS BETWEEN SUTHERLAND AND SWEDENBORG

Rev. Alfred Acton, Ph.D.

The Reverend Alfred Acton, Ph.D. was a minister in the New Church during Sutherland's time. The New Church is also known as the New Christian Church or The General Church of the New Jerusalem. The New Church is founded on Swedenborg's theological works and explanation of Christianity. Acton was well versed in Swedenborg's scientific and theological works. He was raised to the degree of bishop in 1936, and was the Dean of the Theological School at the Academy of the New Church headquarters in Bryn Athyn, Pennsylvania. Acton was also one of the world leaders in Swedenborg's scientific works, especially relating to the brain. He reviewed Swedenborg's scientific works and translated Swedenborg's *The Cerebrum* from Latin into English. This was the first (and only) time this work had been translated into English. It was published by the Swedenborg Scientific Association in 1938.⁴⁵

⁴⁵ Swedenborg, *The Cerebrum* and Acton, *Biographical Note*.

Acton was widely recognized as a leader in understanding, translating, and teaching Swedenborg's scientific works. He actively sought out opinions from scientists and physicians on Swedenborg's ideas, trying to find modern applications and verifications of Swedenborg's scientific ideas, especially in regards to the brain. Acton corresponded with professors at Harvard Medical School, Yale University School of Medicine, Boston University School of Medicine, and University of Cambridge, England among others. The letters to and from the faculty at these institutions ranged from 1931–1957. He also corresponded with at least one osteopathic physician, Isabelle Biddle, D.O., who practiced and taught cranial osteopathy. This correspondence took place some time between 1951 and 1956. Acton continued to search for validation and application of Swedenborg's scientific work throughout his life, up until his death in 1956.⁴⁶

Acton had contact with the Lippincotts' study group in Moorestown, New Jersey. This was referenced by Acton and also by Sutherland. Acton mentioned this in autobiographical notes written in November, 1944. In these notes he wrote,

1938–S.S.A. [Swedenborg Scientific Association] published my translation of *The Cerebrum*, 3 volumes.

In consequence of this publication, I was invited to address a Group of Osteopathic doctors in New Jersey, which I did.⁴⁷

Acton visited this New Jersey "Group of Osteopaths" sometime between 1938 and November 1944. This visit was probably the same one mentioned by Sutherland and will be discussed further in the Lippincott section.

Biddle, Acton, and Sutherland

Sutherland and Acton knew of each other and had met and compared ideas. The details were not recorded, so, little is known about their interac-

⁴⁶ Acton, *Letters*.

⁴⁷ Acton, *Biographical Note*, 12.

tions. Each of these scholars was strongly committed to his respective studies on the brain. Their meeting was referenced by an osteopathic physician who was also a practitioner and teacher of cranial osteopathy, Isabelle Biddle, D.O., from California. She wrote to Acton commenting on the similarities between Swedenborg's and Sutherland's ideas. She mentioned that Acton and Sutherland had met to discuss cranial osteopathy and Swedenborg's ideas about the brain. Biddle studied Swedenborg's *The Cerebrum* and *The Brain*, pursuing the application of Swedenborg's ideas to cranial osteopathy. Biddle wrote to Acton:

Thank you for sending to me the "New Philosophy" magazine with Dr. Bancroft's article. It is most interesting and I intend writing her. I am making a study of Swedenborg's philosophical and scientific works as I am especially interested in "The Brain." I have your edition and also Tafel's.

I have studied cranial osteopathy and understand you saw Dr. Sutherland about it's relation to Swedenborg's theory and they seemed to differ: however, I believe they are very similar and that is what I am working out now. The results from treatment indicate that Swedenborg's theory is correct.⁴⁸

The article to which Biddle referred was, "The Motion of the Brain and Electroencephalography" by Edith D. Bancroft, M.D., published in *The New Philosophy* (the journal of the Swedenborg Scientific Association) in 1951. This article reviewed Swedenborg's concept of brain motion / animation and compared it to emerging findings in electroencephalography.⁴⁹

Not much is known about Isabelle Biddle. The archives at the Cranial Academy, in Indianapolis, do have a transcription of a presentation given by Dr. Biddle at the College of Osteopathic Physicians and Surgeons in Los Angeles, California, February 8, 1951, titled, "The Application and Uses of Cranial Technique." While this transcript does not mention Swedenborg,

⁴⁸ Biddle, *Letter*.

⁴⁹ Bancroft, *Motion of the Brain*, 169–179.

it does demonstrate that Biddle was giving in-depth presentations on cranial osteopathy during the early 1950s. Interestingly, Sutherland moved to California in 1951, where he and his wife lived until his death in 1954.⁵⁰

Acton and the Lippincotts

Sutherland did make reference to Acton in 1953 in a special recording that has been transcribed and printed in *Contributions of Thought: The Collected Writings of William Garner Sutherland, D.O.* This reference was made while Sutherland was commenting on early teaching and study groups.

There was also a [cranial] study group at the Lippincott's in Moorestown, New Jersey which was visited by Dr. Alfred Acton, the translator of Emanuel Swedenborg's anatomical texts.⁵¹

Acton visited the Lippincott's study group at least once, and was actively exploring connections with osteopathic physicians studying cranial osteopathy. He certainly had contact with Howard and Rebecca Lippincott and other osteopathic physicians through the study group. It is interesting that Acton lived, studied, taught, and ministered in Bryn Athyn, a northern suburb of Philadelphia. The Lippincotts' cranial study group was the next state over in Moorestown, New Jersey.

Howard and Rebecca Lippincott

Howard A. Lippincott, D.O., and Rebecca Conrow Lippincott, D.O., were husband and wife osteopathic physicians who became enthusiastic students and supporters of Sutherland. They visited Sutherland in 1942 and quickly became immersed in the world of cranial osteopathy. In November, 1943, the Lippincotts developed the first long standing Cranial Study Group. This group met at the Lippincott's home in Moorestown,

⁵⁰ Biddle, *Cranial Technique*.

⁵¹ Sutherland, *Contributions of Thought*, 311.

New Jersey and was very active. They met regularly, with well-structured tutorial and practice sessions, for many years. Summary program notes of the meetings from 1947–1964 are preserved at the Cranial Academy Archives. Attendance at the regular meetings was usually around twenty osteopathic physicians. The Moorestown Cranial Study Group was a center of regional and national interest in cranial osteopathy and attracted osteopathic physicians from a wide area. By attending the Lippincott cranial study group, Acton was interacting with leaders and future leaders in osteopathy, particularly cranial osteopathy.⁵²

Since the Lippincotts' Moorestown Cranial Study Group did not start until November, 1943 and Acton's reference was written in November, 1944, then Acton's visit to the Cranial Study Group (presumably, the one mentioned by Sutherland during reminiscences in 1953) must have taken place sometime during the first twelve months of that Group's existence between November 1943 and November 1944. It is interesting that Sutherland's first two recorded references to Swedenborg were made in 1944.

Historical overview

The 1940s and 1950s appear to have been a time of interest in Swedenborg by osteopathic physicians active within the cranial osteopathy community, including the founder of cranial osteopathy, William G. Sutherland. Alfred Acton was one of the key individuals from outside the osteopathic profession who helped to spread Swedenborg's ideas. He spread them indirectly by translating Swedenborg's scientific works and directly by contact with leaders and practitioners of cranial osteopathy.

It is likely that Sutherland first came into contact with Swedenborg's works concerning the brain during his early studies in the 1920s when he was developing the cranial concept. Sutherland probably continued to study Swedenborg's works throughout his life as he developed his ideas further, including such concepts as the Breath of Life.

⁵² Sutherland, *With Thinking Fingers*, 77, 81; Lippincott Study Group files 1947–1964; Still-Sutherland Study Group, *Tributes to Anne L. Wales*, 7.

CONCLUSION

Sutherland built on Swedenborg's foundation

Swedenborg's influence on Sutherland was significant. It is no accident that four of the five fundamental components of Sutherland's cranial concept are found in Swedenborg's writings from two hundred years earlier.

Swedenborg was one of the most brilliant students of the human form and function. He described brain functional anatomy and motion in a paradigm unmatched in the eighteenth century. Swedenborg described the rhythmic animation of the brain as a mechanism for soul-body interaction, uniting all other motions of organic life. He described brain motion, reciprocal dural motion, cranial bone motion, and the qualities of the pulsating spirituous fluid animating the cerebrospinal fluid that in turn animated the entire body. This brilliant anatomical work was a stepping stone for Swedenborg as he moved on beyond anatomical science to explore an organic theology that is still influential and meaningful today.

Sutherland had his novel initial insight into the cranial mechanism in 1898. Sutherland pursued this idea searching for more insights. At some point he came across Swedenborg's anatomical writings and found well-developed ideas consistent with his own insight and osteopathic structure-function perspective. It appears that Sutherland integrated a significant portion of Swedenborg's anatomically-based paradigm of rhythmic brain-body interaction into osteopathy as Sutherland developed cranial osteopathy.

Sutherland built on Swedenborg's foundation, fusing Swedenborg's paradigm of the brain into an osteopathic therapeutic approach that became Osteopathy in the Cranial Field, a sophisticated system of diagnosis and treatment, which continues to benefit patients today.

By better understanding Swedenborg's ideas, we can better understand some of the roots of Osteopathy, including Swedenborg's powerful influence on Sutherland's development of the cranial concept. □

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