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Upper-School Teaching at Steiner Waldorf Schools: Cognitive Challenges for The Embodied Self

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Summary. The processes at work in Steiner Waldorf (hereafter 'Waldorf') upper school teaching show specific characteristics. They address, for example, heterogeneous learning groups, structuring the learning process in a manner that engenders in the student communication with the world and with themselves. The didactic preparation of teaching material should not merely facilitate this but also consider the embodied self with its diverse life modes. This process shall be considered in the language of phenomenological anthropology. The dialectics of the centric and eccentric positions will be the subject of discussion as will be the significance of engaged and detached perspectives.
Part I of this article, in this issue, discusses not only the teaching processes but also their philosophical setting. Two concrete examples from the classroom illustrate how this then translates into the appropriate path in practical teaching. In the next issue, Part II of the article will examine classroom methodology. This will discuss how classroom practice can help students, as embodied persons, to relate to their need for intellectual positioning and thus develop a way of thinking that does not alienate them from themselves as persons but puts their embodied, personal existence into context.

Introduction: Frequently voiced questions

Wherever Steiner education or Waldorf schools are the topic of discussion, question that frequently emerges is: What makes them special? What sets them apart? Often, these are colored by any number of nuances such as: What is the essence of this education beyond any currently prevailing educational trends? How to renew a successful model and make it fit for the 21st century? Is it even feasible to have a progressive educational approach given an upper school that caters for students up to their 18th year? If the goal is to improve the quality of Waldorf schools, specific qualitative characteristics of Waldorf education and especially of the teaching at Waldorf schools will have to be made transparent and expressed in systematic terms.

The present article is the result of discussions and an academic conference on the principles of Waldorf education. In that context, the question as to the essence of Waldorf education was raised. The present article will endeavor to take this question in a particular direction and also narrow it down: The core business of teaching – Wherein lies the essence of Waldorf education? Is there an 'average' school day, for instance in an 11th grade mathematics lesson, where features characteristic of a Waldorf school can be identified?

In order to limit the scope of the present article, some well established and visible elements of the educational profile of many Waldorf schools, such as internships, a variety of individual school projects, class plays, etc. were excluded. The attention will focus on whether or not 'everyday school life' displays characteristics specific to Waldorf education. The pointed emphasis of the question comes at the expense of a linguistic ambiguity, if not imprecision, as the wording implies that the essence of Waldorf education is something that is determinable. This essence would be implemented more successfully by good teachers and less so by others. That is not, however, what is meant here by essence. Rather, the intention is to outline how the essence of Waldorf education is implemented *in the very act*, how a teacher's individual grasp results in an occurrence which, retrospectively, may turn out to be a central characteristic of Waldorf education (Gögelein 1990).

The focus of the present article will be on teaching *processes*. These processes will be described and characterized with regard to their significance for the students.

What makes good teaching has been researched and described time and again over the past decades (Rutter 1983). Criteria characteristic of good teaching are, for example:

- Concentration in the classroom,
- Focusing on the teaching goals,
- Prioritizing of subject matters,
- A strong bond or respect for the teacher figure, or
- A climate conducive to bringing joy to teaching.

No doubt this definition is a suitable tool for the assessment of good teaching at Waldorf schools.

But what then makes for good teaching at Waldorf schools specifically? Put into a language familiar to Waldorf schools where questions of their own identity are concerned: How can teaching promote an interest in the world? How can these wings of interest lead to communication with oneself? How can communication with the world evolve into communication with oneself? Is it possible that, in the act of teaching, spiritual aspects are tangibly expressed, here and now, as a coherent stratum of being of the world, and that in turn this stimulates the formation of individuality with equal tangibility?

If spirit is defined, albeit preliminarily, as a coherent stratum of being of the world that expresses itself in the very act, we are dealing with something spiritual that is tangible in teaching and at the same time the spiritually tangible formation of the individuality. This means that the spiritual origins of Waldorf education are encountered in the classroom, in the very process of teaching. Even in this initial paraphrasing of the definition of spirit there is an indication that the focus of this article is the practical teaching life as it may evolve from anthroposophy as a spiritual science.

A glance at teaching heterogeneous learning groups

The teaching of heterogeneous learning groups has been well researched, and re-emerged as the focus of discussion following the PISA shock. The recurring question is whether or not this teaching setup is beneficial and effective for gifted students and whether or not students with less favorable cognitive prerequisites would be frustrated and therefore should be taught in separate learning groups. The discussion of this issue is frequently associated with thought patterns that Weinert characterizes as assessments of the effectiveness of schooling that are either too pessimistic or too optimistic, respectively (Weinert 2001).

Overly pessimistic assessments refer to research that places much greater importance on genes or the environment rather than the effectiveness of schooling, as individual differences, which often continue throughout schooling, stabilize depending on genetic make-up and socio-economic conditions (Jencks 1973, Hernstein 1994).

By contrast, overly optimistic assessments assume that, given the appropriate didactics and developmental assistance, any differences in socio-economic conditions can be offset and students are generally able to compensate for lower learning prerequisites with a more appropriate learning period.

To many teaching professionals, these thinking patterns are familiar from their everyday classroom experience: It is a common assumption that so-called gifted students, that is to say those with high cognitive competence combined with a strong interest and dedication, are less needy of teaching as they already master a given content or goal anyway and are able to apply them independently. It is often thought that, for students with parents who are involved in education, some schooling is actually unnecessary. In this thinking pattern, the effectiveness of schooling is viewed relatively pessimistically.

However, where the assumption is that marked differences in students' abilities and skills can be fundamentally or even permanently eradicated by suitable remedial teaching, or individual steps in a student's development can be mastered 'once and for all' by suitable remedial action, the assessment of the effectiveness of schooling may be somewhat over-optimistic.

At Waldorf schools, so-called heterogeneous learning groups are taught primarily by not applying any external differentiation as to a student's aptitude or achievement. This means teachers are time and again confronted by the thinking patterns outlined above. In particular, they are continually faced with having to focus on teaching heterogeneous groups and, as a result, on the significance of the school for all students as a central aspect of their profile. The work of Stern and Weinert about heterogeneous learning groups is of particular relevance to Waldorf schools:

- ' ... Equally unwarranted is certainly the hope that inspiring teaching would make the differences between students disappear. In actual fact, inspiring teaching and useful exercises encourage students according to their individual prerequisites. General levels improve, but the differences remain at those higher levels.' (Stern 2003)

- 'Regardless of the different abilities and talents of the students, all they know and are capable of in later life must first be learned. Learning is the most powerful mechanism of cognitive development. This applies equally and without qualification to highly as well as less gifted children. In many cases, didactic support is both required and effective. Measures based on motivational psychology or social education, however well meant, can be no substitute for actual teaching but only an often very effective precondition for it.
  Given comparable schooling conditions, it is not possible generally to eliminate individual differences in learning and performance.' (Weinert 2001, p. 85)

Positively put, successful teaching is of interest to all students in all their diversity, regardless of their individual levels of talent. It is exactly because everything a student will know and be able to do in later life first has to be learned that heterogeneous learning groups make sense. Successful teaching in this kind of setting is characterized in that all students learn something. Ideally, they learn with creativeness and joy, thus progressing on their developmental paths. This does not preclude differences in achievement. However, the actual act of learning is something students have to do for themselves, whatever their level of talent. All students benefit from good teaching. The act of learning is something they have to achieve by themselves.

Based on the above insights, the question of where in the core business of teaching the essence of Waldorf education lies may be narrowed down further. How can teaching be structured so that all students may participate in acts of learning that help them to progress and develop their subject-specific, methodological, social, and personal competencies? How are these acts of learning to be fleshed out specifically? Or to put it in the terminology of Waldorf schools: All education is self-education. How can teachers create a learning environment that enables children and adolescents to educate themselves? (Steiner 1956)

In what follows, the question as to the specific characteristics of Waldorf education in the core business of teaching presupposes that this teaching is to be meaningfully structured in accordance with heterogeneous learning groups. On this basis, the question now is which specific approach Waldorf education-based teaching takes and, more particularly, how this extends into adolescence. The focus will be on acts of learning through which students, in a climate of concentration, rise above themselves, finding new ways of communicating both with themselves and the world. They do so not in the sense of Prussian traditional duty but in the hope that spaces may exist or develop where they can apply what they have learned independently and joyfully, deepen their acquired knowledge or set out on a path of practice in order to experience in a multitude of ways how progress in learning, broadly practiced and joyfully applied, enriches their lives. A sparkle of euthenics that pervades the school. – Over recent years, Waldorf schools have tried many such approaches. Time and again they showed how approaches to teaching only work by developing a broad spectrum of skills and if students experience themselves in their own learning progress and feel at home in their school (Iwan 2005).

Waldorf education: The embodied self in heterogeneous learning groups

Waldorf education takes a differentiated approach to the embodied self and thus regards the classroom as a space that facilitates experiences and development for the embodied self. In doing so, it views learning as a process where students can develop as embodied beings and act directly. To illustrate this point by way of a contrast, Waldorf education does not regard the learning process exclusively as a transfer of information where students, using their properly functioning senses, incorporate pieces of information in their inner world, however imagined. At this point, Waldorf education breaks with the legacy of Descartes[1] and views the embodied existence of the student in its immediacy. Students are persons and incarnated as such. They experience their conduct of life, their moods and processes of consciousness as embodied beings. This is the backdrop against which teaching and learning processes are observed. In doing so, it is often taken that teaching creates a realm of experience within which students may change as embodied beings. With slight exaggeration, teaching could be called an experience, a venture, new ground, which, when lived through, finely transforms a student into someone new, someone who has progressed in their development. Thus teaching is also aimed at the development of personal competencies.

The conception of the student as a person incarnated in his or her body will not be elaborated on at this point as it has been described in detail elsewhere (Steiner 1987, Leber 1993). This view on Waldorf education was merely inserted here as the ideas discussed below implicitly assume that learning processes exist which are significant and meaningful in biographical terms. They also require an understanding of the kind of learning by experiencing which enables students, as persons, to create a new horizon and to become approachable up to the level of personal meaningfulness. An explicitly scientific rationale of this approach has been described elsewhere (Combe, Gebhard 2007, Fuchs 2000) and would go beyond the scope of this article.

1. In this context, Descartes' legacy refers to a dualistic anthropology for which the philosopher led the way. He separates physical experiences from psychological ones. On the one hand, there is the material, the extended body (res extensa), and on the other hand an inner world which is seen as non-material and non-spatial (res cogitans). The perceptions and acts of consciousness of this inner world are judged in that they are projections that the inner world constructs in the body by way of mechanic processes.

Based on the aforementioned assumption of the possibility of learning by experiencing, the focus will now be directed to a layer of teaching that stimulates both students and teachers not merely to communicate with the world but also with themselves. In the language of phenomenological anthropology, notably developed by Fuchs (Fuchs 2000, 2008), communication with the world covers experiences of feeling centered within one's body and, in this mode of one's own existing, turns to the multitude of things that may be experienced. One undergoes a centrifugal movement of interest, of understanding perception, of empathy and participation. This is juxtaposed with situations where one observes one's experiences from a point outside but not in an unfamiliar way. Out of this centrifugal movement emerges a thing, an experience that one observes detached from oneself. From an eccentric position, the observer gains a reflexive distance without retreating behind their experiences (Fuchs 2000, Plessner 1975). What comes about is a dialog with the world that is also a soliloquy as one communicates with oneself before the tableau of one's experiences.[2] Both attitudes are the basis of many teaching processes. Any following references to communicating with the world or communicating with oneself allude to attitudes characterizing students' life modes rather than a concept that seeks to achieve explicitly ethical communication of the students with themselves in every lesson or to integrate in the learning processes incremental phases of self-reflection. In the realm of experience that is teaching, a living ambiguity is characterized in which the students *live*: Looking outward – communication with the world, looking inward in eccentric position – communication with oneself.[3] In Waldorf education, the common shorthand term for such an ambiguity is the dynamic field between the poles of outside and inside, and it is one of the concerns of Waldorf schools for students to learn to breathe properly within that field. One goal of Waldorf education is to achieve teaching that breathes and harmonizes the abovementioned communication processes with the world and with oneself and thus generates an entity that encourages development. This addresses a level of the educational process that is not primarily aimed at the students' talents but one that is more general and outlined below in anthropological terms. Teaching is anthropologically legitimate and heterogeneous learning groups are justified because the exercised legitimation is independent of the talent of individual students.

Thus when images are developed in the classroom, the teacher is mindful of these being taken in by the students as embodied beings. To an extent that is in keeping with their age, the resonator of their bodies points their eyes outward much like the images created in classroom teaching. This process is to harmonize with whatever may be discovered in terms of insights and what is distinctive and new, again according to age, by looking from a reflexive distance. When, in adolescence, students can avail themselves of the heightened powers of the reflexive distance and experience them as an eye of a needle through which they personally want to pass time and again in order to develop their own viewpoints and identities, this inner potential needs constant realignment with the world outside. With their powers of judgment increasing in puberty, teaching must provide students with the ability to actually break through into the outside world.

Such a level of teaching as a characteristic of Waldorf education will be explained by examples. First, however, it should be observed that the claim outlined above, that is to say that harmonizing communication with the world and with oneself within the learning process leads to a simple and yet philosophically far-reaching conclusion: What is being taught must be grasped in a way that enables harmonization of inner and outer worlds. But how to bring something alive in the classroom in order to let the dialog or the conversation between inner and outer worlds unfold or even harmonize? Which state of knowledge is the right one for structuring classroom teaching? Does one assume that the subject, as a spectator of the events in an objectively complete world, takes in information, or that they construct their own world which, in relation to an outside world, has stabilized merely in a survivable configuration? – We are entering the philosophical workshop of the teacher.

Entering the philosophical workshop

In recent years, the life world of students has changed dramatically, not least as a result of progress made in the area of brain research and its broad adoption. The common equation of the brain with consciousness leads to widespread skepticism as to whether or not we can trust our perceptions (Fuchs 2008). Is it not the brain that makes us believe the world is, as we perceive it? Do we truly have a free will or is our brain just fooling us into believing we do?

The abovementioned modification of the life world also stems from a perception popular since the modern era that mechanical processes and constructs derived from them are 'the essence' which affects subjective experiences in our sense organs. A classical concert is reduced to nothing but a superposition of sound waves of varying frequencies and therefore merely an oscillation of atmospheric pressure with a specific frequency spectrum. The light afforded by a lamp is nothing but electron jumps whose energy difference turns into an electromagnetic field.

2. The nature of this soliloquy often remains in the unconscious as the person directs their interest at the substance of their experiences. Yet they will have had these experiences as an embodied being. They cannot escape this mode of experience and thus will communicate with themselves in the refelxive distance.

3. If outward or *outside* and inward or *inside* were to refer directly to the embodied self in one's body, the self, in its centrifugal movement, would be incarnated directly and immediately, inward would be the appropriate choice of word while in the eccentric position of reflexive observation it would face its physicalness from the *outside*. In the following, this dual nature of *inside* and outside will not be elaborated on.

If the reductionist program of science becomes part of the life world with only limited methodological reflection, it leads to alienation from the world. The experiencing subject stands at a distance to constructs that are supposed to produce the phenomena. At the same time, the subject's experiences turn into something that just results from the way the subject is organized. Between the world with its objects and the subject there is a gaping chasm that may be experienced as alienation, depletion of meaning or mechanization.

This is not to say anything against the reductionist program of science. Rather, attention is being drawn to the challenge, as part of the educational and didactic process, to consider that direct elementarization of reductionist approaches may cause the very alienation in the classroom that has been outlined above. If reductionist approaches dominate or shape, for example, physics lessons from the outset, students will perceive the ways of thinking associated with these approaches as something that essentially represents the thing itself. Such an influence on the students can be expected.

To what extent students incorporate the reductionist program into their beliefs became apparent when, in 2000, the authors of the third Trends in International Mathematics and Science Study (TIMMS) published their findings as to the scientific world view students had adopted by the time they finished high school (Baumert, Bos, Lehmann 2000). The traditional empiristic worldview was the dominant one. In short, according to this worldview, physicists discover nature's laws of physics step by step. What the questioned high school graduates were barely aware of is that scientists had a large part and considerable latitude in the analysis of their experiments and that freedom of method also means that physics is a constructive achievement of the scientist. – Students often rate their knowledge as something 'that is', that is to say they perceive it as ontological (Bader 2000).

If teaching is designed as a process of communication with the world and with oneself as an embodied being, as is the case in Waldorf education, the content being taught must allow such communication. Communication with the world has to encourage students to experience themselves, right down to their attitude toward life, as someone who can turn to the world anew, as someone who, by way of teaching, has mastered communicating with themselves to a degree that they have progressed in their development and will continue on that path with new potential. Teaching that merely elementarizes reductionist approaches didactically would be based on a content-related starting point that runs contrary to the intentions of Waldorf education. Such teaching would try to induce a process of communication without providing the necessary content-related potential, without giving it nourishment.

One special attribute of the core business of teaching at Waldorf schools is that content is unlocked with the aim of enabling the subject as an embodied person to analyze without feeling alienated. The challenge is not to use the content of teaching indirectly to instill into the students the attitude of a spectator but to enable them to exercise the full spectrum of participation available to them as embodied beings. This is the didactic task in which Waldorf teachers need to position themselves.

Steiner outlined this issue repeatedly in his lectures on education and derived from it concrete teaching advice. In his analysis of the meaning of thinking as part of the third lecture in *Study of Man* (Steiner 1975), he characterizes two possibilities of the soul life which, in the communication with the world, will lead to different results: One the one hand, the application of concepts to differentiate one province from another thus enabling us to 'acquaint ourselves with things' and to observe them, and on the other hand, the tendency of the thought life to set up postulates which claim to be universal. He chooses an example from the world of physics, saying: 'For instance, in our books on physics you will find the law of the mutual impenetrability of bodies set up as an axiom: At that place in space where there is one body no other body can be at the same time. This is laid down as a universal quality of bodies. But one ought only to say: Bodies and beings of such a nature that in the place where they are in space no other similar object can be at the same time are "impenetrable" bodies.'

While the principle expressed in this sentence may be difficult to incorporate into the teaching of introductory physics, it certainly illustrates how seriously the issue of generalizing programs in the structuring of lessons was taken from the very beginning of Waldorf education. In the same vein, Steiner suggested elsewhere that, when teaching zoology, a characterization based on diverse relationships be developed to replace a definition-based approach (Steiner 1975).

In Waldorf education, the power of the individual to reduce elements in their perceptions and thoughts, to separate the essential from the expendable, to grasp the basics of things is guided in a specific direction: in a direction where this power serves to sharpen our observation, to 'acquaint ourselves with things' and develop diverse characterizations. In contrast, another possibility of the thought life, characterized in that elements are declared absolute or universal, is recognized for its alienating 'side-effect'. Finalizing a thing by setting it in stone may well preclude the student from choosing a broader, more open and tentative path to conceptualization thus accepting that further dialog will not take place and alienation sets in. In practical terms, characterizing rather than defining means aiming for a dialog approach, thus instilling into the students a dialog-based reasoning disposition.

Waldorf schools cultivate their students' dialog-based reasoning disposition in science teaching by the application of phenomenological teaching concepts. Students follow Wagenschein's call to 'Save the Phenomena' and exercise an alert and understanding observational disposition by fostering a culture of observation that develops from looking to objective seeing and finally methodical seeing. At the first stage of looking, phenomena are allowed to fully unfold; nature is not interrupted.

Following wonder, first impression and inner concernment, the second stage of objective seeing lets reasoning awake and ask initial questions as to the context of things. By methodically pursuing the conditional structure, objective seeing turns into methodical seeing, thus reaching the third stage.[4]

The next question to consider is that about the insightful context. And contrary to some voices, it can also be found in phenomenological teaching concepts on the basis of the unfolding rationality (Mackensen 2005). It challenges the students in the use of their intellect. However, in doing so, the concept of causality is not limited to the assumption that behind the phenomena lie the causes that generate the phenomena, that is to say a limitation that develops causes which are introduced hypothetically along causal structures of reasoning. Rather, this possibility of conceiving explanations is avoided by organizing and, if appropriate, mathematizing sequences of phenomena. This structure is arranged in such a way as to allow nature to express herself as purely as possible so as to convey, when moving from one phenomenon to the next, the variations and multiplicity of the phenomena (Schieren 1998). This multiplicity is to be the basis for developing the fundamental conditional structure of a subject area. When these conditions are met, those phenomena will appear. The appointed judge in the Kantian sense, who calls nature to the witness stand and compels her to answer the questions he puts to her is superseded by the experimenter who enables nature to present herself as purely as possible (Kant 1974). To put it in the words of Goethe: The phenomena are recognized in their determination and are determined anew by the human mind (Goethe 1966). – A rational empirism is applied which, in dialog with the phenomena, becomes aware of the insightful context in conditional judgments.[5] – As has been shown in recent years, this is a workable approach up to high school exam level and also especially in the training of university-level physics students (Grebe-Ellis, Sommer, Vogt 2002).

When teachers apply phenomenological concepts in their teaching, the question may arise out of the familiarity of phenomenological processes of understanding as to whether the insights gained from the order of sequences of phenomena merely represent another possible view of nature or whether in the phenomena of nature the categories of these insights speak to us actively here and now. This question looks at the productivity of thinking (Da Veiga 2008): Does the personality learn something in its thought movements, in the categories of its thinking which also speaks actively in the form of the phenomena? Can the act of thinking that takes place in categories and brings to consciousness its contents be just the other side of the coin? Is the one side the active generation of the phenomenon itself? – The depth of the question of reality and truth opens up. Thus, teaching that is based on the intention not to lead students unreflectedly into the alienation of reductionist approaches becomes a profoundly philosophical question. At the same time, it becomes apparent how strongly a philosophical positioning resonates in the classroom – consciously, semi-consciously or deeply unconsciously (*Figure 1*).

Even without a final answer to this question, vast perspectives are opened up. These perspectives resonate in the teaching approach of Waldorf schools. On the one hand, the focus is on the productivity of thinking as it conceptualizes itself in the contents of conscious categories, allowing for a productive concept of the spirit. This productive concept of the spirit includes the incarnated person who performs the thinking (Steiner 1962).[6] On the other hand, the phenomena of nature are thought of as actions that happen here and now. Is it there that the spirit appears productively in an outer form? (as opposed to in the conscious categories of thinking of incarnated persons).

If the characteristics of the spirit developed here were to be true, it would be the aim of Waldorf education to also use the contents being taught to give students a spiritual home in the world. This sense of home would be able to develop because, as incarnated persons, students can perform their thinking in harmony with the world. Subject and object would be imagined as activities that form a spiritual oneness. – If a teacher were to embrace this possibility as a result of their own individually attained knowledge, the personality in question would find themselves consciously and cognitively in a state of holism.

Waldorf schools do not demand of their teachers to embrace the realm of possibility outlined above. Also, it is rarely the subject of differentiated discussion among Waldorf education practitioners whether or how individual teachers have exemplarily experienced a state of holism out of an active, outer phenomenon and an act of positive thinking. In everyday Waldorf teaching, this question remains a long vision.

4. This reference to Martin Wagenschein's educational and didactical approaches relevant to Waldorf education is just one of many. Numerous other connections could be made. However, this would go beyond the scope of the present discussion.

5. In this context, conditional judgements refer to relationships that can be expressed as follows: *if* such and such a condition is met *then* such and such phenomena appear.

6. Following the discussion of the concept of force in his essay *Knowing and Human Action in the Light of the Goethean Way of Thinking*, Rudolf Steiner phrases this as follows (Steiner 1962): „... The opposite of this is... when the idea approaches the sense world directly. There the idea itself appears as causative. And here is where we speak of the *will. Will, therefore, is the idea itself apprehended as force.* It is totally inadmissible to speak of an independent will. When a person accomplishes something or other, one cannot say that will is added to the mental picture. If one does speak in that way, then one has not grasped the concepts clearly, for, what is the human personality if one disregards the world of ideas that fills it? It is, in fact, an active existence. Whoever grasps the human personality differently - as dead, inactive, naturally occurring product – puts it on the level of a stone in the road. This active existence, however, is an abstraction; it is nothing real. One cannot grasp it; it is without content. If one wants to grasp it, if one wants a content for it, then one arrives, in fact, at the world of ideas that is engaged in doing…'

In the course of his life, Steiner devoted himself time and again to this question. He documented in a variety of his works (Steiner 1958, Steiner 1960) the many avenues he took in his quest to find answers. To this effect, his contribution to the Itch International Congress of Philosophy in Bologna, Italy (April 6th-11th, 1911), provides one such example of his work (Steiner 2007):

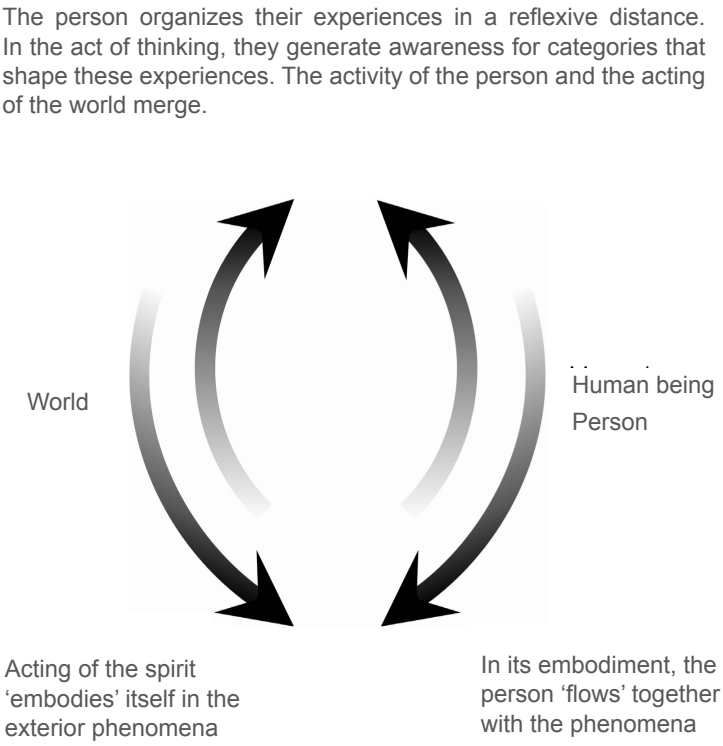

Figure 1. From a viewpoint of educational philosophy, the man/world relationship merges into a state of holism.

'If one wants to reduce a vast, acute characteristic of critical epistemology to a simple formula, one could say: In the facts of the consciousness horizon, the critical philosopher initially sees perceptions, images or symbols, and a possible relationship with a transcendental outer can only be found *within* the thinking consciousness. The consciousness simply could not leapfrog itself, could not prevail over itself in order to submerge into something transcendental. Such an idea has indeed the appearance of something obvious. And yet it is based on a prerequisite one only needs to see through in order to dismiss it. It almost sounds paradoxical if one accuses subjective idealism, which is expressed in said idea, of being covertly materialistic. And yet, one cannot help it. Let me illustrate my point by way of a comparison. Imagine one takes a seal to impress a name into molten sealing wax. All relevant aspects of the name are thus transferred from the seal to the sealing wax. What cannot transfer from the seal to the sealing wax is the metal of which the seal is fashioned. Now let us replace sealing wax with man's soul life, and seal with the transcendental. It becomes immediately obvious that one can only speak of the impossibility of transferring the transcendental to the imagination if one does not think of the objective content of the transcendental as spiritual, this being analogous to the complete transfer of the name to the sealing wax. Rather, the prerequisite for the purpose of critical idealism must be that the content of the transcendental is an analogy of the metal of which the seal is made. However, this can only take place if the covert materialistic assumption is made that the transcendental has to transfer to the imagination by way of a materially thought process. Provided the transcendental is spiritual, the thought of it being absorbed by the imagination is entirely possible.'

Based on the experience of his insight, Steiner might have answered the question as to the essence of Waldorf education by referring to it as an enlivened, educational fleshing out of his philosophical studies. It is up to the individual Waldorf teacher committed to their own rationality to find their own place in the above outlined realm of possibility.

What is an essential in the core business of teaching? – A classroom practice whose very concept includes the possibility of a state of holism that, if it exists, wants to be recognized concretely.

Out of the philosophical workshop and into the classroom: Examples of classroom practice

The philosophical questions prompted here surface in everyday teaching, exemplified by concrete teaching sequences. As outlined above, in doing so, the concept of a state of holism with which teaching at Waldorf schools is often credited, evolves into a task of knowledge which is to be recognized not in the general but in the detail of the subject matter taught. One faces the challenge of finding the special profiling of Waldorf schools, an essence in the core business of teaching, in what is concrete and beyond easily demonstrable special characteristics of their structure. It is especially at junior high and high school levels, that the special educational character only becomes apparent if one engages in the special characteristics in detail. General and generalizing statements are replaced by specifics that express something that is characteristic.

The following two examples will perhaps demonstrate how the above-discussed points become the theme in many Waldorf school lessons. These observations have a sketch-like quality as they are not part of a subject-didactical introduction, which has been described elsewhere (Mackensen 2005, Buck, Mackensen 2006, Sommer 2005, Maier 1993).

The sunrise – experienced in wonder, judged with reason

In the 6th grade physics main lesson, the introduction to optics takes place in a room that can be completely darkened. This room need not be beautiful but should be furnished with a variety of distinguishable items among them perhaps pieces of differently colored cloth hung along the walls.

Having prepared the class for this step, the room should then be completely darkened. In total silence, the darkness is allowed to unfold in its implacability. In standing or sitting, students can use the gravity of their own bodies to achieve a measure of orientation. However, normal everyday consciousness that enables us directly to look at objects in our surroundings can no longer be maintained with its usual quality.

If then a very dim light bulb, placed in a frosted cylinder, slowly brightens, a soft glow emerges on the ceiling or elsewhere in the room. – There, light appears! This first impression of an as yet unstructured brightness can be like an exclamation. By further brightening the light students are perhaps able to make out a corner in the room. The contour emerging out of the powerful yet disorienting darkness triggers a feeling of liberation. It provides something to hold on to. Eventually, individual contours emerge more clearly against others and one is often surprised how they define colored surfaces. One could have the impression of the colors 'rising' from the pieces of cloth. It is a joy to see how colorful the world is, that there are also dark corners, and that everything around us is spatially contoured. –

Based on this experiment is the realization that the lamp, or the sun, glows or shines by itself and gives light while the objects around it accompany it in its brightness or brightening. The brightness inherent in the sun or the lamp is juxtaposed in opposition to surrounding objects that are extrinsically lit by them. In an initial examination, the intrinsic brightness encourages its environment to be illuminated. The experience and the process of brightening are the basis of this concept (sunrise or twilight experiment).

Another differentiation is added to the series of experiments. On the surface of about half a square meter (5-6 square feet), salt is used to create a landscape with mountain ranges. Salt is used because it participates well in the brightness of its surroundings and because it is white and therefore 'extrinsically bright'. An intrinsically bright lamp is moved above the mountain range following the daylight path of the sun. The lamp describes a semi-circle that is arranged in a vertical plane above the landscape. Light first catches the mountaintops, and the occasional hillside becomes visible, much like an alpine meadow early in the morning. Later, mountains take shape with contrasting light and dark sides, the time is now 10 a.m. The various shaded and unshaded areas create a mood ideal for photography. Eventually, the sun reaches its zenith. It is 12 noon, the scenery seems dull. In the absence of any shades, the mountains appear scattered. Now in decline, the sun again casts shadows, giving the scenery a lively structured appearance. When the sun finally sets it plunges the landscape into darkness.

When focusing less on the diverse shadow play and more on the brightness of an individual horizontal plain in the salt landscape[7], one will notice the steady increase in brightness as the lamp moves toward its zenith. *In relation to the horizontal surface, the lamp follows a dome-shaped path across the surface. The surface becomes brighter the closer the lamp moves to the zenith of the dome. In doing so, the dome describes the visible half space above the surface.*

When paying close attention to the hillsides in the salt landscape, it is apparent that they remain in the dark for longer when facing away from the 'morning sun'. A walker crossing one such hillside in the early hours would find their view of the sun obstructed by a mountaintop. The sun would be invisible and the slope would remain in darkness. If a farm were situated on that

7. For the purpose of Wagenschein, this would be the transition from looking to objective and methodical seeing.

hillside, people living there would not see the sun rise until perhaps 10 a.m. Only then would they enjoy the amount of light that had already filled the flat plain hours earlier. The sloped hillside is located on a different plane of horizon. When looking at the brightness at this particular spot, one has to imagine a dome that is pitched at an angle to the dome above the horizontal plane. Accordingly, it will be afternoon before this spot reaches its maximum brightness (*Figure 2*).

Further analysis shows: Above the dome, a directional relationship between the sun's position and the brightened surface can be described. There is also a distance dependency. The closer the lamp is to the surface, the *brighter* the surface becomes. The lamp also appears *larger* when seen from the surface.

For an observer standing on the surface, its illumination depends on the size of the lamp in their field of vision (perspective size). Also important is the observer's viewing direction of the lamp that they can put in relation to the surface on which they stand. The observation stated by the observer *engaged* in the experiment can also be formulated in *detached* geometrical terms on the basis of the dome and the distance: The illumination of a surface is greater the closer the lamp is to the zenith of its horizon and the shorter its distance to the surface.

The excerpts from a sequence of phenomena as developed for 6th grade introductory physics by Von Mackensen (Mackensen 2005) easily illustrate that a phenomenological search for an explanation of basic optical appearances takes place not only in a state of wonder but is experienced by the senses and put into structured thought. At the same time, above the dome as a visible

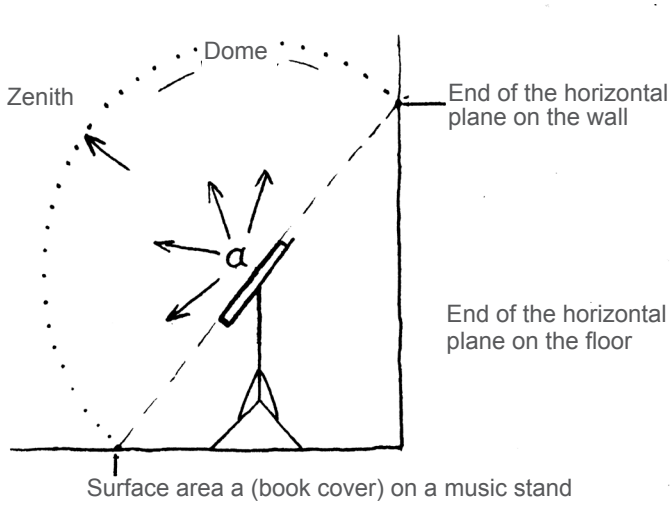

Figure 2. This diagram developed by Mackensen (Mackensen 2005) shows that the brightness of surfaces can be formulated in geometrical terms by means of a dome as the visible half space above a surface. Thus, possible visual relationships of an observer located on the surface are geometrized in a detached manner.

half space above a surface and its zenith, basic geometric terms form part of the analysis from the very beginning. But this analysis is based purely on observation and may not say anything about the nature of light. Rays of light as mechanical phenomena associated with brightness are not introduced.

By looking at the orientation within the dome, a directional relationship, based on the location of the observer, is established. The relationship is a regulative element within the presentation and the conceptualization. The directional relationship determines the light ray model by specifying a direction of the rays. The difference highlighted here is that between the geometrical organization of visual impressions as opposed to hypothetical statements about the nature of light that is to illuminate the world with its rays. On a formally geometric level, the two statements are identical. On a physical one, they are not. – The fact that excluding statements about the nature of light in introductory physics lessons brings with it significant curricular advantages up to the teaching of polarization or the quantum theory makes the phenomenological approach an attractive option even beyond Waldorf school circles (Grebe-Ellis 2005). This also means that the upheavals of the quantum theory can be taught within a different curricular framework and with a certain degree of methodological unity (Sommer 2005).

How strongly many people have assimilated this model as fact becomes apparent when teaching introductory physics while excluding the rays of light. One soon becomes aware of certain habits that give rays of light an ontological dimension. The relearning this necessitates is often much more elaborate compared to acquiring it as a 'first learner' or novice.

The abovementioned brightness conditions of the salt landscape are categorized under two perspectives: As the observer in the *engaged perspective*, one puts oneself on a surface in the salt landscape. One abandons the geographic overview and integrates into the landscape. In this scenario, the perceived size of the lamp and the viewing direction both determine the brightness. This is contrasted by the *detached perspective* where the salt landscape is viewed from the outside. Instead of integrating into the landscape, the observer takes a geographic overview from the outside. The geographic space is organized geometrically.

In the engaged perspective, one relates to one's immediate bodily existence. One analyzes the possible visual relationships as seen from a mountainside in the salt landscape. With reference to the body, the thought is led by a centrifugal interest in the direction in which the lamp could be seen and the size in which it would appear. The resonator of one's own body participates directly in the thought process.

In the detached perspective, this bodily integration appears in a reflexive distance. The direction felt in one's own body becomes an element in the geometric dome concept, and the perceived size an idea of a certain distance. While one does not retreat behind the experiences of the engaged perspective, a shift in position does take place. One's perspective is no longer centered inside the body, rather it has moved away from the center, becoming eccentric. The detached perspective is characterized in that it has an eccentric position in relation to the bodily existence (Fuchs 2000, Plessner 1975). Students as well as teachers who think through the sequence of phenomena developed here refer, in their thinking, to their bodily existence. In doing so, they take up the ambiguity of the body – as described in Chapter 3 – which is characterized by a centric and an eccentric position of a person. Thus, engaging in physics means at the same time engaging in the centric and eccentric positions of their own bodily existence. Their communication with the world also becomes communication with themselves (*Figure 3*). - What sets Waldorf education apart is the fact that very different modes of the bodily existence are addressed by the way a subject matter is presented in class. The frequently voiced demand for teaching to address the 'human being as a whole' is met if lessons address the full spectrum of the student's life modes.

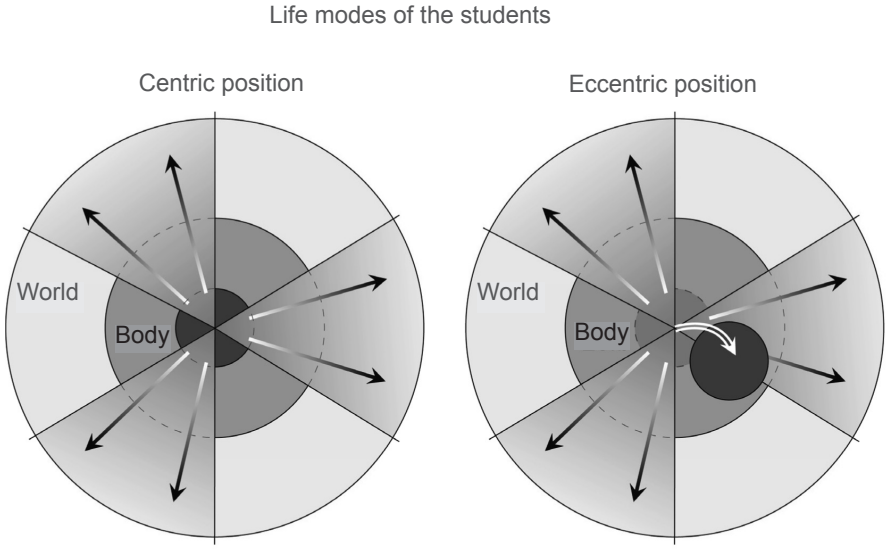

Figure 3. The different life modes of the students in the engaged and detached perspectives.

In this instance, communication with the self is anthropologically founded. Needless to say, the anthropological foundation is not a subject of the physics lessons. Rather, the students engage in the subject of brightness. However, the content-related analysis is designed so that their experiences gained from the experiments and their thought movements involved in the interpretation of the experiments relate to their incarnated human existence. In that sense, this teaching sequence is also anthropologically founded. This form of anthropological foundation may be referred to as communication with oneself.

Points at infinity become imaginable – a projective geometry classic

When planning for the subject of projective geometry in 11th grade mathematics main lesson, the teacher can lay out the subject didactically in a way that allows it, quite literally, to be drawn out of spatial intuition (Bernhard 1984). One possible example for this is to project the triangles ABC1 to

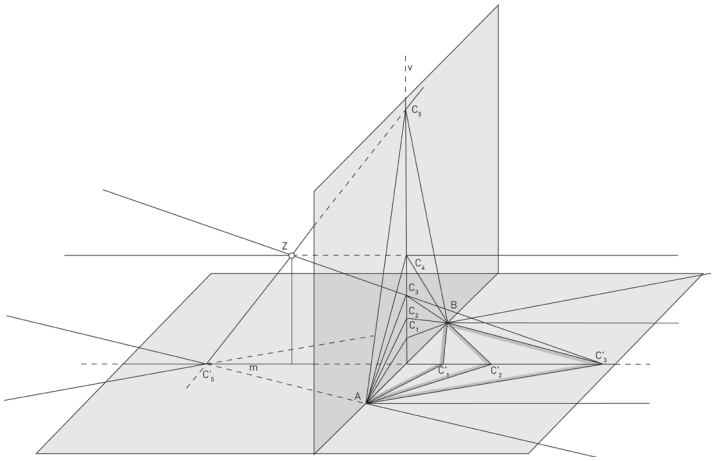

Figure 4. In an example from Bernhard (Bernhard 1984), different triangles are to be projected from a vertical plane into a horizontal plane by use of center point Z. Center Z and tip C_4 are on the same level. Where on the horizontal plane is image point C'_4 located?

ABC5 a center point Z from a vertical plane on to a horizontal plane by use of projective straight lines. A straight line running through Z, continuing e.g. along the sides of triangle ABC2 while remaining fixed on Z, would then denote a triangle ABC2' on the horizontal plane. As points A and B are both located on the line of intersection, they are part of both the original triangle and the projected triangle on the horizontal plane.

Point C_4 in triangle ABC_4 on the vertical plane is on the same level as center point Z. If the projected straight lines are run, as outlined above, along the sides of this triangle, the projection is achieved in the same manner until point C_4 is reached. There, the projected straight line runs parallel to the horizontal plane. Where is image point C'_4 located?

Just before touching C_4, the projected straight line will be slightly inclined and therefore intersect with the horizontal plane. The more its decline diminishes and approaches a horizontal orientation the farther the point of intersection with the horizontal plane moves away from Z. It travels farther and farther to the right. If the projected straight line moves at a constant speed along one side of the triangle toward C_4, the speed at which the point of intersection with the horizontal plane moves to the right increases enormously. Where is image point C'_4 located?

A classroom discussion may yield that the perception of this point becomes blurred and can no longer be grasped in the accustomed way. Soon, alternatives are suggested, for example to erect a vertical plane at a great distance, that is to say 'virtually in infinity'. This would then provide the necessary projection plane, and the problem would be solved. Unfortunately, this was not the question.

- In the course of the discussion, the following sequence of steps can be agreed upon:
- The point vanishes to the right into infinity.
- One still thinks of a point that has vanished. Part of the vanishing process is that projecting straight line and centerline m are arranged parallel to each other. Thus, the appropriate sides of the triangle in the horizontal plane also run parallel to centerline m and the projected straight line.
- These parallel straight lines are like a trace that can still be grasped relatively easily, if one thinks of the point that has vanished (and is no longer readily comprehensible).
- This vanished point that is associated with a direction of parallel lines, may be referred to as far point.

Adding the projections of further triangles (e.g. ABC5) proves this line of thought. The projections in their entirety form a certain wholeness when considering that an infinitely far point C'_4 is allocated as an image point to the original image point C_4. Horizontal plane and projected straight line through Z and C_4 now have a common point in far point C'_4. – Thus, the concept of a far point has been developed from spatial intuition. While the far point is beyond the bounds of the imagination, it can still be grasped as a thought. Thinking takes shape, the imagination reaches its limits.

How this process helps students to develop an awareness of the feasibility of their thinking has been described elsewhere (Sigler 2006) and need not be discussed here. Instead, a number of students' comments will serve as examples. They were made following a lesson in projective geometry in the 2007/08 school year in response to the following question: 'Does the existence of far points pose a problem for you or can you capture their concept easily?'

The answers included:

- 'I can well imagine that, in certain cases, there must be a far point in infinity. Because if you thought it didn't exist just because you can't determine it, the projected image would be incomplete. An original image of a certain shape retains this shape in a way even as a projection. That is why, in the extreme case of a projected point being located in infinity, the logical conclusion must be that in this case also the shape must be retained, even if it is not readily comprehensible.'
- 'Initially, the idea of the existence of far points takes some getting used to. But when you think about it for a while it does start making sense. Also, far points give you reassurance. The fact that they exist puts everything in its place, and that's a neat idea ...'
- 'Yes, the existence of far points gives me a problem. As far as I'm concerned, two straight lines running parallel always maintain the same distance to each other and hence never intersect with one another.'
- 'Logically, it wouldn't make sense to expect two parallels to intersect with one another.
  In terms of perspective, two parallel lines meet on the horizon. Which, unlike a purely geometrical representation, could be linked to the earth's curvature. As far as I'm concerned, to imagine a far point of two parallel lines in infinity is something you can agree on in an understanding with yourself.
  Certainly in your own imagination, unless you actually want two parallel lines to meet in a far point they would never do so.'

While the first two comments are from female students, the two last ones came from their male peers. It is immediately obvious how the communication with the content of the projective geometry lessons is at the same time also communication of the students with themselves.

Conclusions for the quality development of the core business of teaching

Using the above two examples, the indicated path from the philosophical workshop to practical teaching makes it clear that part of the qualitative development of Waldorf schools derives specifically from their unlocking of the content of the subjects they teach. Fertile sequences of phenomena must be developed and presented through appropriate teaching aids. The challenge is also to represent these sequences.

And there is another aspect: Students should learn to feel as contemporaries and to position themselves; the bridge between phenomenological conceptualization and the reductionist program of the sciences must be made transparent to them. If the reductionist program can be analyzed on the basis of cleanly and well thought out phenomenological relationships the *reduction may be recognized in its distinctiveness*. This approach ensures that students do not assess reductionist models ontologically.

In the years to come, it is this kind of bridge building that will present a major challenge for Waldorf schools so as to avoid their teaching being regarded as wayward rather than specific and modern. To give but one example: If Waldorf schools can succeed in approaching, for example, the concept of the atom not as a three-dimensional building block but as a non-material entity which combines the quantitative relationships of various areas of physics in a spatially or energetically structured complex of ideas, their students will get to know a modern physical concept which can also be clearly linked to the phenomenological physics lessons that went before.

This aspect of qualitative development can only be realized on the basis of appropriate further training and requires a readiness on the part of the teachers to pursue new avenues.

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