

THE MEMORY

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What is the memory? How does it work? The learning function is of such importance to us in our daily lives that philosophers and scientists have striven for centuries to understand the processes of the human mind: how it acquires knowledge, stores it, and retrieves it for use when required.

Ralph W. Gerard,¹ professor of neuropsychology at the Mental Health Research Institute of the University of Michigan, suggests that memory involves "the making of an impression by an experience, the retention of some record of this impression and the re-entry of this record into consciousness (or behaviour) as recall and recognition." He continues:

Guesses have been made as to how many items might be accumulated in the memory over a lifetime. Some tests of perception suggest that each 1/10th second is a single frame of experience for the human brain. In that 1/10th second, it can receive perhaps a thousand units of information called bits. In 70 years, not allowing for any reception during sleep, some fifteen trillion bits might pour into the brain and perhaps be stored there. Since this number is more than a thousand times larger than the total of nerve cells, the problem of storage is not exactly simple.

These words were written over twenty years ago, and the author's terminology seems to suggest an analogy with an electronic calculator or computer. He proceeds to describe in detail experiments with various animals of the rodent family which establish some of the characteristics of the animal memory, and he relates them to the observable nature of the human memory.

In many such experiments with rodents, the 'memory maze' is utilised, in which an animal has to 'learn' to walk along a certain path in order to reach and eat a tasty morsel.

Does it take time for a sense-impression to be stored in the memory? The experimenter taught hamsters to run a memory maze, and afterwards subjected their brain to an electric shock. It was found that if the shock was given four hours or more after the

Editorial note: This paper was prepared for presentation to the New Church Club in London, England. The death of Mr. Bruell on February 8, 1975, prevented him from delivering it in person but it was later read to the Club on March 13, 1975.

¹ Ralph W. Gerard, "What is Memory?" in *Scientific American: Psychobiology-The Biological Bases for Behavior* (San Francisco: Freeman Co., 1966).

memory run, the animal's learning was unimpaired, that is, it could still remember the way to its food, but if the shock was given within one minute of the instruction, the memory was completely erased. From this it was concluded that it takes an appreciable time for the memory of something to become fixed.

Can memory be erased by a conscious effort of will on man's part? The scientist answers this by reference to the 'memory wizard' who can glance through a newspaper and then name the word at any position in any column on any page, and who makes an effort, successfully, to forget this mass of information at the close of the performance, so as not to 'clutter up' his memory.

Does the memory of an experience change progressively with time? Apparently it does, for in the case of pictures drawn from memory the drawings tend to become more regular, or some feature may be exaggerated, or an object may change gradually into something else.

Then, what about recall and recognition? It is suggested that failure to recall does not imply loss of the 'trace.' Often, the name or word is 'on the tip of one's tongue,' and may come into the mind some time later. Others, keeping to the computer analogy, would say that the retrieval mechanism was faulty.

The researcher suggested that the most intriguing problem about the memory is the 'tremendous specificity of recall.' The unexpected sight of a person, the sound of a musical chord, a note, a word or a line can recall vividly a long past experience or reawaken an intense emotion.

So much for some of the effects, but how does the memory function?

The human brain consists of ten billion nerve cells which interact in various ways, each cell contributing to behaviour by firing (electrical) impulses, or failing to fire. All the phenomena of memory must be explained in terms of the temporal and spatial patterns of these discharges.

Is the memory 'dynamic' like the wave motion induced in a violin string by a bow? If so, it would depend on circulating nerve impulses which are detectable by electrodes inserted into the brain. The scientists argued that this question could be answered by teaching a rodent a particular maze, then momentarily stopping all nerve impulses in the brain, either by reducing the body temperature by refrigeration, or by giving the brain a severe electric shock, or by making the unfortunate creature breathe

nitrogen instead of the air; yet, in spite of all such measures, the little creature remembered its maze!

And so the research into the memory continues in the university laboratories of the world.

Swedenborg in his *Economy of the Animal Kingdom*, published in 1740-1, described in painstaking detail the anatomy of the human brain. In Part II No. 69 of this work he writes with candour,

I was for a long time in doubt from what point to commence. . . . Wherever I turned, I could not help recognizing in the brain a more than Gordian knot, and all things so concatenated [grouped, apparently casually connected] that one was to be sought in the other, the last and the middle in the first, and *vice versa*; so that unless I would make up my mind to unravel the entire brain, it would be in vain to unravel a part. . . . To evolve the entire brain in the method already begun, I found to be a work of greater extent than could be comprised within the limits of a single Part. What was then to be done? I must begin somewhere; and therefore I resolved to begin from . . . the cortical and cineritious substance. The reason is that this substance . . . is the principal efficient cause of the operations, not only of the brain, but also of the body.

Quoting from Dr. Hugo Odhner's work, *The Human Mind, its Faculties and Degrees*:

Modern histology [the study of the structure of organic tissue] pictures the cortical cells as roughly pyramidal or stellar in shape, and as fed by the seepage of nutritive elements through the walls of the blood capillaries. This food is thought to be taken in by the absorptive surfaces of the dendrites—which are fibrous extensions which ramify from the cell. It is also realized that the cell produces certain products which in part find their way into the ventricles of the brain and thus contribute to the formation of the ventricular and cerebrospinal fluids.

This agrees in general with Swedenborg's description. But he—although at that time the cortical cells had not yet been seen individually through the microscope—drew certain further conclusions which modern observers of these cells in their postmortem state have not been able to confirm. He presumed, on the basis of analogy with other organic structures, that the cortical glands were more spherical in shape, and that there was a tiny vessel which carried the finest parts of the blood from the capillaries into the gland. He also held that each gland contained a chamber or interstice into which the finer essence of the blood was brought in order to be further purified and vitalized. He compared the cortical gland to a heart through which the "purer blood"—sometimes called the "animal spirit"—circulated, and from it flashed out through the nerve-fibre into the brain and body.²

² Hugo Lj. Odhner, *The Human Mind, its Faculties and Degrees* (Bryn Athyn, Pa.: Swedenborg Scientific Association, 1969), pp. 51f.

After treating of the cortical glands in *The Economy of the Animal Kingdom*, Swedenborg turns to a study of the human soul, and he prefaces this by a reference to an earlier chapter on series and degrees, as an essential prerequisite to the understanding of the subject. He states that "Series are what successively and simultaneously comprise things subordinate and co-ordinate. But degrees are distinct progressions, such as when we find one thing is subordinated under another" (1 Econ., 580). This is clearly in accordance with the Doctrine of Degrees as stated in the Writings.

In chapter III of this work, Swedenborg describes the soul of man as "a certain most pure fluid . . . [which] reigns universally in the whole and in every part of its own limited universe or body, [and] continues . . . irrigates . . . nourishes . . . actuates . . . modifies . . . forms . . . renovates" everything therein (2 Econ., 220-22).

In a series of twelve propositions, he infers that this spirit or soul has no life in itself, but that all life flows into it from the Deity. He sees the body as an organic form "determined" by the soul or spirituous fluid, comprising the cortical substances of the brain, the fibres, and the body itself with its sensory and motor organs. The material of the fibre is taken from the material of the fluid, and there is a coestablished harmony between the soul and the body; memory is seen as an impression of things perceived by the senses, which affects the fibres of the brain, and hence there is a communication with the soul.

Swedenborg supports his rational analysis by supposing, for the sake of argument, that this is not so.

No one, we presume, supposes that the images of things perceived by sense are laid up within the brain in little cells or boxes, and there remain as pictures or delineations: still less that this is the case with those species that exist in the memory under no bounded or limited form; as those, for instance, that are purely philosophical or rational. To overlay and cram the brain with all these pictures, one upon another, one beside another, and one under another, would be to drive all its rays of light into a general shadow, or to compel its universe into one undigested chaos: and at the same time to deprive the soul of the power to evoke again the several forms in order according to the disposition of present things, and from each to take some part which may enter as a simple idea into the compound idea, and to reject the parts from the rest that are not in agreement. If then the memory be not such as it appears, and yet before things are fixed in it, the fibre be affected, it follows, that it is only the affection

and adaptation of the fibre that cause them to approach nearer to the nature and perfection of its fluid, and that thus the way of communication is rendered more open; viz., in order that the soul may act as a mind in singulars, and as an animus or sight in comparative generals; and as hearing, touch and taste in positive generals. For we have lately indicated that the force of the soul is one force, or inflows in but one manner, and this according to the modified character or disposition of the parts in the fibre. These results, however, could not be brought to pass, unless there were a perpetual harmonic variety of all the parts in the fibres, and at the same time of all the organic or cortical substances in the two brains and the two medullae. . . . Without a variety of substances there would be no variety of modifications; hence no memory, no imagination, no perception, no thought; for all distinction and relation perish in equality; . . . in this case the mind could evoke no more than simply one thing from the store-house of the memory. . . .

Furthermore this memory of things is not impressed on the fluid itself but on the fibres of the fluid; for the fluid performs its continual circle, which we have called the circle of life, and almost in the same instant that it is in the brain, it is present in any motive fibre of the body, and never puts forth any representative or intuitive force in any place but where the substances of the fibre are in correspondence with it, or are accommodated for its reception and transmission: thus in the body itself it puts forth none but the most general force. Such then is the *coestablished harmony* between the soul and the body. [2 Econ., 297]

However, the world had to await the opening of Swedenborg's spiritual eyes by the Lord before it could learn the true nature of the soul and of its intercourse with the body (see CL 315; ISB 3).

The Doctrines state that at birth man has no knowledges and hence no memory, but in his mind there are vessels receptive of sense impressions from the world, and there is also an influx from the Lord through the inmost heaven, which, passing through the interiors, affects them with nothing but innocence, charity and mercy which are called "remains." These states of good, or "graces" as they are called in AC 1906, recede when the infant grows up, and apparently disappear as he is introduced into the world with its gross pleasures and lusts.

Note that these first remains are not associated with knowledges, but there are remains with such knowledges of Divine truths which men acquire from hearing and reading the Word. Without remains, no man could be saved.

As the infant grows, he receives a stream of impressions through the senses of sight, hearing, smell, taste and touch which give rise

to "material ideas" which are stored in the corporeal, exterior or bodily memory.

I have been instructed that the exterior memory, considered in itself, is nothing else than an organic something formed by the objects of the senses, especially of the sight and hearing, in substances which are the beginnings of the fibres, and that according to the impressions from those objects, variations of form are effected, which are reproduced, and those forms are varied and changed according to the changes of state of the affections and persuasions. [AC 2487]

Man from infancy even to childhood and in some cases to early youth, imbibes goods and truths by instruction from parents and masters; for at that time he eagerly seizes upon those things and simply believes them; the state of innocence helps them forward, fits them in the memory and places them in the first threshold, for infantile and puerile innocence is not the internal innocence which affects the rational, but is the external innocence which only affects the exterior natural. [AC 5135]

Thus, as the child grows, his exterior memory becomes filled with knowledges, or as the Writings call them, *scientifics*, which include truths from the literal sense of the Word. It might be thought that these knowledges are stored in the mind in some arbitrary way, but from AC 5881 we learn that

is unknown to man; but when it pleases the Lord, the angels know it, for

The order in which scientifics and truths are arranged in man's memory the order is wonderful; they cohere fascicularly, and the fascicles themselves also cohere one with another, and this according to the connection of things which the man had comprehended. These coherencies are more wonderful than any one can ever believe; in the other life they are occasionally presented to view; for in the light of heaven, which is spiritual, such things can be shown before the eyesight, but they cannot be shown at all in the light of the world. Scientifics and truths are arranged into these fascicular forms solely by man's loves—into infernal forms by the loves of self and the world, but into heavenly forms by love towards the neighbour and love to God; wherefore whilst man is being regenerated, and conjunction of the good of the internal with the truths of the external is being brought about, a commotion takes place among truths, for they then undergo another arrangement.

It may be wondered whether *all* the sense impressions which we receive from the world around us are committed to the memory. Common experience seems to deny this, for it is said, for example, that no two people walking down a country lane, see or hear the same things. In AC 4301 we read:

When the eye sees objects, it apperceives a pleasantness and delight thence according to the forms, colours and thus the beauties in the whole and in the parts, in a word, according to the order and arrangements into

series; this pleasantness and delight is not of the eye, but of the lower mind (animus) and its affection; and so far as man is affected with these things, so far he sees them and retains them in the memory; whereas those things which the eye sees from no affection, pass away, neither are they inserted in the memory, and thus are not conjoined with it.

The passage goes on to explain that the reverse process also takes place, namely that when a similar delight recurs, the objects are seen again in the memory.

The doctrines draw a distinction between two kinds of memory, the exterior and the interior. Into the exterior there flow the objects of the senses and all kinds of knowledge, but into the interior are stored rational truths.

The rational man can comprehend that man does not live from himself, but by an influx of life through heaven from the Lord; but the sensual man cannot comprehend this, for he says that he is sensible and apperceives manifestly that the life is in himself, and that it is vain to speak contrary to the evidence of the senses. [AC 5094]

From AC 2469 and following numbers:

It is hardly known to any one at this day that man has two memories, one exterior, the other interior; and that the exterior is proper to his body, but the interior proper to his spirit. . . . Man, during the life in the body, can hardly know that he has an interior memory, because then the interior memory acts almost as a one with the exterior memory; for the ideas of thought, which are of the interior memory, flow in into the things which are in the exterior memory as into their recipient vessels, and are there conjoined. [AC 2469-70]

These two memories are altogether distinct from each other. To the exterior memory, which is proper to man during his life in the world, belong all the expressions of languages, also the objects of the external sensuels, and likewise the scientifics which are of the world. To the interior memory belong the ideas of the speech of spirits, which are of the interior sight, and all rational things, from the ideas whereof thought itself exists. That these things are distinct from each other, man does not know, both because he does not reflect thereupon, and because he is in corporeal things, and cannot then so easily withdraw his mind from them. [AC 2471]

Hence it is that men, during their life in the body, cannot speak with each other except by languages distinguished into articulate sounds or expressions, and cannot understand each other unless they are skilled in those languages; the reason is because this is done from the exterior memory. But spirits converse with each other by an universal language distinguished into ideas, such as are the ideas of thought, and can thus converse with any spirit of whatsoever language and nation he may have been in the world; the reason is, because this is done from the interior memory. Every man, immediately after death, comes into this universal

language, because he comes into this interior memory which is proper to his spirit. [AC 2472]

The interior memory vastly excels the exterior, and in comparison thereof is as many myriads to one, or of what is full of light to what is dark; for ten thousands of ideas of the interior memory flow into one of the exterior memory, and there form a sort of general obscure something; hence all the faculties of spirits, and still more those of angels, are in a more perfect state than those of men, both their sensations and their thoughts and perceptions. [AC 2473]

Whatsoever things a man hears and sees and is affected with are insinuated as to ideas and ends, into his interior memory without his being aware of it, and there they remain, so that not a single one is lost, although the same things are obliterated in the exterior memory; the interior memory therefore is such that there are inscribed in it all the particulars of things, yea, the most particular which man has at any time thought, spoken and done, yea, which have appeared to him as a shadow, with the most minute details, from his earliest infancy to extreme old age. Man has with him the memory of all these things when he comes into the other life, and is successively brought into all recollection of them; this is the BOOK of his LIFE, which is opened in the other life, and according to which he is judged: . . . All his ends which had been to him hidden in obscurity, and all that he had thought and likewise all that he had spoken and done from those ends, are recorded in the smallest detail in that Book, that is, in the interior memory, and are made manifest before the angels as in clear day, when the Lord permits it. [AC 2474]

Man after death does not lose the smallest portion of anything that has ever been in either of his memories, but he is not permitted to use the exterior memory there, unless it is permitted by the Lord for the sake of man's judgment, of which examples are given in this section of the *Arcana*.

The memory is the plane of man's conscious life. But what is so remarkable is that, unknown to him, his thoughts are shared with spirits who may be either heavenly or hellish.

It has been shown me to the life, in what manner spirits inflow with a man; when they come to him, they put on all the things of his memory, and thus all that man has learnt and taken in from childhood; the spirits suppose these things to be their own, thus they act with the man as if they were the man; but they are not allowed to enter with a man further than in the inner things which are of the thought and will, not to the outer which are of the actions and speech; for these latter come into act by means of general influx from the Lord with the mediation of particular spirits and angels. But although spirits act with man as if they were the man as to those things which are of his thought and will, still however they do not know that they are with a man, because they possess all things of his memory, and believe that those things are not another's, but their

own; and also lest they should hurt the man, for unless the spirits from hell with a man believed those things to be their own, they would attempt by every method to destroy the man body and soul, for this is infernal delight itself. [AC 6192]

These inflowing spirits have a remarkable property: they raise things out of man's memory and enable him to perceive whether the thing is so, or not. With regard to this influx, we read in AC 6200:

Whilst I have been thinking, the material ideas of thought have appeared as it were in the midst of a kind of wave, and it was observed that this wave was nothing else than such things as were adjoined to that subject in the memory, and that thus the full thought appears to spirits; but on such occasions, nothing else comes to man's apprehension than that which is in the midst, and thus it appeared material. I likened the surrounding wave to spiritual wings, by which the thing thought of is raised out of the memory. Hence man has apperception of a matter. That in this surrounding waving matter there were innumerable things agreeing with the thing thought of was manifest to me from this consideration, that the spirits, who were in a more subtle sphere, knew from thence all those things which I had ever known on that subject; and thus that they fully imbibe and put on all things which are man's and genii, who heed only the lusts and affections, know those things which are of his love.

This influx, which comes to man's mind through his attendant spirits, is either from the Lord through heaven, or from hell, as determined by man's freedom of choice. However, man's rationality, and indeed his ability to think, is derived from the Lord alone.

From the Lord through the internal man there continually flows life into man's rational mind, and through this into the external man, being indeed into the scientifics and knowledges of the external man; and not only does it adapt those things to receive life, but arranges them into order, and thus renders man capable of thinking, and finally of becoming rational; which may appear to everyone from the consideration that in man's thinking faculty are contained innumerable mysteries of science and the analytical art, so innumerable indeed that they can never be all explored to eternity, and these do not at all flow in by the senses or by the external man but by the internal; but man, on his part, advances to meet this life, which is from the Lord, by scientifics and knowledges, and thus he reciprocally joins himself. [AC 2004]

It is remarkable that nothing is lost from either the external or the internal memory, and this seems to be contrary to experience in the world. In our everyday lives we forget things, such as people's names, although such forgetfulness is often only tem-

porary and the answer comes into one's consciousness later. In the internal sense of the Word, forgetting means removal and hence apparent privation, because with regard to the memory,

Those things which a man thinks are immediately under his view, and the things which relate to such subjects present themselves in order around, even to the things not in relation which are most remote and in such case are in oblivion: the things which are opposite are thence separated and hang downwards and present themselves beneath, and act as an equilibrium to those which are above; this orderly arrangement is effected by the good which flows in; so it is with all a man's thought. [AC 5378]

What is meant by things that are opposite? Man's affections appear to be involved here, for if his thoughts are drawn from memories, the memories of the opposite evils and falsities are forgotten and, as it were, beneath.

Summarizing some of the main points briefly, the external memory can now be seen as man's storehouse for all the knowledges he receives in freedom into his mind through the five senses, which knowledges are arranged in a wonderful order according to man's loves. Those in the interior memory form the basis of his thought, and enable him to become a rational man.

All this is made possible by influx from the Lord through the spiritual world in which man's mind is. By no amount of laboratory research could these things be discovered, but they can only be made known through Divine revelation.

It is a sobering thought that each of us in our everyday lives is writing his own Book of Life, and in this context, the most important function of man's memory is to enable him, in the exercise of his freedom, to be led by the Lord to heaven.

COMMUNICATION

To the Editor of THE NEW PHILOSOPHY:

Having read and enjoyed the article "Adam, Noah and the Stone Age" written by the Rev. Erik E. Sandström (THE NEW PHILOSOPHY, Vol. LXXVIII, no. 2, April 1975, pp. 211 ff.) I find myself wanting to discuss a matter that has long been of major concern to me. My major point has to do with the method with which anyone approaches the subject of the Most Ancient Church and the Ancient Church in terms of human history. In order to illustrate this point I will draw specific ideas from Mr. Sandström's article and I do this not so much to refute these ideas, but to clarify what I mean by a proper method.