

Goethean pedagogy

A case in innovative science education and implications for work based learning

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Abstract Purpose

The purpose here is to highlight the profound learning associated with the Goethean methodology in the Holistic Science MSc at Schumacher College, Devon, U.K. This is presented as a case study in profound pedagogy and as an exploration of the implications for workplace learning. Some comparisons are also made with reflective practice.

Design/ methodology/ approach

Background is provided on Goethe's 'way of science' and Barfield's 'participation'. Students were also interviewed about their learning and reflect on their experiences and challenges in learning the Goethean methodology, particularly regarding perceptions and participation, on their altered modes of thinking and feelings about learning, as well as on an 'immediate', corporeal and potentially co-operative mode of knowing in a 'community of practice', which can be extrapolated to the workplace.

Findings

The profoundness of the student experience and personal transformation presented in the interviews reveals that Goethean methodology has a place alongside the more specific analytical knowledge focus of Universities. While the method has challenges in reconciling existing modes of knowing with the new approach, the students are able to see and intuit the wholeness and

dynamism of phenomena more easily, and they gain a different perspective and learn to participate more fully in the world.

Individuality/ value

The article asks that this template for educational practice be considered more widely relevant to today's educational landscape in better providing skills and preparing students for the workplace in a world of 'super-complexity'.

Keywords:

Creativity, Participatory education, Goethe, Schumacher College, Holistic Science

Introduction

There are currently fundamental problems at the heart of University education (Warner, 2015). Knowledge alone seems an inadequate instrument to answer many of the world's complex global crises, as its tendency is to fragment and to approach issues isolated from their connection to the whole, including the workplace. This mode of education, dealing primarily in knowledge transfer, is not preparing students for the modern world. We are, after all, in what Ron Barnett terms the age of super-complexity, which requires 'an epistemology for living amid uncertainty' (Barnett, 2000a, Barnett, 2000b) and an 'ecological' model of university education (Barnett, 2011).

The current 'standard paradigm of learning' is dominated by the unquestioned assumption that the most valuable learning is of just one kind – cognitive/mental (Beckett and Hager, 2002; p 96), which maintains Cartesian dualism at its core. These authors have referred to this as the 'front-end model' of occupational preparation, primarily focused on education that takes place in classrooms, is remote from the workplace and is based on the acquisition of so-called 'technical rationality', which is subsequently applied to try to analyse and solve problems in the 'real-world'. It incorporates the idea that the most valuable learning resides in the minds of learners, who are essentially passive spectators. This has been called the 'onlooker consciousness', which distances itself from a true participation in reality (Lehrs, 2013).

We would like to introduce a different model of education to 'the standard paradigm of learning', as practiced and taught in the MSc in Holistic Science¹ at Schumacher College². At Schumacher College, abstract learning is placed within a whole and living context and grounded in practical, bodily emotional experiences, which align with the corporeality of practice-based learning

¹ This is a full-time one-year programme on which 15 students are enrolled annually, the details of which are at <http://www.schumachercollege.org.uk/about/msc-holistic-science-programme>.

² Schumacher College, Totnes, Devon, UK is a 'partner college' of Plymouth University, Plymouth UK. Information about the overall ethos of the College can be seen at <http://www.schumachercollege.org.uk/about/schumacher>.

(Yakhlef, 2010). Furthermore, this learning is not mechanistic, but ecological and organic (Sterling, 2001, Phillips, 2008).

The focus at the College is on interactive, experiential and participatory learning that encourages novel approaches to scientific investigation. Various non-traditional teaching formats, learning experiences and assessments are facilitated. Investigations are holistic in the sense that they are embodied as well as rational/intellectual and often result in different outcomes to traditional styles of research and reporting. Students are encouraged to blend the analytic-synthetic and the narrative-experiential as extensions and complements of each other in a coherent manner; e.g. involving the use of alternative creative formats such as personal narrative, artwork and experiential material alongside those normally used in scientific writing. Thus, intuitive insights, reflections and feelings that arise during the course of the work can be integrated.

MSc Holistic Science students from a range of backgrounds are generally seeking a new way of relating to knowledge, and engaging with the world's problems. Some students already have experience of working in information technology, business management, government, design and Non-Governmental Organization work, but feel the need to 'start again', while others decide on taking the masters immediately after graduation from undergraduate degrees. Prospective MSc students are motivated towards commitment to follow the path of finding a different relation to the world in integrating their learning and prior expertise with personal quests to find purpose and meaning. Following graduation, some students return to their old workplaces with a new integration of their personal journey; others move to organizations reforming old practise in business, research or education; some write books and present seminars and workshops to bring their new found knowledge and way of 'Being' to a wider audience, while others start their own enterprises.

At the heart of the Schumacher College educational experience is the 'way of science' of Johan Wolfgang Von Goethe (1749-1832). Goethe's rigorous and

systematic way of involving the imagination resonates with the needs and motivations of the students. Goethe's work is an antidote to the tacit dominance of 'rational' thought as the means to solve all problems in cutting through the closed loop that sees knowledge as the only valid way to criticise the predominance of knowledge. Alongside the many approaches such as systems theory that take one beyond the notion of a static world (Senge, 2006, Capra and Luisi, 2014), Goethe gives us a practical method of how to engage with such a dynamic reality. Indeed, Rudolf Steiner, the founder of Waldorf (Steiner) education, was the editor of Goethe's scientific works and was greatly influenced by Goethe's conception of the world (Steiner, 1973, Steiner and Barnes, 2000). A Goethean way of 'seeing' has been further described as 'seeing inclusively' by overcoming the imposition of existing mental frameworks, regarding special needs education for example (Oberski, 2003).

Another important figure whose work will be examined here is the philosopher Owen Barfield (1898-1997). Barfield gives context to Goethe's work within a cycle of evolutionary stages of human consciousness described as 'original participation', 'withdrawal from participation' and 'final participation'. Barfield and Goethe build a bridge between academic knowledge and the type of practical activity and engagement necessary in the workplace.

Goethean Science, participation and the imagination

As well as being an outstanding politician, poet and playwright, Johan Wolfgang von Goethe (1749-1832) developed a methodology to constructively engage with the world through developing a participatory 'way of science'. He investigated topics such as plants, colour, clouds, geology, meteorology and bone morphology (Seamon and Zajonc, 1998, Bortoft, 1996, Opitz, 2004).

Goethe's phenomenological approach is one in which the scientist actively engages with the phenomenon of study, thereby developing the intuitive mode of consciousness to gain insights about the wholeness and dynamism of the phenomenon (Wahl, 2005, Bortoft, 1996, Brook, 1998). For example, Goethe intuited the developmental relationship between leaves and flowers long

before plant developmental geneticists had realised the same thing (Theissen and Saedler, 2001).

Goethe's 'way of science' legitimises and organises the role of imagination, intuition and inspiration in science and makes these qualities systematic (Wahl, 2005). Goethe's approach rests on the development of human consciousness towards a way of seeing, which involves the questioner actively to perceive the 'wholeness' of the phenomenon, the inter-relatedness between the parts and the dynamic processes by which it is formed (Bywater, 2005). The method of inquiry, instead of dissecting an existence already presumed to be objectively there, gives space for a new relation to the wholeness of the phenomenon to reveal itself through the process of looking. It is a holistic science, which sees the dynamic unity of nature and which is truly participatory (Seamon, 2005). There transpires an intimate first-hand encounter between the student and thing studied (Seamon, 1998), where the human being is "*the most exact scientific instrument*" (Naydler, 1996; p 27). This approach is different from that of modern science, which seeks to distance itself from the phenomenon under study. Goethe's way of science involves a metamorphosis of the practitioner who participates with the phenomenon (Amrine, 1998). Thus, the personal development of the practitioner is fundamental to the methodology (Palmer et al., 2010, Zajonc, 2009). The method is accompanied by an embodied feeling of the phenomenon 'coming to presence' within the practitioner.

For example, one Goethean scientist described a dynamic, spreading, shining sensation associated with a 'star'-like quality of a nettle plant (Bortoft, 2012; p 175-176), highlighting a relationship between feelings, knowing and learning (Moon, 2004, p48). Furthermore, Goethean science is an inherently reflective process, since it uses the imagination to play with the phenomenon and to intuit new meaning. Reflective practice is becoming increasingly important as a means towards educational, social and organisational change (Marshall, 2011, Ghaye, 2011). Thus, Goethean science could contribute towards improved reflective practices, which take into account the whole, embodied person in moving beyond solely intellectual reflection.

Goethe called his participatory approach a 'zarte Empirie' or 'delicate empiricism' (Holdrege, 2005b), which involves development of so-called 'new organs of perception' to gain a much fuller and more complete experience of the phenomenon (Naydler, 1996). The focus in academia is usually on textbook explanations and theoretical knowledge, such that students do not develop their skills of observation. So what practical methods are required? We will outline below the stages of Goethean science as described by Daniel Wahl (Wahl, 2005).

The Goethean methodology

The preliminary stage of the Goethean approach is to go to the subject, allowing a first impression to form without intention - to just encounter the subject in a very relaxed way, letting the 'feeling' of the subject come in to the practitioner. The next stage of Goethe's process is 'exact sensory perception'. After the first impression, one approaches the subject with the intention to draw or note down very neutral impressions of the subject. This involves detailed observation of the object perceived through all the senses, while suspending all form of personal judgement and evaluation (Wahl, 2005).

Goethe's next stage, 'exact sensorial imagination', involves a surrender through the imagination to allow the 'background' whole context to the 'foreground' expression of parts to reveal itself. Goethean scientist Craig Holdrege describes his experience of what he calls 'a conversation with nature', in this case 'with' skunk cabbage (Holdrege, 2005a):

"After I go out and observe, I make a point of actively re-remembering the observations. With my mind's eye I inwardly recreate the form of the leaves, I inwardly sense the colors and the smells, and so on. This process of conscious picture building is what Goethe called "exact sensorial imagination". It entails using the faculty of imagination to experience more vividly what I have observed. I try to be as precise as possible - and will often notice where I haven't observed carefully enough, which I try to do the next time I'm out.

When you do this kind of conscious picture building, you grow more and more connected to what you're observing." (Holdrege, 2005a; p35)

Thus, the foundation of Goethe's method is a practical investigation of phenomena by systematically using the imagination to participate more fully with it. Thus, this approach is a practical methodology for developing faculties of perception, imagination, inspiration and intuition where these qualities are intrinsic to the process, rather than 'add-ons' prior to or post analysis (Wahl, 2005, Bortoft, 1996). Moreover, this is not a complete 'free play' because there are constraints on what can legitimately be imagined. Ultimately the phenomenon suggests the unique dynamic process of its origination. This kind of imagination is therefore scientific rather than artistic.

Subsequently, active perception is suspended and as much as possible the scientist 'receives' from the object. The phenomenon is 'seen' in the dynamic awareness reached through the use of the imagination, thereby allowing the 'thing' to express itself through the observer. This stage corresponds to 'seeing in beholding' - being one with the object of study. This allows the content or meaning of the object to be appreciated, as well as the form itself. So, the outer appearance of the 'thing' and its inner content are combined by conceptualisation (Wahl, 2005). More particularly, the nature of the 'thing' and its process of origination are necessarily joined in apprehending the whole quality (Franses, 2015). However, this process is not without its challenges - moving into new modes of perception and knowing can be disorientating for the student, who is trained through their prior education to expect, strive towards or look for a specific 'outcome'.

Interestingly, the Goethean approach is one that is recognised within the 'mainstream'. Maura Flannery describes a Goethean approach to the analysis of proteins (Flannery, 2005). Moreover, the following has been said about the Nobel Prize winning plant geneticist Barbara McClintock (1902-1992):

“[She] gained valuable knowledge by empathizing with her corn plants, submerging herself in their world and dissolving the boundary between object and observer” (Palmer et al, 2010; p28).

In social science, Ramsey has outlined a scholarship of practice for management learning based on deliberative attention, rather than knowledge *per se* (Ramsey, 2014). She proposes a practice based learning where the practice itself is privileged, rather than knowledge that is applied in practice. She goes on to examine the literature, including that of John Shotter’s ‘social poetics’ or ‘witness thinking’, stating that practice-based learning involves the physical and is *“not a learning that goes on just inside the head”* (p 9). Indeed, Shotter has considered the role of Goethe’s method in ‘witness-thinking’ (Shotter, 2005).

Ramsey also considers mindfulness and attention, both of which are utilised in the Goethean method and she discusses Marshall’s approach to first person action research and her ‘intentional disciplines’ as a way of attending to how practice relates to context. Marshall posits that inquiry requires making judgements about when to be focused and directed and when to be open and receptive (Marshall, 2001). Indeed, she describes her method of inquiry through moving between what she calls ‘inner’ and ‘outer arcs of attention’, and cycles of action and reflection that have their own momentum and that avoid static or repetitive modes of thinking. Thus, similar to the Goethean method, there is a rhythm or discipline in moving back and forth between action (agency) and reflection (communion) such that, as Marshall says, *“my inquiring is unfolding of its own volition”* (p 437). The Goethean practise might end up with an action that we feel compelled to take or a call to a modification of future behaviour, without this necessarily being mediated by a rational understanding.

The development of the Goethean way of ‘seeing’ is a different mode of participation than we are generally used to, owing to the spread of the analytical, reductionist mode of thinking, which has prevailed in western science and which has pervaded society (McGilchrist, 2010). The primacy of

the intellect, as giving ground to the phenomena, contrasts with Goethe's work - the reverse experience, of *seeing the phenomena as the ground of reason*. This 'conscious picture building', using the faculty of the imagination to create images in the mind, activates the ability to participate more fully in the phenomenon and to gain insights and feelings about the phenomenon, which will arise within the practitioner. Thus, we need time and space for reflection and to develop the quiet mind required for such practices, so that we can truly participate in the phenomenon we are hoping to understand more fully.

We will now more fully consider the different kinds of 'participation' as outlined by Owen Barfield and how he suggested rebalancing the 'onlooker consciousness' with participation in the world.

Owen Barfield and Participation

Owen Barfield was an English philosopher and a member of the 'Inklings' group that included C.S. Lewis and J.R.R. Tolkien. His interest was in the evolution of human consciousness. *Saving the Appearances, A Study in Idolatry* (Barfield, 2011) describes three modes, which reflect the evolution of human consciousness. These are: *original participation* – a full participation with the world, albeit an unconscious and naïve one (this corresponds in the Goethean process with the preliminary stage of *first impression*); *withdrawal from participation* is the withdrawal of human consciousness from participating in the world, coming to its apogee in the development of the modern scientific method. Lastly, *final participation* is where the 'objective' outer world is imbued with 'subjective' meaning not through a reductive methodology, but through the imagination. It describes *withdrawal from participation* and *original participation* joined in a new synthesis. Barfield saw Goethe's method as the 'missing link' between *withdrawal from participation* and *final participation*, through the systematic development of the imagination.

'It is particularly interesting that a man with the precise make-up of Goethe should have appeared at that precise moment in history of the West. By the middle of the eighteenth century, when he was born, original participation had

virtually faded out, and Goethe himself was a thoroughly modern man. Yet he showed from his earliest childhood and retained all through his life an almost atavistically strong remainder of it. It breathes through his poetry as the peculiar Goethean attitude to Nature, who is felt as a living being, almost as a personality, certainly as a 'thou' rather than as an 'it' or an 'I'. It is almost as if the Gods had purposely retained the sense in Goethe as a sort of seed-corn out of which the beginnings of final participation could peep, for the first time, on the world of science.' (Barfield, 2011; p160)

Thus, there is a shift from a static world that we are separate from and which we view from the 'outside', that we can fix, pin down and explain, to a dynamic world that is constantly in process, which has to be participated in to be revealed. One meets the phenomenon as 'arrival', not as an object that one visits or upon which one imposes a theory. As Barfield says:

"The processes [are] grasped directly and not, as hitherto, since the scientific revolution, hypotheses inferred from actual phenomena." (Barfield, 2011; p158-159)

This change in perspective has a transforming effect on the students and their way of engaging in their studies. Barfield puts Goethe's work in the context of a much larger psychological journey that is of direct relevance to our attitudes to the workplace in terms of participation and wholeness.

Relevance of the Goethe's way of science and Barfield's participation to workplace learning

University education at the moment introduces an irreconcilable tension in the modern student entering the workplace. There is a disconnect between the abstraction the student has learnt and the practical challenges of a workplace. In the workplace, learning and participation in work are inseparable (Billet, 2004). Learning in the workplace is experiential, merging theory with practice and knowledge is fluid and is created during work (Raelin, 2010). So, the Goethean methodology may be particularly suited to the workplace and

workplace learning, as opposed to ‘traditional’ academia with its more abstract approach to transfer of a body of knowledge from the teacher to the student.

The Goethean methodology reveals a dynamic and participatory world that is constantly in process – typical of workplaces. The workplace reflects the creativity of the people in it, rather than being a structured system governed by rules set down in a document. So, a question to be asked is what is the extent and nature of this individual ‘participation’ in this ‘dynamic’ world of the workplace that is in constantly ‘in process’? Furthermore, how does the extent to which individuals participate in the social and cultural environment of their work place affect their ability to learn? Does the way in which the worker ‘sees’ the workplace, their position within it and the nature of their engagement (participation) in it, influence the nature and degree of the learning they attain? Workplaces do indeed afford opportunities for learning. But, how individuals elect to engage in workplace activities has a direct influence on the quality of learning they attain (Billett, 2001). Furthermore, It has been stated that:

“In considering learning as participation in work, it is important to stress that engagement in and what is learnt from socially-determined practices are not determined by the social practice. Instead, individuals decide how they participate in and what they construe and learn from their experience.” (Billett, 2004; p 316).

Goethe’s way of seeing and Barfield’s classification of different levels of participation prepare the student for a more holistic and dynamic way of learning in the workplace, a truly participatory practice. The whole workplace is not only the infrastructure of the building, but also the interests, skills and motivations (agencies) of all the individual employees. The whole workplace expresses itself within each individual. Furthermore, the extent to which each individual participates in the whole and expresses him or herself through the whole will influence the overall success and dynamics of the workplace. This will also influence the degree of the ‘fulfillment’ of all the individuals within the workplace. In this sense, each individual is a part, and thereby ‘part’-icipates,

but the whole is in all of the parts. So there is a dynamic, multi-dimensional inter-relationship between parts and wholes. When each individual participates fully, not only the individual benefits in terms of their learning, but also the 'whole' system (work place) benefits. Indeed, it has also pointed out that:

“There are also worthwhile procedural reasons for making participation and participatory practices a central foundation of a workplace pedagogy.” (Billet, 2004; p 317)

However, there is a tension, since the model of education inculcated into most students is one based on science, which in the traditional model is concerned with acquisition of facts and absolute objectivity, which negates participation. This model of education is not generally predicated on teaching the ability to truly see the dynamics and wholeness of phenomena and to truly participate in it – as described above. Thus, the training through formal education is not conducive to full participation in the processes of the workplace. Full participation gives greater purpose and meaning for employees in their work (Dik et al., 2013). Finding meaning in one's work is important for personal fulfilment, happiness and development. The argument here is that Goethe's way of science, through embodied feeling and imagination, and Barfield's characterisation of levels of participation through human evolution can provide a more holistic approach to workplace dynamics and learning. Peter Reason has examined and extended Barfield's participative worldview and developed a participative and collaborative research methodology, which sees human beings as co-creating their realities through participation (Reason, 1994). This seeks to give an answer to 'what is of value in the enterprise', alongside the more analytical 'how does it work?'

In the next section, building on the background we have provided on the Goethean methodology, Barfield's participation and their relevance to workplace learning, we present the words of several Schumacher College MSc Holistic Science students interviewed regarding their 'lived experience' of their course, with particular regard to Goethean science, participation and

learning. The students reflect on their experiences and challenges in learning the Goethean methodology in the context of their previous education (e.g. in terms of perceptions and participation) as well as what this brings to the fore for them in altering their modes of thinking and feelings about learning, as well as its advantages as an 'immediate' and potentially co-operative mode of knowing in a 'community of practice', which can be extrapolated to the workplace.

Schumacher College MSc Holistic Science Student Interviews

Goethean science is seeking to awaken a natural intelligence, which can best be described first hand through students talking of their experience. The ground of the approach is developing a fullness of the capacity for engagement in the world that is primarily the subject of experience.

Three Interviews were carried out with students from the same MSc Holistic Science class (2013-2014). The interviews are presented using a 'profiling' approach (Seidman, 2013) in which the students speak 'for themselves' of their 'lived experience' of Goethean science. Interviews 1 and 2 were carried out by MW in April 2014, while interview 3 was carried out by PF in April 2015 approximately 8 months after that student had completed her course.

Interview 1 was with a business graduate who had worked in marketing and careers consulting before pursuing the MSc in holistic science. She describes the challenges she experienced in developing this new way of 'seeing' using a Goethean approach. She also reflects on how she feels she will adapt to life after leaving the College in applying and communicating this new understanding. Her PhD thesis, on which she is currently engaged, applies Goethean methodology to movements of social transformation.

I had the most profound experience with the groundsel plant when I did Goethean science. I was sat there in front of this plant thinking "Oh my God! What the hell am I doing? I'm not supposed to be doing this. If my Dad saw me doing this what would he be thinking? And if my friends saw me doing this they'd think I'd gone off my rocker!"

I was trying to let this plant talk to me or see it differently. I was trying to be with it outside of labels or pre-judgements and what happened was that I dropped into this chasm, this void for a week where I couldn't say anything. It was like this whole silence thing - it freaked me out, it really, really freaked me out. And I didn't know what was happening to me.

I was in a completely different relationship with the plant - not coming to it with any preconceived ideas and not knowing what to do with that. Not knowing how to be with it. I felt energetically that something was happening, but I had no words. And I was just totally overwhelmed. And I remember saying to Philip [Franses], "I've got no words, I don't know what I'm supposed to be doing". He says, "You're not supposed to be doing anything!" Because I wanted 'this is what you do'...and you can't do that with phenomenology or Goethean science. You just have to notice and 'be with' [the phenomenon] and I don't think I'd ever noticed or been with in relationship with anything before in that way. So, I was in a place of unknown and quite fearful I think because I kept dropping into "I've got to justify this" and I couldn't justify it.

So, I'm emerging from this experience just really landing with what's happened to me. And, stepping back now because I have been exposed to the opposite of what mechanistic thinking and the mechanistic paradigm I've been brought up in is. I can see that now. I can look at it, but also this is like this brand new way of viewing the world that I'm like a new-born baby in and I'm trying to find language for it, to articulate and be with [it]. I think what I'm trying not to do is every time I feel myself falling back into [the recognition of] 'that is an old way of thinking', to try and pull myself back out, so I'm not trying to over-analyse too many things.

Interview 2 was with a student with a BA in history and a minor in Russian. He also has an educator's certificate in wilderness ecology and a professional certification as a wildlife tracker. He reflects on his prior experience and how direct experience has been excluded from educational and workplace environments. He also reflects on how the Goethean 'new organs of

perception' have to be developed and exercised. He also described how he views his job as a permaculture designer in which he was able to fully exercise his abilities to observe, participate and communicate so that an 'unfolding story' is revealed. This approach is 'open', rather than 'closed'. He also reflects on trusting in the educational experience to emerge. He is now a senior coordinator in an education centre in USA.

I became interested in the philosophy of how experience, direct experience, has become excluded, not just from education, but also from work environments, from philosophy, in the philosophy of science. And what was fascinating to me about that is that it is a self-fulfilling prophecy. If people don't practice their abilities of direct perception and ability to communicate with each other, those abilities never develop or atrophy and then it becomes true that people are unreliable participant observers.

And that's how I ended up going into permaculture design initially because it's a much more experiential approach grounded in observation - participant observation, an engaged kind of observation, where you are always within your experiment as a participant. And eventually, I ended up studying traditional ecological knowledge, and tracking and [I] also began doing a bit of work as an educator.

Something I realised as soon as I started educating folks is how much communication hinders that kind of collaboration. So, for example, when we would go out in the field (and at the time I was coming at the traditional ecological knowledge, rather than say Goethean science), but what we were doing was practicing 'exact sensorial perception'.

And I immediately realised that everybody, every adult, struggled immensely with doing direct sensorial perception and communicating with direct sensorial perception and immediately began to have realisations that they were seeing a lot more than they ever allowed themselves to see. Because as soon as I started to ask them more about the 'thing' they called 'bee' buzzing around the flower, and we started to ask "Well, how many wings did it have? Can you

describe its body markings? How are its eyes placed?" They realised it was a fly! And then they realised that the tips of the feet were gold and then they would just step back and say "Oh my gosh! I never realised there was that much to the world or that I was seeing that much of the world and not actually acknowledging it to myself and therefore not communicating it to others."

And that was the second thing that blew me away, was that when one person would manage to communicate in that way it would open [up] the skill to others in the group and that what quickly began to emerge out of that was a whole different kind of communication. Because they had shifted from fitting their perception immediately into categories from "Hey! Look at the bee flying around the flower" when it, taxonomically, wasn't a bee - to continuously disclosing what is coming into their perception. And that has the effect of continuously opening [up] the world, as opposed to continuously closing the world to perception. And that makes the world a continually unfolding story, an open story, rather than one that is perpetually finished.

Interview 3 was with a student of animal behaviour who had left working in academia some years previously, and did the masters in Holistic Science as a way of exploring the role of science in how we see the world. She reflects on how she became disillusioned with the approach of 'mainstream' science and how the course and the experience of Goethean science has given her a different perspective on the scientific method and a direct practical experience of the power of Goethean science through studying plants to get 'inside of the phenomenon' and to see it as a process rather than looking for a specific outcome.

I went into animal behaviour research with curiosity to understand animals better. During the research, I felt that the lived qualities of the animals were being lost. Scientific language, the way we report the methodology also deadens the inquiry. How we do science and how we talk about science leaves the aliveness out of the individuals and out of the world, with no possibility to receive knowledge from the subject.

At first when I came across Goethean science, I didn't understand what could be done, but there was something very powerful in the methodology. The methodology came alive for me the moment I started practising it. I had been engaged on a theoretical level, but I didn't really understand the power, what it could do to me until I started practising it in the study of a daffodil. So once I started practising that methodology, it came alive. It changed my relationship with plants. When I did the study with the daffodil to learn the methodology, it made me appreciate daffodils in a completely new way.

A particular moment of meaning I associate with Goethean science was in the study of an orchid, I was drawing every day for my dissertation. I started feeling a movement inside of me that seemed to mirror what was happening to the plant. I felt light, growth, stretching towards the light, spiralling, colours, moving upwards and opening out in the sun. I felt I understood something of the being of plant. I had never had anything akin to that feeling with any methodology before. It came after spending twenty days with that plant everyday (see Figure 1):



Figure 1: Student's drawing of a 'mood of place' with the orchid, illustrating the illumination moment, where the ground of perception is the experience of meaning.

It was a freeing experience pursuing a methodology that gave permission to participate with the life of my study subject. That gave me great meaning, with every interaction possibilities opened up for understanding and growth.

The Goethean methodology has a great potential as a parallel process, a receptive type of knowing, coming from the inside of the phenomena. The challenge is to bring participatory and qualitative aspects into science, by having a methodology to follow, where there is repetition of the same process, every day, and the demand to be validated by a community of practice. The potentiality of Goethean science would become obvious in a much more powerful way, if there was a minimum number of people who would practise together in a core way. There would be enough people practising it to achieve a consensus.

I am now practising Goethean science giving workshops, which I have developed with other alumni all around Europe. Goethean Science taught me to be present and responsive in the process itself. There is a shift of emphasis from the outcome to the process. The process becomes the workshop. Instead of trying to impose a framework on people, I pay attention to what people are bringing in naturally. I see my work now as a dynamic flow, constantly changing and evolving, moulding myself to what is happening.

Conclusions

The Goethean methodology provides a rigorous and systematic way of involving the imagination of students to develop the ability to see the dynamics and wholeness of phenomena. Furthermore, Owen Barfield's concept of '*final participation*' reveals how the Goethean-like '*original participation*' and the modern science-like '*withdrawal from participation*' can be synthesised into a new way of '*participating*' in the world, which integrates both intuitive/imaginative/holistic and analytical/reductionist modes of seeing. The profound student experience and personal transformation presented in the student interviews shows that such an approach has a place alongside the more specific analytical knowledge focus in schools and Universities. This

holistic approach moves beyond the mechanistic view of nature on which industrial educational models are based.

The article's aim has been to highlight some of the results of the profound pedagogy at the heart of the Holistic Science degree at Schumacher College, with particular regard to Goethean science and Barfield's 'participation'. It asks that this template for educational practise be considered more widely as relevant to today's educational landscape. In awakening a curiosity about Goethe, we encourage the reader to explore further the alternative to knowledge of finished ideas by 'reversing the direction of attention, into the event of understanding' (Bortoft, 2012; p94). Such an education, though having its own unique challenges as indicated by the student interviews, gives confidence that a fundamental alternative exists in the application of learning to the workplace. This includes the ability to imaginatively and intuitively 'see', feel, embody and reflect on the dynamic emergence of the whole phenomenon, as well as applying the analytical and rational mind in classic problem solving. Thus, the methodology allows for a practical appreciation of how participation in the workplace could be enhanced. This requires further investigation, but the seeds have been sown here, in this brief introduction to the Schumacher College education, Goethean Science and Barfield's participation.

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