

THE hiram TRUST

*Supporting experiential learning through landscape, craft and science,
inspired by the work of Rudolf Steiner and William Morris*

Anthology of articles from 'Paideia' some of which originally appeared in the April 1995 issue of the German monthly Journal for Waldorf Pedagogy: 'Erziehungskunst - Monatsschrift zur Pädagogik Rudolf Steiners'.

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CONTENTS

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May 1997

Descent into Matter (Some Thoughts on the Renewal of Craft Curriculum for Waldorf Schools through the Work of the Hiram Trust) - Aonghus Gordon	3
Willow Basketry Demonstration and Lecture (Text of a talk given at the Hiram Summer Conference at Ruskin Mill in June 1994) - Bernard Graves	5
Agriculture Main Lesson and Botanical Excursion - Linda Jolly	15
Nature in the Human Being - the Human Being in Nature in Support of an Ecology Main-Lesson in Class Nine - Walter Liebendorfer	21
Not only Nature Benefits - Christoph Leuthold.....	25
Re-enlivening the Landscape (The setting up and care of a living environment) - Werner Neudorfer.....	32

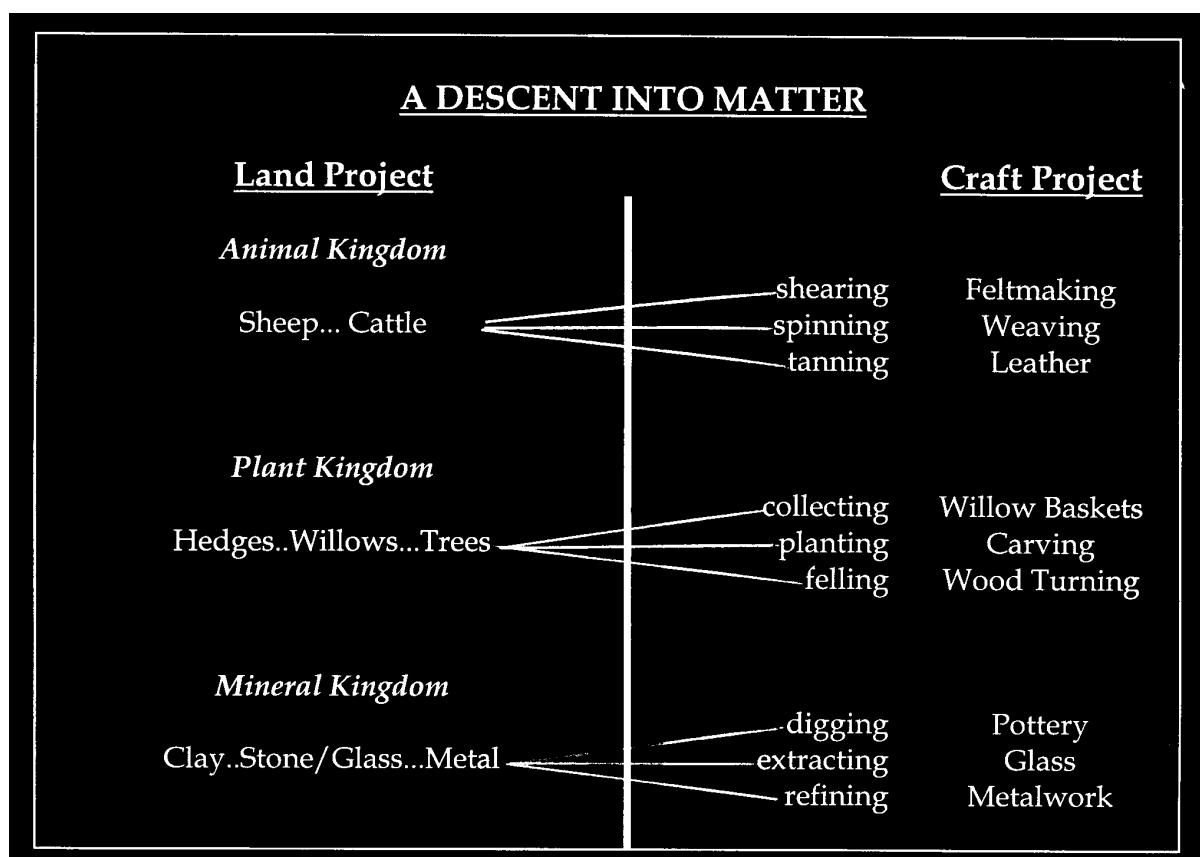
Descent into Matter (Some Thoughts on the Renewal of Craft Curriculum for Waldorf Schools through the Work of the Hiram Trust) - Aonghus Gordon

In 1993 contact made with the Hiram Foundation in Holland led to the foundation of the Hiram Trust here in the UK. During the last two years the Trust has attempted to bring a new orientation to craft and environmental science activity in British Rudolf Steiner schools. This work has been supported by Ruskin Mill and inspired by the Life Science Trust. The work of the Hiram Trust lies at the heart of Waldorf education, where thinking, feeling and willing are brought into a coherent experiential context through an age appropriate craft activity. In addition to being inspired by the work of Rudolf Steiner the Trust has researched the nature of the genius loci manifested through the English folk soul, articulated largely in the life and work of William Morris.

During the last twenty years it is evident that Waldorf pupils have found themselves in a growing dilemma. Embedded within their consciousness is a potential capacity to resolve considerable practical and environmental problems through the interdisciplinary approach to their learning, but their ability to manifest this increasingly requires an as yet undeveloped context. Practical and environmental issues must be given greater credence, for they offer the pupil the chance to unite thinking, feeling and willing creatively. The solving of current problems lifts the will towards a deeper social, ethical morality. Environmental problems are moral problems, requiring people to offer solutions out of creative, practical experience.

A craft curriculum accessing the primary processes and substances of the environment can engender a quality of integrity, particularly for the adolescent. This orientation is entirely dependent on a new awareness of the school grounds and the landscape at large. Biodynamic principles could play a key role in supporting the educational process and help to make the 'outdoor Classroom' visible. Creating educational intimacy within the outdoor Classroom and perceiving the learning process is the challenge. This challenge is ignored at our peril, as the intellect of the adolescent increasingly searches for evidence of an imprint on or mastery of the practical world. If the will is not lifted up through creative practical activity and training it works as an instinctual drive. Creative problem solving through practical work servicing human needs is also the first step towards discovering 'social empathy'. Brought up into consciousness through contemporary ideas of sustainability it potentially allows the adolescent to encounter a new social ethic.

The following diagram offers a coherent approach to the integration of craft project work related to the environment and landscape. Its age appropriateness is dependent on a comprehensive and flexible understanding of child development. The child's descent into matter starts with the tactile experience of wool at the kindergarten stage, continuing through to the fashioning of utilities in clay and metal, that are transformed through the control of fire. Engaging in a craft activity appropriate to the stage of development reached by the child and adolescent facilitates the descent into, and subsequent transformation of, matter.



The three realms of nature, animal, plant and mineral, have corresponding crafts: the Nine ancient crafts of mankind (see diagram). Incorporating one of the crafts from each of the realms into the school curriculum and garden landscape acknowledges a primary educational need. In doing so, the school develops its garden and grounds from an educational standpoint. The grounds have the potential to become educationally transparent, offering a concise new form of visual literacy which incorporates thinking, feeling and willing. The Waldorf curriculum can therefore manifest itself 3-dimensionally throughout the environment of the school.

This orientation is offered to schools who request an environmental survey, often carried out by Class 10 pupils. Several schools are currently undertaking such a project. In addition the Trust runs workshops and hosts an annual summer conference for Waldorf school teachers. The work of the Trust is being developed in collaboration with several teacher training courses.

For further information on the Hiram Trust please contact the Secretary, The Hiram Trust, Upper Grange, Lovedays Mead, Stroud, Gloucestershire GL5 1XB. Telephone/Fax 01453 764065

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(This article was originally published in issue 12 of 'Paideia')

`1 Willow Basketry Demonstration and Lecture (Text of a talk given at the Hiram Summer Conference at Ruskin Mill in June 1994) - Bernard Graves

Movement is, of course, best witnessed in action, watching craftsmen at work. But in keeping with the Hiram school of thinking, we as craftsmen are charged with the task of raising our work into consciousness so that we can also make the connection to the conceptual life, to the developing thinking life of the teenager. Before I do basketwork with you this morning, however, I would like to demonstrate the processes of willow basketry, because that will best illustrate what I want to bring to you. I shall also indicate some of the secrets that lie behind the gestures of the crafts, and I shall try to pick out some archetypal examples.

I'd like to look first in general terms at man's movement, his ability to move. We share this ability with the mineral kingdom. But whereas an animal learns the movement it needs for its life very rapidly after birth - within minutes the calf can be standing suckling from its mother - a child usually takes 1½ years to learn to crawl, stand upright and then walk. It is as if we are delayed in our motor development. It takes time for man to express the symphony of movements which belong to him.

Movement is also intrinsic to our awareness of the presence of life. I once found someone slumped over the wheel of a car, motionless. What is the first thing one does in this situation? One looks for a sign of movement. Unfortunately this poor man had had a heart attack and died at the wheel of his car, but I found myself looking for movement, be it his breath, his eyes, but there was none. I picked up a limb and it flopped. Movement seems to me to confirm the presence of life itself within the human being. I think the Gospel account is archetypal here. Elizabeth's child (John the Baptist) "leaped in her womb" in recognition of Mary, the Mother of Jesus. This quickening movement is an archetypal sign of life.

When we observe a young child, a baby, we see a wonderfully joyful bundle of movement. It can't help it - when it is awake it continually moves: toes are moving, limbs and fingers are moving, everything seems to be moving. The young child up to school seems almost to be moved from the outside by invisible strings, like a puppet. His movements are in response to what is around him, to what he senses. It takes a long time for the child to begin to focus, orientate, to control these movements, to bring harmony and self-direction to them.

We know from Rudolf Steiner, and other people who have worked on these ideas, how the mastery of such outer movements as standing and walking are then interiorised, and go towards developing speech and language, then later on rise into the realm of consciousness to help develop the faculty of thinking and the processes of logic. This is the path of the interiorisation of movement. I would like to investigate how movement, in all its pedagogical manifestations, goes ultimately towards fostering the healthy soul forces of the child: the speaking of a poem by the teacher, with a movement intrinsic in the verse; the movement brought by the eurythmy teacher or the handwork teacher, to name but a few. These soul forces are threefold: firstly the ability to come into the right action, our will; secondly our sentient or feeling life; and lastly our conceptual forces, or thinking life. More particularly, I am interested in how craft movements contribute to the development of these faculties in the growing child. Teachers of all kinds are in the same boat here: we are directly involved in the unfolding and making manifest of these soul forces in the child. In a way, you could say it is what our job consists of to be part of the incarnating path of the child towards puberty.

As craftsmen, of course, we are most directly concerned with how movement is entered into with the hand, and with its reciprocal echo in the whole body gesture. I would like to call the whole symphony of movements each craftsman performs the 'craft gestures'. Within this symphony of movements of each craftsman there are certain essential, perhaps even archetypal, gestures which belong to each craft. These essential gestures I think are the means whereby the individual will impulses are made subject as it were to a higher order, a higher impulse. Perhaps we see this in the archetype of that craft gesture. And there is a man called Udo Steuck of the Christian Community, who has given some wonderfully inspiring thoughts over the years on the connection of the craft gestures and the crafts themselves with their cosmic counterparts in the zodiac.

Now it is in the nature of the craft gestures that when practised the gesture works inwards to continue to foster a healthy inner life. Of course there is the result to be seen in the actual work achieved outwardly, but we are aware that we ourselves are formed and fashioned by that very craft which we take up or bring, to our students.

I should like now to point to a deeply significant thought which Rudolf Steiner gave us, relating especially to the development of adolescents. We are probably all familiar with the idea that during the first seven years of life the child gradually forms its own etheric body by interiorising the child's environment, and discarding the inherited etheric body by school age, around seven years. We call this moment the 'birth of the etheric'. During the next seven years a comparable building of the astral body occurs, with the 'birth' of the individual astral at around age 14, the point where the youngster starts out on the journey to discover self.

In a lecture given in 1921 entitled '*The Etheric Heart*', (originally distributed in *The Golden Blade* 1985, and now printed as '*The Human Heart*'), Rudolf Steiner points very directly to the being and manifestation of movement in the development of the astral body from puberty onwards. The lecture is called '*The Etheric Heart*' because, unlike the rest of the organism, the heart defers the shedding of its inherited etheric substance until the time of puberty. He describes how this etheric heart is cosmically formed before birth, being a mirror of the entire zodiac planetary system, sun and moon. It is interiorised in the region of the physical heart, and at puberty all movements we have experienced are inscribed by the astral body and stream towards the region of our etheric heart.

Now, in an imagination, he refers to this etheric heart as a kind of cosmic treasure trove, a casket, a basket, and into this basket come the effects of movement on our plastic astral body; they are like precious stones or jewels in the casket. It is also the intentions behind our movements which are inscribed here, and the effects of our deeds, too. And at death these 'treasures' are handed over to the cosmos again and they form the future possibilities of the next incarnation, particularly our next habit body, etheric body, and in the physical realm they form the head in our next incarnation. This is as far as he takes the idea.

So, in other words when we look at the physiognomy of our brothers and sisters on earth around us now we see a kind of echo or imprint before us when we look at the way we walk, or at our temperaments. We have a kind of imprint of the work gesture of a previous life; the ability to come into movement in the past. When I came across this I realised why all teenagers enjoy being subjected to a schooling of the will, through different craft workshops. I know as adults we would find that very difficult. It's all right with conference weekends, when you do a little bit of felting here and a little something else there, but we would not enjoy a whole school programme of it; perhaps we might find that a little difficult. We would require a certain amount of choice and freedom in our work. But just as every child in Class Five realises his Greekness, or in Class Six his Romanness, as it is being addressed by the teacher, so I have experienced that through weaving, pottery and basketwork they sense unconsciously that the possibility arises for them to be impressed by what the craft gestures are offering. They offer something needed in their own maturation, in their own biography, at that moment in time. And it may well be that the teenager will become a computer scientist in later life, but right now they need what basketry can give them. It belongs in the process of healthy individual development, at the time of adolescence, as a help towards maturation and the unfolding of individual egohood and freedom.

Now: craft, hand-power, hand-work. Of course it is only possible in as much as I come into some activity. I cannot think a basket into being. And so in a sense the threshold for all crafts is via the gate of the will. Activity has to happen, and of course there are many hurdles to be overcome. We know the passivity, the lethargy, the not-wanting-to; the awkwardness and self-consciousness which arises when a person is confronted with having to do something. As adults we sort of say "Well, I'm all thumbs". We shrug it off: we have a way of dealing with it when we make mistakes. But an adolescent hasn't got that ability to objectify the self, which helps adults to shrug it off, and so in that moment they are very, very exposed.

Last week I visited a blacksmith just outside Wakefield, and I was reminded of an experience I had as a child. On the way to my grandmother's house, where I used to go on Saturdays for extra tuition in reading and writing (because I wasn't very good at them), there was a blacksmith, who used to shoe horses. I always used to arrive at my grandmother's an hour and a half late. They were very tolerant of this because they

knew where I was. My bus just happened to stop before my grandparents' house, and I had to walk the rest of the way, past the blacksmith's.

You know, I couldn't get past it. I was literally spellbound by what the blacksmith was doing: the fire, the noise, the hissing. But above all I remember the tapping: the anvil percussion. I don't remember the presence of the elemental or fairy world in childhood, but I do remember slipping into a strange form of consciousness whilst watching the blacksmith at work. And I now know how it is to be at the other end, performing these gestures, and what is actually taking place. Because when you watch a blacksmith, a weaver or a potter, something akin to music is witnessed: something alive and appeasing, healing of itself, just through watching the gestures of the craft. There is grace in the movement of the blacksmith, although he may be a big, burly man with tattoos up his arm, as this chap in Wakefield was. When he spoke to us as a man he was quite different, almost scary. When he was a blacksmith he was suddenly transformed and he had a lightness and grace in his movements, and he really performed a kind of dance there. And out of this dance, of course, the shoe appeared, as would the basket from the basketmaker...

Now one could say that essentially what has happened is that through the mastery of his craft movements (attained through personal effort, not God-given), his 'learned good habits' have brought ideas out of the realm of the spiritual, (or perhaps one could say, out of the abstract realm), and been transformed, given shape and material expression. This is, in a way, the archetypal deed of the craftsman. He brings an idea into the physical world. An artist has to be a craftsman (learning how to use his materials, paints, etc.) but perhaps he raises materials to a certain level at which something original can arise. Craftsmen and artists are not totally separate: they are one in a way, but every artist has to become a craftsman, and every craftsman has to learn to be an artist, too.

In contrast to the blacksmith working, when we see a machine it conjures up a very different experience. There the work gesture is merely a mimicry of the abstract gesture. The movement is conceptualised and made possible by the machine, and the musical element is omitted. If you go to a modern blacksmith's workshop, the experience is horrific. Then you see what a power hammer does. Have you ever seen a power hammer? It's unbelievable: it's frightening. It does the work very efficiently, but it is quite without the musical element.

So how do we, as teachers, firstly acquire these gestures, and how then do we impart them? What is this process of osmosis almost, whereby we give the gestures to the students, help them to acquire them? What is the process whereby they are learned? Of course, at an obvious level, in the first instance I must perform the right gesture myself, and if I pick up my hammer today in my right hand, and use it with my right hand, and then tomorrow with my left, and then in the afternoon I change back to my right hand again, there is no way the apprentice or student is going to know what to do.

The process whereby habits are learned is really an enhanced form of imitation. You may have noticed that your own young children, if you have them, mimic your gestures, and seeing this you've thought, 'My God' That's me! This is because the being of movement is the gesture, and the pre-school child is most sensitive to what lives in gesture in the adult world. Not so much what we say as adults, but what we do, is influential with the young child. This is one of the reasons why Steiner indicated that the kindergarten should be placed right next door to the blacksmith's workshop, so that the children would be impressed by the activity of the work.

I'd like to point now to what developed as the archetypal schooling of the will, in the form of the Craft Guilds, where there was apprentice, journeyman and master. One started as an apprentice, not literally just sweeping the floor, although very often it was that kind of activity. I think that probably just being around the work that was going on, in the atmosphere of it, one just sort of came in from the outside. (It's interesting having workshops with adults instead of children the adults want to get right in and do the most complicated things on day one; they want to jump over many steps, which are necessary before one can sit at the basketmaker's plank...). And although I'm not suggesting that we should reinstate the five or seven years apprenticeship idea, I think if we could distil what was happening in this phase we might find a way, in the modern context, to bring that into our workshop practice.

So what was actually happening in the apprenticeship phase? Surely the first thing is that the student learns the movements, until they become a habit, unconsciously absorbed by his own etheric body. Now we know that in the initial stage of trying to learn a new physical skill, (whether it be riding a bicycle, working willows, or whatever), there is a threshold which is very critical. We feel very awkward, very conscious of the movements that are needed, and that causes us to be almost sclerotic in our gestures. This is because we are having to bring too much consciousness to a realm that should be basically unconscious. We were discussing this this morning, saying that in this realm of movement we are essentially unconscious. It doesn't mean we are immoral or amoral in the consequences of our will - not at all, we have to develop that - but we are, as such, unconscious. So, as I said, we experience a threshold of hyperconsciousness until we acquire new habits, and then the movements begin to flow.

It has happened in a workshop, several times, that a youngster has been experiencing that very threshold and says 'I can't do it'. He's frustrated, awkward. And then one day - it happens best after they have left off the work for a term - they come back, and you don't say anything, you just start work, and he suddenly says, "Hey, I've got it." It takes time to work into the etheric body, it takes time to sink in. There is value in not giving students too long a time on any craft, but saying 'we'll come back to it'. This of course raises the issue of how the work is programmed into the school curriculum. The apprentice has to interiorise the movements that have been personalised by the master. He takes from the master the archetypal aspect of the movement and interiorises it, makes it his own. And that takes time.

Then, after apprenticeship comes the journeyman phase, when he travelled around to see other masters working. What he has to learn in this stage is how to distinguish between the archetypal and individual elements in the craft of the masters he observes. He himself moves in this way from the archetype towards developing his own individual way of working, and this is what we are about in our work with adolescents. We are trying to help them to discover their individuality. We could say that the apprenticeship period is a time when the human individual will is ordered by cosmic will.

Now there is of course another very important element, and that is rhythm, connected more to our sentient being, having its place in the rhythmic activity of heart and lung. Every craft has its own right rhythm, which we adapt to suit our own individual disposition or temperament. I have to be very careful as a teacher of adolescents not to impose my own rhythm, my gesture, implicitly on the young person. I have, I would say, in the very early days of the teaching, that right to say 'you do it like this', and I know that it can subsequently be interiorised and adapted to become his own. As in education generally, we are not seeking to create replicas of ourselves, but particularly in the teaching of craft one needs to know when is the moment to let go, and allow them to develop their own right rhythm, their relationship to the work gesture. The rhythm of the blacksmith's movement is obvious, and so it is with the weaver: maybe it will become obvious, when I show you where the basketmaker's rhythm can be found.

A third aspect arises now: where is the conceptual dimension in craft teaching? How does craftwork performed in this way help to develop the conceptual life of the young person? This seems contradictory to what I said before, namely that consciousness does not truly enter into movement, since our conceptual life is conscious, of course. But the conceptual element I have in mind is expressed ultimately in what we see made manifest as form. That form is the conceptualised aspect of our thinking life. In other words, I have a picture of this basket in mind, and now there it is. Of course there are times when I allow free creativity; something new comes about, in the realisation of which I again enter into this area of conscious thought. The head comes into play, as it were. It is the realm whereby the thought is brought, through rhythm, into matter. It is a three-fold path, and it is intrinsic in every craft and every aspect of craft.

I will now take three archetypal crafts, and try to describe where in them these three areas of human experience live. The three crafts I have chosen each have an accent towards one of these areas in particular. Let's take pottery as a first example, particularly the modelling side of pottery, where we process the clay the wedging of the clay in preparation for use. If you think about it, you have a hard, solid old rock, dead matter, which has been subject to a long process of decay, and now it is made ready by the wedging process, ready to receive form through the movement of the hands of the potter in the activity of modelling. I don't mean the decoration of the clay or the slip-glazed painting, but the forming, impressing, modelling, sculptural processes. This is not done so much with the fingertips it's done with the palm. This is will activity. It's like making bread, like the kneading of the dough. The will is carried along with the rhythm, but it is essentially a

will gesture. That gesture of impressing the matter with our hands is foremost in our perception of someone doing this. Pushing, pulling, resistance all these belong very much to the exercise of the will.

There is also, however, a thinking quality, and, feeling too, expressed via the artistry, the way we decorate the pot, the colours we choose to glaze it with. This activity raises it into a different realm. So you have on the one hand the will activity in the formation, the movement of impressing the clay, including a rhythmic component in this activity; the conceptual factor appears in the idea expressed in the eventual shape, form, design of the pot; and the rhythmic factor, the feeling quality, is principally expressed in the decoration, the artistry.

Now if we turn to weaving on a loom, the most obvious movement is a repeated rhythmical one, up and down with the beating of the baton. With the archetypal warp and weft, the rhythm consists of up and down and in and out, and the large shuttle moves from left to right rhythmically. It's well known that weavers dream off, as if they are out on the sea, as they weave away.

There are many songs and sagas that illustrate this element of semi-consciousness in the activity of weaving. (Spinning is very different: we spin thoughts...) So the weaver's gesture lies very much in the middle realm: it's a rhythmic, breathing process, in a two-dimensional plane. The cloth spreads like a sea in front of the weaver, and in the workshop the students settle into their own 'boats' their own looms, and become part of them. The social interaction in the workshop has to go away for a while: you can't chit-chat. You get into your own boat and go out to sea.

There is also the thinking element again here, however. Once one has mastered the rhythmic element it is necessary to grasp, via logical thought, the fact that when different threads are picked up different weave patterns come about in the cloth, and this is determined by a set of numbers. I have seen "special needs" students who cannot read or write or do arithmetic, yet they can interpret the series of numbers on the head of the loom which correspond to the foot pedals, and it has been a mystery to us all how they do it. But it is not the head working with those numbers - it is the feet. Again here we have a conceptual element being introduced to the student via the will, in the feet, through the movement of the pedals, which also imbue the cloth with this thought or idea, or pattern.

Now we ascend to knitting. Rudolf Steiner said to teachers, "What can we do on the first day of school?" And do you know what his answer was? 'Let the children be aware that they have hands' That is exactly what he said.. 'Hands with which to work'. And then he said 'You must do knitting'. If we take the rhythmical movement of the weaver and then minimalise it, bringing it up higher and working with the fingertips, then we are knitting. To drop a stitch is terrible! Of course some children don't care two hoots, but the majority of them are devastated if this happens, and it must be put right at all costs. Now we do knitting in Class One, not because it represents the beginning of the craft curriculum, but for a specific reason. We are using here the digital part of the hands, the fingers not so much the 'will' part, which would be the palms, (the hands are also threefold, like the whole human being). We are using the part of the hand that we use to count - we don't count on our palms - and this is the thinking area of the hands. The interiorisation which accompanies the movement of knitting will help to develop a healthy conceptual life in adolescence. In fact in the *'Supplementary Course' (Waldorf Education for Adolescence)* Rudolf Steiner said to teachers as they went into the upper school, 'You don't need to worry about the development of intellectual faculties of upper school pupils: that is the job of teachers in the lower school. What you have to do is help them to become aware that they have hands and a body, which are their new instruments of learning'. That says it all, because what has been attained through movement, rhythm, poetry, through knitting, in the lower school, all that is interiorised and works upwards through the child towards the soul-spiritual nature. In fact it is a basic pedagogical law that if you wish to address the soul and spiritual nature of the child you should introduce activity, move into rhythm, into walking, stamping or clapping. If you want to address the physical body (and this is how as a teacher you can put your children to sleep, or make them go blue in the face), if you wish to work almost curatively (and in my work I have to be very aware of this), you sit the child still and tell them a story. You feed him imaginations, you enter via that imaginative world, and these imaginations are digested by the child and assimilated into the physical realm, to such an extent that one can thus actually heal the physical body. So, you see, one works with what seems to be the opposite pole, the opposite way round. We all know it as adults, we've just never thought about it - we're all stressed out, we have problems:

personally I like to go and dig the garden, get into movement, go for a walk. (I know we also say 'sleep on it', but I am here referring to getting to grips with ourselves through movement, through activity).

Now we shall go on to basket-making. We have in Aberdeen a piece of land which we are able to use for the purpose of growing willows. I know some of you are keen to set down a plantation of willows, and afterwards we can carry on that discussion if you want more information on how to do it. But it is of course, a craft that allows for the possibilities of work within the context of the landscape, with the cycle of the seasons, and also work in the workshop. I can illustrate this.

It depends of course on the time of year when the students from the Waldorf school come, whether we are cutting, harvesting, or whether it's the stripping time in spring. There is a lean time for activity, which is the summertime. But the last group I had came out in the Autumn term. On the first day I like them to go out to the willows and then come to the workshop via that experience, rather than enter the workshop and start working with materials straight away. To begin with they are all hyped up and excited, coming to a new workshop, and so when you say we're going out to see the willows their faces drop, because they thought they were coming along to do something. We have to go way down the hill and down a track, and gradually we get nearer and they see these things growing there, and gradually they become captivated by it. At first, being out on the land, on a farm, is a bit dispiriting, but give them a row to start cutting, and 'Oh, dear!' what a mess': Willows here, there and everywhere, total chaos! Of course you told them exactly how to lay them out, with the butts all going the same way, with one person picking them up and another taking them to the barrel, grading them. You take the tips and shake them out, then go down a foot and grade them into piles of different lengths. It all seems so easy... If they mix the butts and tips together the wrong way round it doesn't work. When you come to grade them in the first instance, so you start to meet the consequences of your slackness straight away. A lot of craft work is about that, about suddenly realising what you have done or not done, and carrying the can for it, and saying 'I did that', or 'I didn't do that', and it is easier to accept as feedback from the materials rather than from the teacher, parent or whoever is saying the same thing.

So, willows. In the very name of the plant we have water, 'wil-low', with the 'l' sounds. Of course willows like water - essentially they grow on water and light. It is known that most willows actually put back more than they take out of the ground. It is a watery plant. The 'l' sound gives us the rising of the water, the sap, up to the growing, tip. On a good day, you can actually watch them grow and almost hear them growing. You saw in the album the sets which we planted in the spring, 30 centimetres long, set down in April or May in Scotland, by autumn were six, seven and eight feet tall, just in one season's growth. And there is something exciting about that. There is vigour, vitality, which the students are unconsciously witnessing.

Now, having been harvested, some of the willows are dried. This one has been dried with the bark on, you see. And then it will be soaked, mellowed, before it is used. Some others are pitted, put into water, (a stream or a bath), after cutting in about October or November, when the leaves fall, and left there over Christmas until early spring, and then all the buds will start to open up and catkins develop. And that's the time when the cambium cell layer has swelled away from the wood and allowed the new growth. That's the point when you can strip the willow to obtain the white willow, the natural wood colour. Most people are familiar with the buff colour. This one here has a brown colour, and this is achieved by boiling the willow for eight to twelve hours with the bark on, at any time of year it's dried, and then you strip it. Different colours - brown, chocolate, purple, almost blackcurrant colour, can be achieved by steaming the willow with the bark on for an hour or two in a vat of boiling water.

There is quite a lot involved in the preparation of the willow, and it is wonderful if you can have the opportunity of stripping the willow outside. Again you get this 'But it's not basketmaking...', but once they have done one they realise, and it becomes addictive. I have been on the streets in Aberdeen with the youngsters, and they demonstrate to the general public. People come up and have a go, then they don't go away!

You have a thing here called a willow break - it's two rods welded together, or one continuous one with what look like ram's horns on the top, and you slap the butt end in and pull it, and that squeezes the wood, and when it springs back it bounces the bark off. Turn it round, and then you slap that end in, and the idea is to get it off all in one go. In the end they very much enjoy it. The other side of the matter is, of course, that if they do it wrongly and if they don't pull right there are lots of possibilities for mistakes - they end up

fracturing their willows or bending and kinking them. And then when they come to make the basket they have all this material which isn't right, it's fractured and broken, and they think, 'If only I'd taken a bit more care'. It's a bit like the weavers when they prepare their warps. If they make a mistake at that point, later on when they come to do their weaving, they know about it.

So, the atmosphere when you come into the workshop is of course very specific to basketmaking, as it would be specific to any particular craft. There's a smell, which is probably the first thing that people notice. It's a honey-scented, sweet smell when you've got the willow mellowed to the right degree. There can be also a rather nasty smell, particularly in the summer, when it's difficult to avoid, which is the smell of the mould. It's a musty smell, but still mellow, sweet, and which has a sort of uplifting quality about it that most people can enjoy. In fact it's the smell of the salicylic acid. When you boil it and it steams off it is very, very pungent, and people ask what it is and begin to sniff, and when told they say 'Oh, very nice....' It's the stuff they make aspirin from!

When the Class Nine students come into the workshop they get a little record book to keep, with drawings, illustrations of the basketwork process, and for their own work, their own designs, to go into as well, and they take it away with them as a record of what they do, because I like them to come back and pick it up again. We start at Class Nine, which is of course the time when we introduce the crafts, as opposed to handwork. I can't go into that now, but that is the point when leatherwork and basketwork come in to the curriculum.

Now let's look at the actual process. Having soaked the willows they are mellowed under blankets, under cloth. That sort of sweet smell pervades the whole workshop. It's a pleasant smell. You see in all craft work we're not just developing skills: all the senses come into play. Each rod has a butt end and a tip end, and in the terminology given to different parts of the basket we have a certain mirroring, of the human being: back, belly, butt end... There is something in each individual willow of uprightness, and it also has elasticity, tension, and I can really feel this inner tension when I bend it. This way it feels really floppy, that way there's an inner tension. I can feel its dynamic inner elasticity, which calls on my will. I have to exercise my will to actually put this rod in place, because it seems to have a will of its own. They will go all over the place if one dreams off to sleep. Now, in basket terminology you have a foot track, on which the basket stands; you have the sides of the basket, the crown or border, and in this case you have a handle to finish it off. What you actually have is an expression of something that lives in this middle realm of the human being. The basket is a sort of extension of our hand, of our conveying faculty, a limb function of course, but it's also part of our middle realm. Bringing the basket into balance as you carry it also presupposes that you have an inner balance of your own, so it has to do with that human quality also.

The whole of the process of basketmaking, which I am trying to show you, mirrors very much this middle space of the human being. The basket is like our ribcage, with its own place in the centre, its own heart space and rhythmical elements, And in the process of weaving the basket there is a spiralling gesture; the woven materials are working their way round, creating their own space, so you have in front of you a volume being created.

Now I can't demonstrate exactly the posture of the traditional basketmaker because it is indeed actually on the floor, or raised up just a few inches with a piece of box or by sitting on his *sandwich* box or a cushion. And he is usually seated somewhere around the outside of the workshop, with the basketmaker's plank in front of him. Interestingly, what happens during the process of basketmaking is that the craftsman rises from an initially horizontal working position - like a sleeping posture, perhaps - towards a much more conscious, upright position as he works nearer to the crown and border of his basket. We have benches in the workshop which keep the same elevation; they are raised to this height with a little stool, so you are actually in the authentic position but just raised up a little bit. The traditional posture was too difficult, and many people say to us, 'Gosh.' How awkward and cumbersome that way', but that's ridiculous because these positions have evolved over centuries of craft work. As in every craft, there's a right way to do it.

Now, how do we start? Well, the real threshold for entering into basketry is the grading and selection of the willow rods for the basket. The student is not expected to do that because he doesn't know what he needs. But once you've got that far the first thing you have to do is choose the different sticks you need for the

various parts of the basket. This requires judgement, foresight, planning, making a design or drawing. (This element is present in most crafts).

This bundle was actually put together by a student. It's supposed to be made up of rods of the same thickness, and yet it has some thick and some thin, which would make life very difficult for an unskilled basketmaker. A student might tie a piece of string with a peg, for a gauge or measuring rod, and as long as he doesn't let go he can manage, but if this one slips the whole lot starts changing. It's the whole question of preparation and care. It's not possible to do it by eye. It starts out being by eye, and some people get out the callipers and start measuring. But in fact it's a tactile thing you start with your eyes because we're all trained to use our eyes as our principal aid to thinking but eyes are deceptive, the most deceptive sense a human being has. They don't always tell us the truth, and that's why blind people can make baskets very aptly.

So you select your materials and you have it all there, and you're ready to start. Now we talked about a thinking element which enters weaving through the pattern, and there is also that same element in basketry. There is logic needed in weaving materials together. Mathematical law comes into it, and you suddenly find that there are some students who are fascinated by it, and they really get into numbers. So again, to start with I would have to tell the students what they need, and I'll begin by demonstrating the most simple, basic processes. The point of entry is a very conscious one. What I'm going to do is thread the six base sticks through each other. I'm not going to weave, I'm not going to fall asleep, I'm going to have to be very, very conscious.

You take one rod; you find its tension. And if you can imagine it, that is going to be the inside of my basket. This is going to be underneath the basket, the crown of the base. Then I put it on the board and judge a point at the centre of that rod, and I pierce it through. There's hardly a more conscious feeling than that. Some students suddenly hesitate 'Oh, teacher, where's the ruler?' because they need the security of a precise measuring instrument, but I don't have a ruler in the workshop for that reason. I've thrown it away, because what you really need is to judge, or approximate, because until you can do that you can't really be accurate in using your measure. You can use callipers or digital rulers, but do you really sense that measurement? Then you have to do that to all six. You pierce the three and I'll show you what to do right from the first stage. What you get is all sorts of combinations of that possibility. You end up with three of these and you think, 'How do I get them together?' It's an absolute nightmare. Then these other three go together, butt to tip, thick and thin. That's what's called the slath; you use that tension for a good crown on the base. If you don't achieve it, when you put weight in the basket it bellies out. Some baskets are made wrong, and they rock, because that hasn't been taken into account. Then the slath is tied together so that you make a cross first of all in very conscious form. Then you start to tie the slath together, the tip ends of two rods are used to start with. Now this is the beginning of the spiralling gesture, but you don't experience that yet. Now this cross formation is transformed into a star, and then comes the geometry: twelve o'clock, six o'clock, three o'clock, nine o'clock etc., and those don't move, you move the other rods into the spaces in between them, and by the time you've finished weaving you've actually got equally spaced base sticks in the fashion of a star. Of course the mathematical geniuses amongst us will know how many points there are on this star, but it's amazing what diverse answers you get when you ask the students that same question! You know you started with three thick ones and three thin ones - you put them through; now how many have you got? They say 'One', 'Two', 'Four', 'Seven', etc., and these are pupils from the Waldorf School. You wonder what on earth has been going, on all these years.

The base is woven to the required width producing this flattish shape. As they say in the cookery demonstrations here's one I made earlier... You would then have a base like this. Trim off the butts carefully another very conscious activity, (if it's not you ruin the basket or cut your finger off). Then you'd have something like that, a base, and that's where it starts. You can see the crown. That is of course where the archetypal sense of convex form comes from. It's a ceiling, a celestial dome which is mirrored down to the human being. In this case it's going to become a foot, a base for the basket to stand on. Now we have to prepare the side sticks, as they are called. And at this point I need to know precisely what shape of basket I want to achieve, whether I want a sort of belly-shaped basket or a straight sided one. If you look at an angle you can see the difference. Depending upon what I want I now make a slight cut on the butt end of the willow, either on the back or the belly side. This procedure is called a slipe, and it's done using the curved end of the knife.

This is of course an amazing threshold for the youngsters. In the end they all come round to doing it. Here you start pulling this way with the right hand, and exercise a bit of antipathy with the gesture of the left hand, balancing it, resisting it. It's about balance again, and I'm pivoting like this and then it works easily. You have to have a very sharp knife to do it properly, and having got the sharp knife and the technique you now have twelve base sticks. Now I'm going to 'stake up'. I need two rods for every base stick, so I need twenty-four, so prepare twenty-four. Then you take the base, the butt end, and grip it with the left hand. You place it next to the space here, and with the right hand you use a sliding, pumping action towards the left. And the girls say, 'Oh, it hurts sir!' Adults particularly are very good at finding other ways of doing this operation, and I usually have to go round afterwards and firm them up...

This is the stage of basketry when you can really run away with yourself. Imagine half a dozen students doing this in the workshop there's chaos: It's amazing to see it. And this is only making a small basket; imagine how it would be if they were making long baskets, with eight or nine foot lengths of willow.

You remember we started with a cross, a very conscious gesture, which we worked to a star, which is a radial form, and then that form is accentuated. Traditionally it's done like this - it's called "putting the back out". Imagine, the students are in here, hot and bothered and doing all this, and then they come upright again and look at it, and they say 'It's a sun.' or 'It's a spider.' Suddenly a picture emerges. The sun is of course the archetypal symbol. The basket is turned over and then the side stakes are picked up, in a gesture which is two movements, a pricking down and up at the same time, all around the basket. They will then be gathered up like this and tied in a loop at the top, and then you can begin to relate to this space in front of you as a basket. You have gone from two dimensions into three.

I usually have a dumb-bell with a hole in the middle, which goes into the basket because you need a little bit of weight there, otherwise it tips towards you as you pull on it. Now comes the more typical part of basketmaking which people normally have in mind when they think of the craft. They don't see all the other that led to this. In this process you have many possible variations, as with textile weaving. But to begin with you take the basic, most archetypal form of weaving, which is in and out, or in front of one and behind one, which is technically called 'randing'. It becomes a weave pattern, with the butt starting off the next consecutive space to the right, one at a time. Now this is where the mathematics are helpful. Many people can't understand why, if I have an even number of stakes, when I get back to the beginning again I'm off on the same track as before. What that produces is one willow rod wrapped on the outside and one stuck on the inside. So you realise that you need an odd number. It's the same with weaving. Sometimes you need to take numbers divisible by three and add one, and all sorts of things, in order to achieve patterns in the side of your basket.

At this point most people quieten down, and it becomes a love affair almost, between you and your basket which is emerging out of this rhythmic spiralling of the rods. You see how left and right hand work together with a sort of giving and receiving activity. I always say that the thumb is the most important part of the basketmaker's body, because the thumb does the pressing in. The thumb is also the digit of the will. It's not two hands climbing up like a monkey - that doesn't work. It has to be done with a rhythm, which again you can't teach intellectually. You demonstrate, you do it..

This activity carries itself once you get into it, but to start with it is awkward - dexterity is needed. I have had students who are ambidextrous, or cross-dominant, and you get a situation where the left and right hand can't work harmoniously together, can't cross over, or can't give to one another. You get a focus on the left hand trying to do something, and the right hand goes to sleep. Then the right hand will come up and do something, and the left either comes up or does nothing at all - and so it goes.

Now we must stop here. This would then grow, and a border would be woven at the top, and handles could be put on. But even now you can see the space being enclosed, and it is this facet of basketry (apart from the challenge that the actual material gives you, the creation of order out of chaos), this balanced space, this body, which is so important, which has its own being. In fact the Indians recognised this in their mythology: baskets were always buried with the person who made them for that very reason. The person was ensouled, encapsulated, in the basket. He needed that basket to make the journey to another land after death.

N.B. The use of the masculine gender ("he/him") is intended to be understood throughout as he/she, him/her.

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Agriculture Main Lesson and Botanical Excursion - Linda Jolly

In the beginning of the seventies, an expression emerged which was soon adopted widely in the entire Western world: namely, 'ecology'. Initially this term described the relationship between man and animal as well as the place where there was life (*oikos* - Greek house). But this original meaning increasingly came to encompass the relationship between man and nature, between individual human beings and groups of human beings (social ecology). At all events, the focus of interest are directed at the relationship between living organisms. This attention on relationships, i.e. on something prevailing between certain entities, points to a new way of looking at things, and at the same time to a shift in consciousness compared to the more traditional attitudes of earlier times.

Thus we are confronted with a question in our schools which is both legitimate and important, and that is: "What are you doing about ecology?" Of course one could respond to it by saying that the whole of Waldorf education is based on essentially ecological ideas, but what the students want to know is what our schools are doing in concrete terms to tackle ecological problems.

As a teacher of horticulture and biology I have had ample opportunity to learn from the pupils themselves what they associate with the word 'ecology'. Ecology to them means information about environmental problems, e.g. the pollution of air and water, etc. There is certainly no lack of awareness of this kind of 'ecology' among the pupils and one could easily be tempted to contribute even more to this type of information and awareness in the school context. Yet the multitude of catastrophic news items pouring out over our children today is apt to engender discouragement and pessimism - a fact acknowledged by many educators today. Young people long for real experiences of nature and what they want to feel is that they can do something towards saving nature. So the question must be: What can schools do to enable children to experience positive ecological actions of humanity in nature as a counterweight to all the disaster reports? How can we help the children to experience nature at a deeper level and attain a better understanding of the relationships between all living beings?

In the following I am describing some of our work outside the Classroom, i.e. some of the things our school in Bergen, Norway does outdoors, in the context of our Class 9 agriculture main-lesson, as well as the botany excursion with Class 11. Both main-lessons aim to meet the pupils' need to experience nature for themselves and to gain some insight into the web of relationships which intimately connect our own existence with nature.

The work experience part of the agriculture main-lessons needs sound preparation in the Classroom. After all, children should not just be sent out to work on the land without the preparation necessary to understand the manifold connections of rural life. Hence, at the end of Class 8, the Classroom part of the agriculture main-lesson starts with a historical survey of the development of agriculture (early settlement, domestication, plant cultivation, etc.) which will not be related in greater detail here.

Agriculture main-lesson - beginning of Class 9

After the summer holidays, Class 9 pupils, together with a number of teachers, go to spend some time on a biodynamic farm with mixed husbandry (Skillebyholm in Järna, Sweden). The main-lesson is now continued, following on from the previous term's introduction to the history of agriculture; now the focus is on the development of agriculture in northern regions where everything began a few thousand years later than it did in the civilisations of antiquity. As one travels through those landscapes of Norway or Sweden today which were developed and cultivated by man, it is not an easy thing to imagine that once upon a time the great woodlands were only broken up in a few places by a mountain peak or crest, or moors in some cases. There was no open land. It was the need for pastures for domestic animals as well as arable land which led to the creation of open spaces by means of fire clearing. This type of ground clearance has been confirmed by the sampling of pollen preserved in the moors. From this we also know that the original deciduous forests were relatively poor in species - about four species per square meter. These early plant communities had to make way for pasture plants comprising 36 species per square meter. This was followed by the development of meadow plant communities comprising 42 species per square meter. Alongside the plants there also emerged insects, small animals and birds, which found new sources of life there. Here we

find motifs that are of relevance to our pupils: greater wealth and variety in nature was created through the work of human hands. The great wealth and variety still preserved in the landscapes of Scandinavia is made up of a mosaic of woodland, pasture and arable land. However all of this is not a product which, once created, will last forever. Such land use needs continuous cultivation. Without cultivation and without domestic animals, the uniform woodlands would take over again. The pupils can see this for themselves in nature and hence also understand an important viewpoint in the present public debate. What is at stake is the future of agriculture in the North. Together we devote ourselves to the study of some of the major meadow plants which are dependent on open land and we discover a multitude of organisms which in turn depend on these plants.

Then we continue our studies of the development of agriculture in the North and learn about the way of life on the large family farms of the Viking age. The important aspect to point out here is that all the fields were worked for the benefit of the whole community. In the Middle Ages the Cistercians played an important part in developing the cultivated landscape by draining the water-logged land, channelling rivers, terracing steep hills, planting superior tree species and introducing medicinal herbs and vegetables, and probably also fruit trees and berry bushes.

The beginnings of 'modern' agriculture was associated with the introduction of the potato in the 18th century. The potato, an immigrant from the age of discovery, had been known in Norway for several generations, since 1750, before its value as a foodplant was discovered in 1820. This is when harvests of four times the weight of grain fruits were achieved. Then it was discovered that one could do more with the potato than merely eat the tubers. Potato *schnapps* became a surplus product of big farmers, and thus the foundations were laid for a profit-oriented agriculture and the production of trade goods in the place of a craft which created a basis of life for generations of people. The production of spirits represented the beginning of specialisation which took the place of the earlier forms of natural and self-sufficient husbandry. This gives the pupils the basis for an understanding of how the agricultural reforms of the present are linked to the industrial revolution and the mechanisation of labour.

Fertilisation was a central task in the agriculture of the Middle Ages and it was regulated by law. The earlier *Frostatings Law* (about 950 A.D.) provided for fertilisation in four-year-cycles. Animal husbandry (number per acre) was regulated by law in order to prevent soil impoverishment. Maintaining a state of balance between animals and arable land was considered essential for maintaining soil fertility.

The mineral theory of Liebig paved the way for a radical change in fertilisation patterns. Liebig's analyses identified three chemical substances as promoters of plant growth. Phosphorus and potassium could be extracted by mining. The limiting factor was nitrogen. When it became possible after the First World War to produce nitrogen fertiliser industrially, agriculture and animal husbandry could be practised in isolation from each other. Thus, an ecological balance that had been maintained over several thousands of years began to shift.

The pupils will then learn about the group of farmers in Silesia who found that the introduction and increased application of artificial fertilisers led to problems in relation to animal fertility as well as to higher levels of degenerative diseases affecting cultivated plants. These farmers asked Rudolf Steiner for help to better understand these phenomena and to create new foundations for a profitable way of agriculture. Working on the farm itself gives the pupils an opportunity to understand in real terms what Steiner's concept of the farm as an organism, with a location-dependent state of balance between farm animals and plant production, actually entails. By now the pupils will have met all the 'inhabitants' of the farm and will have grasped the fact that its variety is the most important foundation for an ecologically responsible agriculture.

The main-lesson subject in the final week of our agriculture work experience project is the supply of foodstuffs in industrialised and developing countries. Against the background of reports and articles in newspapers and magazines as well as the fundamental question of "Why do we have so much and they so little?" we study food production from a global perspective. The use of non-renewable energy resources in conventional Western agriculture is compared to the so-called primitive systems of agriculture as well as to systems of agriculture based on ecological principles. We also study the consumption of natural resources in the production of animal produce - meat, eggs, cheese and milk - which are consumed in massive quantities in the West. This is followed by a comparison with the consumption of resources in the context of plant-based production. We also take a look at the energy costs incurred on the route from the producer via the

shops to the consumer. We pay close attention to the EU-debate about the free flow of goods and prices, as well as the agricultural situation of the developing countries in their former position as colonies and their present function as suppliers of certain raw materials. Questions of ownership, debt policy and the involvement of multinational companies must also be raised in this discussion.

In spite of the fairly comprehensive study of the development and position of today's agriculture, practical work is the most important element of our project in the country. Tackling practical tasks in all areas of the farm gives every pupil a proper experience of working together with nature to a set rhythm of time.

The pupils usually work in groups of five to six with one work leader from the farm or else a student from our Upper School. Students from Classes 11 or 12 or even older youths serve as good examples and encourage the younger ones to do their best. From a social point of view it is of great importance that the older pupils act as guardians for the children of Class Nine. In addition, some of our oldest pupils experience for the first time what it is like to act as teachers.

Artistic exercises are one part of the social ecology of this enterprise. These are either in music or theatre production. At the end of our sojourn on the farm we offer the results of this artistic work to our hosts as a leaving present. Practical work on the farm, evaluation of today's agriculture methods in relation to nature and joint artistic exercises combine to make the agriculture main-lesson a memorable experience that many pupils look back to with fondness. "This is how we should live every day"- a comment I would heartily concur with.

Botanical excursion with Class 11

The main objectives of the botanical excursion with Class 11 are working with nature experiences artistically and cultivating the perceptive faculties of the senses in a systematic manner. To this end we go to an island off the coast, at a time when the flowering period is at its peak. We take with us water colour paper and sketchbooks as well as plant identification books and magnifying glasses. We are aiming not just to become familiar with individual plants but also with an ancient landscape developed and cultivated by man, some of which is still preserved. Landscape as a kind of changing background scenery of our daily life is a state of affairs we often barely notice. We race through the landscape by fast means of transport without becoming aware of our environment.

It is the unusual and especially strong impressions which occasionally provide us with a nature experience, such as autumnal woodlands glowing in rich colours after a frosty night or leafy trees opening up to the spring sunshine in tenderest shades of green. That is why it is necessary that we go out into nature and experience things of this kind. Only then can we appreciate the untiring work of previous generations, through which our cultivated landscape with its special composition has been created.

Our very approach to the island on the school's sailing schooner makes for an excellent start to this work. Sailing along the coast there are a lot of things to be discovered. The eye rests with pleasure on places where people still work the land and animals are put to pasture. The most beautiful and picturesque parts of the landscape can usually be found there. In selecting a motif one would normally start from the contrast between the open spaces created by human hands and the powerful untamed aspects of nature surrounding them. The old vicarage on the Fjelberg island where we are going to spend a week, is such a site: a little jewel in the shadow of a powerful *fjell*.

On arrival at the vicarage we start our painting exercises in order to then discover the landscape in a different way. We start with the meeting of light and dark (yellow and blue) on a sheet of paper. The diluted colours intensify at the opposite edges of the paper - an exercise which is not exactly foreign to our Waldorf pupils but can still engender something of an 'ah'-experience in the face of our green-clad landscape. On the basis of the imaginary landscape that now arises on our painted sheets of paper, we go out into the open and paint a picture of what we see. We can see how the light of the skies meets upon the heaviness of the earth, producing many shades of green on the horizon. A further step can be accomplished by practising with tones of green alone. How many nuances of green can be created in such a composition of colour? How much red is there in the green of nature? How far does green extend towards blue, red and yellow without losing its green? Afterwards one can take one's sheet of paper outside and paint the nuances of colour observable at the transition between woodland and meadow or between the many different types of plant that make up a

hedge. In all these places one may experience 'seeing green for the first time'. All of a sudden, even the monotonous green of a commercial pine forest may speak a different language from the richly varied green of the neighbouring forest of leafed trees.

A blossom might stand out from the veritable sea of shades of green formed by the rounded roof of a deciduous wood. It will strike the observer as a foreign element, as something of a revelation. We come closer to that kind of experience through a painting exercise where certain areas are left blank in a 'sea' of green. Applying clear colours to these blank bits will bring to light the blossoms in a flowery meadow or a rhododendron hedge or even a rose bush! The colour contrast we experience by means of such exercises helps us appreciate how difficult it was for people before Goethe's time to understand what the blossoms actually have to do with the green from which they burst forth. After all, the blossom was so different from the rest of the plant that its connection to it was not taken for granted. It was Goethe who first recognised that the entire plant is formed out of the elements of stem and leaf. He saw that the calyx and petals represented metamorphosed forms of the leaf element. In the case of yellow and blue blossoms this can be understood without undue difficulty through colour exercises. In the case of red, it is helpful to occasionally examine individual petals or single reddish tinted leaves of the remaining plant. And whoever tries to capture plants in painting will invariably find, whilst mixing his green from the basic colours, that every plant green has an admixture of red besides yellow and blue in it. In other words, the red blossom is already contained in the green of the rest of the plant in a hidden form. With this new experience in mind, we can now go out again and capture our impressions in paint - for instance of a natural meadow in the midst of mountainous terrain or of a strip of vegetation along a path. This can then be compared to an artificially fertilised piece of grassland.

What are our colour experiences in different locations?

We use chalk and crayon in order to highlight particular situations. We go out into an oak wood, for example, with dark paper and white pastels. If we then find a place where the gnarled trunk of the oak tree and its branches contrast with the lighter leafy sections, or with the sky above, we have an ideal motif for reflecting the form and character of the oak. Hatching the light areas of the motif will give prominence to the peculiar, heavy dark form of the oak. In other places we might notice how the light trunks and leaves of birch trees shine out against the darker background of the oaks - more impressions to be captured in charcoal drawings. In this case we work with the motif by hatching the dark background and leaving blanks for the white slender stems and the tender veil of leaves. Such exercises are an opportunity to work with the relationships between the different elements of a landscape, with the relationship between colours, between light and dark. This gives a sense of something as a whole, as opposed to being fixated on an isolated object. Thus this method is appropriate to the ecological way of looking we desire to attain. In the exercise with oak and birch a familiar form engenders a new discovery through the work with the spaces in-between. After an exercise of this kind the pupils have a wholly new basis for understanding the essential being of different plants.

After a few days of working systematically, the pupils may feel more free to find their own motifs in the surrounding landscape. It is important on such occasions to learn to perceive with the eyes and colour sense of others. For this reason we pin up our paintings every day and look at them together.

The pupils are also expected to notice details and become familiar with individual plant species. Drawing with pastels can be very helpful for learning concentrated and exact observation. Every pupil is supposed to draw up to twelve different plants. This also involves detailed drawings of different leaf shapes as well as sketches of petal configurations. Only after drawing several plants do we start using identification keys and discussing scientific Classifications.

Leaf metamorphoses are a further subject of separate study. The leaf shapes emerge best when painted black on white paper. The spectrum of variation resulting from each pupil's series of leaves provides a good basis for discussing common 'themes', i.e. relationships between the plants. Through drawing we find a common expression of the characteristics of related plants. This is preferable to concentrating on outer features which are often misleading. The pupils discover that rhythm, balance and harmony inherent in the world of plants can speak as evocatively as poetry. Auguste Rodin expressed it like this: "It is the artist who is truly familiar

with Nature. The blossom engages him in a dialogue through the graceful curve of its stems and the harmonious play of its colours. Each blossom has an inner word bestowed upon it by Nature.”

In conversation the pupils can also practise to perceive one another whilst practising plant perception. We start off by studying a certain plant together and go on to discuss the drawings we have pinned up. Now we discover how difficult it is to attain a sober and objective view when the imagination takes over. Others find a certain inner resistance to entering into the flow of movement and colour. The pupils help each other to overcome their one-sidedness and note their own progress from day to day.

At first, many pupils display a certain amount of anxiety and scepticism when faced with the task of practising a natural discipline in this manner. But the joy of discovery, as well as the feedback provided by artistic activity, invariably results in a positive working mood. The work day is frequently a lot longer here than an ordinary school day, but the pupils take this for granted. Their responses speak for themselves. On returning to school we arrange all our work in an exhibition which enables the younger pupils to share in what the older ones have been engaged in.

Ecology has something to do with the relationship between things in living contexts - with relationships between organism in the landscape, between organs in the human body, between people working together. Our excursions with Classes 9 and 11 make it possible for the pupils to become conscious of a positive and constructive relationship between man and nature. However, the whole enterprise will only be successful when there is real working together between the individual pupils as well as between pupils and teachers.

The Class 9 pupils grow through the work they carry out together with their teachers. They discover that the well-being of nature is something for which adults, too, are willing to sweat. The pupils from Class 11 appreciate a way of working together which involves their natural science teacher in the same amount of effort in producing drawings and paintings and where art teachers, too, have to struggle with Latin terms and identification keys.

On the final day we concluded our observations in the following way. The entire Class walked the whole of the terrain and each work team presented its particular section of the land examined to the rest of the Class by way of discussing the results of their joint research work. Thus the entire course of vegetation development was shown once more - stage by stage. The pupils' drawings and paintings were arranged to reflect the order of that development and exhibited in the study room - beautifully documenting twelve years of artistic contemplation.

In this way we tried to slowly approach and grasp the essence of landscape development, with the aim of recognising the growing process of an organic entity, the unfolding of a landscape organism.

It seems extremely important to me that young people especially, who are expected to find their own bearings in the world in the near future, and who will in many cases even go to university, have a full understanding of the organic into which have flown their very own perceptions and experiences. I consider it important that they are enabled once more to grasp what has been experienced in thinking before they leave school to enter into a world where they will be exposed to all that life has to offer in terms of the abstract concepts and ideas of modern science.

Especially in the field of ecology where there is a lot of talk today about holism, or even the ‘organism of the forest’, ‘lake’, not to say the ‘organism of the earth’ it is of paramount importance to recognise fully the actual materialistic-mechanistic content of many, rather symbolic, references to ‘eco-systems’. For the very same researchers who sell ecology as a holistic science will, in most cases in their lectures and publications, explain evolution or the process of succession in terms of actions and reactions of individual parts where, in the sense of a Darwinian struggle for existence, only the accidental advantage of survival fitness determines the individual being's overall course of development. The fact that in a succession, for instance, the later plant species substitute those preceding them, is usually explained by pointing out that the latter were more competitive under prevailing conditions of maturity and therefore pushed away the earlier ones.

If we applied such reasoning to the concept of organism in the case of an individual being, we would arrive - in analogy to this idea - at some utterly absurd statements: the second teeth, for example, would have to be

viewed as competitors of the first teeth, or the replacement bones in man would be substituting their embryonic cartilaginous form as a result of the former's competitive advantage.

Observation and thought in the realm of the organic necessitates an eye for the essence and order of its phenomena which invariably are expressions of an all-encompassing formative principle. People who have never had an opportunity to school their perception in this way find it hard to counter the abstract-intellectual concepts of modern biology and are consequently ill-equipped for making a constructive contribution towards overcoming the true causes of our environmental crisis. For this is rooted in the utter inability of our modern world to relate inwardly to the living world.

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Translated by Heidi Heimann

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Nature in the Human Being - the Human Being in Nature in Support of an Ecology Main-Lesson in Class Nine - Walter Liebendorfer

When we study the human skeleton with our fourteen year-olds in Class Eight, there is often a surprising quietness among them. The very boys who were not exactly gentle with each other in the break now observe the fine structure of foot and leg with a certain reverence. We hold up drawings beside them which show the delicate curved course of the trajectories (directions taken by the osseous structure) within the joints. There are structures here which go beyond the individual parts of the skeleton. This is a source of wonder if one begins one's studies by focusing on details, perhaps even modelling a hip joint. It seems appropriate during the time of puberty to start with details which can be apprehended as sober facts and only then to discover for oneself the comprehensive structures that unite them. The bony structure referred to above, which is found in the spongiosa (tissue on the inside of the bone) makes it possible for us throughout the long period of growth of the skeleton and, indeed, throughout our lives, to overcome ever and again the dully perceived burden of gravity. The skeleton hardens, but despite this, never becomes too heavy. It is truly astonishing: matter, hard bony substance, is given lasting form by the activity of our will. Thus while jumping or climbing in the mountains, we can experience, now somewhat more consciously, something of this power which can overcome gravity something of the liberating levity which carries us through life. The power of uprightness, which forms us from early childhood on, right into the details of our bones and vertebrae, and thus sculpts the human form, both functionally and beautifully, has a certain mystery about it. In conventional physics we do not recognise the term levity, and Newton showed interest in the phenomenon of the falling apple, without, as far as we know, concerning himself unduly with the question of how it got up into the tree in the first place. Nevertheless the activity of this power which overcomes gravity may be clearly felt, particularly when from time to time, it is missing or weaker, or if, for one reason or another, we are downcast. Does not our fundamental experience of reality have something to do with a dull perception of the activity of our own will? That is to say, with effectiveness. How different, on the other hand, is the formation and structure of the skull. Particularly in the upper part of the skull, the bones are formed differently and even earlier than the bones of our arms and legs.

This so called skull casing develops like a shell around the brain as it forms itself. The structures that form it harden quickly, grow together, and then form the dome that we so much admire. There seems to be no will activity involved here and once this form has been completed it is difficult to alter it. Despite the completely opposite principles by which this is formed, the whole nevertheless contributes to the uniform human being. We thus also discover the middle, the chest area, which is composed of both types of ossification. The plate forms typical of the skull and the spare bones typical of the extremities, which are developed in the course of one's youth.

During what is a turbulent time for all young people today, the time of puberty, which Steiner characterised with the more comprehensive expression, "ripeness for the earth", our pupils' attention is directed much more intensely than at first appears to the world of the adult. How often do they encounter prejudice, rules for the sake of rules; and how often, even resignation and indifference! All the while they carry within them a secret, scarcely formed question: What image of the human being does the adult carry within him? Is it a static image; or is there room in it for dynamic developments which might even bring about changes in the world of the adults?

The theme that we have sketched above, which naturally encompasses a great deal more (among other things it is important to deal with major sense organs in this connection), is to present to the Eighth Class as clearly and concretely as possible, a situation of the human being in the world. The central issue here is that they perceive the meaning of uprightness, which makes it possible for us to liberate ourselves from the ties of instinct and nature. This makes it possible for us to become conscious that we stand opposite things in the world. We can develop objective consciousness and can learn to know the world in increasing freedom.

From the Eighth to the Ninth Class: A Transition to the Active Human Being

If we now step into Class Nine as a subject teacher to introduce a natural science main-lesson, we find faces that have changed. The looks we get are questioning and challenging, and we may find that the Classic formula ‘anthropology is continued’ which is to be found in the generally used and valued curriculum of the Waldorf schools (compiled by Caroline von Heydebrand) presents certain problems. Is it possible simply to continue anything at this time of general and necessary upheaval? Must not steps be taken, in the first place by teachers themselves, to awaken a new consciousness? Is it not our task to be versatile precisely in nurturing this new consciousness? This alone would enable us to introduce new developments. Questions like these led to an arrangement which has been tried in the Classroom for a number of years, in a variety of different ways.

While, on the one hand, in Class Eight we pursued the question of the position of the human being in nature, i.e., a study in which the human being appears as an image, in the Ninth Class, on the other hand, we can look at the human being as an agent, as a creator of culture. We had seen how the human being became emancipated from the ties of nature in the whole composition of his bodily form. Can one now take the opposite route? If we succeed in finding such a path then this may have the consequence that the human being, whilst retaining the qualities that are in many ways emancipated from nature, can freely resolve and energetically strive with now considerably extended insight and knowledge, to re-integrate into nature as a whole. Still further: a human being might thus bestow new impulses for development on nature.

The Ecology Main-lesson - An Example From the Tropics

Taking this theme and searching for an answer to a question, it is worthwhile to take a particular, perhaps even a limited, geographical area, perhaps also with a particular climate and vegetation, and study it in detail, such as the tropical rainforest and the savannah on its borders.

What are the natural conditions here? How does plant life adapt to the soil conditions? Which animals live there? And not least, how have human beings lived in this area so far? What is the situation today? How will it be tomorrow? Scientific research now shows that there are alternative solutions for particular areas. As a basis for forming our own judgement we would do well to look at these alternatives. Thus in many tropical areas the significant growth in population is a completely new factor in relation to past history. This factor will have a considerable influence on natural events in one direction or another. Can our own research, even if it is initially carried out in the Classroom, contribute anything of significance to the situation? If it is to do so we should give it the opportunity to develop over a certain number of years and achieve a certain maturity.

In our work in this main-lesson, we do *not* set ourselves the task of cataloguing the various organisms and natural influences, of studying them independently, and of giving them names. Far rather, we try to discover how one thing is linked with another. It very soon becomes apparent that these relationships are not those of cause and effect, in the way we so often expect. In the living world, different laws obtain. A concrete example will make this clear. In the African savannah, there is an harmonious equilibrium of grasses and trees which is maintained by the working together of a great variety of organisms. Thus, for instance, one may observe that a group of giraffes, which begins to graze at an acacia, moves on after a short while to start on another acacia. In the crown of the tree there are delicate feathery leaves which are skilfully nipped off by the giraffe using its long and subtle tongue. Among the leaves are long, pointed thorns some of which are swollen at their base. These are the home of ants, which had previously irritated the acacia, so that the swellings came about (as a result of the acacia’s own activity), and could then provide homes for the ants. Now when the giraffes come along and begin to feed on the leaves, the ants are disturbed, and begin to irritate the giraffes. These then move on, but for this very reason are able later to return, which would not be possible if the acacia had lost too many of its leaves since it grows to the limits of its own potential. In the end, even we human beings derive pleasure from this process, for the deserted dwellings of the ants make a wonderful music in the wind. The Africans call this tree the *flute acacia*. We can see here one of the many networks of different life processes, some of which have not yet been researched scientifically. Each life form owes its existence to the other. Insights of this kind form a significant part of the new science of this century: ecology.

One of the Classic researchers in this area, August Thienemann, points out that the concept ecology was first used by Ernst Haeckel. He used the word *oikos* in the sense of *household* and *living relationships*. However,

ecology is not simply a matter of living relationships. We have to be capable of crossing boundaries in our thinking if we want to carry these relationships in our consciousness as a whole system. Comparable boundaries have already been crossed in this century in the realm of physics, and the renowned quantum physicist Arthur Zajonc even goes as far as to refer to an *ecological consciousness*. This means that we have to extend the boundaries of natural science, which has become excessively focused on individual objects, and look more at the relationships between organisms, and at the relationships between organisms and their environment. The important Finnish philosopher, Georg Henrik von Wright, agrees with the Anglo-American physicist Freeman Dyson that it is possible to develop a *cosmic ecology*. This does not mean that the individual organism becomes meaningless, but rather that we can only understand it as an organism in the context of a multifarious living nexus within which we also have to take account of hierarchical differences within the kingdoms of nature.

The Human Being and Nature: Co-Operation or Destruction?

How does the human being relate to these complex living networks? There was a time in which it was thought one could distinguish in principle between people living in civilisation and others entirely in natural surroundings. A closer look reveals, however, that all human beings bear the stamp of civilisation to a greater or lesser extent; there is, of course, a considerable difference between peoples whose whole way of life revolves around nature, and the inhabitants of a big city such as, say, London. A number of detailed anthropological surveys are now available on the life of peoples or groups of tribes who were previously considered primitive races, for example, the Makuna Indians in the north western part of the Amazon. Surveys have shown that this community, consisting of small villages of between 15 and 20 inhabitants, has developed a perfect integration within the local ecology with no sign of wastage. The Makunas live by hunting and by gathering widely dispersed fruits and seeds. They also cultivate areas left bare by fire which they desert after about three years, and which regenerate in the form of secondary forest within fifteen to twenty years. Their agrarian culture is diverse and there is no sign of want or malnutrition in any of their villages. The people have an extensive knowledge of the plants and animals, which they need for their nourishment and a complicated system of eating taboos and other rules that ensures moderation. Compared with the economy of the immigrant white settlers we find one significant difference: the consumption of the Makunas is based on needs, whereas the white settlers strive for the greatest possible production in the shortest possible time. The latter results in the pillaging of both forests and rivers. Similar forms of highly developed ecological cultivation may be found in other places, for instance, among the Kayapo on the border of the Amazon forest with the savannah lands around it. There, too, husbandry is based on skilful use of slash and burn techniques. Gradually a picture emerges of tropical landscapes that have been cultivated for ages. At the same time nature was not left the poorer for it, but rather benefited in the form of greater differentiation in the various landscapes (as may be seen from the richer composition of formerly cultivated areas). Thus it is possible, in principle, that groups of human beings, sometimes even whole peoples, can integrate themselves harmoniously within an ecological network and, at the same time, enrich nature by means of new developments. Natural ecosystems are in any case subject to climatic change, volcanic eruptions or fire catastrophes, and generally show remarkable resilience. Sometimes indeed, a whole system is given a new direction. Thus, too, nature constantly takes up the cultural impulses of the human being and after a while brings them into a state of equilibrium. At least into the middle of this century our own European cultivated areas bore witness to this type of co-operation between nature and the human being.

Where the situation becomes problematical is when there is a combination of industrial thinking which is one-sidedly geared to production with massive use of scientifically oriented technology, and a strong increase in the population. There is a great need now in view of the widespread pessimism, even among the younger generation, to contemplate ways in which a positive development can be brought about, even by modern human beings who have lost touch with nature and are geared to urban life. They do exist, and could be brought about with some effort. What is certain is that we have no alternative but to bring about a change in our attitude to nature. For this to come about our thinking needs to change in quality. It seems to me that the time of "ripeness for the earth" in the life of the human being is a particularly apt one for such a change to come about. It should perhaps begin with an acquired understanding of anthropology. In contrast to the animals, who have been wisely embedded in their various ecological niches - which is reflected in specialisation right into anatomical detail and the instinctive behaviour that goes with it - the human being is adapted for freedom by the form of his brain, his face, teeth, speech organs and, not least, by his hands, which have been preserved from any form of specialisation.

However, freedom means not only emancipation but also the possibility of co-operation and communication. It may be seen as our task to show this by means of individual, well-chosen examples worked through thoroughly with the pupils. We may feel it is a great cultural task that we have to carry out in the field of pedagogy. Thus in my opinion a newly conceived anthropology of the senses, in which the senses are seen as intentional sense activity, is an area which could be very fruitful combined with the description of various animals and their peculiar sense organisations. Our whole civilisation endows us for life with the view that our senses are receptive systems and thus makes the chasm between subject and object appear unalterable. It may, however, be demonstrated, that it is precisely our senses which have the capacity to unite us intimately with the world if they are cultivated appropriately. At a time in which multi-media culture is developing rapidly and expanding vigorously, this question is not merely a philosophical one. Other areas of research also seem to me to be very topical today: for example, research into the anthropology of speech and its application in contemporary pedagogy. The first beginnings of such research and the new perspectives it offers are already available. Once this has been discovered we can see rich fields of research opening up in social anthropology and also social ecology. What is essentially new in this research, is, as I have shown above, its whole approach. It is no longer a question of determining individual phenomena, perceived and treated as objects but rather a matter of seeing connections, and being willing and able to act out of an imaginative consciousness. If, in Class Eight, we can see with astonishment how individual bones develop within an overall network and are able to carry out their allotted task effectively within this, we can also develop, step by step, the corresponding concept of an ecological whole in Class Nine. This concept also includes our own existence to the extent that we are willing to take the leap from an anthropocentric to an ecocentric consciousness.

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Translated by William Forward

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Work Experience Projects in Forest Management and Botany for Class 9 and Class 12

As any adult knows whose work involves dealing with adolescents, it is becoming increasingly difficult for both sides to cope with puberty. This is partly due to the fact that on the one hand the child's everyday environment has fundamentally changed in recent years, with a far-reaching depletion of soul-content, and that on the other young people are finding it increasingly difficult to face the future in a mood of hope and free of fear.

At many schools everyday life with adolescents has already turned into a nightmare - be it because they have lost all interest in inwardly interacting with the world and just sit around in a state of utter passivity or be it because the amount of aggression they carry within them makes any creative handling of Classroom material virtually impossible. The number of teachers unable to cope and leaving the profession is rising daily.

What we urgently need in education to be able to teach in the Classroom in a meaningful way in the future, are new approaches to counteract the increasing intellectualisation of learning and the resultant wide-spread loss of enthusiasm and interest. Particularly in adolescence girls and boys need proper "hands-on" experience, especially of a kind to activate the will and the forces connected with the rhythmic system. The projects *Regionale Oberstufe Jura Südfuß* in Switzerland and the practically orientated upper school stream *Schule und Beruf* (1) in Muttens near Basel, are examples of such a new approach.

Forest Management Work Experience for Class 9 - Content and Objectives

The two ninth Classes of the *Rudolf Steiner Schule Zürich* (Plattenstraße) have been working in alpine forests for a period of ten days each year for 14 years now, initially in the *Engadin* valley, and since 1984 also in the *Oberwallis* region where very strong links have developed, especially with locals from the community of *Oberwald* as well as the forest administration of the region. In the following article I am presenting a few highlights from this work that reflect my experience in nearly 30 'practicals' in forest management involving various Classes.

The fate of a mountain village is inseparably linked with that of the forest. Without it there would be no continuity of human settlement in the majority of alpine valleys and the existence of safe transport routes could equally not be taken for granted. It forms a protective barrier against avalanches, rockfall and torrential water all of which are apt to bring destruction and chaos to the valley when there is no forest.

In many areas the amount of very old stock in these special forests whose purpose it is to protect the valley is disproportionately high, and due to the lack of money and labour they are not maintained properly, if at all, i.e. very few new trees are planted. In addition nowadays many such forests show symptoms of large-scale decay and erosion and would therefore, if anything, require extra efforts to ensure their survival. Hence working in alpine woodland is an excellent way of taking on a meaningful and extremely urgent task together with one's pupils and making an effective contribution to the health of the environment.

Tree felling must be experienced as a process of harvesting as opposed to an act of destruction and because of this the way the task is approached is of vital importance: without false sentimentality but at the same time in an attitude of reverence towards a being that may have been growing in this particular place for four to six hundred years, standing up to innumerable storms, avalanches, falling rock and strikes by lightning. Therefore, before we set about our work, we spend some time pondering such questions together, and we will ask ourselves how old that tree we are about to cut down might be, and what the valley might have looked like when the tree was very small. Of course we also consider the objective of our work, i.e. the rejuvenation of the forest, and other issues such as the height of the tree and the proper direction of its fall. Generally all of this will engender in the pupils an appropriate attitude of respect as well as the right kind of mood for the work.

It goes without saying that the pupils work with hand-tools only: double-handed cross-cut saws, felling and splitting axes, wedges, etc. The exact felling of a large tree on a mountain slope is a technically extremely sophisticated job and requires a high degree of concentration and well-controlled, expert guidance as the tools used are very sharp and risks of injury and damage plentiful.

Time after time I am deeply touched by how this kind of work in particular - involving large movements which must be exercised with considerable strength and skill - shows so very clearly how these young people stand upon the earth and how well connected they are with their physical bodies. It is possible, too, on occasions like this, to correct specific things and the pupils themselves will often be amazed at how much can be learnt about using one's body in just one morning - an important experience of achievement especially at that age!

For tricky situations, or when things crop up that are nearly impossible to tackle manually, there are chainsaws and pulleys available for our use; this provides the pupils with first-hand experience of the enormous power and destructive potential as well as the noise and stench of these dangerous 'tools'.

Woodland management naturally implies the further processing of the trees felled: stripping off branches, sawing trunks into sections, etc. This is very often a good opportunity to explain what is involved in producing a marketable product, i.e. a variety of product lines which meet prospective buyers' needs: correct appraisal of wood quality, standardised lengths with tolerances, cleanly trimmed straight cuts etc. - all of them requirements which were not 'dreamed up' by the teacher to be met by students, but requirements of our work which approach us "from outside, from the world" and which we have to confront objectively.

Besides felling and planting we have been commissioned to undertake clearing (2), maintenance of young woodland and forest roads, building footpaths, clearing woods at the bottom of the valley after floods and many other things.

A Class is normally divided up into three to four work groups, each of them led by at least two or three colleagues or suitable parents (if possible with appropriate professional or even "green" backgrounds). A catering service providing good wholesome food, usually run by two additional parents, is a further vital ingredient for successful operations.

Another important point to consider are the breaks which are needed to minimise any dangers caused by fatigue. This applies to the course of each day as well as the entire week's programme. The latter is structured in such a way that the pupils can be engaged with one particular type of work for two to three days respectively, followed by a complete day of something quite different: glacier walks, climbing expeditions, visits to hydro-power stations or sawmills, trails through the forest with questions about the wood, geography, vegetation, wildlife, etc. In this way the experience may be deepened in a holistic manner. The day should be organised so that the rest periods provided are not just used for eating and lying about but equally for artistic activities as well as taking stock of what has been achieved.

All this takes time - in any case more than a week - or else the whole exercise will be dilettante in nature, no proper work will be accomplished and the whole experience will lack in depth and intensity.

Working in the Forest for Social and Ecological Harmony

These days most young people's experience of the mountains is confined to holiday and leisure activities: the landscape is "consumed" for winter sports, climbing, mountain-biking, hang-gliding and so forth. Through working in a mountain valley a very different relationship - far more awake and inward in nature - to the land and also to its people may be fostered. The young people experience in concrete terms what is involved in looking after a tiny section of the alpine forest and they begin to appreciate the work that has been done here as a matter of course by foresters and farmers over many centuries and is still being done today, largely for the common good, in order to keep the region habitable and available to tourism.

In that way one's own contribution helps create a certain social balance between the mountain population and that of the low regions and towns. The work accomplished by these youngsters who are often and rightly considered spoilt by country people, towards maintaining the living space of people less privileged than they are in material terms, leaves a strong impression on the latter and the young people's often really major contributions are duly appreciated. That recognition may be felt especially during the final evening when the mayor, town councillors and foresters, accompanied by their wives, present themselves in their Sunday best at the traditional Swiss *Raclette* dinner which the community organises in honour of the Class, and express -

in very moving words - their heart-felt thanks to the Class. In the hushed atmosphere of such occasions one may sense the profound feeling of satisfaction and encouragement experienced by one or the other pupil.

The fact that nature is not there to be “consumed” but needs the balance provided by our free gifts is part of the fundamental attitude we all need to foster in relation to the future of our earth; indeed, the survival of our planet will depend on it and this is what makes this one of the central issues of cultural life today. Especially against the background of the ubiquitous lamentations over the destruction of the environment, e.g. the progressive dying of the woodlands in alpine regions, an opportunity to actively contribute towards maintaining these forests here and now can be a real awakening experience. Of course all this applies in general terms; however, for the particular state of soul of the adolescent experiences of this kind are of eminent educational value.

Learning by Doing: Meeting the Needs of Inner Development

The time of puberty is characterised by the deep conflict the young person experiences between his/her extremely critical and highly analytical attitude towards his/her social environment (which is ultimately measured by the highest of objectives and ideals) and his/her own body-soul inertia.

At a time like this when the sense of self-worth is frequently low and overlaid as it frequently is by a generalised feeling of *weltschmerz*, can lead to severe depressiveness, any opportunity to experience one's own strength and ability to make things happen, is of vital importance. If young people can find out that they can actively work towards creating something for the future, crises may be overcome and decisive changes initiated in the individual's overall development.

At the same time we are all aware how infinitely difficult it can be, especially during that age, to get a young person to do anything at all, in other words to engage in the very thing which might help him/her overcome this state of “being imprisoned within oneself” by directing his/her interests and forces towards the world. And should there be grounds to suspect that the action proposed might even be physically demanding the young person quite rightly demands some insight into the purpose of it all; thus endless discussions frequently take the place of action.

The need to maintain a forest whose function it is to protect, speaks for itself. It is derived directly (and often very impressively so) from examining the situation as it presents itself. After briefly considering the state of affairs in situ, a discussion about the ‘how’ can generally be started straight away. In most cases the ‘only’ thing left to do for teachers and foresters is to create the optimum framework for the work (safety, technical competence, equipment) and every now and again encourage the youngsters to persevere - lovingly but firmly, whilst reminding them of the common objective. This is in stark contrast to many a situation in the Classroom and hence a valuable opportunity for the teacher to strengthen the pupils' will forces by engaging them in meaningful action: learning by doing. Also inherent in this is the possibility of creating a new relationship between teachers and students by establishing a new distribution of roles through working together. The same applies to the relationships between the pupils themselves: as the actual work teams are not made up according to sympathy or antipathy the pupils will find new ways of meeting and getting to know one another through practical work; this in turn may newly enliven and shape the overall constitution of the Class.

Forest Work in Relation to Human Development

Beyond these basic aspects there are a whole number of more specific ones which are apt to meet the latent questions of adolescence like pictorial answers provided by life itself. I would like to illustrate this by a few examples.

During puberty the second physical growth and development spurt takes place. In boys, in particular, these forces go straight into their limbs; hence they often find it infinitely hard to attain real uprightness in their bodies and to use their muscular strength in a purposeful way. At times like this a tree that has attained and maintained its uprightness over centuries in spite of endless snow masses and storms can speak as a powerful symbol.

All forest work demands that one stands on the ground properly; the whole body posture has to be correctly aligned to the work at hand. It is difficult to conceive of another working environment where one's body needs to be as precisely positioned to the work environment as is the case in forest work. And once again it is

true that it is not the teacher's 'bullying' which enforces such uncomfortable positions and at the same time such supreme concentration on precise handling, but the extremely sharp blade and the potential destruction caused by a tree falling in the wrong place. It can be felt during such work that it means a lot to the pupils to be taken seriously, to be trusted and given proper responsibility.

It is a special experience to be able to witness how the forces stored up in the boys' limbs (for example during the usual 'power games' in school break times) can now be usefully spent as they work with big handtools, wielding an axe for instance, which requires quite a lot of bodily strength and at the same time skill and body control. We are often amazed - teachers and pupils alike - at the strength a gangling youth can suddenly muster to drive the tool into the notch when he concentrates properly and gets the 'hang' of what is involved. Presence of mind is paramount because quite often the adult in charge will have to step in to redirect the powerful strikes of a strong boy before damage is done by the unbridled strength unleashed on such occasions. When it comes to heaving the heavy logs around great physical forces have to be expended, in this case in strict accordance with the laws of leverage. The practical intelligence required for this sort of work is usually not found in the more intellectually inclined pupils.

Girls at that age generally display a better connection between soul and body than boys which also corresponds with the more inwardly directed physical maturation. That enables them to compensate for many a thing boys can do due to physical strength or previous experience by exactitude and practice.

Girls tend to prefer using the "two-hander", the large wood saw operated by a team of two. This requires in particular a good spatial sense and an ability to tune into one another as the saw blade must always be moved on one and the same plane and the arms moved rhythmically and freely. In order to bring that about the imaginative powers need to be well connected with the body and space in general - then the arms will begin to "think". Bad sawing demands an immediate price: all subsequent working steps will be extremely laborious. I have rarely come across boys capable of the skill, perseverance and ability to attune to the other partner that is so often displayed by girls during sawing. I recall a tall girl who spent a whole afternoon sawing up log after log in perfect harmony with a dwarf-sized boy with very short arms; his various attempts to perform this work with other boys had borne no fruit.

The same applies to clearing the trees felled. The boys tend to be more motivated by 'action' type situations: the time before the tree falls, lugging the logs around, moving them down the slope to storage (3), stripping off the branches, etc. Such observations are by no means to be taken as moral or sexist judgements but merely point to the differences in body-soul constitution. Hence the importance of asking both sexes to engage in the type of work they do not incline towards strongly.

Learning to Apply an Ancient Technique

Felling a tree by hand introduces the pupils to an ancient technique which played a significance role during the transition of mankind from "forest man" to ego-freed man living on open cultivated land (early stone age). A person who is capable of cutting trees and cultivating a piece of land has attained a measure of autonomy - a motif which shows up in a special way throughout adolescence.

By agriculture man "rejuvenates" the earth, as the life forces can be reactivated time and time again through the action of the plough. In the forest, it is true, it isn't grain that is sown context of forest life this also signifies a renewal of the life forces. It is important for the pupils to be able to learn by doing that working at the life pole of the forest, e.g. planting little young trees, is directly connected with lumbering, i.e. the passage of the forest through the point of death: thus only are the forces for new life released. "Die and Become"- another symbol that may resonate with the soul experience of the adolescent. Working for the rejuvenation of the forest, opening up the earth and carefully embedding the new trees' tender roots presuppose and hence also develops other capacities besides tree-felling: plants dug into the earth without care and love have little chance to grow.

Such an experience, even if it remains unconscious, can be of great significance for people at the very stage of their development when many of them feel as if thrust out of the stream of life, between the childhood they have lost and the adult life they have not quite attained yet. It may produce something like this feeling: "Here I am, living in the present - at the place where past and present meet. In this capacity I take hold of the earth and I am capable of working with nature to the extent that I understand some of her life processes; I

may help shape and even enhance these processes. In that I have made a connection with the earth and brought to life a vital force within myself.

It goes without saying that the pupils are offered numerous opportunities during work and rest periods to conduct their own nature observations; besides, many things are pointed out to them when the right moment arises. For example, it is only natural to take an exact look at the way the trunk is structured, to count the annual rings and discuss their different widths and forms (history of the tree, marks from fire and rock fall, fungus infestation, formation of pressure and tension marks, etc.), to check the sugar content in the bast/phloem by tasting it, to check the ultra thin growth layer (the cambium) between corpus and phloem as well as point out the protective bark. This will often lead to further discussions about photo-synthesis, sap streams, bark beetles, woodpeckers and many other related matters. Pupils' questions or encounters with certain animals will also frequently give rise to spontaneous discussions about the different types of trees and other species of forest vegetation and wildlife.

My work with youngsters who have grown up in the city brings home to me more and more how many children today totally lack even the most basic experience of nature; they will ask naïve questions and know neither animals nor plants. This type of active immersion in nature over an extended period can give them an important chance to do some catching up after all. In this sense such work experience projects also serve as fundamental lessons in natural history as well as 'medicine' for a new form of "illiteracy" that is becoming manifest in the young.

On those occasions when we have worked hard and strenuously but in a good spirit of togetherness, and I see the pupils walking briskly to the overnight chalet, singing or laughing, with a certain light-hearted contentedness shining out of their faces, I may hope that they have indeed enjoyed a positive interaction with the world - of a kind that will give them courage and self-confidence.

Work Experience Projects in Botany - Class 12

Now I would like to describe yet another ecological activity in our Upper School. According to the curriculum the subject of botany comprises an overview of the realm of phanerogams - morphology and study of the major plant families.

To enable our pupils to actively experience the plant kingdom and widen their horizons to the greater eco-systems our Zurich school has conducted one-week botany work experience projects in the *Aletsch* region since 1982, so far on nine different occasions. For accommodation, food and indoor work space we were hosted by the very well-equipped "Naturschutzzentrum Aletschwald" (nature conservation centre) in the *Riederfurka* Alps (2199 metres above sea level).

Our subject was the successive inhabitation and transformation of the landscape through the world of plants - from stony desert to larch and stone pine forests - in those areas where raw mineral ground is laid bare due to the ice masses of the Great Aletsch Glacier receding, and where vegetation develops from fresh.

At any location of this type one would normally observe a definite and predictable succession of various stages of inhabitation through fixed states of symbiosis, and this is referred to as ecological succession. As this takes place over many decades or even centuries direct observation of the processes involved is not usually possible.

However, at the edge of the glacier which has been receding at a reasonably steady pace for the last 150 years, a highly unusual situation prevails which offers unique opportunities to observe this process of ecological succession in a comprehensive manner: due to the steady melting away of the ice a new band of rock along the glacier tongue is laid bare each year which results in the formation of annual ring type zones in the landscape, starting at year zero at the edge of the ice and increasing in age with increasing distance from the ice. In other words, all the developmental stages which ordinarily succeed one another at any one location are spread out before our eyes here, like in a picture book, arranged in space next to each other, and available to be viewed at once (4). The oldest stages of this continuous succession on the young moraine are 145 years old today, from 1850, the time of the last historical high point of alpine glaciation. Today this zone is inhabited by an impressive pioneer forest that in some respects already displays certain traits of the mature final developmental stage of the larch and stone pine forest; that stage comprises many more years and occurs in the immediate vicinity in those somewhat higher regions not affected by glaciation since the ice age.

From Field Work to a Living Concept of Organism

Subsequent to a joint survey of the area and a number of observation exercises the pupils were asked to divide up into groups of three or four and study two to three evolutionary stages as intensely as possible over a period of four days. To do this they had to move from the large to the small scale - from a description of the location (height, exposition, local relief, mother rock, etc.) to a general characterisation of the vegetation right down to an exact structural analysis of the vegetation: vertical structure (stratification and horizontal division according to plant groups on the surface). To this end we also determined the number of species and the degree of coverage (5) on representative sample sites.

About two thirds of the working day (the outdoor part of it) were allocated to the kind of work described with the remaining third taken up by capturing the same locations in drawing and painting exercises: here, too, we started from the periphery and gradually approached the constituent parts of the overall environment - right down to detail sketches of typical growth patterns of individual little plants, for example. Naturally this brings out yet another, totally different aspect: the perception of plant forms, colours and moods. Both ways of seeing, the scientific and the artistic served above all for paving the way to a vital third task: comparing the different developmental stages and perceiving the transformations of phenotypes in very exact terms. Thus on a path similar to that of observation exercises focused on a developing single plant, we are led to grasping the metamorphosis of a landscape: from that which has come into being to that which is becoming, from form to change of form, from matter to process, from phenomenon to being.

To achieve this the pupils also had to pace the land in both directions, observing the transition from one stage to the next. This demands inward movement. Such inner mobility basically amounts to re-creating the formative processes of nature; through becoming active in this way we are uniting ourselves with the essential being of the object concerned. Goethe referred to this perception of the formative forces which can be attained through practice of the kind described as “contemplative judgement”.

During some of the evenings - in addition to the usual field work evaluations - the pupils were asked to recall some of the transformations they had observed by merely describing them and then to check the accuracy of their perceptions on the following day.

But even then the objective was to look at the processes observed together and pin-point those transitions where the development takes place in leaps and bounds (discontinuously), where a developmental motif appears suddenly, for example, or a change occurs that was not to be predicted on the basis of what had happened up to that point. For instance, at certain moments in time many plants suddenly begin to straighten up, and certain species such as ferns and heathers seem to spring out of nowhere or disappear altogether; there are times when the number of species which had been increasing continuously over 80 years or so to 150 species, suddenly drops to less than half of this number.

As we went more and more deeply into these matters we also looked into questions such as the possible relationship of ecological succession to other areas of organic development with which the students were already more familiar: e.g. to the development of a single phanerogam or to the geological-historical evolution of the plant kingdom, which appears to be repeating itself here in time-lapse mode.

Editor's note: Based on his comprehensive experience the author will be launching his own eco-educational project named “Bildungswerkstatt Bergwald” (Mountain forest education workshop) in summer 1995; this project will be devoted to two highly topical objectives: in the first place it will offer a range of much needed work experience projects where young people in particular can be given the opportunity to interact with nature in a practical and meaningful way. These projects will be tailored to meet the educational needs of different types of schools as well as groups of young people from other contexts. In addition practical courses for adults, with special emphasis on practical-ecological programmes for teachers, are envisaged. A further objective is to effectively contribute to the care of the alpine environment, in particular the partially endangered alpine forests, for the benefit of alpine communities. Address: Dr. Christoph Leuthold, Segantinstrasse 6, CH-8049 Zürich.

- 1) “Schule und Beruf” is an initiative towards a practically oriented Upper School comprising in addition to the usual Class room work a 3-4 week work experience project in different fields of vocational life once a quarter throughout the school year (so far this has been introduced in Classes 11 and 12, a tenth Class will

start this year if sufficient numbers apply). With regard to “Regionale Oberstufe JuraFuB” cf. “Erziehungskunst” 1993, Heft 3, p.286 ff. And 1994, Heft 7/8 p.665 ff. (Thomas Stöckli/Rudolf Wepfer).

- 2) Clearing of branches, etc. after felling operations
- 3) Traditional form of gathering up the logs in mountain areas downhill to the wood store, mostly along special trench-like grooves in the ground.
- 4) Strictly speaking this is not succession in the true sense; however, such a series of stages may, in the presence of uniform site conditions, be taken as a fairly exact picture of succession
- 5) Degree of coverage: ground coverage measured by individual species of plants, groups of plants or by strata.

Translated by Heidi Heimann

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Re-enlivening the Landscape (The setting up and care of a living environment) - Werner Neudorfer

Dittenheim is a village in Upper Altmühltal. Thirty years ago it was ravaged by wholesale clearing of the undergrowth. After that there were no more hedges or coppices at all. Going for a walk there one would not hear the song of a single bird. It was a dead strip of land, similar to the fields in Eastern Germany.

In the spring of 1986, the first hedge was planted on the private initiative of a number of committed young people; it was financed by the recently founded Mittelfranken Association for the care of the countryside. The original idea of the association was that the farmers would do their own planting of hedgerows; but in Dittenheim they lacked the initiative and relevant qualification. Thus the work was done by a few young people in the evenings and at weekends. In the autumn of 1986, they were given permission to plant a very large hedge, five hundred metres in length, consisting of three thousand plants. The scale of this project went beyond the powers of these people on their own. Thus the project itself was called into question - I at once felt the desire to get involved with my pupils. Thus I went to the landowner, to the Association for the Care of the Countryside, and to the Mayor, etcetera. I was looking for board and lodging for a whole Class. I was also looking for a teacher who would support a project such as this with his Class.

For several weeks in the summer holidays I had to deal with all kinds of questions ('Are the pupils supposed to plant the hedge?' - 'What is a Steiner School anyway?' - 'Well, have you got all the necessary equipment?') - and I had a great deal of persuading to do; no one had done this kind of thing before. In November, the time came. The girls stayed in the gym of the local kindergarten, and the boys in the Church hall adjoining the Vicarage. Meals were taken in the Village pub. The Publican's van transported the children to the place of work.

After four days, the Class had planted three thousand native and ecologically valuable hedgerow plants in a hedgerow six deep and had fenced it off. It was the biggest hedge in the whole of Altmühltal. An almost incredible achievement! The following spring we made our first visit to it. Pupils and teachers were armed with sickles, and trimmed the hedge. Almost all the plants had taken.

These initial efforts already raised a certain interest and the Class was awarded an ecology prize by the Mittelfranken District. The award was made in the presence of a number of dignitaries in our school. In the second year, we planted a number of smaller hedges. From the third year, the work was carried out by each of the two Classes Nine for a week each.

We now have the dance floor of the local Inn at our disposal. We have divided it into sleeping, teaching and recreation spaces. The daily rhythm includes, in addition to the actual work, daily lessons and a variety of activities which make the work experience even more interesting for the pupils - such as table tennis championships, games, songs and music making, painting and drawing, etcetera. Ever more and new tasks are now being offered, which fall within the category 'setting up and care of a living environment'. We are working primarily for the Association for the Care of the Countryside, but also for the Environment Agency, for the District and Parishes for Farmers, and recently often for Bio Dynamic Farmers. Some tasks have their own time limit, i.e., the hedge must be planted within the two weeks. Other tasks can, however, be dealt with more flexibly: we are left quite free with the care of the hedge. What we didn't manage this year can be done next year. These are welcome buffers for our time allocation. Each task is planned in advance by the Association for the Care of the Countryside, carried out by us, cared for and recorded; a report is sent to the Association, which sometimes passes it on to the Local Council. We have thus become quite well known in the District.

For some time now we have been receiving sponsorship from various quarters for the work we have done. The account we have opened especially for it. 'The Account for Ecological work at the Rudolf Steiner School in Nurnberg' currently shows a five figure balance! Planning in the Dittenheim area now takes particular account of our wishes. The co-operation of the Association for the Care of the Countryside at the Rudolf Steiner School has so far been excellent.

Many of our hedges are model micro environments. Teachers of ecology in Bavaria do further education in Dittenheim, and use our hedges as examples. Groups of students from universities may also be seen studying there. Even Hermann Benjes (the 'inventor' of Benjes hedges) has already visited ours. The biggest hedgerows in this area have all been planted by our students. The Bavarian Department of the Environment's publication 'Nature around the school,' regularly awarded the Rudolf Steiner School distinctions for its work. In the year 1994 we came first in the Mittelfranken District, and were awarded a special prize by the Bavarian Department of the Environment.

None of this is the primary object of our pedagogical work, but it is a mark of recognition for the pupils and teachers. It also places our school in the public eye in a positive way.

The Class is divided into four work groups of eight or nine pupils. The groups are determined by the teachers, and remain unchanged for the whole week. Sometimes it is possible to allow the pupils to rearrange the groups on the last day. We work at various sites. The groups carry out major projects at each of the sites. Sometimes there are minor projects too.

PLANTING BUSHES IN THE HEDGEROWS

We plant out in rows which are kept to exactly. The skills acquired in the field survey work are useful for this. Keeping exactly to the rows is very important for the subsequent care of the hedge. For the first two years the grass grows much quicker than the bush. So the hedge must be mown and long grass scythed down. It helps to be able to rely on the bushes being ideally a metre apart when doing this otherwise one might simply not find the bush, or, even worse, mow or cut it down. Every pupil who has worked at a hedgerow with a scythe understands the absolute necessity of rigorous and accurate planting. The process of planting is worked through in the Classroom beforehand by means of a work sheet, and gone through once more before the planting begins. The roots of the plant are cut with an axe, or with clippers. The hole in which it is planted is dug to roughly the depth of the spade's blade. Then the plant is lifted in and the roots are stroked down into place by hand. Then the earth is filled in and pressed down in layers. To test whether the plant is well embedded, one then tries to lift it out by its tip. It soon becomes apparent whether or not it has been well planted. The test is carried out by the teacher to begin with. By the third day the pupils themselves are very interested, and check their work themselves. During the lessons, and while planting, the planting plan is discussed. It will have been conceived according to the needs of the individual plants, and the hedgerow as a whole. The pupils have to get to know and distinguish the individual plant species. Each planting group itself decides who does what. Those who are less suited to heavy physical work might fetch the plants from the shed, and take care of the roots. The stronger ones will dig the holes. After planting, one goes back over the row checking that each plant is well in place, and then the plant is cut back by a third from the top (final check).

FENCING

Unless the hedgerow is fenced off, there is a serious risk of the plants being destroyed by wildlife. The pupils were able to experience this directly when they got up one morning to find many hawthorn bushes nibbled. Fencing is not only a necessity, it is also a very satisfying task, because one can always see what one has done. Knocking in the fencing posts with a pile-driver is heavy labour. Lining up the posts requires measuring skills. Constructing the supports requires craft skills, and finally, drawing the fence tight, and nailing down the wire requires good team work. A multiplicity of demands is made of the pupils, each of which follows naturally from the other. Everyone can understand that the corner post needs two supports because it is under tension from two directions.

In the case of some earlier plantings, the fence fell over after a few years, and grass and bushes grew into it. When we plant a hedgerow, we take the fence down after three to five years. If we do this carefully, a good deal of the wire mesh can be used again. The old posts can be used as fence posts again (usually) somewhat shorter the second time around), or are used for firewood. Our 'fence recycling' saves the Association for the Care of the Countryside a good deal of money. This year, a total of one thousand six hundred metres of fencing was erected, of which nine hundred metres of wire mesh was recycled together with two hundred fence posts.

THE CARE OF FOREST AND HEDGEROWS

Until 1990 the fence posts came from a business in the Black Forest. They were thus transported across half of Germany. Meanwhile, our own forests have a superabundance of wood, since neither firewood nor windfalls are removed. Many a pine plantation is allowed to get too old without the necessary human care, and then collapses. So now we make our own fence posts are able to at the same time to provide much needed care for nearby plantations. Before the work experience begins a number of helpers go into the forest, and cut down enough pines in the plantation for several hundred fence posts. The pupils then drag them out of the plantation, lop and load them. At the farm, they are given points on the circular saw and then used by us as fenceposts.

Twenty years ago, a number of hedges were planted in this area as windbreaks using a small variety of bushes and trees. But no one took care of these hedges afterwards, and so over the course of the years, the formerly thick hedges turned into sparse rows of trees. Often the dominant trees such as the maple or ash suppress the denser varieties. Thorough and regular care of the hedges can avoid this problem, or even restore such an old hedgerow to its intended ecological function.

Some hedges we tend to prop in sections, i.e., a ten metre section is cut back radically, and the next ten metre is allowed to stand. After this treatment the hedge looks like the blade of a saw. What has been cut back can rejuvenate, and the old stems produce a dense crop of shoots. In other cases, we remove some types of tree entirely to encourage the neighbouring varieties of bush. Both methods encourages a variety of growth in the hedge.

The pupils do not always find this work easy. If on the one hand, we are planting bushes or trees, why are we cutting them back on the other? The teacher has to prepare this work well and pass on to the pupils valuable information about the different types of bush. The hedge is a valuable environment for birds and insects which find shelter and nourishment there. The smaller types of shrub, such as sloe, dog rose or whitethorn fulfil this task better than tall trees. The trees are cut back, so that the small bushes can develop.

SETTING UP A DEADWOOD OR A BENJES HEDGE?

The care of hedges produces a great deal of cuttings. The larger bits are used for firewood. Twigs and brush are piled up in layers of at least a metre to produce a deadwood hedge. This will later evolve into a living hedge according to the principle of a Benjes hedge. The birds which very quickly move into this deadwood hedge to live or take shelter bring the seeds of a variety of shrubs in their droppings, having previously gathered them whilst feeding on living hedges. Sheltered by the deadwood hedge, small bushes and trees grow up, and thus, from a heap of dead wood emerges a living hedge. The pupils can see how, in nature, even 'waste products' are put to good use. It all remains within the great cycle of nature from which the human being lives and profits. The 'Benjes method'(named after the ecologist Hermann Benjes) has advantages and disadvantages compared with ordinary hedge planting. Over four years we have been able to observe these.

With the Benjes method, it takes much longer for a proper hedge to emerge, but it is also a great deal cheaper. Traditional hedge planting guarantees a quick result, but is quite expensive. In the case of the Benjes hedge. The choice of plant is left up to nature (the birds). By planting out living plants one can plan the composition of a hedge oneself. Our Benjes hedges have not always developed according to the textbook. We often added bushes to the Benjes hedge later because they had not developed fully on their own. We can thus combine the planting method with the Benjes method. We plant a number of rows of bushes and trees in the middle, and pile up deadwood around it instead of the fence. This is the surest method in our experience.

THE CARE OF YOUNG HEDGES

A newly planted hedge needs human care for the first few years. This is an important experience for the pupils. In the summer the hedges are mown and cut back with a scythe. In November the pupils go out again with their scythes.

The summer cut is primarily to ensure that the hedgerow plants get plenty of light. The little plants are generally no more than 30 to 60 centimetres high. The grass and thistles round about can, however, go up to

a metre or more. The little plants would succumb in the first year to lack of light. So we have to cut back the grass around each little plant. The hedgerow plant needs a pool of light. The autumn task takes account of another concern - when the long grass falls over in the autumn, and then the snow falls onto it little hollows are formed beneath the layer of snows and grass.

In these little hollows the mice can run up to the stems of the hedge plants, and gnaw at their bark. The bush will then not bring forth shoots in the spring. Thus the autumn cutting is concerned with removing the grass around the stem of the bush. If the foot of the bush is clear, that is the best guarantee for its survival through the first winter.

This work with the sickle can be very exciting. While clearing the grass round the three year old hedge of a hundred and fifty plants, one group found ten birds nests, or wasps nests. After a while it became a question of who could find the most, and each nest was carefully examined. Thus even this small hedge was, in the truest sense of the word, a habitat.

LOPPING VALUABLE SPECIES AND MAKING ADVENT WREATHS

In co-operation with the forester we do some clearing in a plantation of Douglas firs. We cut the lower branches of the trees off, and are allowed to keep them. Then one group stays behind and makes advent wreaths out of them for the school. Compared to some of the other rather tiring tasks, this is a peaceful, refreshing, contemplative activity.

Our co-operation with the local forester has worked very well for several years. He often helped us with equipment or good advice. We were also often in a position to do him many a small favour. A welcome task between bouts of heavy work is the gathering of rosehips or sloes. The pupils can turn them into a very good rosehip concentrate or sloe elixir. Both are very popular at the school bazaar. The technical equipment for this is provided by the local inn.

THEORETICAL INSTRUCTION

To understand a working method, and how things work with nature, it is sensible and necessary to continue regular instruction. Every now and then the pupils also need to look back at what they have done. This can happen at the beginning of the lesson.

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In addition each pupil keeps a folder for progress reports, the lesson content and drawings of plants. The lesson content is not always the same. It depends on the projects, and on the degree of exhaustion suffered by pupils and teachers alike.

This year we dealt with the following subjects:

1. Possible formats for a hedge, planting (seedlings in a nursery - transplanting - planting - aftercare - fencing). The idea of the Benjes hedge. Advantages and disadvantages of both methods, experience with each method. The third possibility was a combination of both methods, i.e., the middle rows are planted and deadwood is stacked on either side as substitute fence.
2. The ideal build-up of a hedgerow with a crown, higher and lower layers of shrub and ground cover. Which animals live in which zone?
3. Human use of wood as a resource. Twigs or brushwood. Firewood, offcuts, stored coppice. Valuable species, lopping. This topic is best treated with examples of the various types of wood. Here we are helped by our school carpentry and woodwork shop.

The pupil needs to see that conserving and making use of nature are not exclusive of each other. In our cultivated landscape, nature often needs human beings to make use of its products (today this is known as care of the countryside). At the same time husbandry should be considerate and thoughtful. To learn this is our primary objective.

Germany still imports a great deal of hardwood from the tropics. It would be much more sensible to cultivate and make use of our own forests according to our own needs.

4. The trees and bushes to be found in our plantations and in the region for the pupils to get to know the individual species, we cut twigs and discuss them in the evening as part of a lesson. We discuss its particular value for animal life, its possible uses for human beings, its growth patterns, light and soil requirements etcetera. The pupils must learn to observe carefully, thus each one makes a drawing of a twig paying particular attention to fruit leaf or bud.
5. The effects of the hedgerow in the landscape: preventing erosion, protection from cold, natural control of pests, habitat for flora and fauna.
6. Projects carried out by the Waldorf School in Nurnberg: individual trees, for example - avenues, orchards, mixed forest, shaping the forest's edge, hedgerows, coppices and Benjes hedges; stepping stone projects, linking projects, habitat networks.
7. The pupils write a letter to a farmer, Mayor, vicar or Parish Council. In the letter they offer our services for the setting up and care of the environments mentioned above, setting out the reasons for them (motto: 'Pests from out the meadows fly, once a Waldorf kid they spy').
8. What the hedgerows do for human beings and the earth: generate oxygen; purify and moisten the air; store water.

There are a number of other topics which one could discuss altogether or in the groups while at work. For example, the history of Altmuhital and of the locality where the project is being carried out. The history of the Nurnberg forest. Harmful influences in the forest. Highland forestry. Forests in other regions of the earth.

FRAMEWORK AND ORGANISATION

The work experience weeks are always in November. This is determined by the Association for the Care of the Countryside and the nurseries. November plantings have the best growth rate. The main project is usually a hedge, and is requested a year in advance. This is necessary because the planting of these hedgerows is largely financed by the Department of the Environment and the procedures that have to be gone through take a very long time. In any case, planning a long time in advance is advantageous for us.

In October there is a Parents' Evening for both Classes Nine. Slides are shown of the preceding year's experience. The parents recognised the need for good equipment and working clothes when they see the pictures of us working in snow and rain. We work in all weathers. The idea of work experience in environmental protection and cultivation of the landscape strikes a strong chord in our parents. The undertaking is also very cheap, since the location is not far from the school (60 kilometres). The parents' evening is of great importance for the teachers as well. During the half term holidays (end of October) the teachers supervising the work experience are taken out for a day to the chosen location and are introduced to each site and to the techniques that will be employed. We visit the sites of previous projects, so everyone has a clear idea of what is to be done. This is necessary because each teacher must lead a group from the very outset. Many teachers prepare themselves by reading up relevant articles on cultivating the landscape. Thus the teachers are not anxious and unprepared when they take up their task, but well attuned, full of joyous anticipation and confidence.

In October there is also a press conference giving the dates and details of the projects. The local press draws attention to our work. For the two weeks of our work experience, one of our sponsors places two vans at our disposal, and a farmer provides a tractor and trailer for use on site. Then at last we can begin.

The pupils take a train to the location. They begin with their work, and with life on site. This living together plays an important role in determining how the pupils remember the work experience and its aims. It really should be an experience. Several things contribute towards this. Our hosts are very kind and the food is plentiful and excellent. Our table tennis tables sometimes occupy and enthuse the whole Class. Various championships are a must for the teachers too.

On Wednesday afternoon there is time off. The Class goes to the nearby gymnasium, to the swimming pool or to a museum in the nearest town. During the daily work it is important to have regular breaks at the appropriate moment, which must be sensed by the teacher and organised. Each group is supplied with refreshments in the break. Either the teacher has a basket with tea and cakes, or the farmer comes into the field and brings us a snack.

This year our 'building site' was only two hundred metres away from the farm. In the tea breaks, we returned to the farm's kitchen. Just walking through the stables was an experience. During our two weeks stay, two calves were born. Over refreshments, one can look back over the work done, or prepare the next phase, and

set new targets. One has to ensure however that the pupils have a certain amount of time to themselves. Refreshments provided by the farmer are not left to chance, but are carefully planned and organised.

This is very important because valuable conversations can take place between the pupils and the farmers. The pupils can see that their efforts are recognised, and that others are interested in their work ('It's not just school we're working for'). After a meal they go back to work refreshed. With the more laborious tasks one can head off boredom with additional breaks. While clearing a hedgerow from the previous year, I often do a bit of botany with the pupils: 'What is the name of this shrub?' 'How can one identify it?' 'Can it be used?' 'Which animals find it particularly valuable?' Ideally, one would have only one group at each site. When there are less than ten pupils, they keep each other at work. When there are more than ten, they distract each other. If one has only one group, a number of disciplinary problems simply don't arise. Trainee teachers are often able to lead a group if the framework is right.

After the work experience the press reappear, and there is a report in the newspaper. The pupils enjoy this aspect too. 'Our hedgerow' 'We are in the papers' 'We have done something really important - so important that it attracts public attention'.

When the project is completed, and the hedge is finally there, it is a very impressive sight. Many pupils could not imagine that we would really achieve this 'colossal project'. This year, pupils, teachers, farmers and trainee teachers all stood astonished and somewhat reverently before this five hundred metre long future habitat for our animals and plants. Each of us had the feeling - 'We have created something worthwhile here'.

A few weeks after the work experience, the pupils also write a review. This is very instructive for the teachers because the pupils also include reference to things that went wrong. Almost all pupils are left with a positive impression of the work, and of the project as a whole. The teachers involved also meet to review what has been done. During this session, we discuss the pupils, and analyse the project once more. Thus every year the work experience is better thought through and organised. Sometimes we take this opportunity to plan the next care day, or the next work experience.

Great demands are made of each of the teachers who accompany this. They must prepare themselves well, and adapt quickly to a new area of work, so that they are able to lead a group at once, and to accept responsibility for the pupils on site. Also for the equipment and plants. This requires courage. However, the teachers must be prepared to set a good example for hard work, to participate in life on site, and its organisation. The day begins at seven o'clock at the latest, waking pupils, and ends after ten with the goodnight story.

Our plantations are working towards a better future. It is very important that the pupils are able to experience something that leads into the future - in the case the development of their own hedge. During the work experience, whether clearing the hedgerows and gathering rosehips, or studying botany, we look at the work of older siblings or pupils in higher Classes. After the work experience, the pupils revisit their own hedgerow in the course of regular care. To this end, we have instituted a day for the care of hedgerows. The first one is in the ninth or the tenth Class. The pupils generally take the train to the work site in June, and go on with a tractor and trailer to their hedge, then they spend the whole morning clearing it with a sickle. Our host in the local inn provides a hearty lunch in his beer garden, and there are some leisure pursuits in the afternoon.

A hedge care day goes very well with the botany Main Lesson in Class Twelve. The pupils show a great deal of interest, and take their work very seriously. Some Classes have returned once more to their hedges after taking their end of school exams (Abitur). This year a student of biology came along to lead a group during the work experience. She had planted the first 'Waldorf hedge' as a Class Niner in 1986. It is also a task to cultivate awareness of nature amongst colleagues and co-workers. Thus there is a work day or a hedge care day for the teachers too. Twenty teachers set to work with as many pupils at a one thousand plant hedgerow. After a long break for lunch there were games for the pupils and a walk to a nearby castle.

Over the last eight years our work has developed so well that this idea can accompany the pupils right through the Upper School (and indeed, beyond). This was made possible by the vigorous efforts of our

pupils, the commitment of the teachers, and the support of the whole College. Thus we are able with confidence and gratitude to see the fruits of our work grow and thrive from year to year.

Translated by William Forward

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