What Was That?
Forgetting and Remembering

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One of the most popular imaginations of the learning process is the picture of the Nürnberg Funnel. It's placed on the head of the student, and then the prepared knowledge is poured in bit by bit. Unfortunately, this practical device has a catch, which we know from our everyday experience: forgetting.

Yesterday I still knew the twenty new English vocabulary words, and today five have blown right out of my head!

Is forgetting the enemy of learning? Should we direct all our pedagogical efforts to the end that students have as complete a memory as possible? Whoever concerns himself with research into learning and memory will quickly note that it is not so simple. There are people who can hold the words from twelve thousand books in their heads but cannot dress themselves, or those who know all the powers to the fiftieth power of all two-digit numbers, but remain behind in middle school. Such "idiot savants" often purchase their fantastic memory with lower intelligence in other fields and with deficits in the emotional or social realm. One woman complained about her capacity to remember immediate experiences from her personal life or a political event in connection with every date of the year. Every day her whole life runs through her head and makes her crazy.

Imagine what it would be like not to remember.

Obviously it is important for every pedagogical practice to take into consideration why we need memory and what form of memory we are striving for. Imagine that we could not remember. Experiences would flow by, and everything in every moment would be unusual and new. We ourselves would be a blank page; consciousness would split into as many splinters as there are moments, but also that which makes us a personality would fall apart. Memory

gives us the possibility of learning: Discoveries can be remembered and passed on, and to be able to bring what is past into the present creates the precondition for shaping the future. The meaning that memory has for us will become clearer if we consider the various forms of memory, as differentiated by science today, such as short-term and long-term memory.

A first, elementary stage of memory is the so-called "priming": Stimuli that were taken in earlier and then are met with again are inculcated more deeply into the memory. Television commercials take advantage of this; first a long spot is used, followed by a slightly different, shorter variation later.

A second type of memory is procedural memory, which includes capacities such as swimming and riding a bicycle, as well as playing a musical instrument.

The pure, context-free memory of facts can be considered a third stage. This would include facts such as: "Paris is the capital of France" and "The Thirty Years' War took place between 1618 and 1648."

The highest form of memory, but also the one most susceptible to disturbances, is the episodic-autobiographical memory. This enables us to travel in time back into the past, to bring specific events in our own biography and also historical happenings into the present—something like factual memory permeated with reflection.

As one considers these various forms of memory, it becomes clear on the one hand that we need all of them, and on the other hand, it makes sense to say that forgetting is to be regarded not as the enemy, but rather as the necessary polarity of remembering. For what would it be like if the painstaking process of learning to swim or learning to write were constantly remembered and brought into consciousness? It is important that once certain things are learned, they sink into unconsciousness. Through forgetting we build capacities. This holds true not only for forms of movement but also for cognitive processes: Practicing arithmetic problems, writing essays, doing foreign language exercises all lead to the effect that certain processes penetrate our "flesh and blood" and now as accomplishments stand at our disposal.

Forgetting also has meaning for the episodic-autobiographical memory: It creates space for experiences to be processed and woven together with other experiences and leads one to the essence of events. According to memory researcher Hans-Joachim Markowitsch, forgetting is much less the disintegration and disappearance of information that has been received, and much more the adjustment, downgrading, and reshaping of what had been acquired earlier.

Memory is not a hard disk.

This formation of memory shows that in old age the experiences of childhood can be remembered more colorfully than events of the preceding decades, that

we lighten negative experiences with high spirits, and conversely, we suppress unimportant aspects, so that we do not drown under the burden of a glut of information. In this sense Honoré de Balzac said, "Memory brings beauty to life, but only forgetting makes it bearable."

The dynamic and subjective nature of remembering shows that the oft-repeated comparison with the computer is mistaken. There is no place in the brain that is a "hard disk" site having the name of memory, no particular region for short-term or long-term memory. In spite of intensive investigation, there is still no clear answer to the question about the bodily anchoring of memory. While thirty years ago one used the analogy of the card index of an old-fashioned library, with each area of the brain corresponding to a specific function, now a reversal has taken place—going so far as to say that a particular region of the brain, relevant to the particular representation of an experience, can change over time or with increased practice of a capacity.

Remembering means waking up, forgetting means going to sleep.

A good memory, as should be clear from our considerations about forgetting, is not necessarily a complete memory, but rather one that consists of a healthy rhythm between forgetting and remembering. Rudolf Steiner spoke of this as early as 1919, in the lectures now published as *The Foundations of Human Experience* [also known as *Study of Man*]. In these lectures Steiner connected the interaction between forgetting and remembering to the rhythm of sleeping and waking. Steiner said, "What is remembering? It is the awakening of a constellation of ideas. And what is forgetting? The going to sleep of the constellation of ideas."

Such a conceptual formulation opens up an interesting perspective. Self-observation and sleep research both show that sound sleep leads to bodily recuperation, balance in the soul, and a stronger presence of the "I." Sound sleep fosters spiritual presence and enables us to react more quickly and more appropriately in the face of the unexpected. Correspondingly, can we therefore say that forgetting enables fresh learning? This question leads to the field of pedagogy. It is necessary to describe the conditions that lead to a good memory.

Remembering requires attentiveness and emotion.

To begin with, it is important to observe how new impressions and content are taken in. In general one can say that something will be remembered well which is received with keen attention, energetic interest and, above all, an intense involvement of the feelings. Who does not remember his first love? The emotions build "the unchanging, constant core of the memory organization," according to psychologist David Rapaport. Rudolf Steiner characterized the feeling life as the actual "bearer of the constant imagination."

The interdependence of the efficiency of the memory with the degree of attentiveness and emotional involvement has, since that time, been experimentally demonstrated. From this arises the first pedagogical requirement: The curriculum should alternate between moments of concentration and relaxation. It should be structured in a lively and pictorial way; in short, it should be immersed in the medium of the artistic. Where it is possible, it will be helpful to take into consideration the affinity between rhythm and memory. The ancient Greeks knew what an aid a particular poetic measure could provide to the memory: *The Iliad* and *The Odyssey* were understood to be the curriculum and were learned by heart. The ongoing effect of such a rhythmical memory is particularly impressive when the rhythmical element is supported by movement. Rhythmical stomping and clapping facilitate learning the times tables, and rhythmical movement in connection with metrical verses or rhymes helps acquire foreign languages.

Memory needs movement.

The reference to the element of movement brings up a further topic that has meaning for the education of memory: Will activity creates a sound basis for remembering something. For this reason, it is good, in the study of biology for example, not only to look at the various forms of plants, but also to draw them. Or in language classes, it is important to practice dialogues, role-playing and little scenes. It appears that the important thing is that an inner participation is aroused. The ideal would be to describe an historical figure so vividly that a picture is inwardly built up and the person's experiences can be felt with inner empathy.

This will-directed memory formation actually has roots in history. In earlier times nomadic tribes would erect monuments at the places where something important took place. When they returned to these places, the past experiences would arise again. We can experience a kind of reflection of this "local memory" still today when we visit the places of our childhood after a long absence, perhaps even wander around a bit, and then note what a wealth of memories suddenly arise. It has been noted how feelings and will activities can be connected with the acquisition of new material, to facilitate remembering later.

Learning is consolidated in sleep.

Now we can return to the important, above-mentioned productive role of forgetting. "Active forgetting" takes place, for example, in healthy sleep. Sigmund Freud, in his book, *The Meaning of Dreams* (1900), spoke of the importance of sleep for processing the impressions of daily life. Since that time, numerous studies have shown that insufficient sleep, or lack of opportunity for particular periods of sleep—such as REM sleep, or deep sleep—leads to

gaps in memory. Sleep has a very important meaning for the consolidation and individualization of impressions, facts, and other content taken in during the day.

These facts provide the decisive foundation for organizing the curriculum in Waldorf pedagogy. It is set up so that the introduction of a new topic does not lead to a conclusion on the first day. Rather, on the first day the interest is awakened, attention is guided, and the feelings and will of the student are called upon. This happens, for example, with a physical experiment that is carefully observed and appreciated with wonder, after which it is followed by the unconscious processing that takes place during the night. When the lesson is taken up again the next morning, it is presented in a way that it answers the need that has arisen in the students for classification and penetration of the material with thoughts. The lesson guides the working out of concepts and laws pertaining to the phenomena. This threefold ordering of the lessons, arranged with the participation of will activity, involvement of the feeling life, and conceptual penetration over two days, is one way in which forgetting can be integrated into the lesson plan. Another way (of taking advantage of forgetting) is to use polarity in the alternation of subjects in the main lesson blocks: When a particular subject is allowed to sink into forgetfulness, the essential points can be brought out when the theme comes up again at a later time and incorporated into the students' individual experiences.

Learning in three steps

After the receiving of information and the processing of it, there follows remembering. The success of this step has to do with the strength of the already-mentioned factors that an individual has at his disposal at any give point in time. Everyone knows that this strength is not just a question of conscious motivation. Many times, even with the best will, we cannot come up with what we are trying to remember, although we feel that the name, the event, or the connection is right on the tip of our tongue. The strength to bring what has sunk down into unconsciousness back to conscious awareness depends on the entire life organization, above all psychological and physical health. When a child is nervous or sick, he will not be able to remember things well. Stress and anxiety are counterproductive to all stages of memory formation and function. Psychiatry is familiar with countless varieties of stress-induced disturbances of the memory. Stress can lead to blocks which bar access to information.

With these considerations it appears that a curriculum that can do without pressure and threats of failure, in the place of which the learning process is penetrated with a pictorial quality, imagination, and humor, is the best training for memory, and more meaningful than the Nürnberg Funnel.

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