Sleep as a Task of Waldorf Education

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The paths trod by children night after night into the depths of the spiritual world into which they immerse themselves are of immense importance to the success of our education. Rudolf Steiner already pointed this out at the beginning of the *Study of Man* like a prelude to the founding of the first Waldorf school.[1] At the same time, the task of fathoming a connection between daily experience and nighttime sleep was put forward in order to fructify our teaching practice. Especially the rhythmic phenomena of the nightly rest period exhibits impressive characteristics that together with the background of various indications by Rudolf Steiner are very interesting and motivating. Hansjoerg Hofrichter pointed out such phenomena in an article in *Erziehungskunst* in May, 1994.[2]

The state of sleep is not a passive giving up of oneself. It is actively initiated.[3] The fact that we can, today, by reason of observations made on people sleeping, describe the various states of sleep has been adequately documented. Aristotle circa 350 B.C. identified the phases of rapid eye

movement that are associated with dreaming. What is remarkable is the rhythmically swinging immersion into the various observable states of sleep. Measurement of electrical brain activity by an EEG gives an exact delineation of the physiological processes.

The Physiological Phases of Sleep

When falling asleep, the frequency of measurable current changes from 8 to 12 Hz. (the so-called alpha waves) to the beta waves of 13 to 40 Hz. In a second phase, these beta waves are superposed by isolated deflections in order to then finally be replaced by the slow delta waves (approximately 3 Hz.) in the third phase of sleep. The actual deep sleep that has the slowest electrical brain activity of one wave per second, the so-called "slow wave sleep" (SWS) begins after approximately 20 minutes. When it appears for the first time at night it can last up to 30 minutes. However, we reach this state of sleep only two, or three times during a seven- to eight-hour rest period and then only in the beginning of the sleep period.

In phases three and four, growth hormones in the blood plasma rise markedly. During experimentation people were purposely wakened at the beginning of this phase of deep sleep and only allowed to experience the other phases, complained of strong physical indisposition and had marked difficulties with kinesthesia the next day.

After the fourth phase (about 50 minutes), the "way back" through the other phases begins and lasts about 20 minutes. Then begins the phase of so-called "paradox sleep." This REM sleep, so named because of the observable rapid eye movement (REM), is apparent through significant increase in bodily functions. The heart rate increases for a short time and fluctuates between 50 and 90 beats per minute during the entire REM phase. Breathing becomes faster and more irregular. The body hardly moves. Even muscle tension that otherwise prevents the lowering of body temperature

is suspended during this time. At the same time, eye movement behind closed lids can be detected. The delicate muscles of the middle ear, which serve in the selection of certain sound phenomena, also become active.

We always experience our dreams during this phase even if later we cannot remember them. Even though the brain's electrical frequency (beta waves) clearly indicates that the person is in a state of light sleep, it is hard to awaken that person during this time. If, by certain purposeful interventions, this paradox sleep is prevented for extended periods of time, the person taking part in the experiment often complains of psychical disturbances. The person feels tense and irritable, displays aggressive behavior, anxiety, suspicion, and possibly experiences significant memory lapse. There are indications that the REM phase benefits the consolidation of memories.

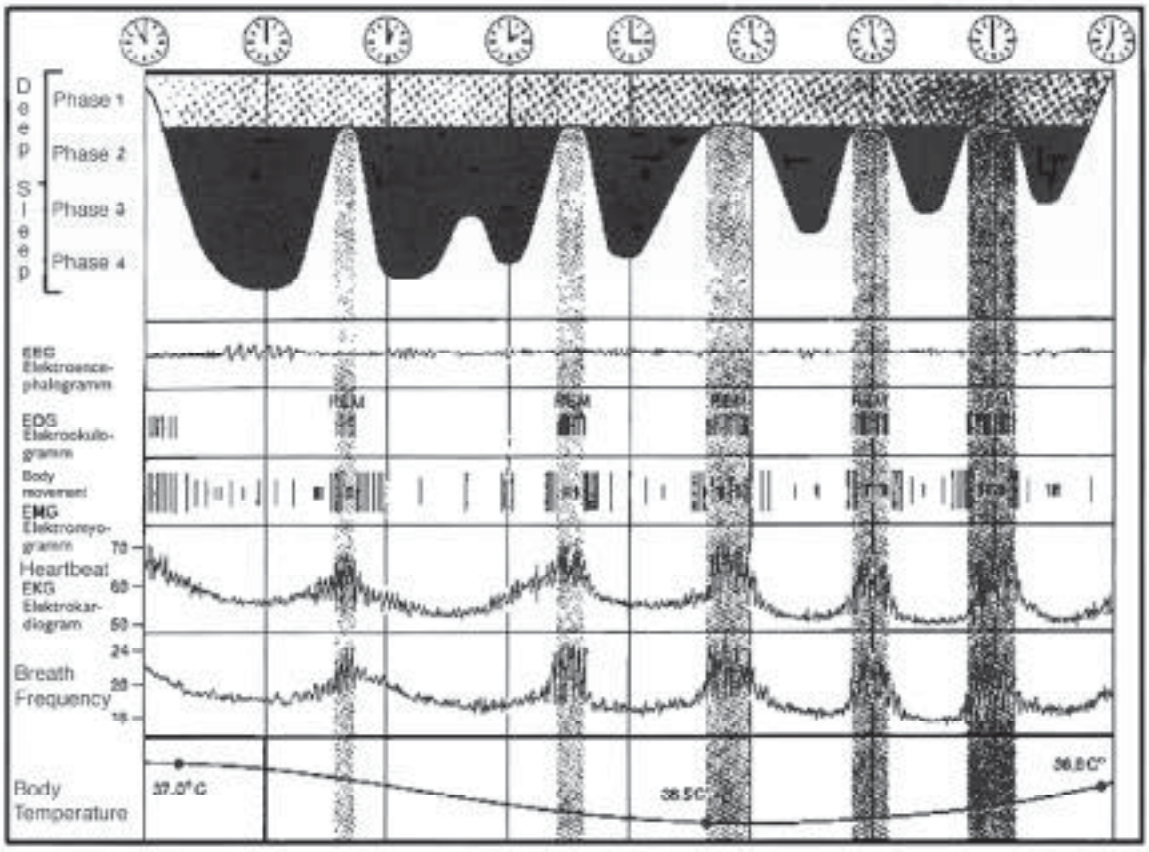
After this episode we can wake-up for a short time and then we begin the nightly journey anew. The entire journey, from falling asleep to the first REM phase, lasts on average about 90 minutes and consists of these four parts each of about the same time duration:

- immersion, phases one to three, about 20 minutes long
- deep sleep, phase four, about 30 minutes long with the tendency to become shorter with each passage
- the return, phases three to one in reverse order, about 20 minutes long
- paradox or REM sleep, about 20 minutes long with the tendency to lengthen with each passage.

In the first half of the night, deep sleep occurs only twice while the length of time of REM sleep continually increases until it reaches 40% in the morning.

It is significant that the cycle described varies little between individuals. So it is that with people who normally sleep only a short time, the portion of deep sleep is increased—and with long sleepers, above all,

the length of phase two is extended. For the rest, the pattern of a five-time upswing and downswing lasting approximately 90 minutes each applies for all adults. The entire curve that we complete by repeated immersion into the world of sleep is marked by a slow decline in body temperature of about 0.55 C° during a period that lasts about five hours ending with an increase in body temperature.



Dream Images and Their Preparation

Dreams during the REM phase are only accessible to our memory in full when we awaken immediately after this phase. Often they appear addled and seem to have no connection to the previous day's experiences. The fact that small children have especially extended dreamtime shows that the content of consciousness that comes about is, at first, hardly determined by the physical world. In total, the percentage of REM sleep with newborns is about 50% (16 hours of sleep) at its highest point and

then sinks to about 18.5% with a 12-year-old child. It then increases once again to 22% with young adults and finally, little by little, to just 13.5% with the aged.[4]

Rudolf Steiner also described how the quality of dreams change:

> Dreams of the small child still reveal the creative energy that comes from the spiritual world and is active in the physical body, as opposed to adults where dream content is confused and must, upon awakening, be inserted into a space/time order by the physical body.[5]

Access to the dream world of the small child is unequivocally lost. Only through their own efforts can adults come close to the active, spiritual hierarchies during sleep.[6]

Just as dreams are the domain of the small child only older children and adults are in a position to carry reminiscences of waking life into the world of sleep.[7] This apparently happens during the phases of deep sleep. In other words, it has been shown that not only during REM sleep does consciousness content come about that can be remembered. Sleep-trial subjects who were awakened during slow wave sleep could report on sleep experiences that did not originate from a previous REM phase. Such experiences were, however, much more strongly built upon ordered elements of the previous day's experiences.

The impression arises that the subsequent dream experiences are in some way prepared in the deep sleep phases. Waking experiences are carried into the depths of the spiritual world while during REM sleep images can arise that emanate from the creative energies of the spiritual world. However, we normally see only the after-images of our earthly life mirrored that we have ourselves painted into our dream phases.

The physiological process of sight inverts itself in dream images. With cats it has been determined how in a waking state the movement of

gaze follows an outer light stimulus followed by an electrical impulse in the corpus geniculatum of the brain; only then does the seen image appear on the optical cortex. During a dream, the opposite occurs. The impulse to the corpus geniculatum happens first followed by the movement of gaze. The image comes about in reverse order—from the inside to the outside. The decisive moment at which it is possible for daily happenings to be carried into the dream world occurs with the freeing-up of the etheric body at the beginning of the change of teeth. Only so far as the child is already in a position to carry his or her earthly experiences during waking life into his or her nightly world is that child approachable through Waldorf education.

> And just as much as comes in from the earthly world during sleep containing nothing more of the world beyond, exactly in that measure, is the possibility opened to us, in the age between the change of teeth and sexual maturity, to approach the child through education.[8]

The freed-up etheric body no longer gathers archetypical images that work through the physical body directly from the spiritual world, but takes them, self-prepared from daily experiences, along on the nightly journey. The Waldorf curriculum replaces the effects of form-creating spiritual beings. So, that is how the high value placed upon the significance of sleep should be understood as Rudolf Steiner indicated at the beginning of *The Study of Man*.[9]

Instruction That Is Education for Proper Sleep

In three different instances Rudolf Steiner described how we could teach the curriculum so that it could further work in sleep in the positive way.[10] If we lead the children into a creative activity such as form drawing, it is necessary to evoke an outlook of an inner nature. For instance, inner activity should receive an impulse that creates a sense for symmetry. The child should be able to form the logical completion from out of him- or

herself. The active urge to finish incomplete forms stimulates the body of formative energy to pulsate further during sleep. The child has, through this, the tendency to finish what was begun so that through the night a permanent ability can be attained from the practiced activity.

If the physical body and the etheric body are engaged by outer activity, perhaps through eurythmy, then the two higher bodies, the astral and the "I," have the tendency to resist this activity because it does not, at first, suit their own impulse. Nevertheless, the movements are impressed upon these higher bodies, and they carry the memory of them in the spiritual world at night. There, the activities of the day can be attuned and put into accordance with the spiritual experiences. Only through this working together can the eurythmy work of the previous day unfold its health-giving force.

In the first case, it has to do with leading the formative activity of the children into the sphere of creative thought of the spiritual hierarchies.[11] The second example points us to another way: Outer activity of the physical body and the etheric body, (and this applies not only to eurythmy), must be in accord with the laws of cosmic forms of movement and rhythms. That is how the energy that is changed during the night can also radiate toward the activity of the following day.

The Sleep Between Observation and Understanding

If we do not stimulate the children to their own physical activity during a lesson, then there is a third aspect to consider. We must stimulate the deliberate, understanding perception of the children when we teach from a phenomenological science experiment or describe a historical event in such a manner that they direct their full attention to the lesson content so that they are constantly coming to conclusions. In other words, the children do not just take in a stream of words or behaviors, but rather they recognize patterns and forms and organize sequences of action and units of speech together into something that makes sense. It is best when the events

presented are inserted into a space and time order because this appeals to the whole being. The students must, thereby, through their will, wholly connect themselves to the forces and laws of the objective, physical world. The next step is to characterize the bare facts that have been presented. Once again in review, we look at the content, and underline what is essential, so that we can evaluate and judge the order of importance of different particulars as they apply to the whole context. With this, we further stimulate the feelings of the children before they are dismissed from the lesson. The conclusions that were formed can now further work on the limbs during sleep in that part of a person into which the astral body and the "I" withdraw.

What is experienced by the waking day-consciousness is processed in the metabolic regions and altered through the mediation of the planetary energies of Mercury and Venus. Through this, a transformation now begins to unfold. Namely, during the night the etheric body unfolds its activity in the head.[12] It should be recognized that the electrical currents of the brain slow down and the steady rise and fall of the delta waves increases. The astral body, with its faster and unsteady rhythm, has gradually withdrawn from this region. The events perceived during the day now appear as images in the conceptual activity of the head that the children find before them the next morning.

Mercury and Venus as Representative Images of Sleep

These two planets so strongly deviate from the other wandering stars in their laws of motion that they really cannot be commensurately presented in the same spherical system with the Earth. They must be considered in connection with the words "contrary to Earth," just as the ancient astronomers in the time of Pythagoras described them.[13] Talking about these two planets, Rudolf Steiner spoke of a "stumbling around within themselves."

Mercury and Venus, as viewed from the Earth as the nearest planets to the Sun, never stand in opposition to the central star. They can, therefore, at no time be seen as full-shining heavenly lights at midnight, but rather only mornings and evenings at the thresholds of sleep. To our perception they move in front of and behind the Sun.

Venus, especially, gets up to one quarter the distance from the Sun close to the Earth. No other planet comes so close to the Earth. Then it goes back into the cosmic deep behind the Sun. One recognizes again from this image the slow sinking and rising of body temperature during sleep. Between these two extreme positions of the lower and upper conjunctions, Venus can be seen either as the morning or evening star. Like Mercury and the Moon, Venus maintains its brilliance by reflecting sunlight.

Mercury structures the synodal (coming together or conjunction) orbit of Venus, lasting $1\frac{3}{5}$ years, into five sections. With a median synodal orbit time of 116 days, which is subject to strong fluctuations, Mercury goes around the Sun (as viewed from the Earth) exactly five times during a Venus-synod. As opposed to Venus, Mercury is never seen because it remains in the immediate vicinity of the Sun. With every lower conjunction, when it comes nearest to the Earth from behind the Sun, Mercury describes a loop with its retrograde course during a period of 19 to 24 days (22% to 28% or about a quarter of the synodal orbit).

Venus also remains retrograde (always as viewed from the Earth) for 42 days during its lower conjunction. In eight years Venus traverses its entire orbit exactly five times before its particular phenomena are repeated at about the same places in the zodiac. During these eight years Venus describes a looping path around the Earth in the shape of a five-pointed star. Mercury divides each of these five loops into five sections. These five sections are again structured: the synodal Moon orbit at 29.5 days corresponds almost exactly to one quarter of a Mercury synod. The following comparison chart can be made with the physiological phases of sleep:

Venus synod	Nighttime sleeping period
Immersion into the cosmic depths during an upper conjunction and renewed nearing to the earth	Sinking and renewed rising of body temperature
Length: 584 days	Length: seven to eight hours

Ratio: 1:5

Mercury synod	Gradual immersion into deep sleep, renewed emergence with a phase of paradox (REM) sleep and possibly short awakenings.
Travels around the sun with a retrograde period near the earth that makes up about one quarter of the orbit time.	Average length: 90 minutes
Average length: 116 days	Five rounds make up one nightly rest period.
Five Mercury synods make up one Venus-synod.	

Ratio: 1:4

Synodal Moon Orbit:	Physiological Sleep Phases:
Length: 29.5 days	Immersion (20 minutes)
Four Moon orbits correspond to one Mercury synod	Deep sleep (30 minutes, tendency to shorten)
	Return (20 minutes)
	Paradox Sleep (REM) (20 minutes)
	Tendency to lengthen

Mercury, like Venus, changes its direction that is visible to us every time it comes near to the Earth and, for a short time, executes an opposing movement to the Sun's ecliptic. Mercury behaves like the astral body when it comes out of the spiritual world and nears the physical body and wants to enter into it so that perhaps there is a short awakening. This coming near is completed five times every night during REM sleep before the "longing of the soul for the physical body becomes so great that it sinks into it."[14] Even though the synodal orbit times of Venus and Mercury are different from all other rhythmic orders, there is something that they have in common. By reason of their nearness to the Sun, both of them execute their path through the zodiac (viewed from the Earth) in about the same time as our central star—that is, a year. So, they draw their own rhythm from the steady course of the Sun in cosmic space.

Observations made by modern sleep researchers can anticipate in detail the laws of movement of Venus and Mercury. These two planets bring growth forces close to the human soul when the physical body and the etheric body are in plant-like states.[15]

The physiological processes in persons who are sleeping are divided into two large groups. Many sequences point to configurations of time that generally apply and that stand in established relationships among themselves. Especially in the deep-sleeping phase, the frequencies of brain electrical current along with the delta waves come close to the beat of the pulse. In the biological time-organism of human beings, pulse and breathing act as equalizing centers between long-wave rhythms in the domain of the metabolism and high frequencies in the domain of the nerve-sense system.[16] During REM sleep the brain's electrical activity accelerates and the heart rate and breathing become irregular. The rhythms dissolve out of the cosmic order and exhibit no more ordered time configuration until the person again moves into a state of quiet sleep. However, these states of sleep in which both higher bodies are blended into the order of cosmic rhythms are significant for the transformation of daily experiences.

The Astral Body Between Waking Consciousness and Dreaming

After they have been processed by the human "I" and the astral body in the metabolic-limb system, carried out into the spheres of planetary transformation forces and mirrored into the active etheric body, the images of waking perception now appear as unconscious pictures. On that foundation, lessons the next day include a review of the previously presented events with the goal of forming a concept. Now, in preparing for what comes next, that part of the events that are licit and compliant to laws must be raised into consciousness so that the pictures that came about during sleep take on meaning.[17] Namely, when the picture is not made conscious the etheric body has the tendency to penetrate the physical body. Its uncontrolled effect would work clear into the nerves and blood processes.

If the astral body does not succeed in carrying over the perceptions of the day into deep sleep, the transformation through the planetary forces does not come about and consequences can be felt. It can be assumed that dream pictures of the subsequent REM phase are then overshadowed by the impression of the day's events and remain limited. Dreams require a preceding immersion into slow- wave sleep as is proven by complete sleep deprivation: In the closing period, at first the portion of deep sleep is increased, and only in the second night is the portion of REM sleep increased.

However, if our dream pictures merely mirror echoes our daily experiences then sleep is missing its enlivening effect. We feel refreshed following dreams which rise above the laws of time and space and whose contents come from totally different spheres than that of our daily lives.[18]

Concepts from the Realm of Imagination

Still, refreshing, healing sleep is not the primary goal of the school lessons. It is the symptom of a successful link-up with the spiritual world. Sleep should sandwich itself between perceptions filled with feeling and the formation of concepts.

As human beings we are organized into the world so that we experience observed things and their associated meanings as separate. The activity of our senses, that can only pass on disassociated pieces to us, is supplemented by this conceptual thinking so that we gain knowledge of objective world-connectivity.[19] This process should now be interrupted for the students and continued by the immersion into sleep. What is changed through this for the formation of concepts?

In observing a physical experiment or in merely registering historic events, the students form individual perceptions. They draw conclusions from what their eyes and ears offer them, and recognize and organize them according to their personal, previous experiences. The conclusion, however, is an act of will like that which we otherwise principally carry out with the limbs. This act of will is seamlessly inserted into the lawful processes of the physical world.

The goal of the processes of knowledge is the concept, which belongs to observed and registered content. However, this arises for our thinking into the head only insofar as at night the etheric body can unfold its activity. Between individualized perception and the understanding of supra-personal world events, the student completes his or her steps to knowledge. In the best case, feelings of having evidence for and a deep certainty of experiencing truth arise. This perception can spread in the soul as becoming reacquainted with something old and trusted, warm and light-filled.

Whoever can find the connection with the universally valid world organization and experience it personally lifts him- or herself above the mere acting-out of his or her own sympathies and antipathies. "A true individuality will be that one who reaches the furthest with his or her feelings in the realm of the imagination."[20] This connection happens at night for the student insofar as his or her daily, waking observations can meet the individual's own genius.[21] What is being taught here through the world of hierarchical beings is the way from limbs to head, from conclusions to understanding.

Footnotes:

[1] Steiner, Rudolf. *Allgemeine Menschenkunde als Grundlage der Paedagogik* (*The Study of Man*), first lecture, August 21, 1919.

[2] Hofrichter, Hansjoerg. "Der Schlaf – ein vernachlaessigtes Thema" (Sleep, a Neglected Subject) in *Erzeihungskunst* #58, Stuttgart, 1994.

[3] Sleep is initiated through a low stimulus-frequency and tension of the ascending reticular activation system (ARAS) in the brainstem, whereas a high frequency and tension of the same system causes a person to awaken.

[4] The percentages in youth age groups reflect the normal reduction in amount of sleep beginning at about age 14; this affects, above all, the percentage of deep sleep while the absolute duration of REM sleep remains practically constant.

[5] Steiner, Rudolf. Lecture on April 9, 1923.

[6] In his book *Knowledge of Higher Worlds*, Rudolf Steiner describes how the dream world of the student of the occult changes during the course of his or her endeavors.

[7] Steiner, Rudolf. *The Study of Man*, first lecture.

[8] Ibid.

[9] Ibid.

[10] Steiner, Rudolf. Lectures on August 14, 1923.

[11] Kranich, E. M. Die Veraenderungen von Wachen und Schlafen im Kindes- und Jugendalter. (Changes found in Waking and Sleeping during Childhood and Youth) Found in: *Der Rhythmus von Schlafen und Wachen und seine Bedeutung im Kindes-und Jugendalter* (*The Rhythm of Sleeping and Waking and Its Significance in Childhood and Youth*), by Stefan Leber. Stuttgart, 1990.

[12] Lecture by Rudolf Steiner on August 20, 1922, Complete Works #305.

[13] Steiner, Rudolf. Lecture on May 2, 1920, Complete Works #201.

[14] Steiner, Rudolf. Lecture on April 21, 1923, Complete Works #349, and also a lecture on March 21, 1923.

[15] Kranich, E. M. *Die Formensprache der Pflanze, Grundlinien einer kosmologischen Botanik* (*The Language of Form in Plants; Guidelines for Cosmological Botany*), Stuttgart, 1979.

[16] Hildebrandt, Gunther. "Zeiterleben und Zeitorganismus des Menschen" (The Experience of Time and the Time Organism in Human Beings), found in *Was ist Zeit? Die Welt zwischen Wesen und Erscheinung* (*What is Time? The World between Being and Embodiment*) by G. Kniebe.

[17] Steiner, Rudolf. Lecture on July 14, 1921, Complete Works #302.

[18] Steiner, Rudolf. Lecture on December 25, 1921, Complete Works #303.

[19] Steiner, Rudolf. *Philosophy to Freedom*, from chapters titled: " The World as Perception," "Getting to Know the World," and "Human Individuality."
[20] Ibid., p 87.
[21] Leber, Stefan. "Der Rhythmus von Schlafen und Wachen," (The Rhythm of Sleeping and Waking), Stuttgart, 1990.