

SWEDENBORG, PSYCHOLOGY, AND THE CEREBELLUM¹

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I wish, this evening, to speak about psychology in general and the role of the cerebellum in specific. The special relevance of the latter to the former will emerge, I hope, in the course of my remarks. In the case of both topics we shall also see that there are important anticipations in the works of Swedenborg, both the pre-theological and the Theological.

I emphasize here the word "anticipations," for demonstrating anticipation is much less demanding than proving influence. The ideas of Swedenborg may well have influenced those who followed, but to trace influence one must first establish that Swedenborg had the ideas before others, which is the same thing as showing anticipation. The term "anticipations" may in fact err to the side of implying that Swedenborg was not a source of ideas for later thinkers. My present aim, however, is to avoid the question of influence altogether, and it is this I wish to communicate by speaking of Swedenborg's "anticipations."

Even apart from the question of influence, Swedenborg's anticipations are of more than academic interest in that they suggest principles which still have application to life today. Seeing Swedenborg as a precursor of modern psychology can both increase our appreciation of the work of psychology and give us insights that may go beyond even the present scope of psychology.

What Is Psychology?

Before getting into the subject of Swedenborg's anticipations of modern psychology, we must first address the question: What do we mean by modern psychology? This can be answered by saying "the science of behavior," or "the study of the mind," depending on one's outlook. But it can be addressed in another way as well. One can reflect on the modern discipline of psychology and ask how and

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when it came to be what it is. A common reply to this consideration is to say that the turning point was Freud's development of the concept of the unconscious mind. This concept provided a central organizing principle for psychology the way that the concept of evolution did for biology. There is a real truth in the picture that without the idea of the unconscious modern psychology would not exist, or at least would be nothing like what it is. The understanding of the unconscious is a cornerstone of the healing power of psychology, for one would not necessarily need to turn to psychology to deal with problems that were entirely within the conscious realm.

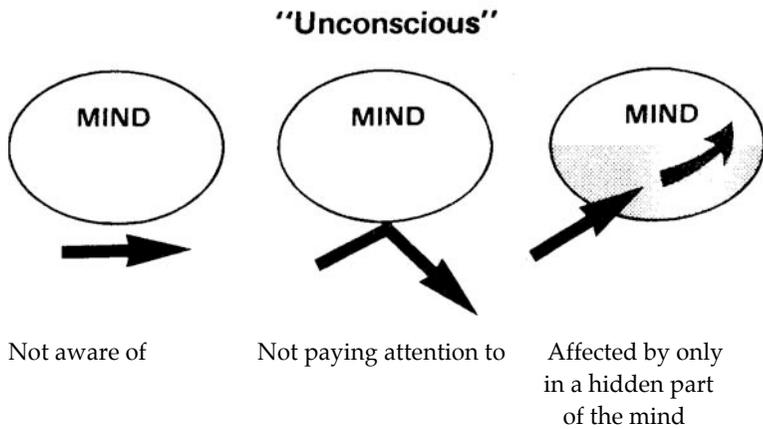
The Development of the Idea of the Unconscious

While it is true that Freud played a crucial role in introducing the concept of an unconscious mind, it would not be fair to say that he discovered the concept. If, however, it was not first found by Freud, at what point, then, did it first come to light? Let me tantalize those who are waiting for the Swedenborgian connection by noting that one of the foremost expositors of the history of the unconscious, Henri Ellenberger (1970, 53), cites the year 1775 as the birth of the modern understanding of the unconscious. In 1775, only five years after Swedenborg announced the beginning of the era of the New Church, there was a culmination of events that had taken place in the 1750's and 1760's which led to a confrontation between exorcism and Mesmerism. This led in turn, according to Ellenberger, to the realization that there was a hidden plane of motivation in the mind. But more about this later. For the moment we must back up and allow that there is some conception of the unconscious mind going back even to ancient times.

Before beginning our historical review, let us note on diagram 1 three different possible meanings of "unconscious." First, it can mean that someone is simply unaware of something. A person elsewhere in this town this evening is not conscious of what we say here. Second, is the possibility that although someone here is experiencing sound waves bouncing off his eardrum, he is not paying attention to what is being said and remains unaffected by it. Finally, we have the case of someone who is affected without being aware of being affected.

As early as Plato's doctrine of reminiscence one encounters the idea that there are things in the mind of which one is not immediately aware. And Galen, in the second century A.D., recognized

Diagram 1



that the mind makes unconscious inferences from perceptions. What is it, then, that distinguished the modern conception of the unconscious as something relatively recent? Why is it said that the unconscious was discovered?

There are two aspects that had to be added to the idea of the unconscious to give it the power that it has today: first, it had to be recognized that below the level of consciousness were not only cognitive elements, but feeling or emotions, as well; second, it was necessary to come to see that there are important causal connections between the unconscious functioning of the mind and the activity of which one is aware, that the true motivations for the latter may lie in the former. Only having realized these things can one then go on to deal with the pathology of the conscious mind by resorting to what lies hidden in the unconscious. The tremendous breakthrough for modern psychology was the recognition that to heal the conscious mind often requires going below the surface to deal with causes of which one is not directly aware.

The transition to the modern understanding of the unconscious began in the 17th and 18th centuries. Lancelot Law Whyte (1960, 95) sees Descartes as a key figure in this transition, not because Descartes began to see the importance of the unconscious, but just the reverse! Descartes' clear distinction between mind and body and especially his insistence that the workings of the mind are immediately evident and transparent to one who introspects, provoked a

reaction from others, who felt that the explanatory limitations of the Cartesian model required a resort to a model including unconscious activity in the mind.

Locke summarized the position of Descartes, with which he agreed, in 1690: "It is impossible to perceive without perceiving that he does perceive." He was answered in the same year by John Norris: "There are infinitely more ideas impressed on our minds than we can possibly attend to or perceive" (quoted by Whyte 1960, 96). Leibniz, however, is generally regarded as the first to develop this view in detail. It was he who introduced the distinction between perception, of which one is often not aware, and apperception, which is to be understood as conscious perception (Whyte 1960, 99). His follower, Christian Wolff, carried forward the Leibnizian approach to the mind in his *Psychologia Empirica and Psychologia Rationalis* (note Swedenborg's close connection here: his *Psychologica* is notes on the former and the title of the latter he uses for his own *Rational Psychology*.)

Whyte suggests that Wolff may have been the first to use the German word for consciousness to mean awareness (Whyte 1960, 101), which implies the increasing recognition of the unconscious as mental activity of which we are unaware. The Oxford English Dictionary notes him as the first to use the Latin word *psychologia* in its modern sense in its entry under "Psychology." We have thus some incidental evidence of the close connection between the development of the concept of the unconscious and the birth of modern psychology. The linguistic evidence cannot be a substitute for a study of the conceptual development, but it can be an illustrative adjunct to it.

C.A. Crusius (1715-1773) is the figure whom Whyte chooses as a bridge from the 17th and early 18th century thinkers who focused on the cognitive aspects of the unconscious to those in the late 18th who began to see the unconscious as the seat of passions. Crusius, he suggests, recognized "that thinking and willing are twin functions of the soul of which we become aware under special circumstances" (Whyte 1960, 108).

It is at roughly the same point in his study that Whyte introduces this intriguing comment:

In order again to stress the incompleteness of this survey, or rather the irrelevance of the criterion of completeness to the history of ideas, I leave to others the question how far E.

Swedenborg (1688-1722), [sic] Swedish scientist, philosopher, and mystic, explicitly indicated his awareness of the importance of the unconscious mind. He certainly stressed that thought depended on the combined activity of the various parts of the brain, and that it is just this correlation of separated factors which the unconscious processes prepare for the attention of the conscious mind. (Whyte 1960, 103)

There are several things here upon which one might want to comment. First, one might question the assertion of the irrelevance of the criterion of completeness to the history of ideas. How can Whyte be sure that he has not left out a crucial figure here, that he would not have charted the course of his subject very differently if he had investigated Swedenborg more deeply? This, in fact, is the very thing we will seek to demonstrate later on.

We can be grateful to Whyte for at least mentioning Swedenborg and allowing that there is more to be said. We may remain a little nervous, however, noting that he has missed 50 years of Swedenborg's life and therefore has included him in the wrong chapter of his book (*The Discoverers: Before 1730*).

Placed in his proper context, Swedenborg comes just at what Whyte regards as the turning point, for it was in the middle of the 18th century that the recognition of the emotional and causal aspects of the unconscious began to gain currency. Before examining Swedenborg's place in the development of the idea of the unconscious, we need first to explore the subject of the cerebellum.

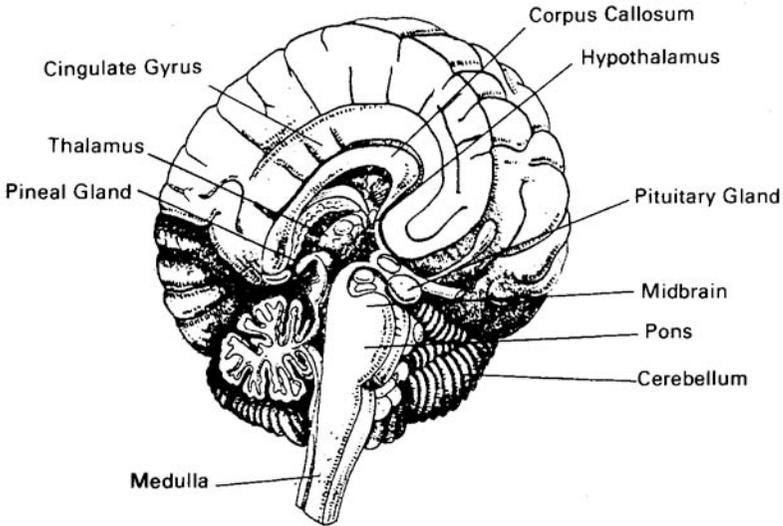
The Ignorance Concerning the Cerebellum in the 18th Century

Let us first clear what the cerebellum is. Looking at diagram 2 you will see the largest and most obvious part of the brain, the cerebrum. It is divided into two hemispheres connected by the corpus callosum. These two hemispheres are the right and left brains about which one hears so much these days. The cerebellum is a much smaller structure nestled beneath the back of the cerebrum.

By the 18th century, the cerebellum, along with other brain structures, had been carefully dissected, described, and drawn; but very little was known about its function. Summing up the state of affairs in 1784, George Prochaska wrote:

Hitherto it has not been possible to determine what portion of the cerebrum or cerebellum are specially subservient to this or

Diagram 2



that faculty of the mind. The conjectures by which eminent men have attempted to determine these are extremely improbable, and that department of physiology is as obscure now as ever. (Quoted by Young 1970, 11)

Robert M. Young cites this as representing the state of affairs obtaining when Franz Joseph Gall began his work on phrenology at the beginning of the 19th century. We will explore his studies a little later. For now let us turn back to Swedenborg.

Swedenborg on the Cerebellum

In the Theological Writings a number of things are said concerning the function of the cerebellum. We read for example, in the *Arcana Coelestia*:

There was heard a sound as of muttered thunder that flowed down from on high above the occiput, and continued around the whole of that region. I wondered who they were, and was told that they were those who relate to the general involuntary sense They can well perceive a man's thoughts, but are not willing to utter them; like the cerebellum, which perceives

everything the cerebrum does, but does not publish it. When their manifest operation into all the province of the occiput had ceased, it was shown how far their operation extended . . . (AC 4326)

This passage relates the cerebellum to the general involuntary sense. Other passages similarly identify the cerebellum as spontaneous or natural, and distinguish it from the cerebrum which is voluntary (e.g. AC 9670:2).

A further point is also made in contrasting the cerebellum with the cerebrum: "The cerebellum is awake in the time of sleep, while the cerebrum is asleep" (AC 1977:2, cf SD 3188).

The cerebellum is also said to have the vital role of governing the voluntary things of the cerebrum:

The Angels of the inmost Heaven correspond to those things with man which belong to the provinces of the heart and the cerebellum The things which are of the heart and the cerebellum are called involuntary and spontaneous, because they so appear. (AC 9683)

This protective governing function is said to apply especially to the organs of generation (SD 3862).

We have here a very definite and comprehensive picture painted of the role of the cerebellum, and this in a day when supposedly nothing was known about its function! One might be tempted to say that Swedenborg received simply by direct revelation, but as with many things in the Writings, the evidence is clear that he underwent a process of seemingly discovering these things for himself, before the Divine endorsement was given to them by revelation.

Now let me just review four points about the functions of the cerebellum mentioned in the Writings. Its functions are said to be involuntary, natural, and spontaneous. It is said to be awake while the cerebrum sleeps. It has a general governmental role over the cerebrum and the body as a whole. Finally, and very specifically, it has a special role in governing the organs of generation.

In the pre-theological works we find all the major points about the cerebellum had already been made:

1) The function of the cerebellum is involuntary, natural, and spontaneous: "The source of natural motion is the cerebellum. . . . The source of voluntary motion is the cerebrum" (AK 382). "By natural instincts I mean all those operations which do not come

within the consciousness of the mind. . . . Of these operations the cerebellum appears to be the conductor" (EAK 1:269).

2) The point is made about the cerebellum waking while the cerebrum sleeps (*Brain* 104g; AK 382).

3) The governing role of the cerebellum is mentioned: "Unless, therefore, a cerebellum were adjoined to the will, that is, a second brain which takes cognizance of every singular thing in the body, without, however, the mind becoming conscious of it, and which constantly, but silently and quietly, acts according to the order of nature, and the tenor of its laws, all would be over in a moment with its kingdom" (*Brain* 683).

4) Finally, the specific government of the genital organs is even mentioned (AK 394, note h; *Generation* 44).

The obvious question at this point is: How did Swedenborg figure all this out? This is a difficult question. He did note the contrasts between the brains of men and those of animals, and also the evidence of pathology. But his principal source seems to have been the accounts of the structure that were available to everyone at his day. He reached his conclusions by reflecting with great insight on specific details. He noted the distribution and relative quantities of gray and white matter in the cerebellum, recognizing that it had relatively more of the gray than the cerebrum. He observed that the structure was more regular and consolidated than that of the cerebrum. He took into account the fact that nerves from both parts of the brain seemed to go throughout the body. From such particulars he was able to infer his amazing conclusions.

Swedenborg on the Unconscious Mind

As was beginning to emerge from the passages on the cerebellum, even in the pre-theological works, Swedenborg regarded the cerebellum as operating in the unconscious domain of the mind. Its sensation, its governmental functions, all go on apart from the awareness or control of the conscious cerebrum. From the earlier works, however, we might get the impression that Swedenborg is still in the company of those who place only cognitive functions in the unconscious. In the Theological works, however, a new theme becomes manifest. In *Divine Love and Wisdom*, for instance, we read:

As all things of the body relate to the will and understanding, and all things of the body to the heart and lungs, there are two brains in the head, which are distinct from each other as are

the will and the understanding; the cerebellum is especially for the will, and the cerebrum for the understanding (DLW 384).

Before discussing the significance of this passage, a terminological note of caution should be interjected, for it is important to observe the distinction, assumed in the Writings, but often not specified, between "Voluntary" the opposite of "Intellectual," and "Voluntary," the opposite of "Involuntary." From the passage just quoted it can be seen that the cerebellum is voluntary in the first sense, but from other passages it is clear that the cerebellum is not at all voluntary in the second sense.

By relating the understanding to the cerebrum and the will to the cerebellum, the implication is made that the understanding is what we think of as the conscious mind, while the will functions in the realm of the unconscious. This is suggested even more explicitly in the *Apocalypse Explained*: "Affections do not become evident to man, but thoughts do" (AE 1175:4). This passage not only shows clear evidence of regarding the unconscious as a realm of feelings or emotions, but also goes on to identify the affections at this level as having a causal role relative to the conscious mind: "Affections produce thoughts, but thoughts do not produce affections; there is an appearance that they do, but it is a fallacy" (*ibid.*). We have, then, in the Theological Writings, the essentials that Whyte regards as constituting the fully modern concept of the unconscious and this over 100 years before Freud. We also have this idea of an unconscious involving feelings or emotions clearly associated with the cerebellum.

The placing of will or affection in the unconscious part of the mind is not just a passing reference in the Writings. The doctrines are full of implications bearing on unconscious loves. Hereditary inclinations toward evil would seem to fall into this category and even more evident would be the similar placement of remains of good and truth. In this regard, it is interesting to note that the Latin verb so often used with regard to remains (*recondere*) and generally translated "stored up," could with equal correctness be rendered "hidden away."

One of the most important doctrines about the loves hidden in the unconscious part of the mind is the teaching that many of the operations and conjunctions of conjugal love go on unbeknown to husband or wife. In *Conjugal Love* 193, for instance, we read: "The love of man's wisdom was transferred from the man to the woman

that it might become conjugal love. This is effected by the wife's love. Neither the man nor the wife being conscious of it."

An incidental point I would note relative to this passage is that what is here rendered "neither... conscious" is, in the standard edition, translated "unconscious." The difference is very slight, but it introduces an anachronism since Swedenborg did not have available a single word for the concept that we would now call "unconscious." Frequently one encounters "not aware," or "does not know" as circumlocutions and one can be sure that when one finds the word "unconscious" in a translation that the original involves some such phrase.

The facility with which the translators fill in the modern term "unconscious" in such contexts is symptomatic of a broader phenomenon. When today we read what the Writings say about the mind, we fail to note the novelty of some of the teachings because the concepts they embody have come to currency in the last 200 years. On the other hand, when the first readers of the Writings encountered these teachings they probably failed to see their novelty because the ideas involved were so new that they simply didn't understand the full force of what was said.

Before turning to the final section of this address, let me suggest to you two further sources of information regarding the teachings of the Theological works regarding the unconscious. First, I would note a two-part article by the Rev. Brian Keith in the 1985 volume of *New Church Life*. The article is entitled "Can I Know if I Am Going to Heaven?" and of especial relevance to our present discussion is his appendix (pp. 402-404) treating of what we can and cannot know about ourselves. Second, I wish to draw your attention to the Rev. Dr. Hugo Odhner's 1946 assembly address, published in *New Church Life* and entitled "The Mystery of the Human Will." In it he touches not only on the unconsciousness of the will but even on the relation of various parts of the will to the cerebellum.

Now that we have completed our survey of the teachings of the Theological and pre-theological works regarding the unconscious and the cerebellum, let us now bring ourselves up-to-date respecting modern studies of the cerebellum.

Nineteenth and Twentieth Century Conceptions of the Cerebellum

In order to explore early nineteenth century thinking about the functions of the cerebellum, let us turn back to the subject of

phrenology. Many people today regard phrenology as a joke. The idea of reading character or mental strengths from bumps on the head does seem naive to the modern mind. It is generally realized that phrenology fell into disrepute during the course of the 1800's. What is not always realized is that it fell into disfavor because of the rejection of the whole idea of localization of specific mental powers to specific parts of the brain. Many who would scoff at phrenology, however, are among the fans of the modern theories of right brain/left brain dichotomies. Yet such distinctions between right and left would have been rejected by the opponents of phrenology. The phrenologists were not as foolish as many now suppose them to have been. One of the earliest of them, Gall, has been mentioned already. Here we must note that he speculated on the functions of the cerebellum, suggesting shortly after 1800 that it was involved in sexual instinct and emotion. Thus, shortly after the time of Swedenborg, we have another who had theories concerning the cerebellum similar to the Swedenborg's. By the end of the nineteenth century, however, the ideas of both Swedenborg and Gall had largely been forgotten. In the case of Gall, and perhaps to some extent that of Swedenborg, the reason was the fall from favor of phrenology.

Jean Pierre Flurens is often credited with disproving phrenology. He drew his conclusions by observing such things as ablation (removal) of specific parts of the brain. He did not, it must be noted, rule out the whole notion of relating specific functions to specific parts of the brain, but simply the idea of making such associations with regard to mental functions. This leaves open the whole realm of establishing connections of specific physical functions with specific parts of the brain. Far from questioning this, Flurens actually made suggestions as to such connections. With regard to the cerebellum, for instance, by noting what happens when it has been taken out, he came to the conclusion that its principal role is in the coordination of voluntary movements. In itself, this fits in perfectly well with Swedenborg's theories. It is Flurens' exclusion from the cerebellum of specific mental correlates that rules out or directly conflicts with the statements of Swedenborg.

From the time of the middle of the 19th century to the present, coordination of voluntary movements has been the accepted idea of what the cerebellum does. Along with coordination, or as part of it, balance and proprioception are believed to be maintained by the cerebellum. It gives you that sense of where you are: up, down, side to side. Interestingly, one could say that without the model of the

computer that has developed in the 20th century, people really wouldn't be able to account fully for the way the cerebellum works, and indeed the way the coordination of movement works. Our concept of the mind is such that we understand it in new ways as new models or metaphors become possible and come into vogue.

Thomas Willis, for instance, a precursor even of Swedenborg, likened the two lobes of the brain to twin towers and that was the best they could do. They had castles and towers in those days. They didn't have computers or holograms to try to describe the mind. With the computer model, though, people can say some interesting things about the function of the cerebellum in coordination.

It is said, for instance, that when you reach out your hand to grasp something, if your brain were to depend on the sensory feedback of your fingers actually touching the object, it would knock it over or crush it before the nervous system could carry a message back to stop it. There needs to be anticipation in the mind as to when the hand is going to reach the point at which to stop. That is to say, there need to be very many and very rapid calculations as to where to stop the hand and when to send the message to stop the hand. According to modern physiology, these calculations are carried out in the cerebellum.

This, then, is a very brief indication of where the understanding of the cerebellum rests today, or rather where things stood just a few years ago. Interesting developments, though, have been taking place just in the last decade or two. One of these is the placement, by Dr. Robert Heath, of pacemakers in the cerebellum. Now what are these pacemakers used for? They are not used, as you might expect from the modern understanding of the cerebellum, for the coordination of voluntary motion, or for balance. They are used to control violent behavior. Thus the idea that the cerebellum can have anything to do with emotion, feeling, or the causes of voluntary behavior is a big surprise to modern physiologists. Certain people who had severe problems with violent behavior, to the extent even of going into homicidal fits, have been treated by placing electric pacemakers in their cerebellum.

Although these pacemakers don't always work, they certainly seem to work in some cases. Some people have been implanted with these cerebellar pacemakers and they have completely ceased from their homicidal fits or violent behavior. They've become normal, active people in ordinary society. They don't need to be confined. They don't need to be restrained.

One concern, though, is about the placebo effect, the feeling that just doing something to them changed their psychological state. It would not really be ethical to use a control group in this case, sticking in electrodes that aren't really doing anything into people's brains. So that particular protection or control is not available for this kind of thing.

There have been some cases of spontaneous controls, though, which does lend interesting credibility to the idea that the cerebellar pacemakers are really affecting the behavior. One person, for instance, who had had the pacemaker implanted, with a consequent remission of his pathological behavior, all of a sudden returned to his violent states again and went into a homicidal rage and just about killed someone. It was found that this had been after receiving a bump or a jar to the head and, having x-rayed his head it was found that the wires had been broken that were going from the power source to the electrodes in the cerebellum.

This procedure does not have a long history at present, as it's not been done all that many times. But the evidence is promising that this is a way for treating such people, and it seems very intriguing as far as what it implies about a new understanding of the functions of the cerebellum. Nobody would have expected, it would seem, on the basis of the 20th century model of the cerebellum that putting electrodes in the cerebellum would somehow control violent, emotional behavior. But there are pathways which have been traced from the cerebellum into the lower parts of the cerebrum.

And, as a matter of fact, Dr. Heath and other colleagues have also made observations, with regard to the cerebellum, about the Harlow monkeys. I don't know how many people have heard about them. In the late 50's and early 60's Harry Harlow and his co-workers deprived infant monkeys of all maternal affection or even any touch from any other monkeys or people. They were just raised without any kind of maternal or tactile influence, and this did severe psychological damage to them. They were very sad little beasts and it was a very dramatic demonstration of the need for infants to be touched and fondled. Heath and his colleagues did studies on them by inserting brain electrodes and noted pathology in the electrical discharges from the cerebellum and the other structures involved in emotional expression. This was one of the developments that led to the implanting of cerebellar pacemakers.

Now these findings are really no big surprise to those who have read Swedenborg on the functions of the cerebellum. I would note,

also, that people have begun to explore the connection between emotion and motion. The older orthodox idea of what the cerebellum controlled, the sense of balance and the sense of movement, the coordination of movement, has been brought together with the new idea, new at least to most people, of emotion and the cerebellum.

This is based, in part, on the studies with the Harlow monkeys. I mentioned before that they were deprived of their mothers. In place of their mothers, different groups of monkeys were given different choices of surrogates including: a wire mesh "mother," a terry cloth version, and one that moved. There was a definite preference for the moving surrogate and the infant monkeys allowed to opt for this surrogate showed less affective disorder in later life.

There has not been a great deal of follow-up at this point but it has been theorized that perhaps this connection between motion and emotion is one of the reasons that children like to run around and move so much. Adults are happier sitting still. But, perhaps children, by stimulation of the cerebellum, are able to trigger pleasure centers in the brain.

Well, that brings to a close my summary of the history of the study of the cerebellum. And I think you can see a fairly close connection between some of the most recent developments and Swedenborg's observations of 200 years ago. I would also like, in closing, to bring again back the idea of the unconscious. I think there is a great storehouse of things hidden away in the Writings which have just begun to be tapped as far as understanding the psychology of the human mind in terms of the unconscious and what is in the unconscious. They were there 200 years ago. It's too bad people didn't start utilizing these insights right away. But I think there can still be a great contribution drawn from what the Writings say about the unconscious phenomena of the mind, especially those related to and focusing in the cerebellum, a contribution which could advance modern psychology and what it is attempting to do in the healing of the mind. ■

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