

THE NEUROLOGICAL BASIS OF INFLUX

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Following on from Karl Birjukov's article on "Influx,"¹ I have divided this contribution—which considers the neurological basis for Swedenborg's concept of influx—into several parts, depending on the relevant part of the nervous system involved; I am using a modification of the same system as Norman Berridge used in his book *The Natural Basis of Spiritual Reality*,² that is, how different parts of the physical brain provide a framework for, or correspond to, spiritual influx.

A problem I have is obtaining insight or intuition into what Swedenborg means personally by "influx" and its various stages as he describes them in many places of the Writings, mainly in *Arcana Coelestia*, but always somewhat impersonally. This is true with the work of most philosophers, though *The Dream Diary*—not meant by Swedenborg for publication—edited and commented on by Bergquist,³ provides a useful though limited explanatory link between his spiritual and personal life. In sections 52–54 he describes an intense visionary experience in Delft, Holland, on Easter Monday 1744, when meeting Jesus in the spirit. This marked the start of a conscious influx of Divine Love which continued throughout the rest of his life, and underlies his subsequent emphasis that God can best be known through the person of a human being, which he calls the Divine Human.

* I would like to thank the Editor of this issue of *The New Philosophy* not only for the encouragement and help he gave me in writing my article on Influx but also for the three months I lived with him and his wife June while I taught anatomy in the College in the spring of 2004. This included a spell in hospital where a coronary artery by-pass provided an improved blood supply to my heart. My heart was refreshed by this and by Erland and June's care for me and the thoughtfulness of my students who visited me in hospital. College Nurse Allyn Simons made sure I was medically insured. These experiences were a wonderful example of the influx of Divine Love and Wisdom for which I would like to deeply thank them and the Lord. I would also like to thank Matthew Lawrence of mattart.co.uk for help with the illustration.

¹ Karl Birjukov, "Influx: Some Preliminary Philosophical Reflections," (*The New Philosophy* CXV July–December 2012): 303–324.

² Norman J. Berridge, *The Natural Basis of Spiritual Reality* (Bryn Athyn, PA: Swedenborg Scientific Association 1992).

³ Lars Bergquist, *Swedenborg's Dream Diary*. Translated by Anders Hallengren. (West Chester, PA: Swedenborg Foundation, Pa. 2001).

The esse of Reason without the esse of love is very different than with it, and without love, faith in Him is not faith, nor is Reason reason.⁴ This must be kept in mind in reading Swedenborg as apart from this incident in the *Dream Diary*, his personal experience of Divine love is not made the explicit basis of his philosophical system. Without noting this reference to Divine love personified for him by Jesus in the *Dream Diary* as the first and great sine qua non of Swedenborg's system, his system tends to be treated as just another philosophical system. A prosaic example would be the puzzle we would have in explaining the superior performance of an automobile without mentioning that the fuel tank had been filled with higher octane gasoline.

For many philosophers, their personal life plays a peripheral role in the theoretical framework of their philosophy. The title of Jane Williams-Hogan's article in an earlier volume of *The New Philosophy* suggests that the context of Swedenborg's earlier philosophical efforts (1743) was a "human project" to bridge the gap between faith and reason where the necessity of Divine love is hardly mentioned. She quotes Spinoza, writing that we "ought" to express an "intellectual love of God,"⁵ but that seems a somewhat dutiful comment and unlikely to have much to do with Swedenborgian influx the nature of which I attempt to show in this article. I take it that Swedenborg's problem, the gulf between faith and reason, was basically solved in 1744 in Delft, and the *Arcana Caelestia* followed. I examine the neurobiological basis for this bridge between faith and reason constructed by the neurohormonal activity on the brain. I suggest that lymphs in Swedenborg's words are the agents of influx, or even an explanation for the soul itself as Swedenborg suggests in his analysis of one of his visionary experiences, described as part of a Memorable Relation (AC 4050).

The soul is perhaps a word that describes an "other" in a state of love. Woman becomes the soul of man for a man and vice versa, a sort of

⁴ H.Lj. Odhner, *Principles of the New Philosophy* (Bryn Athyn, PA: Swedenborg Scientific Association 1986), 5. While the "esse" of a thing is itself unknowable, its qualities are made manifest as "essence." Thus the essence of God is knowable as "Divine Love and Wisdom," quoting TCR 28 et seq., and in human beings, most often in the conjugal state.

⁵ Jane K. Williams-Hogan, "The Philosophical Context of Swedenborg the Philosopher—Reason and Faith, Faith and Reason—A Human Project," *The New Philosophy* CXV (July–December 2012).

“imprinting,” a term used for the way a sheep bonds with her new born lamb. If we substitute woman or man for God then that gives an idea of the nature of the soul, the attraction we feel for God. The Delft experience can be considered a special form of conjugal love which many people experience without realising its Divine significance or its importance in Swedenborg’s or their own philosophy.

Long before human beings appeared on this earth to form the angelic heavens, neurohormones existed in animals, unconsciously and tacitly, together with the senses, modifying their brains, bodies, and feelings in the course of evolution, with the aim in their case of preserving their bodies and bodily species by and for reproduction. Swedenborg makes feelings concrete and human by his personification of what we now call hormones or biochemical messengers,⁶ as this article attempts to explain. The influx from the senses alters the form of the brain, as do the spirits or lymphs of Swedenborg. The senses as they apprehend the environment, together with accompanying neurohormonal response, are continually altering the neurological form of the brain as they respond to changes in the environment and the internal milieu of the body. These changes can be expressed in the terms of chaos, which can be likened to the internal flux of a tornado or “twister”; the movement of each air molecule is apparently random, but the “end,” the movement of the whole twister, can be expressed as a meaningful accident, an attractor in the language of chaos, depositing say Dorothy on the yellow brick road to the booth of the Wizard of Oz, obtaining on the way a brain for the Scarecrow, a heart for the Tin Woodman, and courage for the Lion. The end of divine providence is the survival of the animal and the creation of a heaven from the human race. Swedenborg’s *Arcana* are insights into this secret story. The diagram indicates a flow of spirits, like the swirling movements of hormones, as in a tornado, pictured as wind born cherubs, illustrating Swedenborg’s way of personifying angelic forms and the *Arcana* of regeneration.

In *Divine Love and Wisdom* §15 Swedenborg writes that the notion that a soul can exist and think and be wise without a body is an error that stems

⁶ Hormone (ὁρμῶν in Greek) is the present participle masculine singular of the Greek word hormao (ὁρμαῶ), to set in motion, and came into use in 1905, when hormones were first identified.

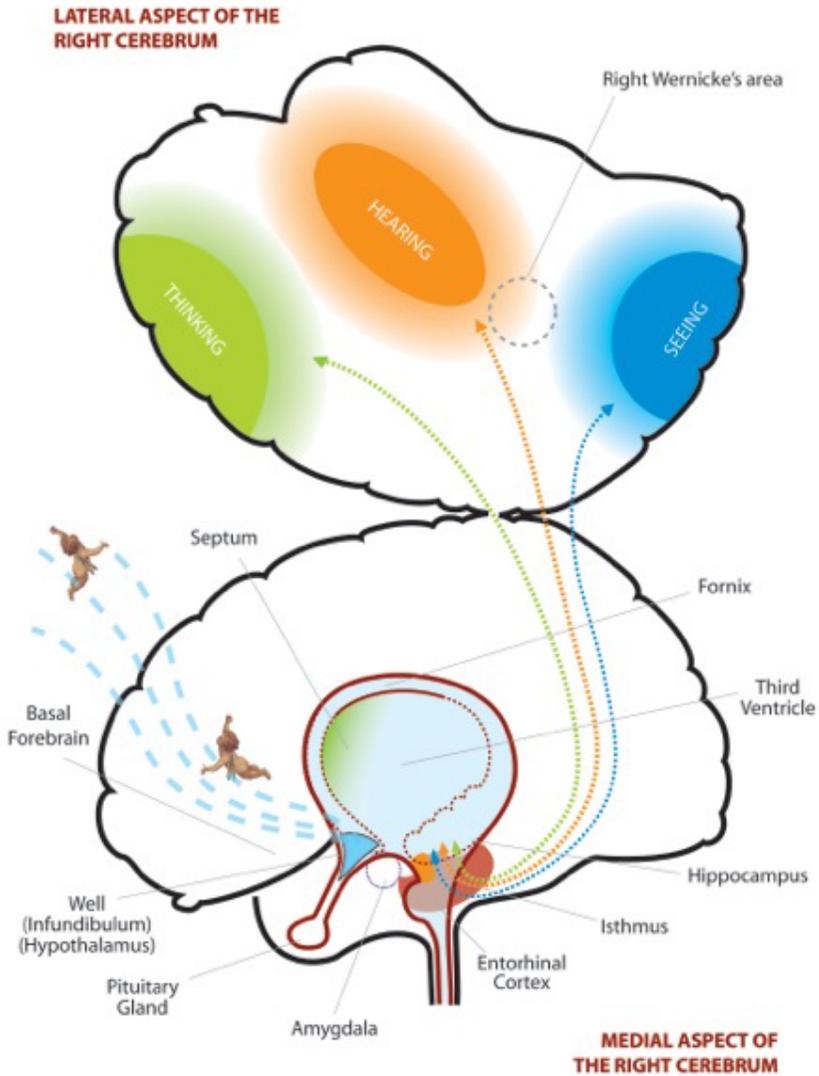


Illustration by mattart.co.uk

from deceptive appearances. Is the soul a deception, a sort of ideal Platonism without the body, or the body a deception without the soul? I suggest that modern knowledge of hormones brings us a step closer to saving appearances if by “appearances” Swedenborg means the same as Plato means in his famous phrase “saving the phenomena,” phenomena being what we would call “appearances.”⁷ Plato means that by giving an admittedly provisional explanation with appearances we so to speak “save” them. The soul I suggest is explained by the lymphs, which thus save the “appearance” of the soul.

The lymphs can be pictured as passing through the brain and into the “space” above, not a physical space but a figurative or metaphorical one, a firmament, corresponding with a heaven or hell “outside” the diagram, as if objective, but really internal. On their way they mould the neuronal form of memories stored in the cortex, indicating their correspondence to the as yet undesignated dimensions of the celestial heaven, the esse of which can only be imagined, but finally achieving a taste of ultimate reality in Divine Love. These forms, images of the external world consisting of neuronal constellations in the cerebral cortex, are indexed in the hippocampus, the neurobiological basis for semantic memory, as I describe below. Memories are represented in our minds in terms of sensations of things in space, time, and motion, i.e. matter, and their states, their spiritual essence, is represented as moods and emotions,⁸ together called conatus, governed by the influx from the infundibulum.

There is difference between the way the right and left brain handle the influx from the senses. The left brain seems to do it analytically, whereas the right brain does it symbolically, in the form of shapes, images, and even people. I come to this later in the article.

Swedenborg claimed that he received ideas from none other than the Lord while reading the Word (*TCR* 779). But again we must remember this was after 1744, the date of the Delft experience, which must have altered his opinion about the source of influx. In his garden in Hornsgatan he had a summer house with a mirror on the wall. He once asked a little girl if she wanted to see an angel and got her to look at the image of herself in the

⁷ O. Barfield, *Saving the Appearances. A Study in Idolatry*. A Harbinger Book. (New York: Harcourt, Brace & World, Inc.). Not dated.

⁸ Odhner, *Principles of the New Philosophy*, 5–6.

mirror. Whatever we perceive, the derived idea is an image both of the material and the spiritual of ourselves, as in a mirror. The image is formed in the cerebral cortex, and in a state of love with God, the image is an angelic one so to speak due to spiritual influx, from the infundibulum. It is more real than the same thing seen but untouched by this love. There is a qualitative change. As Odhner says on page seven of his *Principles of the New Philosophy*, spiritual things in contiguity with Divine love, are “more real” than natural things. Although Swedenborg’s experience of the Lord’s presence was quite special, this experience of reality when reading the Bible or experiencing the environment is available to anybody in love, not just Swedenborg. Odhner’s quotations are from older translations of the Writings; “esse” is now “substance” and “essence” is “form.”

Until unity with the Lord is experienced, there is an ambiguity with the concept of influx as to decide what is flowing into what. The Oxford Dictionary defines influx as meaning the “flowing in, especially of a stream into a river.” Swedenborg says that influx does not mean a pouring in of one thing into another, as liquid into a cup (TCR 695.4), but it is to be defined as “successive operation” (*Intercourse between Soul and Body* 1.3) and as “all that precedes and composes the sequent, and through the sequent, the ultimate in order.” (*Conjugal Love* 313). The Divine is adjoined to man “by contiguity” (DLW 56). Previous to his spiritual experience of Divine Love in Delft there were so to speak two wills, two rivers, conflicting with each other in Swedenborg’s intellect, his own will (his ambition and pride) and the Lord’s will. My intuition as to what he is getting at in these phrases is obtained by being “in love” with another human being, where “I” becomes “you” or “thou” by contiguity, and the stream becomes one with a rather impersonal (in the sense that it loves all mankind) though heavenly river, the sequent. This is a transient state, but eternal in its sequelae, even as in the angelic heavens the light fluctuates according to the state of love, but remains available in memory as an aid to comparison. The depiction of the spirits as cherubs in the figure is supposed to represent how Swedenborg, after his regeneration, saw how a regenerate man longs to become more heavenly. The cherubs long to become angels, (see my comments on AC 4050 and 4051 below) and the

great neurohormonal systems of the brain, which the cherubs represent, give the unity of intentionality found in heaven.⁹

In animals and in creation generally, except in humans who have eaten of the tree of the knowledge of good and evil, this unity of intentionality is unquestioned, and therefore there is no conflict. In the regenerate state influx causes fulfilment of the Lord's Prayer when the Father's will is done on earth as in heaven. Unconscious creation does this without question, and so does man before the fall, because he is then in love with God. Falling out of love, he feels and thinks, in that order, that his own will is somehow autonomous, when in reality his autonomy is like a sheep to his shepherd. Influx originates in the Lord, so Divine love has been a conatus, a striving on the Lord's part, ever since the Big Bang, to create heaven out of Homo Sapiens. The serpent in the garden of Eden persuaded Eve that she was that origin, and therefore the arbiter of good and evil.

There is an ambiguity as to what animate and inanimate mean. All things flow (*panta rea*), but inanimate things flow so slowly they are called inanimate, unless you observe the electrons and the quanta of anything above absolute zero temperature, whizzing about in their orbits within the so called inanimate. Survival, a manifestation of conatus, is shown in animate creatures by the way they evolve both as a species and as individuals. In the past, species and even individuals were regarded as fixed, like the constellations of so-called "fixed stars," with no "successive operation" being seen. As species, before artificial breeding started, they changed so slowly as appearing to be fixed; now it is clear that both change with time, as does the environment. Love of survival is manifest by the interplay, the creative *storgé*, an expression of universal conatus (*Spiritual Diary* 2770) between creatures and their environment and vice versa, but the environment is thought to be more inanimate than the creature. Both alter, like two "individuals," seeking a *modus vivendi*, the creation of a "loving" ecological niche or marriage for the benefit of both "lives," animate and inanimate. Both are the objects of the Lord's Providence, the only source of life. The history of evolution—spiritual, physical, geological, climatic, animal as well as human—has been a history of the efforts of

⁹ Walter J. Freeman, *Societies of Brains. A Study in the Neuroscience of Love and Hate* (Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers 1995): 47.

the Lord for others than Himself, for them to be fruitful and multiply, a constant elaboration of living forms; an eternal springtime, but with the “death” of the individuals of innumerable species, including His own on the cross, for the sake of a higher life. Language and consciousness makes this effort explicit, and in the Lord’s sense, spiritual life, the life of the tree in the midst of the garden, has replaced animal life as something that exists after the death of the body. Falling in love with the Lord, when his will become ours, is therefore the first and great commandment, and a matter of common sense if we wish to live forever. Swedenborg describes the spiritual sun as remaining motionless midway between the zenith and the horizon, as a consequence of which angels enjoy everlasting light and everlasting spring. (*Interaction of Soul and Body* 2.4.2.) This seems to be like the tree of life in the midst of the garden being replaced at “the fall” by the tree of the knowledge of good and evil; a spiritual sun is replaced by a natural sun, with the death of both, for the spiritual sun gives life to the natural sun, as the tree of life gives life to the tree of the knowledge of good and evil.

This article on influx will be more personal than perhaps is usual in a philosophical journal, but the Writings should be of use in our personal lives, so I describe a personal experience and illustrate it by the much deeper analysis that Swedenborg gives to his own experience. Many years ago I fell in love, and remember singing a hymn by Rev. Frank Sewell at the time, at a gathering of a New Church Society in England. The hymn includes the words “He, of the Virgin born. He has loosed our chains . . .” The chains of selfhood are dissolved in an influx of love. Our individual stream flows into the Lord’s stream for a brief but apocalyptic moment and the memory and wonderful aftershocks, of that infinite moment give an insight into what I think is Divine love, equivalent in some ways to Swedenborg’s visionary experience described in sections 52–54 of the *Dream Diary*. The nervous system is by its structure divided into the somatic or bodily, and the autonomic, visceral, and hormonal. Because the activities of the neurohormones are invisible (implicit) we imagine there is a soul or spirit that needs to interact with the body, much as before alcohol was discovered, the effect of wine was and is termed spiritual; “whisky” means the water of life in Gaelic.

Neurophysiologically the brain-body of all vertebrates is the mechanism for transmuting sensations into feelings, those feelings into emotions or states, and so into muscular activity which as far as possible promotes the individual's survival and the reproduction of the species. The sensations are olfactory, optic, auditory, haptic (all the modulations of touch) and taste. Animals, including humans, translate their sensations into muscular action, mostly in the limbs as they hunt, fight, flee, or engage in consummatory activity; humans add language to express these activities in the muscular articulations of speech.

A good description for the change in perception that occurs with the influx of Divine love appears in Henri Corbin's book *Swedenborg and Esoteric Islam*.¹⁰ He calls the wonderful change of perspective as entering *mundus imaginalis*, a world not imaginary but "imaginal." To illustrate this Corbin cites on page three a Persian legend that describes the effect of this influx in a poetic and inspiring way: "Does this involve leaving oneself in order to attain oneself? Not exactly. A great event changes everything; it is as if one has passed through a mountain; a self is found beyond the mountain, a superior self 'in the second person' to whom things happen rather than one initiates." This may be what the Lord is referring to when he talks about faith making a mountain remove into the sea in Mark 11:23, allowing Divine love's influx transform the view which the mountain previously blocked. It is a climb to transfiguration. This is equivalent to entering a state that comes not by observation but seems to inflow, altering perception like the sun coming up on the fourth day of creation. A new, more real, self comes to consciousness, a self whom one can address as "thou" rather than "I," because of the influx of Divine love. "Amor ergo es," "I (your Lord) am loved therefore Thou art," is a better way of expressing the certainty of one's existence than "Cogito ergo sum," "I think therefore I am" as Descartes expressed it. The changes which take place, which "imprint" a new lamb into its mother, is a similar but simpler example of the same process, as the lamb achieves a reality in the mother's mind, as we achieve reality by being loved by God.

¹⁰ Henry Corbin, *Swedenborg and Esoteric Islam*. Translated from the French by Leonard Fox. Swedenborg Studies Monograph Series, No. 4 (West Chester, PA: Swedenborg Foundation, 1995): 3f.

The anatomy of the limbic system

I suggest that the limbic system, the amygdala and hippocampal complex, depicted in the lower part of the diagram, is the anatomical or neurological basis for influx. The figure is a very rough diagram of the connections of this ancient part of the vertebrate brain, which also includes the hypothalamus (infundibulum in Swedenborg's terms), isthmus (also a Swedenborg term), the basal forebrain and other places in the midbrain and brain stem too intricate to detail, and above, the cerebral cortex. The amygdala together with the hypothalamus and the isthmus provide the mechanisms for the emotional coloring of a sensation, good (consummatory), or bad (needing fight or flight), and the requisite muscular actions for the survival of the animal. Through the interplay of sensation and neurohormonal production in the limbic system all episodes, if they enter consciousness, take on a neurophysiological form, somatic or visceral. The diagram shows the emergence of spirits or angels, men in spiritual form, from the infundibulum, as I explain below in reference to Swedenborg's vision he describes in *Arcana Caelestia* § 4050.

The anatomy of the hippocampus

In the human, the hippocampus (seahorse) is a sea horsed- (hence hippocampus), banana- or horned-shaped (hence another name for it "Cornu Ammonis," the horn of Ammon, an Egyptian God with a goat's head) nucleus, one on each side of the brain about five inches long, merging with the fornix that connects it to the hypothalamus. It is linked by nerve fibres to all parts of the cerebral cortex, where the labels thinking, hearing and seeing represent the parts of the cortex where the results of these activities become conscious. Here are some figures for the microscopic anatomy of the rat hippocampus which is about 10 times smaller than the human hippocampus, to give some idea of the astronomical numbers of cells there as described by Buszáki.¹¹ A single Cornu Ammonis 3 cell in the rat, a CA3 cell (one of the cells in the hippocampus) has an axon (exporting "wire," taking impulses from one cell to other cells) which

¹¹ G, Buszáki, *Rhythms of the Brain* (Oxford University Press, 2006), 285.

in length varies from 150 to 400 millimeters, and synapses (joins up with) between 25,000 and 50,000 others cells in the hippocampus on the same side and with about 30,000 cells in the hippocampus on the opposite side. There are about 200,000 CA3 cells in each hippocampus, and this works out to 40 kilometres (about 24 miles) of axon collaterals, and 5–10 billion synapses or connections in each hippocampus. This incredible working matrix is contained in a structure the size of a large bean in the rat brain. In humans each hippocampus is about 10 times bigger than this, due to the increase in the size of each brain hemisphere compared with a rat. This forms the basis for explicit or semantic memory, both of time (mainly the left hippocampus) and space (mainly the right hippocampus), as opposed to other forms of memory, such as procedural memory. The form of the brain is not static but a shimmering, never resting flux throughout our waking and sleeping lives, reflecting Swedenborg's and other philosophers conviction that motion is one of the fundamental attributes of the Divine.

The anatomy of the hypothalamus

The infundibulum (Latin for a "well," named by Vesalius¹² about 100 years before Swedenborg's time) is a recess in the floor of the third ventricle, a cerebrospinal fluid (CSF)-containing cavity in the brain. (Swedenborg was the first person to describe the CSF¹³). To the naked eye the infundibulum seems to lead down to the pituitary gland. In the past it was thought that the pituitary gland was the channel through which nasal secretions and saliva reached the nose and mouth from the third ventricle. Pituitary comes from the Greek word *ptuo*, "ptuo,"¹⁴ to spit. Today the infundibulum and the isthmus are known to be the source of many neuromodulators, which can be understood as biochemical substances that alter the qualitative and quantitative structure of their target neurones.

¹² Andreas Vesalius, born December 1, 1514, in Brussels. Died October 15, 1564, on Zakynthos Island in Greece on the way back from a pilgrimage to Jerusalem. He described the infundibulum in his book *De Humani Corporis Fabrica*.

¹³ Before Swedenborg, Anatomists cut off the head of the body and the CSF drained away.

¹⁴ See John 9.6. [Jesus] spat on the ground and made clay. [ο Ιησους] επτυσεν χαμαι, και εποιησεν πηλον.

These are known today as, for example, acetyl choline, nor-epinephrine, oxytocin, etc., a modern way of understanding Swedenborg's concept of influx

Angels are the agents for spiritual change as Swedenborg says: “. . . spirits inflow into the thoughts and voluntary things of man; but the angels into his ends; and thus through the ends into the things which follows from those ends. For the angels inflow through good spirits and into those things which with the man are the good of life and truths of faith...The influx is tacit, and is imperceptible to man, but is still operative and efficient in secret” (AC 5854). Here Swedenborg seems to imply that the infundibular lymphs are the biochemical basis for the angelic heavens.

Swedenborg's vision of the infundibulum

Here is Swedenborg's vision of the infundibulum, taken in abbreviated form from *Arcana Caelestia* § 4050:

A certain face was first of all visible to me above a skylight and then presently withdrew inside . . . Then I saw some walls without a roof . . . and lastly I saw what looked like a starry sky . . . and supposed that something hideous would be displayed to me . . . but shortly after the starry sky disappeared and a well appeared from which a brilliant cloud or vapour emerged. Something else seemed to be pumped out of the well. I asked what these things meant and represented, and was told that this was a representation of the infundibulum within the brain, above which was the brain itself, meant by the sky. And what I had seen after that was the vessel meant by the well and called the infundibulum, while the cloud or vapour which emerged from it was the lymph which passes through and is pumped out of it . . . I was shown after this the nature of those who belong to this province, though only those of the baser sort, whom I saw running about this way and that, devoting themselves to those they saw, paying attention to everything, and reporting to others the things they heard.

These lymphs are described by Swedenborg as either of a morally intermediate sort or as morally defiling sort whereas the best sorts of lymphs are to be found in the ventricles of the brain, as described in *Arcana Caelestia* §4049. I show only the third ventricle and the infundibulum in the floor of that ventricle or *cavum majorum*, in the figure. There are really four ventricles in all.

Swedenborg further details the anatomy of what we now call the limbic system. The isthmus was also known to him as the origin for lymphs as he calls them. The hypothalamus and its nearby brain parts are now known as the source of fourteen neuromodulators,¹⁵ but more are being found.

Near the infundibulum, the basal forebrain (see diagram) is the origin for a system sprinkling the whole brain with acetyl choline. This hormone produces co-ordinated brain oscillations both in the hippocampus¹⁶ and other parts of the brain, thus bringing widely separated brain areas into co-operative activity, the so-called "binding process." This operation differentiates the environment into its parts but juxtaposes those parts to make a whole. This is an Aristotelian place of ultimates, expressing in its parts the perfection of the Lord's celestial heaven, a more Platonic place.

The isthmus, which lies just caudal or inferior to the hypothalamus, is now known to be the source of four spirits: dopamine, epinephrine, norepinephrine and serotonin. The influx of this last encourages initiative, the lack of which is associated with depression. They all "sprinkle" the brain via anatomical systems similar to that for acetyl choline.

Swedenborg's description of their anatomy correlates very well with modern knowledge. He writes in AC 4051: "There are communities correlative with that region called the isthmus and also spirits correlative with little knots of fibres in the brain which have a glandular appearance, from which they flow forth for different functionings." One can imagine the little knots covered with holes from which the lymphs emerge, like a spray on the spout of a watering can.

Swedenborg goes on to describe in AC 4051 the nature of these spirits: "The lymphs came in front of me and addressed me saying that they were

¹⁵ E.R. Kandel, et al., *Principles of Neuroscience* (New York: McGraw-Hill,2000), 289.

¹⁶ Buszáki, 309.

men. But I was allowed to reply to them that they were not men provided with bodies, but were spirits and so also men . . . I was also allowed to tell them that they were men by virtue of intelligence and wisdom.”

This comment seems to me to exhibit an aspect of Swedenborg’s mental characteristics; it caused him to “see” the qualities of the spiritual world as men and women, rather than, as in many people, merely as vague feelings; he was perhaps an “eidetic imager” as was Bishop Berkeley to whom the reality of physical things consists in being perceived;¹⁷ Berkeley held that things do not exist unless someone is perceiving them, hence the famous poem by Ronald Knox about the tree in the university Quad,¹⁸ but Berkeley’s position is logical if we believe that God is love, and that love creates reality. In considering other people or things we meet on this earth we often express what they mean or feel to us by describing them as people (*fictio personae*, *conformation*, *prosopopoeia*, or as metaphors that transfer from a known to express an unknown¹⁹) drawn from the experience of people and things we have met or read about in life. In the spiritual world these expressions find bodily form so to speak, as they did in Swedenborg’s visionary description of the spiritual significance of the Bible’s characters, especially the Patriarchs and their wives and children. He does not detail the ages or appearances of the Patriarchs, which is curious.

Today we know of a lymph called growth hormone which agrees well with Swedenborg’s statement that the lymphs were men, desirous of growth in intelligence and wisdom. Swedenborg provides an interesting illustration that the brain mirrors heaven, with his notion that lymphs correspond to the angels of heaven in all their infinite interplay. In the diagram I represent the “lymphs” of the infundibulum as they emerge into the third ventricle and then more vaguely into all parts of the brain as

¹⁷ D. Berman, *Berkeley and Irish Philosophy* (London & New York: Continuum, 2005), 9ff, & 99.

¹⁸ There was a young man who said, “God / Must think it exceedingly odd / If he finds that this tree / Continues to be / When there’s no one about in the quad. Reply: Dear Sir, / Your astonishment’s odd; / I am always about in the Quad. / And that’s why the tree / Will continue to be, since observed by / Yours faithfully, GOD.”

¹⁹ Emanuel Swedenborg, *Ludus Heliconius and other Latin poems*, 37–38, quoted from S. McCune, “Falu Gruva and Emanuel Swedenborg,” *The New Philosophy* CXVII (July–December 2014): 151.

cherubs, hopefully on the way to growing up into celestial angels in the starry sky, or the soaring arches of a gothic cathedral. Lymphs are a feature of the brain of all animals, long before man turned them into “inhabitants” of the spiritual world of Swedenborg, which he describes as a reality of the Most Ancient Church.

Influx and memory

In the natural world the will is measured by the sense of effort needed for muscular action. We express the expenditure of effort with the term “work.” Neurobiologically, the qualitative features for this can be measured by the activity of stretch receptors in the muscles, transferred to the realm of physics by Newton’s Laws of Motion. In heaven, that effort is removed as a consequence of the natural will being replaced by an influx of the Lord’s will. In Eden, or in the Most Ancient Church, no work was needed, or felt like work, until the fall, when the sweat on Adam’s brow (an effect of epinephrine and acetyl choline on the sweat glands) expressed his will, now separated from the Lord, to cultivate the ground previously done by the Lord through them, Adam and Eve. In a state of love to the Lord even daily chores can be imagined as expressions of the Lord’s will, which make the burden much lighter.

Swedenborg describes the stages of influx in *AC 657* as follows:

The Lord flows by way of man’s intellectual into his rational, and by way of the rational into the factual knowledge belonging to the memory. And from there comes the life of the senses—of seeing and hearing. This is the true influx and the true interaction of the soul with the body. Without the influx of the Lord’s life into man’s intellectual concepts—or rather into the desires of the will, and by the way of these desires of the will into intellectual concepts, and by way of intellectual concepts into rational concepts, and by way of rational concepts into his factual knowledge which belongs to the memory—no life can possibly exist with man.

He ends paragraph *AC 657* by saying that “influx enables a person to be rational, to reflect, and to understand what truth and good are. These matters will in the Lord’s divine mercy be dealt with later on, as also with

life as it exist with animals.” Swedenborg is dealing here not with life as more normally understood, but with a state where our wills are replaced by the celestial, the Lord’s will. However if we do not constantly remind ourselves of this, “the snake bites the heels of the horse and the rider falls off backwards” as Swedenborg explains Genesis 49.17 in AC 6395. The flaming swords of the cherubs drive us “away from the east in the garden” as analysed in AC 306.

In order to reflect we need the function of memory to register consciously the changes we notice in our “souls” due to influx. In AC 7112 Swedenborg writes about the change that takes place in memory when we enter heaven, a new Eden. As the memories of our childhood homes change when we get married, so the angels of heaven “do not know what straw is, or what bricks are either”; that is, the painful memories, the sweat of bondage, in “Egypt” are no longer remembered.

Memories can be changed in this life. For example, the memories of emotional trauma can be healed given time and reflection. Many people have unpleasant memories. Some memories are so bad that they cause what is called a Post Traumatic Stress Disorder (PTSD), when the memory of a bad experience becomes a cataract of conflicting emotions and images in the memory, isolating the sufferer from normality. In my medical practice I have had experience in modifying memories in patients suffering from PTSD using a technique called EMDR (Eye Movement Desensitization and Reprocessing²⁰). This technique activates brain mechanisms which remove painful memories, or as many patients say, removes them themselves from the experience, as if they watched themselves from an out of body perspective. There is evidence that it enlists the help of acetyl choline in altering the Electroencephalogram (EEG) rhythms of the hippocampus.²¹ Acetyl choline is an infundibular spirit or angel, depending on the state of the will in Swedenborg’s terms or “attention” in more usual neurobiological terms, produced by the brain in the neighbourhood of the hypothalamus, the basal forebrain, and in the septum (see diagram). In the

²⁰ F. Shapiro, *Movement Desensitization and Reprocessing (EMDR). Basic Principles, Protocols, and Procedures*. Second Edition. (New York, London: The Guilford Press, 2001).

²¹ J. O’Keefe & L. Nadel, *The Hippocampus as a Cognitive Map* (Oxford: Clarendon Press), 129. John O’Keefe, May-Britt, and Edvard Moser have been awarded the 2014 Nobel Prize for Medicine and Physiology for their work on the place cells of the hippocampus.

process of EMDR many patients have the sensation of leaving the scene of the traumatic event, as if an angel picked them up and away out of "Egypt." The experience is however almost indescribable as many patients have said to me.

Influx in animals or storgé

Swedenborg's description of influx divides it into a series of terms: celestial, intellectual, spiritual, rational, and natural.

As I write this on an early spring morning, a blackbird is building her nest in a recess in the wall of our house. Earlier in the day her "husband" joined other birds in the dawn chorus to mark out his territory and impress any female blackbird, in what can easily be imagined by us as a hymn of praise to his own prowess, marking his territory, and reflecting the creative will of the Lord as it flows in spring-like splendor from the celestial heavens, much as influx makes us sing hymns in church or cathedral, as I describe above with reference to Frank Sewall's hymn. Although a bird does not rationalize or produce meanings, or metaphors based on metaphiers of metaphrands, as we humans do,²² they are expressing in their own ways the influx of the Lord's life, the storgé (Spiritual Diary 2770, and many other references), building a home and singing in ways simpler but very like our own. A scientific way of describing this is that it is a biological imperative or instinct while in Swedenborgian terms it is expression of general influx from the Lord originating in the celestial. We of course have no idea if the blackbird is more conscious of storgé than is a tree when in spring it puts out new leaves.

However Swedenborg writes in AC 5993 that man cannot live at all from general influx as can animals. The human expression "spring like

²² J. Jaynes, *The Origin of Consciousness in the Breakdown of the Bicameral Mind*. A Mariner Book. (Boston & New York: Houghton Mifflin Company, 2001). As an example, Jaynes analyses the metaphor "the snow blankets the ground" (p. 55). The snowy blanket is a metaphor, made of an infinite number of flaky metaphors. The metaphrand is something about the completeness and evenness with which the snow covers the ground. The metaphier is a blanket on a bed. The paraphiers of the metaphier are the warmth, protection, and slumber induced by the blanket until wakening time comes. These are paraphrands of the blanket. It is as if the interior natural is called forth by the rational and so the things in the interior natural are so to speak extracted as metaphors by the rational.

splendor from the celestial heaven” implies a human awareness of influx from the celestial which is therefore no longer general as it is filtered so to speak by the rational of each to express that influx. Animals are not conscious as man is, and are therefore devoid of reason. Their influx is general or irrational in this sense.

The Rationalisation of Influx

Over the last 3000 or so years human beings have added more and more linguistic labels or metaphors in order to rationalise general influx. Plato’s famous phrase “saving the phenomena” reflects this process. Astrologers saw representations, a rationalization of earthly life in the constellations of the stars, more than 3000 years ago. The Magi arrived at Bethlehem because of these representations according to their system of Greek astrology that had replaced the Babylonian one with the coming of Alexander the Great.²³ In about 400 BC Democritus and Leucippus thought of the atomic theory of matter, further refined by Empedocles to four different types of atom for earth, air, water and fire, out of which everything else was made. In the 17th and 18th centuries AD, the nature of light was investigated by Newton and others. For the expression of infinitesimals, Newton and Leibniz introduced the techniques of calculus; a mathematical expression for an aspect of influx Swedenborg calls a “progression of successive order into simultaneous order.” Swedenborg and Laplace described the nebula hypothesis for the formation of the stars, and further developments took place in astronomy after his time. Proust (law of definite proportions of matter in chemical reactions), Dalton’s atomic theory (all atoms of a particular type are identical), Avogadro’s principle as to how molecules are built up in with definite proportions of atoms, Faraday’s demonstration that if you break molecules down by electrolysis they break into definite proportions, and so on. The further rationalisation of influx gathered momentum towards the end of the 19th century. Modern physics has revealed that matter is made of even smaller indivisible particles, first atoms of various forms, hydrogen, oxygen, and so on,

²³ Michael R. Molnar, *The Star of Bethlehem. The Legacy of the Magi* (New Brunswick NJ, & London: Rutgers University Press, 2000).

followed by electrons, protons, neutrons, followed by subatomic particles, quarks etc., and eventually quanta.²⁴ This labelling makes influx seem mechanical, memory work only, without spiritual life; the effect of a snake biting the heels of the horse so that the rider falls off backward. This is a Kantian way of thinking, although the wonderful epitaph on his grave in Königsberg (now Kaliningrad) Cathedral breathes the scent of Swedenborg even if it lacks fully the Divine Love: “Der bestirnte Himmel über mir und das moralische Gesetz in mir” — “the starry heaven above me and the moral law within me.”²⁵

The rationalisation of the visceral

Swedenborg says the brain, like heaven, belongs to the realm of ends (AC 4054) so that the soul may be eternally happy. As I sit contemplating my garden over a little period of time, when in love with the Lord as far as I understand it, the garden takes on an aspect which I can describe as the result of influx, a suggestion of what it is like to be eternally happy, reminding me of Swedenborg’s description of the little girl in his summer house mirror. This seems to be a process very similar to what describes the bonding between a sheep (see below) and her new born lamb, as we bond with the Lord and His creation. It gets under our skin. The proportions of the garden can be measured in cubits of length, breadth, and height but also in cubits of holiness, truth, and goodness, like Noah’s ark, although as Swedenborg says, this can sound pretty odd (AC 647). The length, breadth, and height of the Garden of Gethsemane were changed for Mary as she met the Gardener outside His tomb. His celestial poured into her intellectual as He called her “Mary” described in John 20.16; a heavy stone, a mountain, was rolled away from her heart and eyes.

The perfectly rational person can be understood to be someone in love with God, even if the results of that love can be very unpleasant and irrational from another human’s point of view, much as people say they cannot understand what a man sees in “her” when talking about a man’s

²⁴ Andrew, F. Rex, & R. Wolfson, *Essential College Physics* (Addison-Wesley, 2010).

²⁵ N. MacGregor, *Germany. Memories of a Nation* (Alan Lane, 2014), 42.

girl friend. Paul's vision on the road to Damascus caused him a very uncomfortable life (What on earth did he see in that man Jesus?), and Swedenborg's own descriptions of the effects of his visions on his own life are far from comfortable. I will come to the differences between influx into the right or left brain later in this article.

Swedenborg describes the way the Lord's life inflows through the intellectual with man into the rational. As the Lord himself said, no one has seen the Father, the source of life, except the Son, or son of man referring back to Man as he is before the "fall," or in our case, during moments of ecstasy. Swedenborg's visionary experiences are described through earth-based parables which he calls *Arcana Caelestia* or metaphors for heaven. The Son's life as it inflows from the Father, (though they are One, like a sheep and her lamb, perhaps a lamb of God as John the Baptist said in John 1.29) can only be described by earth-based metaphors stored and extracted from our memories. To the disciples He said it was given to them to know the mysteries of the kingdom of God; but to others in parables or, as I would say, metaphors. The disciples were able to "know" God by contiguity, like a wife knows her husband, as incarnated in Jesus; He got under their skin and into their ribs; they experienced his celestial influx rationalizing their physical influx from seeing, hearing, touching and smelling God Himself as a Man in the Holy Land. One can understand their ecstatic reaction to Him turning up again after the crucifixion, in say Luke 24, or at Pentecost.

Rationalization of feeling or affections can be likened to constructing a fraction, a ratio. The numerator is the affection or love each individual has for something or other and the denominator is God's love. We express the ratio, the balance between the love for God, the ideal denominator, with our own particular loves, the numerators. The nearer this fraction approaches unity the more rational or real life appears to be. When it achieves unity we die so to speak to self as the celestial angels do. We use our intellect, because as Swedenborg says it is via the intellectual that the celestial inflows, to describe the ratio between the Lord's love and our own loves, expressed in terms of natural likes and dislikes, our jobs, hobbies, friends etc. We are alive in accordance as this ratio approaches unity. Muscles are modified neurons and their activity is governed by neuromodulators in the same way as more conventional neurons, but of

course they are easier for their owners and other people to see and guess the meaning behind the appearances. This is especially so when the muscles of our tongues form the metaphors of language to describe the rational in the natural, whereas the neurons of the brain are hidden inside the skull, much as Divine influx is hidden from consciousness except in its effects. As it is said in AC 5854: “spirits inflow into the thoughts and voluntary things of man; but the angels into his ends; and thus through the ends into the things which follows from those ends. For the angels inflow through good spirits and into those things which with the man are the good of life and truths of faith . . . The influx is tacit, and is imperceptible to man, but is still operative and efficient in secret” (AC 4059). By “tacit” I take it that Swedenborg means that we are unconscious of the way angels inflow and affect our judgements and we are only conscious of the end result.²⁶ The more Divine love we enjoy the clearer the ends, the eternal happiness of the soul, becomes.

The evolution of life as a reflection of divine influx

The word influx comes to English from Late Latin and has an evolutionary history. The Oxford Dictionary describes influx in terms of rivers and streams (flowing in, esp. of stream etc.—into river etc). Rivers are as old as those flowing in the Garden of Eden. Like evolution in a Darwinian sense meaning has been piled on meaning, much like repainting a cupboard without bothering to scrape off the old paint. The paint gets thicker and thicker with more and more layers. As animal species evolve, neurobiological “fixes” are added to the existing machinery that is kept like old coats of paint. The results of influx, the hovering of the Lord’s spirit over the dark waters of chaos, evening by morning, day by day, millennium after millennium, manifested by the evolutionary changes noted originally by Darwin and Lyell, were present long before vertebrate brains evolved. Our own brains have evolved to enable evolution to be expressed in language and writing. It is also expressed in a simple way in the structures and life of bacteria and protozoa, which can now also be found

²⁶ K. Marbe, *Experimentell-Psychologische Untersuchungen über das Urteil, eine Einleitung in die Logik* (Leipzig: Rngelmann, 1901). Quoted in Jaynes, J., *Ibid.*, p. 37 to describe the unconscious process of decision making.

as mitochondria in our own cells, in which they have new uses for lives other than themselves. These are parts of the end, cause, and the effect of the Lord's love, which is survival and reproduction of something other than Himself, in the natural as in the spiritual world. However there are no neurological structures in bacteria on which to base a neurobiology of influx as clearly as in the vertebrate brain.

Watching a bird's activity lets us see the effect of general influx. Our brains and animal brains have the same ground plan, as pointed out by Freeman.²⁷ He describes the fundamental similarities of the ground plans of animal brains with our own in his description of the Tiger Salamander's brain. This creature has existed on this earth for the last 450 million years. Freeman writes that the basis or core of all vertebrate brains is the association area, later to enlarge into what we call the hippocampus. The association area plays a prominent role in learning, spatial orientation and episodic memory and as I said above seems to be the anatomical base for influx. As evolution has progressed this area has "sprouted" new growths, particularly the neocortex or cerebrum of humans. The structures of each of the innumerable modules of the cortex are basically the same as the single hippocampus, though much smaller. In mammals, including humans, the association area, based on the hippocampus is called the limbic system. The limbic system is "essential for all intentional action, including perception and most forms of learning" (Freeman 2000). As Swedenborg says; "The Lord flows by way of man's intellectual into his rational, and by way of the rational into the factual knowledge belonging to the memory. And from there comes the life of the senses—of seeing and hearing." Here we can see that Swedenborg is describing the functions of the limbic system.

The functions of the limbic system, which includes the infundibulum or hypothalamus, can be considered as the biological representative of the influx of heaven in our brains, and is essential for all intentional action, or what Swedenborg calls uses. Freeman's experiments on rabbits show that the EEG patterns in their olfactory bulbs, into which the smell receptors from the nose penetrate, are chaotic, in his use of that term. That is, they are not just random waves, like the acoustic waves of white noise, but certain patterns can be detected, individual for each rabbit and each smell

²⁷ Walter J. Freeman, *How Brains Make Up Their Minds* (London, UK: Phoenix, 2000).

and each passing moment. However, certain rules govern the patterns. Fourier analysis of these waves reveals that they are made up a variety of simpler sine wave patterns, suggesting that they are the product of wave generators working in some kind of unison based on the whole brain of the rabbit, just as heaven can be described as the result of the co-operative action of numerous societies and individuals. Freeman likens it to watching the morning rush hour crowds in a railway station. People approach the train doors, each at his or her own pace, in a chaotic fashion; one of the invisible rules however is that they do not bump into each other (its rude or irrational!) until the door is reached and they can squeeze in, as that rule relaxes and an end is reached. The invisible rule prevents chaos becoming random activity. If a fire alarm sounds, everybody starts moving in another direction as another rule is superimposed. When a rabbit expects something to eat, it's olfactory EEG patterns change, expressing hunger. This is due to what is called a "preaffference mechanism,"²⁸ using correlative inputs, produced by what Swedenborg would call the rational, an angelic influence, or as a modern biologist would say, the influx of neuromodulators such as acetyl choline and serotonin on the brain, with a subsequent alteration of the EEG patterns.

Preaffference prepares the brain for something new. In this way it corresponds to Divine Providence, or even more easily understood, to the prophetic voices of the Old Testament preparing Israel for the coming of the Messiah. We can understand how an apparently chaotic pattern of the brain (or the Old Testament) can make sense or appears rational when the end comes into view. The rabbit finds its lettuce or Immanuel is born in Bethlehem, the "home of bread" in the Hebrew tongue. By watching a rabbit's behaviour, non-linear causality, the activity of the brain, is turned into what appears to be the linear causality of Divine Providence.

The language of dynamics and chaos theory which have proved so useful in describing the activity of the brain, originated with Edward

²⁸ Kant uses a term "synthetic a priori" which I think is equivalent to preaffference. See O'Keefe & Nadel 1978 p. 22. "Will" is another name for correlative discharges with which the brain prepares itself for a new experience.

Lorenz's accident with his computer²⁹ in predicting the weather. Useful math models have emerged to describe chaos both in the weather and in the behaviour of the brain. Brain activity, like the weather, exists in a sort of simmering chaos, subject to minute and unforeseen forces like the butterfly flapping its wings in China, causing a storm in Bryn Athyn.

Electrical wave rhythms in the brain are the measureable phenomena identifying a state of preaffection, readying the animal for an immediate future, emerging from the innumerable degrees of freedom which otherwise prevail in the brain. Regarding the weather, the Lord Himself says: "The wind bloweth where it listeth, and thou hearest the sound thereof, but canst not tell whence it cometh, and whither it goeth; so is every one that is born of the spirit" (John 3:8).

The neurobiology of bonding or storgé

There is a phenomenon called "bonding." When a sheep has her first lamb she smells it and certain EEG patterns are set up in her olfactory bulbs and cerebral cortex under the influence of a hormone called oxytocin, produced at parturition in the hypothalamus and the pituitary. She bonds with this first born lamb, and rejects any other lamb which attempts to approach her. When perhaps in a subsequent year she delivers another lamb, neurohumeral mechanisms exist in her brain, as in all mammals, "for unlearning by a neurological meltdown of intentional or emotional beliefs without loss of procedural and declarative memories. This enables understanding between herself and her new lamb to evolve by subsequent cooperative actions."³⁰ Oxytocin is produced from the hypothalamus of all mammals, including humans when falling in love, giving birth, suckling the young, or in sexual intercourse.

²⁹ In 1961 Lorenz at MIT was using a numerical computer model to rerun a weather prediction, when, as a shortcut on a number in the sequence, he entered the decimal 0.506 instead of entering the full 0.506127. The result was a completely different weather scenario. In 1963 Lorenz published a theoretical study of this effect in a well-known paper titled "Deterministic Nonperiodic Flow." The idea that one butterfly could eventually have a far-reaching ripple effect on subsequent historic events first appears in "A Sound of Thunder," a 1952 short story by Ray Bradbury about time travel.

³⁰ Freeman, 1995.

As humans we experience this influx of angelic oxytocin as “bonding” or falling in love, causing in Paul’s case a literal fall to the ground on the road to Damascus, when he bonded with the Lord and became St Paul (Acts 9:3,4). The same thing happens more frequently and prosaically when a young man falls to his knees in front of his intended, or a mother gazes fondly at her new baby. These are the results of hormonal changes or influx in the brain. As Jesus says when we get married we leave our fathers and mothers and cleave to our wives or husbands. Our intentional beliefs are melted down, but of course we retain our procedural and declarative memories.³¹ Karl Birjukov has called my attention to AC 7112. Here Swedenborg talks about the change that takes place in memory when we enter heaven. As the memories of our childhood homes change when we get married, so the angels of heaven “do not know what straw is, or what bricks are either. Such things were well known to those angels when they were in the world, but they forgot about them when they entered heaven, because there they moved on to spiritual things” (AC 7112). Karl has also written privately to me: “It makes sense why Joseph’s son was named ‘Manasseh.’ In Hebrew this means ‘causing to be forgotten.’ It is clear that this son represents the will, or the desiring faculty, but it is essentially a new kind of desiring, in many ways replacing the old will of faith meant by Simeon. And clearly, Ephraim and Manasseh replace Reuben and Simeon in the new set-up at the end of Genesis, even if only representationally.”

Mediate and immediate influx

In AC 3318(2), Swedenborg says “The life flowing in with man from the Lord comes from his Divine Love. This Love, that is the life from it, applies itself to the vessels that are in man’s rational and that are in his natural.” In AC 3314, he expands further what he means by the natural and the rational, and what he means by immediate and mediate influx or flow, but says that these concepts can only be grasped with great difficulty. With some trepidation I will try to describe what I think he is suggesting.

³¹ D. Lister, “The Feeling of What Happens/Smile or Die.” An Archive Transaction of the Swedenborg Society, London, 2012.

The good and truth of the natural is what we are born with, like instinct in a blackbird building its nest. I take this to mean that the natural structure of the brain is something given, immediately or directly, resulting in *storgé*. It is genetically hard wired, an example of what Kant would describe as an *a priori* state. For example, many foetuses can be seen to be right handed even in the womb; that is, infants and children are hard wired or innocent in Swedenborg's sense, like a bird or quadruped, and maybe in the sense that the Lord meant by his comparison of little children with the kingdom of heaven in Luke 18.16. Swedenborg then says in *AC* 3314 that the good of the rational flows into the good of the natural independently of truth, thus into it directly. By this I take him to mean that the good of the natural is the good that a blackbird demonstrates by building her nest, and as a child does in her activities. They are generally rational but unconsciously so. Swedenborg also says that the good of the rational flows into the truth of the natural indirectly by way of the truth of the rational. My hen blackbird had a fight with another blackbird hen whose nest was too close to her own. The other hen abandoned her nest, because the good of the Divine celestial expressed by general influx and expressed in human statement, "it is irrational to build my nest here," made her abandon it. The rational is based on the truths of experience which change the developing rationality of the owner of the brain; that is mediately, altering the way we experience as individuals the inflow of will or love from the celestial heaven as expressed in ultimates. The neurobiological mechanisms for free will in man are uncertain, but see Benjamin Libet's work summarised in Wikipedia.

Certain parts of the brain are made corresponding to the good of heaven, and then are modified by the experience of the owner, as children learn how to express the values of the society they live in. Thus most people are born with the ability to build up memories or natural truths that correspond to the real world. Swedenborg's upbringing was remarkably religious and moral in the conventional sense, but this does not mean that the Lord discriminates against children with less model parents or upbringing. Celestial good, the light which lights every man who comes into the world, is shown by the ability, via the intellectual and the rational, to know the good of celestial truth, even if our upbringing is less pious and exemplary than Swedenborg's. The Bible reveals the less than perfect

natural ancestry of the Lord, though celestial loves flowed from Him into his ancestor's lives, redeeming them by His life and death, if they so willed. The approval or mercy of a bad parent gives joy to a child that springs directly from immediate influx of this love. Neurologically speaking this is the effect of influx via the isthmus and the hypothalamus. These are structures hard-wired and native to the brain and therefore a source of immediate influx, enabling the baby animal to survive her dangerous environment or the baby child the horrors of an abusive human parent. A child's efforts to please a bad parent are innocent, and therefore reflect a love for what is truly, immediately good, a good which God alone knows. However unless we are born again we cannot enter this childlike state, as Jesus impresses on Nicodemus in John 3.

Immediate influx in children

Swedenborg describes what I take to be immediate influx in *Heaven and Hell*. (K. Ryder's translation § 277.4). "I have been told from heaven that little children are especially under the watch of the Lord; what flows into them [influx in the old translation] is from the inmost heaven . . . and the influx passes through their interiors; and in passing through does not affect them except by innocence." It is good to read this after learning of the disastrous effects on the brains by the neglect suffered by the 100,000 or so children in the Rumanian orphanages of the Ceausescu's regime in the years before 1989.

In this connection it is also interesting to read Mark 10:13-16. "And they brought young children to him, that he should touch them; and his disciples rebuked those that brought them. [Jesus then said] Suffer little children to come to me, and forbid them not; for of such is the kingdom of heaven. . . . And He took them up in his arms, put His hands upon them, and blessed them." Here is Divine influx incarnated. We can see heaven caressing and moulding the child's brain directly, just as a mother's tender love moulds her baby's brain into an image of heaven. In adults, EEG patterns in the cortex represent cognitions based on life's experiences acquired by life in the world.

Influx as a metaphor

Influx means a “flowing in,” which in the natural or physical world is a metaphor for the behaviour of some fluid or gas or the transfer of heat, say, flowing from a higher pressure, degree, concentration, or whatever metaphor comes in handy to “one of the learned” of AC 9401, to a lower one under the influence of something we call pressure or temperature. In the case of gravity, this is metaphorically traction, pulling us down towards the earth’s center. Up until Einstein this was considered as action at distance. Now gravity is understood as a property inherent in space-time, just as influx can be seen as a property of the brain, “although it does not inhere in it” (*Economy of the Animal Kingdom 2*).³²

As Swedenborg says in AC 5119:

By reciprocal influx is not meant that the exterior natural flows into the interior natural, because this is impossible; for exterior things cannot possibly flow into interior ones . . . but the things which are in the interior natural are called forth by the rational, and through this, the things which are in the exterior natural; not that the things in themselves are called forth, but the things which are concluded or as it were extracted from them. Such is reciprocal influx.

In Swedenborg we are dealing with an enormous system of correspondences or metaphors, the metaphiers, metaphrands, paraphiers and paraphrands of Jaynes,³³ to describe something up until Swedenborg’s time indescribable, or interior as Swedenborg would say, using something a little better understood, or exterior, as Swedenborg often says of his own spiritual experiences. Jaynes suggests quite convincingly that this ability to express metaphors or parables in language is what makes man conscious. He also stresses the fact that we have no idea of the mental processes that precede the spoken metaphor. Swedenborg describes these processes as those of influx. We become conscious because each new

³² Odhner, 17.

³³ Jaynes, 48ff. Quoting Jaynes: “There are thus always two terms in a metaphor, the thing to be described, which I shall call the metaphrand, and the thing or relation used to elucidate it, which I shall call the metaphier. (p. 48)

cognition is based on earlier experiences, modified by the rational into something corresponding to the essence of the new experience. The Lord's New Testament parables or metaphors for the kingdoms of heaven or hell support this idea.

The influx of love

The first and great commandment is "Thou shall love the Lord thy God, and the second likewise, Thy neighbor as thyself." Obeying a command is something which needs effort, an expression of the personal will, the good of the rational flowing into the good of the natural indirectly by way of the truth of the rational, rather than directly from the Lord's will. In the regenerate person, the person in love with God is dead, so to speak, to self, and the good of the rational flows directly into the good of the natural. In neurobiological terms both situations need a corollary discharge. In the regenerate person this comes directly from the limbic system, like a rabbit naturally loving lettuce. In the unregenerate it comes via a conscious decision of the will, or conscience, like a rabbit learning to like meat! In the regenerate state, the will (the intellectual, the faculty of knowing and reasoning) does the Lord's will (the celestial), needing no effort on the part of the human, because of "bonding" with the celestial. It is like a mother finding it difficult to find fault with her child, whom another may find annoying.

The words of the great commandment can also be understood as a statement of the situation after a spiritual rebirth, the removal of the mountain, in which so to speak the brain gets rewired, like falling in love, getting to know and like somebody well, or becoming an expert at something. The good of the rational then flows into the good of the natural independently of truth, thus into it directly. I describe this as a celestial state, as experienced by the celestial angels, neurobiologically through the influx of neuromodulators. The intellect is superfluous except to report the results. The Hebrew and the Greek for the first and second commandments can be understood as statements rather than commandments, "will" not "shalt," as if they were foretelling the experience many of us have of falling in love, even if we often miss the Divine signification. Knowing

love, we no longer need a command to love: it happens “immediately,” an immediate influx. The effect is as described by Peter at Pentecost, quoting Joel in Acts 2:17, “I will pour out my spirit upon all flesh.” None of us know however what God’s love is in itself. We are forced to speak and act metaphorically based on the assumption that the love, the oxytocin, of which we feel the influx resembles in some respects God’s love as it is in the heavens.

The hippocampus as neurological base for free will

As I mention above, the hippocampus is an important part of the limbic system, the neurological basis for the correlation of say, hearing a command, and the doing of it by the internal celestial man, in which case as Swedenborg says it is a percept (AC 5732). The hippocampus is a “random space”³⁴ of nerve cells and their fibres the organisation of which enables the indexing and linking of the cognitions of life’s episodes or events to form, when needed, an episodic and semantic memory of our lives, which—once neurobiologically indexed in the hippocampus—can be accessed again in any order, emotionally, chronologically or spatially, as we like. It represents free will only if we love God above anything else, i.e., it becomes a truly random space because God’s love is known, and offers therefore infinite degrees of freedom, an expression of a situation where command and action become one so to speak. Each nerve cell or neuron can reach any other neuron within the hippocampus, and each hippocampal nerve cell is connected with the networks of cerebral cortical modules which code cognitions in the form of images, built up and modified during our lives from infancy to adulthood. Of course if you have Alzheimer’s disease, which destroys the hippocampus’ wonderful flexibility, the degrees of freedom of a normal brain’s activity are lost.

Buszáki³⁵ draws attention to the way that the experience of physical space and time intervals are not represented in the hippocampus by distances between the nerve cells but by the resistances at the synaptic

³⁴ Buszáki, 289.

³⁵ Ibid. 290.

junctions in the multidimensional grid space or graph of the hippocampus. These resistances are the result of many neuromodulators, intra- and extracellular, as if each nerve cell was itself a tiny brain. The strength of these synapses can be increased or decreased by neuromodulators, and this seems to alter the apparent distances, physical or emotional, between places and events in the outside world. For example, if attention is influenced by joy, a journey gets shorter. Sadness increases “distance” and “lengthens” time. Swedenborg emphasises that in the spiritual world distances are measured by the emotional closeness or affection angels or devils have for each other. The hippocampus can also be likened to an ordinary map on a flat piece of paper, which when crushed together, brings features of the map together in an apparently haphazard way dependant on the way the map has been constructed and crushed over the years of the life of the individual owner of the map.

There are three ways in which similarity between cognitions is constructed—chronologically, formally, and emotionally. A flower resembles another flower by its general form or secondly by the emotion it calls forth, and by the memory of flower experienced previously. The cognitions of the two flowers are thus bound together chronologically, formally, or emotionally, materially or “spiritually.” Time, however, is often expressed in spatial terms by the right hippocampus and chronologically by the left. For example, we say next Christmas is far away in the distance or in several months time, but time also flies.

The hippocampus as a librarian, using stochastic resonance as a way of selecting a book

Buzsáki suggests a neurological explanation, a brain mechanism, to explain the binding of separate ideas together, a synthetic a priori process, a sort of prophetic dictate, the conjunction of two previously unlinked cognitions, “an acausal connecting principle,” an intuition or perception. This combining of separate cortical neural networks that represent ideas occurs in the hippocampus and thus brings them together to form meaningful metaphors. The structure of the hippocampus means that it is an “autoassociator” when what is called attention is turned on. This is ex-

pressed by slow, longer EEG theta waves being superimposed on shorter faster gamma waves. The gamma (with a frequency of 30 + per second) waves can be understood as representing very localised brain activities in the hippocampus that are then organised and joined into larger assemblies by the slower theta waves (with a frequency of 4–7 per second).

Theta waves are produced by a mechanism which, in the hippocampus, we name “attention” or “the voluntary,” a mechanism of the pace makers in the septum of the limbic system (see the figure), as well as other places, under the influence of the hypothalamic hormones, especially acetyl choline. In the neurophysiological experimental world there are long lists of what psychological or top-down constructs³⁶ the theta waves represent, but Buszáki suggests “attention” for input and “voluntary movement” as output.³⁷ The small rapid gamma oscillations are like the leaves of a tree fluttering individually in a gentle breeze, but organised into groups by a large gust, the theta waves. Each leaf may be invisible when considered by itself but the group is easily seen. One can also think of the hippocampus as a long piece of cloth made of many stitches and waved rhythmically in the wind from the septal end, via the fornix (see diagram). If a tachistoscopic light, representing “attention,” is shone obliquely on the cloth, only the peaks of the waves are momentarily lit up and united in memory as a coherent sheet of logically connected ideas. The “valleys” are ignored. The waves are indicated by the slightly wavy edge on the upper side of the hippocampus in the diagram, though in fact this also indicates the anatomical dentate (tooth like) nucleus.

The technical name for apparently accidental grouping by the “wind” revealed by the tachistoscopic light is called “stochastic” or “probabilistic resonance,” a combination of slow and fast EEG oscillations, none of which by themselves reach the threshold to be noticed, or expressible as consciousness. The wind obeys its own laws, as do the leaves. How they act together is stochastic, probabilistic, an expression of “free” will, or in the regenerate person an example of Divine influx. The biochemical, intra-cellular result for this is called “long term potentiation.” Long term poten-

³⁶ For example, arousal, attention, volition, comparator, instrumental response, conditioning, reversal learning, motivation, readiness, etc.

³⁷ Buszáki, 20.

tiation is an increase of the electrical potential within a group of hippocampal cells, an increase in synaptic weight or coherence between cells in the group, indexing an increased likelihood of the expression of a particular cognitive memory.

The cerebral cortex codes for different cognitions, like the titles and contents in the books on the shelves of a library. They are accessed and correlated with each other via the "index" kept in the hippocampus or catalogue of the library or in the librarian's brain, and this gives access to widely separate but corresponding items on the shelves of the library or in the cerebral cortex. The hippocampus/amygdala has a double coding or classification mechanism; that is, both for the titles of the books and the mood or state with which they are coded and searched for. This explains why memories tend to reflect the mood of the person, both in their original construction and in their recall. When you are gloomy, gloomy memories predominate, and when you are happy, happy ones spring to mind.

The librarian can search for a title by the shape of the words, the form of the cognition or for the emotional similarity, for example a book called "The Science of Feeling" can be chosen because of the form of the title, or because of the mood it represents.

The hippocampus is linked with innumerable modules in the cerebral cortex representing particular ideas or memories. Many modules can perform the same functions as the rest of the cortex, reminding one that there is much redundancy of representation for each cognition. Imagine, say, the physics term or cognition "jay hat" (j) in some module of the cerebral cortex. It sounds like a jay which could be a bird, but that does not sound rational in this context, so we learn that it is a small letter J, with a "hat" on top. As before, the hippocampus is like a librarian in a large library. We go to her and ask her if she knows of any books on "jay hats." You may have to explain you are not interested in birds or hats. Of course if she has never heard of "jay hats" before, this, the representation, does not exist in her memory, so another cognition representing "ignorance" is connected by the hippocampus to describe this new cognition, articulated by "I do not know." The librarian can join up different cortical modules or shelves in the "library" of her own cerebral cortex with their associated feelings which were established as each memory was formed. The librarian can find books which are similar to each other either in factual content

or emotional valence, and join them together in a correspondential relationship, just as in Swedenborg's brain, Arcana Caelestia were expressed in earthly ultimates. I have used the word "jay hat," obscure to non-physicists, like myself, to emphasise the extraordinary capacity the brain has for making what are abstract, invisible ideas "seeable" by expressing them with metaphors which are already known.

"Jay hat" is the technical term for the direction of a unit vector along the y-axis of a graph. It would be interesting if influx—or the dimensions of good, truth, and holiness—could be described in terms of vector mathematics, but there is no way of measuring such things with any accuracy at present. However, we can see that Swedenborg is introducing geometrical ideas into his consideration of moral values when he describes the dimensions of the Ark.

In the same way an author writing a novel "clothes" the emotions and actions suitable to her story with the characters or metaphors of fictional human beings, (*fictio personae* again) much as the Bible does, though in this case the characters exist in reality, as they are the products of the Divine author, the origin of all life with which the visible "seeable" creation corresponds. Swedenborg uses the characters of say Abraham, Isaac, and Jacob to represent the celestial, rational and natural spirits, springing from the infundibulum, which as he says are not men, but represent men. In AC 4051 Swedenborg says: "The lymphs came in front of me and addressed me saying that they were men. But I was allowed to reply to them that they were not men provided with bodies, but were spirits and so also men . . . I was also allowed to tell them that they were men by virtue of intelligence and wisdom."

To illustrate this I will quote from Karl Birjukov's quote from *Arcana Caelestia* 1756, p. 586 of *The New Philosophy* (Vol. CXVI, Nos. 3 & 4).

All these matters presented above are those which in general are embodied in the internal sense of this chapter [14 of Genesis], but the whole train of thought and its beauty cannot be seen when every single thing is explained according to the meaning of the words, as they would be if they were comprehended in a single idea. When all are comprehended in a single idea those things which have hitherto lain scattered now appear beautifully joined and linked together.

He gives a list in AC 3030 (4) as to how good and truth have got to fit each other.

Prophetic dictation and stochastic resonance

In attempting to clarify the use of influx, Swedenborg uses the term mediate and immediate. We can also understand mediate influx as the connection we make metaphorically between two concepts, a synthetic a posteriori proposition in Kant's phrase. AC 3318(3-4) on the vessels of man's life uses the metaphor that man is a vessel, mellowed by temptation, into which good of the Lord's love flows in, as the good, first to the rational of a man, and then into the good of the natural, and starts to be joined to the truths in both these vessels, the rational and the natural. In this way a natural object starts to correspond to some good in the rational, as the following examples of prophetic influx attempts to show, particularly Jeremiah's description of seething cauldron or vessel with the face of it towards the north. The material object is the "medium" through which the spiritual or metaphorical message comes, as the good of the natural demonstrates the good of the rational.

I described the way the hippocampus can be described as librarian in a library pulling cognitions and emotions together to make meaningful cognitions out of ultimates. The linkage appears stochastic, because the Lord's providence is humanly acausal. The cognitions cited below, from the book of Jeremiah, use the Hebrew words *shākēd* and *shōkēd* which existed in Jeremiah's cerebral cortex in the form of neural networks. They are pulled together by a punning similarity indexed by the hippocampuses of the prophet and of those people who listen to him and share his values, culture, and language.

Swedenborg writes in *Heaven and Hell* how the Lord spoke with the prophets.

He [the Lord] did not speak with the prophets as with the Ancients by means of an influx into their interiors; but by means of spirits that were sent to them, whom the Lord filled with His aspect, and thus inspired the words which they dictated to the prophets; so that it was not influx but a dictate . . . (HH 254)

To clarify this idea, I would like to quote some simple examples of the internal sense appearing to someone by what Swedenborg calls “dictate.” I take this information from *Prophecy and Divination, a Study of Man’s Intercourse with the Unseen World* by Alfred Guillaume.^{38, 39} I will take Jeremiah first and then some more easily understood examples but from a world more similar to Jeremiah’s than ours.

In Jeremiah 1:12, we read:

Moreover the word of the Lord came unto me saying what seest thou? And I said the rod of an almond tree (shākēd in Hebrew). Then said the Lord unto me, Thou hast well seen: for I watch (shōkēd) over my word to perform it.

Similarly too in Jeremiah 1:13

And the word of the Lord came to me a second time, saying “What seest thou?” And I said “a seething cauldron (narpħōak): and the face of it is towards the north,” and the Lord said unto me, “Out of the north evil shall break forth upon all the inhabitants of the land.” [In a more accurate translation “disaster will blow (tiptak) out of the north.”]⁴⁰

A seething cauldron in the Hebrew is literally “one that is blown upon” rather than, as we think, that seething has something to do with the shaking of water by the heat of the fire. The prophecy says that evil will be blown forth or break forth from the north. In both these examples there is a dictate from the Lord caused by the similarities between words and their meanings in the time of Jeremiah.

Guillaume describes another more prosaic example on page 118 of his book in a story from 8th century Assyria, where the soothsayer or truth

³⁸ Alfred Guillaume, *Prophecy and Divination. A Study of Man’s Intercourse with the Unseen World*. The Bampton Lectures. (London: Hodder and Stoughton Limited, 1938), 154.

³⁹ Alfred Guillaume was Professor of Arabic and Head of the Department of the Near and Middle East in the School of Oriental and African Studies in the University of London, and later visiting Professor of Arabic at Princeton University. (See Wikipedia)

⁴⁰ “Narpħoak” is the passive participle singular masculine “being blown” of “narpħak” which means “he blew,” “Tiptak” is “Piel” third person singular feminine “she will blow or pour out,” of narpħak.

sayer, as we can call him, on a much lower ethical plane than Jeremiah, explains the steps involved in “prophecy.” It is one from a series of anecdotes compiled by a Mesopotamian judge, al-Muhassin by name, over a period of about twenty years, starting in 971 AD. The judge’s story is in a book called *The Table Talk of a Mesopotamian Judge*. His world is much more similar to Jeremiah’s world than the hustle and bustle of today’s world, and therefore worth quoting, besides being a good story.⁴¹

Ismail, the son of Bulbul, kept to his house (he was frightened of being attacked by an angry neighbour) and as his wife was expecting a child, ordered an astrologer to be fetched to take the child’s horoscope. However, someone expressed doubt about the value of astrology and suggested a neighbouring Bedouin wizard (literally a knower). Without telling the Bedouin why he was called, when he arrived Ismail asked him why he had been called. The Bedouin glanced around the apartment and said, “To ask about an unborn child.” He was then asked whether it was a boy or girl. Again the man glanced about the apartment and replied: “A boy.” They talked about other things and while they did this a boy was born. Sometime later the Bedouin was asked how he had known the answer to the questions. He said “All that I do is to note omens, to watch the flight of birds, and to divine from what we see. You began by asking me why I had been summoned. As I glanced around the room my eye fell upon a water-cooler with pots attached to it; I thought to myself something carried. (Haml in Arabic). This is the general meaning according to Guillaume, but there is also a special meaning of a “foetus,” the mother during the time of pregnancy, being called a Hāmil, i.e. “carrier.” The soothsayer also explained that he knew it was a boy because he saw a male sparrow perched on top of the water cooler as the question as to the sex of the child was asked.

A modern slant on this comes from Karl Jung who treated Wolfgang Pauli, the physicist, for severe depression in about 1928. Pauli, in his professional work, was looking for a unified field theory. At the same time Jung was looking for a unifying principle behind meaningful coincidences.

⁴¹ Buszáki, 238.

Jung invented the term “an acausal connecting principle” as opposed to causality, which is the “modern prejudice of the west.” As Jung says further, we are obliged to abandon, on the plane of atomic magnitudes, a causal description of nature in the ordinary space time system, and in its place, set up invisible fields of probability in multidimensional space.⁴² The spiritual world is discrete from the material world but connected to it by correspondences, when he, Jung, talks about mediate influx, that is, influx with a correspondential cause, but one only seen by the “prophet” not by his audience to whom it appears immediately divine via an acausal connecting principle, thus giving the prophet’s word authority. The description of the functions of the hippocampus can explain these prophetic functions and the way this correspondential causality is expressed in the brain. Stochastic resonance there gives a good insight as to how the brain corresponds with the spiritual or metaphorical world.

Epilepsy as an immediate influx

To illustrate immediate influx, perhaps celestial, a recent film called “Art & Epilepsy” describes what can be called the “Dostoevsky effect,” after a description of an experience that Dostoevsky described to a friend, a philosopher called Nicolai Strakhov: “A happiness unthinkable in the normal state and unimaginable to anyone who has not experienced it . . . I am then in perfect harmony with myself and the entire universe.” He uses his fictional character Prince Myshkin in his book *The Idiot*, to describe the experience which until recently has been thought to be fictional. A physical basis for this “influx” documented in epileptic patients has been discovered as due to activity in part of the brain, called the insula, which lies deep in the brain within a fissure dividing the temporal, frontal, and parietal lobes. My reason for including this is that although its “joy”-causing activity is most clearly seen in epileptics, it is possible that it plays a part in a normal immediate influx of joyful feelings, inexplicable by life’s circumstances, such as Paul’s experience on the road to Damascus. That is, it seems to have no external cause, but depends on the form of the brain, and if one loves the Lord, it is understood as a form of immediate influx

⁴² Ibid., 238.

from Him. A beautiful description of this joy is given in *The Memorial of Blaise Pascal* as quoted by Bergquist.⁴³

This highlights the independence of the neural systems of emotion and cognition⁴⁴ both in the brain and in societies in heaven to which they correspond. The language of the dynamics of chaos offers a useful description of this activity. A component of weather is wind, the movement of countless air molecules; and this corresponds to the activity of countless brain neurones. The air temperature corresponds to the emotions. A stable mode of activity in a self-organising system manifests as an attractor, so called because the system returns to that mode after it has been perturbed, as after a passing storm,⁴⁵ an attack of epilepsy, or loss of temper. In regard to weather, it is interesting that the atmosphere as a whole corresponds to the spiritual world; and our need of the atmosphere for survival, in breathing for example, is a clear correspondent of our dependence on the constant presence of the spiritual world and its influences for our existence.

It is well known that Swedenborg sees heaven and hell as a collection of societies. In heaven they are bound by a mutual love to the Lord and to each other. This collection of societies in heaven corresponds to the functions of various parts of the brain, the seeing, hearing, tasting, and feelings of joy, hate, rage, and their motor expressions. In the person who has union with the Lord, so as to enter a land of No-where (the “mundus imaginalis” beyond the mountain of Qāf),⁴⁶ these are attributes of the Lord, the Thou, as demonstrated in a good marriage, as the separate selves disappear without loss of identity, but are expressed as the “you” of the partner. In hell they are the attributes of each quarrelling “I” or ego trying to bully another “you” into submission. However, if one of these “societies” gets out of control, the whole brain, the whole heaven of the indi-

⁴³ L. Bergquist, *Swedenborg's Secret* (London: Swedenborg Society, 2005), 157. “From about ten-thirty to around half an hour after midnight. FIRE. Abrahams’s God, Isaac’s God, Jacob’s God, not the philosophers’ and scientist’ God. Joy, joy, joy, tears of joy, Jesus Christ, Jesus Christ.”

⁴⁴ Michael S. Gazzaniga, Editor-in-Chief. *The Cognitive Neurosciences*, III. (Massachusetts Institute of Technology, 2004), 1008.

⁴⁵ Walter J. Freeman, *Societies of Brains. A Study in the Neuroscience of Love and Hate* (Hillsdale, New Jersey: Lawrence Erlbaum Associates, Publishers. 1995), 63 ff.

⁴⁶ A Persian name taken from Corbin’s book *Swedenborg and Esoteric Islam*.

vidual so to speak, becomes overwhelmed by the “hatreds” of that one society. The best-known example of this is epilepsy, descriptions of which occur quite often in the New Testament, when the Lord is recorded as restoring order, as he did with the winds and the waves on the Sea of Galilee (Matthew 8.24). It reminds us, too, of Swedenborg’s descriptions of the last Judgment in 1759.

The proprium and the self

The neurological basis for the feeling of self depends on the constant proprioceptive input we receive from our bodies, mainly the muscles, joints and skin, using the conscious proprioceptive system. There are large bundles of nerve fibres which run up the back side of the spinal cord called the “gracile” and “cuneate fasciculi,” from every part of the body. They form the first stage of a nerve pathway that leads from the body to the thalamus and then to the cerebral cortex. Impulses traverse these pathways at a rate of about twenty meters per second constantly updating the brain “map” as to where the body and its limbs are in space. One can appreciate the efficiency of this system when you watch a tennis player performing. She not only knows where the hand holding the racket is, even while keeping her eye on the ball, but also where the centre of the racket is so that she can hit the ball with the racket’s center to get the best return to her opponent. She can also “see” herself and her opponent moving around in the “space” of the tennis court that somehow corresponds to her firmament.

Each spectator also forms his own firmament in which the match is taking place so it is difficult to know which or where the “real” tennis court is situated. A very rare devastating virus infection destroys the proprioceptive system, and the sufferer finds that unless she keeps her eyes continually on the position of the limbs they wander off on their own accord because she does not know where they are without using the visual system to replace the proprioceptive system. Another system, the spinocerebellar system is part of the mechanism of procedural memory, not episodic; it is the memory of how to do things, such as hit the tennis ball, once the conscious proprioceptive system has located it. The neurological mechanism of procedural memory, that is how to hit the ball, is also

almost completely unconscious.⁴⁷ We do not hear the wheels grinding in spite of the incredible activity in the neural network involved. Nor do we see the equally incredible shimmering turmoil inside the smooth carapace of the skull.

Due to the efficiency of our proprioceptive system and procedural memory we seem to move about and have our being in the firmament or the analogue space of our minds, and do not realise that it is due to the efficiency of the machinery of influx that we get this illusion of free will. 90% of the activity of the body, including the proprioceptive system, is unconscious, the result of immediate influx, much as in a blackbird.

In the history of philosophy there has been much discussion about the nature of space, from Aristotle's idea that the place of an object in what we call space, is the internal wall of its container, the idea that the universe was totally filled with matter, Newton's absolute space, space filled with Leibnizian monads, Berkeley's denial that space exists anywhere except in our minds, and so on. (See a good summary in O'Keefe and Nadel 1978⁴⁸). In very rare condition called anosognosia, associated with destruction by a stroke of the right parietal lobe, the patients fail to acknowledge that half the field of view is only half of what others see as the whole.⁴⁹ This suggests that space is a function of our brains, but we do not know what it is in itself.

The dry land and the firmament of Genesis chapter 1

A useful way of thinking of both sorts of influx, immediate and mediate, is that it seems to find its expression in our brains in a form analogous to a map of our body and the surrounding "landscape," dependant on the immediate and mediate spiritual geography and affections of the brain's owner. The contours of this map, the heights of the mountains, the depths of the valleys, can alter continuously and forever, assuming their correspondence with the spiritual world under the influence of influx.

⁴⁷ Lister.

⁴⁸ O'Keefe & Nadel.

⁴⁹ Rita Carter, *Mapping the Mind* (London: Weidenfeld & Nicolson, 1998), 198.

The words *Arcana Caelestia* or *Coelestia* mean the secrets of a cavity, the firmament, from the Greek for cavity or space, a *koilos*. This corresponds to the analogous space which, with a bit of introspection, we can easily comprehend as being the place where our mind exists and has its being. If you are talking with somebody it is easiest to think of their mind as being somewhere behind their eyes, but this is only a convenient convention.

The firmament is an amazingly accurate analogue of the real world, a place for example where in his own firmament, Einstein's theory of relativity originated. The laws of gravity and motion made their first appearance in Newton's firmament. They were further refined by Einstein where he describes that someone in an inertial framework experiences space and time differently from another, admittedly only noticeable when travelling at great speeds relative to that other. With these concepts we seem to be approaching the correspondential geography of Swedenborg's heaven and hell, where space and time depend on the affections of their angelic or demonic inhabitants, as expressed neurobiologically by the synaptic weights between hippocampal cells.

The influx of ideas

It is well known that certain ideas seem to "drop" into the world at similar times; e. g. Darwin and Wallace happened on their theories of evolution by natural selection at much the same time. This seems to indicate an interesting connection between each person's firmament and the spiritual world from which influx "arrives." The spiritual world is timeless, or always present, but influx from the spiritual world seems to us to need time, to form a causal connection between events, as in the seven days of creation in Genesis, which becomes a feature of the present once we have read about it. As St. Augustine says about this world, "The past is over and the future is not yet come, all that exists is now; so how long does now last?" Due to the random spaces of the hippocampus the time we experience between events in our heads is flexible. Of course "now" lasts an instantaneous forever in the spiritual world as it does in our heads. Memories of past events in our lives can enter the "now" of the present moment through the random neurological space-times representatives of the physical hippocampuses.

A very clear description of this phenomenon as it exists in the spiritual world is given by Dr. George Ritchie in his book *Return from Tomorrow*. As a young man he died from an attack of pneumonia for some nine minutes of worldly time, but in an apparently timeless tour of the firmament of his mind with Jesus he saw the nuclear engine of the second US atomic submarine being built. Nine years later, in 1952, he read about it in *Life* magazine back on this earth, when it was being physically built in Schenectady. Its building there can be viewed as the result of an influx from the spiritual world, though of course the US Navy thought they had developed it as of themselves, being unaware of the influx.⁵⁰ We are up against the problem of the difference between linear end cause and effect, as opposed to circular causality, where the end is both the cause and the effect; Divine influx, the Holy Proceeding outside time, is the link between all three.

The above account by George Ritchie throws light on the experience Swedenborg describes of the Most Ancient and other churches of several thousand years ago. The brain is tied only loosely to the contemporary world. The state or mood of the Most Ancient Church can exist now in our minds. Swedenborg's travels to other earths in the universe also illustrate the extraordinary way in which the brain expresses celestial influx. It is a property of the brain itself and does not require influx in the conventional meaning of that word. The phrase "Arcana Caelestia" takes on a new meaning.

The hippocampus as a cognitive map

The neurological basis for this episodic/semantic memory is the hippocampus which, as well as linking cognitions of the cerebral cortex together as described above working with the entorhinal cortex, forms a map for places and events, in time and space, in our lives. The entorhinal cortex lies near the hippocampus, as in the figure. It is a very small area where enormous amounts of information enter and leave the hippocampus from other parts of the brain, mainly the so-called association cortices

⁵⁰ G. Ritchie George, M.D. *Return from Tomorrow* (Old Tappan, New Jersey, USA: Chosen Books. Fleming H Revell Company, 1978).

that make the finished versions of the images of which we are conscious via the influx of seeing, hearing, feeling, touching, and olfaction though this last has its own special access to the hippocampus. Rough copies, so to speak, are made in the main cortical areas of the diagram but then are refined and encoded by the association cortices and then indexed in the hippocampus for the episode itself and the amygdala for the emotional valence of the episode. The entorhinal cortex through which nearly all communication between the cerebral cortex and hippocampus takes place, has a grid-like representation of the environment with so-called “place cells” which are part of the neurological mechanism for forming this map of the firmament or analogue “I.”⁵¹

Influx into the right and left brains

The cognitive functions of the right brain are very different from those of the left brain as split brain experiments have made clear. The left brain is analytical and contains the speech center as normally understood. The right brain excels the left brain in categorising shapes, sizes, textures, and spatial patterns.⁵² The influx of the infundibular spirits has quite a different effect on the right brain compared with the left. Swedenborg’s gift was his ability, a right brain property, to personify states and give them personalities, to personalise the *Arcana Caelestia*, as the following extract suggests.

Swedenborg writes in AC 1270, a Memorable Relation concerning the Antediluvians, those who lived before the flood. Remember that this is pseudo history and can describe a present state:

Presently some [men] were let out of that hell . . . the evil (antediluvian) spirits appeared to the left above in order that they might inflow into me thence, thus from afar. I was told that they were allowed to inflow into the right side of the head, but not the left side; and from the right side head into the left side of the chest, but by no means in to the left side of the head, because if they did so I should be destroyed; for in that case they

⁵¹ Buszáki, 299.

⁵² Jaynes, 118. “The right brain is excellent at sorting out shapes, sizes, and textures.”

would have inflowed with their persuasions which are direful and deadly; whereas if they flow into the right side of the head, and thence into the left side of the chest, it would be by means of cupidities. Such is the case of influx. (2) Their persuasions are of such a nature that they extinguish all good and truth, so that those into whom they flow can perceive nothing whatever [and] after that cannot think; and therefore the other spirits are removed. When they began to flow in I fell asleep. Then while I slept they flowed in by means of cupidities and this with such violence that if awake I could not have resisted them. In my sleep I was sensible of the vehemence of it, which I cannot describe, save that afterwards that they tried to kill me by a suffocating afflatus, which was like a terrible nightmare.

I think cupidities or desires to which the evil spirits are appealing are what Swedenborg wished to put into practice as part of the nightmare. One can imagine having such a nightmare, but thankfully waking up to find that it was just an unpleasant dream, due to evil spirits. In dreams and nightmares, the connections between the brain and the body are blocked, so the dreamer cannot act out his dreams, except in what we call sleep walking. This is why Swedenborg says "When they began to flow in I fell asleep."

In schizophrenia, the brain remains connected with the body with sometimes nightmarish results in the waking state. To illustrate this, my family have suffered from various degrees of mental illness, including what is now called schizophrenia, but which I think Swedenborg calls an influx of antediluvian spirits. One relation of mine was told to destroy himself by hanging, which he did, but was rescued and was resuscitated, though unconscious and on life support for about two weeks. There is evidence that the right brain or hemisphere in right handed people is the source or point of entry of the destructive voices, the expression of infundibular neurohormonal influx on the right brain in schizophrenia, which are then heard on the left sided Wernicke's area (via the anterior commissure according to Jaynes) as Swedenborg implies in the above quote. Schizophrenia is a disease in which these spirits can flow into the right brain or cerebral hemisphere, they then try to destroy the patient if allowed into the left as Swedenborg implies. This is why he describes the way evil antediluvian spirits are allowed to flow into the right side of the

head but not to the left except in dreams, if one accepts that his use of the word “left” refers to the left hemisphere, and also if Swedenborg was himself right handed. Evil spirits, communicate in speech as well as with visions, using the neurobiological mechanisms taken over from the individual concerned. In normal hearing the brain registers the sounds in Wernicke’s area of the left brain (see diagram) in most right handed people. Right sided speech, which is speech originating in the right cerebral hemisphere from an area equivalent to Wernicke’s area, is heard only by the victim herself, and appears like an evil spirit. (See Julian Jaynes⁵³). The “voice” originating on the right side can of course be beneficial and usefully insightful, but if it is evil it leads to destruction by invading the left cerebrum. My family member describes his “voice” as self satisfied, frighteningly persuasive and logical, a male voice telling him, for example, it would be for his own good to kill himself. It called itself the One and although my relation resisted for many weeks he had to give in eventually, and hang himself.

Jaynes⁵⁴ describes another example of what we call schizophrenia:

The patient is enjoying the sun sitting in a deck chair on the beach on Coney island . . . (he says) suddenly, clearer, deeper and even louder than before, the deep voice came at me again, right in my ear this time, and getting me tight and shivery inside. “Larry Jayson, I told you before that you weren’t any good. Why are you sitting here making believe you are as good as anyone else when you’re not? Whom are you fooling? You’re no good,” the voice said slowly, in the same deep tones. “You’ve never been any good or use on earth. There is the ocean. You might as well just drown yourself. Just walk in, and keep walking.” And so he did but was rescued by life guards and treated in hospital.

The story of Genesis includes the striking story of the serpent making first Eve and then Adam realise they are naked. One can imagine them getting tight and shivery inside, in the cool of the evening, like Larry Jason, and the voice of the serpent equally accusatory and unpleasant, serpent-

⁵³ Ibid., 101 ff.

⁵⁴ Ibid., 96.

like, nightmarish, and compelling. I think this is the first appearance of an antediluvian spirit, playing at being God. There is nothing of course evil in being naked or in sunbathing on Coney Island, and here in Eden we witness the first appearance of a conflict between the law, the serpent, and the prophets, which led to the Lord's crucifixion, led by a generation of vipers personified by the legalistic and overdressed Pharisees (Matt 3.7).

Swedenborg in AC 1635 says that "the influx into the internal organs of hearing is different from the influx of discourse with men; [the speech of the spirits] was heard by none except myself." This makes clear that the deep voice in the above quote was that of a spirit, operating through what corresponds to Wernicke's area (see the figure for the approximate site) on the right, as Jayne's describes. The other sunbathers on Coney Island did not hear the voice that Larry Jayson heard.

My family member also describes the terrifying feeling of being alone, or solipsism as he called it, at the same time as a loss of spiritual freedom, with the inability to say "no" to the voice. Julian Jaynes⁵⁵ describes it well as the "The Erosion of the Analogue 'I,'" the interior world, the firmament of our heaven, in which we normally experience ourselves as freely moving about, in our mind's eye so to speak, enjoying in freedom the influx of heaven. Under the influx of evil, the firmament ceases to have any height, breadth, or depth, a non-existing void if you can imagine such a thing where all sense of location is lost in infinite dark. The "sum" of Descartes' *Cogito ergo sum*, an analogue "I," no longer applies, which supports the idea that reality or truth is defined by being loved by the Divine. The "I" depends on the "thou" of Divine love for its existence. Gödel's proof of the "On Formally Undecidable Propositions of Principia Mathematica and Related Systems" touches this problem of identity. "I" of the phrase "I am" is a formally undecidable proposition if not loved by God.

Jaynes⁵⁶ quotes another patient from E. Meyer and I. Covi, "The experience of depersonalization: A written report by a patient," *Psychiatry*, 1960, 23: 215–217. "My ability to think and decide and will to do, is torn

⁵⁵ *Ibid.*, 417.

⁵⁶ *Ibid.*, 418. Jaynes quotes from patients of Dr. C. C. Pfeiffer of the Brain-Bio Center of Princeton, New Jersey, where schizophrenia is regarded as several biochemical illnesses primarily treatable by brain nutrients.

apart by itself . . . Instead of wishing to do things, they are done by something that seems mechanical and frightening . . . the feeling that should dwell within a person is outside, longing to come back and yet having taken with it the power to return.”

This comment by a patient on the influence of evil spirits is oddly reminiscent of the view that the universe is just a piece of clockwork, a view suggested by Newton’s insights. It is as if God’s influx is of no moment in the scheme of things, and the universe can be reduced to a purely mathematical and mechanical formula, a clockwork universe, reminiscent too of a Calvinistic, preordained, loveless, theology. As Karl Birjukov writes on page 574 of his article on Influx in *TNP* Vol. CXVI: “The scientific program and the philosophical principles it has commandeered are driven by a desire to create a representation of reality that refers to nothing outside itself [meaning the natural world and hence the universe] as possessed of any relevant explanatory power.” Of course my relative’s voice, The One, would “say” that he, the One, (like Lucifer), was the only principality and power in control of the universe, whereas the Lord would say that it is the result of the influx of lying spirits.

The neurobiological limbic system is a material metaphor for the “limbus” of Swedenborg (*TCR* 103, but translated a “border” by Jonathan Rose). In an animal, the limbic system is the neurological basis for “intent” that the animal possesses for preserving its own life. Swedenborg’s limbus divides heavenly intents from hellish intents and in heaven corresponds to the desire on God’s part to get us all to heaven or to hell depending on our individual tastes, just as the limbic system “intends” its natural animal owner to survive and reproduce according to its tastes at the expense of others, not realising that the survival of the species, not the individual, is the cause, end, and effect of evolution. This is an exact analogue for the biblical revelation that death of self leads to life for others; an animal kills for its own life, and thus the species, whereas Christ let his animal body, as taken from his mother Mary, be “killed” for others to live spiritually. Animals are unconscious of their intent but it perfectly fits the idea that humans are indeed animals intended for heaven.

Cause needs an end to have an effect. As mentioned above, Gödel is famous for pointing out that nothing is complete in itself, contained in the title of his famous article “On Formally Undecidable Propositions of

Principia Mathematica and Related Systems." Without a context, mathematical formulae, as in the "Principia Mathematica" of Russell and Whitehead are meaningless, as indeed they aimed to be.⁵⁷ In the same way the intellectual cannot exist without the celestial, nor the rational without the intellectual, not the natural without the rational. It is the relationship between two degrees, like male and female, which make one, without either existing without the other.

The intellectual springs from the celestial and the celestial from the infinite that is the esse of the Divine (*Apocalypse Explained* 870). Only God is good in this sense, without a dualism. The end of the intellectual is the rational, and when considering the way mankind has defined the natural, using the rational, as I have summarised very shortly above, it is clear that the rational describes the natural in a series of metaphors. This is a property of the hippocampus which combines the images of the cortex in an endless series of metaphors derived from the language centres of Wernicke's area on the left and its corresponding area on the right, from other metaphiers embodied in the neural networks of the cortex. The hippocampus is like a continually expandable catalogue within the limits of our life span. A basic metaphor of infinity is based on the consciousness we have of the almost limitless associative abilities of a normal hippocampus. Dementia destroys this but it is restored to us in heaven as George Ritchie's experience makes clear.⁵⁸

The influx of divine love

Consciousness of God's love is so difficult to understand because it requires the removal of Mark 11.23's mountain, and without finding oneself on the other side of the mountain you do not know the other side is there. The removal of the mountain brings the two sides together, and "I" becomes "Thou," but the "Thou" is at the same time the "I." An interesting light is cast on this by Hebrew's incomplete or "future" tense; the feminine third person singular for a verb meaning, for example, "she is," is the same word meaning "thou art," (second person masculine). This is a nice

⁵⁷ E. Nagel, & J.R. Newman, *Gödel's Proof* (London & New York: Routledge Classics, 2005).

⁵⁸ Ritchie, M.D.

illustration of the male-female image of God, without which we could not express either one or the other. God so to speak is the influx of that relationship. He is God of the gap, not the gap of ignorance as this phrase often implies, but the God of the relationship between a “He” and “she,” or between a “He” and a “Thou” as Hebrew grammar suggests.

In married love we receive some of the most insightful states we are capable of; glimpses of the infinite esse of the Divine, from which the celestial inflows the natural. When you fall in love you no longer see the woman as a stranger or a sister but as a wife. The early chapters of the *Arcana Caelestia* are a rich and poetic description of the relationship we can have with each other as men and women and with God. For example in AC 94 Swedenborg comments on Verse 7 of Genesis chapter 2. “When He (Jehovah God) breathed into his [Adam’s] nostrils the breath of life, man became a living soul.” In this state man–woman are a celestial unity. The English words “am” and “is” come from the Sanskrit “asmi” which means breath. “I am that I am” of Exodus chapter 3, as God spoke to Moses out of the burning bush, is an attempt to do justice to the indescribable feelings of conjugal love. As Swedenborg says, the “h,” the breath sound of aitch, added to Abram and Sara to make respectively Abraham and Sarah, signifies putting on the Divine (Genesis 17.5, AC 2008, and 17.15, AC 2060). Genesis describes earlier this expression of conjugal love as a rib being formed into a woman, or the mother of “all living” (Genesis 2.23). When you are “in love” all this can become understandable, and remains so with practice.

Falling in love is a manifestation of the celestial with the resulting inflow via the intellectual into the rational which is made new in a deep sense. In the same way that the influx of oxytocin dissolves old attachments that ewes have for their former lambs by the dissolution of intentional brain structures to make possible the establishment of bonds with a new lamb, as oxytocin, now an angel in Swedenborg’s world, causes a man to leave his father and mother and attach himself to a woman. Swedenborg explores this aspect in greater detail in the stories of Abraham, Sarah and Pharaoh, Abraham, Sarah and Abimelech and Isaac, Rebekah and Abimelech, and how they illustrate various states; natural, rational and celestial. All three episodes reflect the tensions experienced by Pharaoh or Abimelech who represent the Lord’s relationship with His Father,

and to a lesser degree all human beings, who when in love, have to decide between love to each other and love to the Lord unless they realise the correspondence of their own loves to the Lord's love.

One of the most remarkable facets of falling in love is the way that the lover's attention is focused on the beloved. As Buszáki says, attention, as are all "cognitions," is a psychological construct,⁵⁹ a metaphor for something we intuit, often thought of as top-down, and initiated in some hypothetical "executive" top level area, i.e. the Lord in the context of Swedenborg's degrees of influx. Buszáki calls attention to a quantitative change rather than a qualitative change, reflecting an enhanced sensitivity of the processing circuits to inputs, inputs in this context being the sight or thought of the beloved who ideally will be God for us, or in the Lord's case, His heavenly Father. Such an enhanced quantitative gain in the neural networks can be achieved mainly by subcortical neurotransmitters of the hypothalamus, or in Swedenborg's terms, lymphs or spirits such as are found in the infundibulum and isthmus, such as acetyl choline, norepinephrine, serotonin and oxytocin as we call these chemical angels today. Acetyl choline causes fast gamma oscillations uniting the thalamus and cerebral cortex, and in the hippocampus gamma waves unite with theta wave to index and correlate various inputs from the cerebral cortex.

The thalamus and rhythms of the brain

Situated just above the hypothalamus is the thalamus, is described by Swedenborg in his book *The Cerebrum*⁶⁰ but he does not comment on the thalamus in his theological writings. It is a large nucleus of millions of nerve cells forming a junction and processing station in the middle of the brain, through which all sensory information passes from the body to the cortex of the cerebral hemispheres. From the cerebral cortex as described above, the images from the external world pass to the hippocampus to form the basis or index of episodic memory. The thalamus named by Galen (AD 129–c.200) means the bridal chamber in Greek. Some thalamic cells operate like the cardiac pacemaker. The cardiac pacemaker "forces"

⁵⁹ Buszáki, 21.

⁶⁰ Acton, A. *Three Transactions on the Cerebrum*. A Posthumous Work by Emanuel Swedenborg (Philadelphia. Pa. USA: Swedenborg Scientific Association, 1938), 517ff.

all the muscle fibres of the heart to beat in a rhythmic, sequential way, pumping the blood corpuscles out of the ventricles into the aorta and so into the body. If we replace the idea of blood corpuscles with the idea of nerve impulses or action potentials, units of energy (“animal spirits” in Swedenborg’s phrase) flowing through nerve fibres, then the thalamus can be understood as “beating” them into rhythmic, sequential order with which they flow into the cortex, in turn organising the cortical structure to form coherent neural networks corresponding to the environment.

The EEG measures the electrical activity of millions of nerve cells acting in unison in the cortex. According to Swedenborg the cortex corresponds to the starry heavens (AC 4050). The cognitions in the cortex combine to form ever-changing rhythmic patterns, like the changing constellations of the so-called fixed stars, changing so slowly from a human perspective as to seem fixed. Under the influence of electrical pace-making activity of the thalamus, made visible outside the brain by an EEG machine, the cognitions of the visual cortex are linked with those of the auditory cortex in the thalamus so that one can bind together something one sees and hears, together with its context from other sensory modalities, into a harmonic whole.

Spiritual stages

In AC 6–13 Swedenborg describes the possible spiritual progress of a man or woman as the Bible describes as the seven days of creation, the first state being that of childhood, and the subsequent days of creation describing the following stages of man’s spiritual development or not as the case may be. There is a gradual evolution up as far as the seventh day when he becomes celestial. These changes are accompanied by changes in lymphs, as well as structural changes in the brain and body corresponding to these seven creative days.

I have suggested that the celestial state is for us the highest state of love that we can attain, an experience of which Swedenborg describes in his *Dream Diary*, sections 54 ff. For Jesus, it is love for His Father which takes precedence over everything else, but it was reached by Him through a series of steps as illustrated by the stories of Abraham, Pharaoh and

Sarah, Abraham, Abimelech and Sarah, and finally Isaac, Abimelech and Rebecca. Here is a short summary of what *Arcana Caelestia* says about these: these degrees of love are the result of spiritual influx from the limbic system, corresponding to the hormones as we know them today.

Memory knowledges

AC 1491. Pharaoh corresponds to memory knowledges, from which as Swedenborg says comes mental competence, as in childhood, before some of the hormones accompanying puberty develop. Here Sarah signifies the conjunction with the celestial, that is Abraham in the Lord's mind, and therefore she should not be touched by the mere memory knowledges of Pharaoh. Academic knowledge built on memory knowledge is highly prized in higher educational institutions and in the Lord's time on earth this was the position of many Pharisees and Sadducees. There is a danger that the rational and celestial may be excluded and profaned by this intellectual attitude to God, however high-minded. To cite a Biblical example, the Lord says in Matthew 22:41, citing Psalm 16:2: "The Lord said to my Lord, Sit at my right hand until I make all your enemies your footstool. If therefore David calls him Lord; how is He his Son?" To the Pharisees this was a well known bit of memory knowledge. To David, in the Spirit, it indicated a celestial state, as it did for Jesus. You cannot join mere memory knowledge to the celestial without a Pharisaic confusion of degrees.

The human rational

Genesis 20.4–5. AC 2523. Sarah is talking to Abimelech about Abraham and says: "He is my brother." Swedenborg explains that good and truth of the rational are joined to each other like sister and brother. This brother-sister relationship is different from the sphere surrounding husband and wife. The nature of the bond is different. Swedenborg says that from the latter comes the heavenly marriage and also conjugal love, even down to the natural world below. Divine Truth and Divine Good are linked to each other as if in a marriage, but in the human, good comes from Divine Good that is immediate influx, but truth is acquired through knowledge and

cognitions which are implanted by means of the senses, external and internal, and so coming by an external route. The love that Abimelech felt for Sarah had something of the human in it. Marriages in most societies, both ancient and modern, are arranged for “human” good, which is different from Divine good. Such things as keeping property in the family, supporting a religious or ethnic group, social status, and so on, all play their part both for the parents and for the prospective partners. Divine Good is in danger of getting adulterated with natural, rational good. Abimelech plays the part of a man or woman in love, but not one who is in love with God, and this is a threat to Sarah’s relationship to Abraham. The rational is a higher state than that represented by mere memory knowledge, but less perfect than the Divine.

The divine marriage

AC 3396. Concerning Genesis 26: 6–9. Here Rebekah is Divine Truth who may properly be linked only to Divine Good, and therefore she is out of bounds to Abimelech. Abimelech, representing the Lord’s doctrine of faith, suddenly understands this when he looks through a window and sees Isaac “playing, perhaps dancing” with Rebecca (AC 3389). This seems to imply that in Him, the Doctrine of Faith personified by Abimelech, is dealing with two people in love with each other, and thus representative of the Divine Marriage which He, the Lord, had to die for, due to the failure of society of his time to understand celestial love, and to consider it as merely a doctrine of faith. As Isaac/Rebecca (laughter/beauty in Hebrew) here represent the Divine, it is a sacrosanct relationship, where the brains of both of them are acting in correspondence with the other and with the Lord’s will. The Lord’s doctrine of faith is represented by Abimelech; the “play” illustrates the heavenly marriage between Divine Truth and Good, this blessed state being confirmed by the Lord when He turned water into wine at the marriage in Cana of Galilee.

An important expression of Divine influx is the marriage of man with woman, as a result of which a new human being is formed, together a new set of infant lymphs, spirits, or angels. These in their turn mature and then through another marriage, produce another generation of men and woman, and so on to fill the infinite dimensions corresponding to heaven and hell.

The Divine spirit finds its expression in the biological men and women of the Bible and Swedenborg's interpretation is what can be read as a Second Coming. In *Arcana Coelestia* 4050 Swedenborg writes "The lymphs came in front of me and addressed me saying that they were men. But I was allowed to reply to them that they were not men provided with bodies, but were spirits and so also men . . . I was also allowed to tell them that they were men by virtue of intelligence and wisdom." As Swedenborg says, "the human race and the angelic heaven make one, and mutually and reciprocally subsist from each other, and thus that the one cannot be taken away from the other" (LJ 9). □

Words for the New Church

IV

Science and Philosophy

Words for the New Church was originally published in 1879 by J.B. Lippincott & Co. for the Academy of the New Church, then reprinted by the Swedenborg Scientific Association, Bryn Athyn, PA, in 1976. The Contents table below gives an idea of the scope of topics addressed.

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