



thefieldcentre

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formation

1. the action of forming or process of being formed
2. a thing that has been formed

ORIGIN

Latin *formare* 'to form', based on Latin *forma* 'a mould or form'

Cover image: Ground plan of the Field Centre building

WELCOME

Aonghus Gordon

Welcome to the Winter/Spring issue of the Field Centre Journal of Research and Practice.

There is a deep and rich vein of research in issue eight. Reflecting on past issues, we can begin to see how, in the space of a few years, Ruskin Mill Trust has managed to strengthen and celebrate its research fields. Born out of a practitioner culture, our research shakes hands with the more academic world. This is a conscious aspect of the broader vision of the Trust, where communities of practice are best served by practitioners themselves undertaking action research to ensure knowledge and understanding for future succession.

The late Dr Sue Reed was a tenacious advocate of “practice enhanced research and research enhanced practice”. Her many years’ service to Ruskin Mill Trust is celebrated in this issue. Sue built on a rich and well-informed practice of textiles and built up a body of knowledge and experience that is now woven into the understanding of textiles, both as a craft and therapeutic practice.

Dr Judyth Sassoon looks at the design thinking behind Oxford University’s Museum and the Field Centre, taking an aesthetic and building new insights. This is a brave attempt and brings together an exemplar of John Ruskin’s architectural thought with our own genius loci-informed building. The Field Centre creates space and purpose to reflect on practice, particularly with regards to the materials of clay, in the construction of the Rotunda, the pillars from Park Wood and the fleece used as insulation in the dome. These three key materials inform the curriculum of the nine ancient crafts of mankind, drawn from animal, plant and mineral, in the student curriculum of *Practical Skills Therapeutic Education*.

The Trust invited Johannes Kühn, previous Leader of the Science Section at the Goetheanum, to accompany a team of researchers as part of the inauguration of Goethean Science work in the Trust. His visit started in the Field Centre and moved to Sunfield, where many aspects of Rudolf Steiner spiritual science and the original Goethean Science foundation in these islands were founded after the 1930s. The Trust now operates Sunfield as a specialist school, and there are intentions to resurrect a new Goethean Science research centre at Sunfield. This is still in the early stages.



The Field Centre interior

From Sunfield, the team moved to the emerging Castelliz Centre in Pembrokeshire, at Coleg Plas Dwbl. Johannes writes briefly on his journey and visit in endorsing the Golden Triangle of Goethean Science research.

Maarten Ekama follows in exploring Goethe's research on granite, and offers translations of his key writings in the area. This brings to light the solid foundations that Goethe built on from his highly developed observations and imagination in scientific questions.

The Trust continually researches its own practice. To this end, Sue Reed and Julie Woods collaborated on investigating the Ruskin Mill Trust Student Study – a deep dive into the biography and reimagining of student potential. This is placed in the context of the Seven Life Processes and artistic work by Johannes Steuck, an artist commissioned in the early stages of Freeman College, in the centre of Sheffield, whose work illustrates different aspects of Rudolf Steiner's life processes. The life processes give the foundation for our inner personal autonomy when correctly nurtured and developed, a template on which to establish student health.

Katherine Kelly, who was a member of staff in the early days of development at the Glasshouse, researches inclusion in education. Her insights celebrate and contribute to the many achievements of inclusion that Ruskin Mill Trust enjoys with regards to public access and contemporary apprenticeship learning in many of the Trust's social enterprises.

Birdsong and the dawn chorus are taken for granted in the north west of Europe. Dr Judyth Sassoon presents her research on how to understand the



significance of this gift from the natural world; through the lens of Goethean morphology she gives an opportunity to extend our understanding.

Simon Reakes dives into the compost heap and reveals a number of insights from Jochen Bockemühl's foundational Goethean Science work. He appropriately combines a transition from Goethe to Steiner and brings a new vision of how to work with the material world in such a way that it enlivens both the materials and landscape.

Dr Troy Vine takes us on a journey regarding projective geometry, bringing together both mathematics and colour. The reader may wish to extend their interest and knowledge after reading this article by taking a look at the recent publication, *Experience Colour*, written in collaboration with Matthias Rang and Nora Lobe, published by the Ruskin Mill Field Centre.

The issue concludes with further investigation by Paul Garnault into theatre and colour, placing it as both a threshold and sacred art, and an overview of research around the Trust from Dr Gill Nah, with particular reference to work-based learning.

I hope you find the contents hold the requisite breadth and depth to support your own practice. Wishing you all the best as both a reader and researcher in the field of Goethean science and Rudolf Steiner spiritual science.

Aonghus Gordon OBE
Founder and Executive Chair of Trustees
Ruskin Mill Trust

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JOURNAL OF RESEARCH AND PRACTICE

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Journal overview

The Field Centre Journal of Research and Practice presents research carried out in and around the Field Centre (Nailsworth, UK), the hub for Ruskin Mill Trust's research, and more broadly, work which shares our research themes. The *Journal* is open access and available via the Field Centre website www.thefieldcentre.org.uk, as well as distributed in print form. Our research themes are:

- Action research, which is integral to the various dimensions of Ruskin Mill Trust's method of *Practical Skills Therapeutic Education*, particularly research connected to our staff's practice of craft, biodynamic agriculture and therapeutic pedagogy.
- Research on any topic within the paradigm of Goethean science.
- Research on Rudolf Steiner's life, work and legacy.
- Research reports on work currently being carried out around the Trust.

Research specifically on the outcomes and impact of Ruskin Mill Trust's *Practical Skills Therapeutic Education* method using mainstream research methods will usually be referred to existing scholarly journals in the appropriate academic disciplines.

Editorial board

Editor

Prof Laurence Cox

Editorial Committee

Dr Gill Nah, Simon Reakes MSc,
Dr Judyth Sassoon, Dr Troy Vine

Submissions

We welcome contributions for future issues from practitioners and researchers alike. We are open to a wide range of writing styles, formats and approaches in our general remit.

Articles should be no longer than 3,500 words and the deadline is September 1 2023. High quality images (300 dpi minimum) are very welcome if you have permission to use them (please check). Articles should be submitted as Word, Open Office or RTF files. Images should be sent separately as JPG files with captions and details of permissions.

To discuss submissions please email: laurence.cox@rmlt.org.uk

Ruskin Mill Land Trust

Old Bristol Road, Nailsworth, Gloucestershire GL6 0LA Reg. charity no. 1053705



Ruskin Today

JOHN RUSKIN
FOR THE 21st CENTURY

Why are we *Ruskin* Mill Trust? What has a 19th-century art critic and social reformer to offer young people with special educational needs in the 21st century?

John Ruskin (1819–1900) was a true public intellectual of his day who attracted audiences of over a thousand, delivering mesmerising talks with vast illustrations: more TED talk than academic lecture. What attracted people was Ruskin's capacity to take the themes of the day along with a wider vision of what makes for a healthy and connected human life. An appreciative exploration of the world leads

to valuing skilled practical engagement and a community in which that is nurtured. For our students, putting his ideas into practice is transformative.

To celebrate his bicentenary, Ruskin Mill Trust commissioned an expanded second edition of a 2006 collection of essays. Nineteen contemporary authors from many fields responded to Ruskin's work with a short discussion of why it matters today. The book includes contributions from Aonghus Gordon, Matt Briggs, Berni Courts, Judyth Sassoon and Laurence Cox.

The book can be ordered from rmlt.org.uk

EDITORIAL

Prof Laurence Cox

Welcome to the eighth issue of the *Field Centre Journal of Research and Practice*. The journal reflects the work of the new Ruskin Mill Centre for Research, which includes the Field Centre (Nailsworth, Gloucestershire), the Life Science Centre (Pishwanton, East Lothian) and the developing Castelliz (Clynderwen, Carmarthenshire) and Sunfield (Clent, Stourbridge) research centres. It also reflects the work of the Ruskin Mill Centre for Practice, which delivers our Master's degree in Practical Skills Therapeutic Education, our extensive offer of lower-level courses for staff and external students, and supports our senior staff carrying out PhDs researching Ruskin Mill Trust's practice in half a dozen different universities and disciplines.

Drawing on the wide-ranging insights of Rudolf Steiner, John Ruskin and William Morris among others, Ruskin Mill Trust uses traditional crafts and biodynamic farming as forms of therapeutic education for young people with special educational needs and behavioural issues, in our distinctive method of *Practical Skills Therapeutic Education* (PSTE).

The Journal is a space for the many different kinds of research around Ruskin Mill Trust, showing their significance beyond their immediate context. This issue includes reflections on the spirit of place, Goethe's engagement with granite, research on openness and inclusion in education, an exploration of morphology through the dawn chorus, research on the history of Goethean enquiry and on its model of paradigm change, theatre exercises for the creative process and an overview of research around the Trust.

In this issue we also mark the sad loss of Sue Reed, a long-time collaborator with the *Journal* and an animating spirit of the Field Centre. We publish her last article, co-written with Julie Woods about our signature method of the Student Study, and offer an appreciation of her many years of work for the Trust.

We hope that this issue of the Journal will speak equally to parents, staff and students around Ruskin Mill who want to understand more of the research that keeps our approach alive and effective; to special needs educators, craftspeople and farmers who want to reflect more deeply on their own practice; and to researchers across a wide range of fields who value this sort of dialogue between disciplines and between research and practice.

We invite our authors to write for this wider audience without dumbing down or flattening out what is particular to their own engagement with the world. In particular, we hope that each article is able to show readers why the subject matters and what they may be able to learn from this. We invite our readers in turn to try to grasp imaginatively the many different forms of connection represented in this journal: between stone and science, between drama and the dawn chorus – but also between the written word and the practical movement, and between a specific activity and how it can help the distressed young people we work with to transform their own lives.

Prof Laurence Cox
Research Consultant, the Field Centre

genius loci

Genius loci, from the Latin 'spirit of place', recognises the heritage and uniqueness of locality. In each educational provision, Ruskin Mill Trust works holistically with the landscape, its geology, flora and fauna, and history of human activity, to develop specialist curriculum activities.

The background image shows the interior of a large, historic building, likely the Oxford University Museum of Natural History. The architecture is characterized by high, vaulted ceilings with intricate stone tracery and a series of tall, slender columns. The floor is polished and reflects the ambient light. In the foreground and middle ground, several large dinosaur skeletons are displayed on wooden platforms. The skeletons are arranged in a way that suggests a path through the museum. The lighting is soft and even, highlighting the details of the architecture and the bones of the dinosaurs. The overall atmosphere is one of a grand, well-maintained institution.

**The Oxford University Museum
and the Field Centre:**

Two Buildings, One Philosophy

Judyth Sassoon

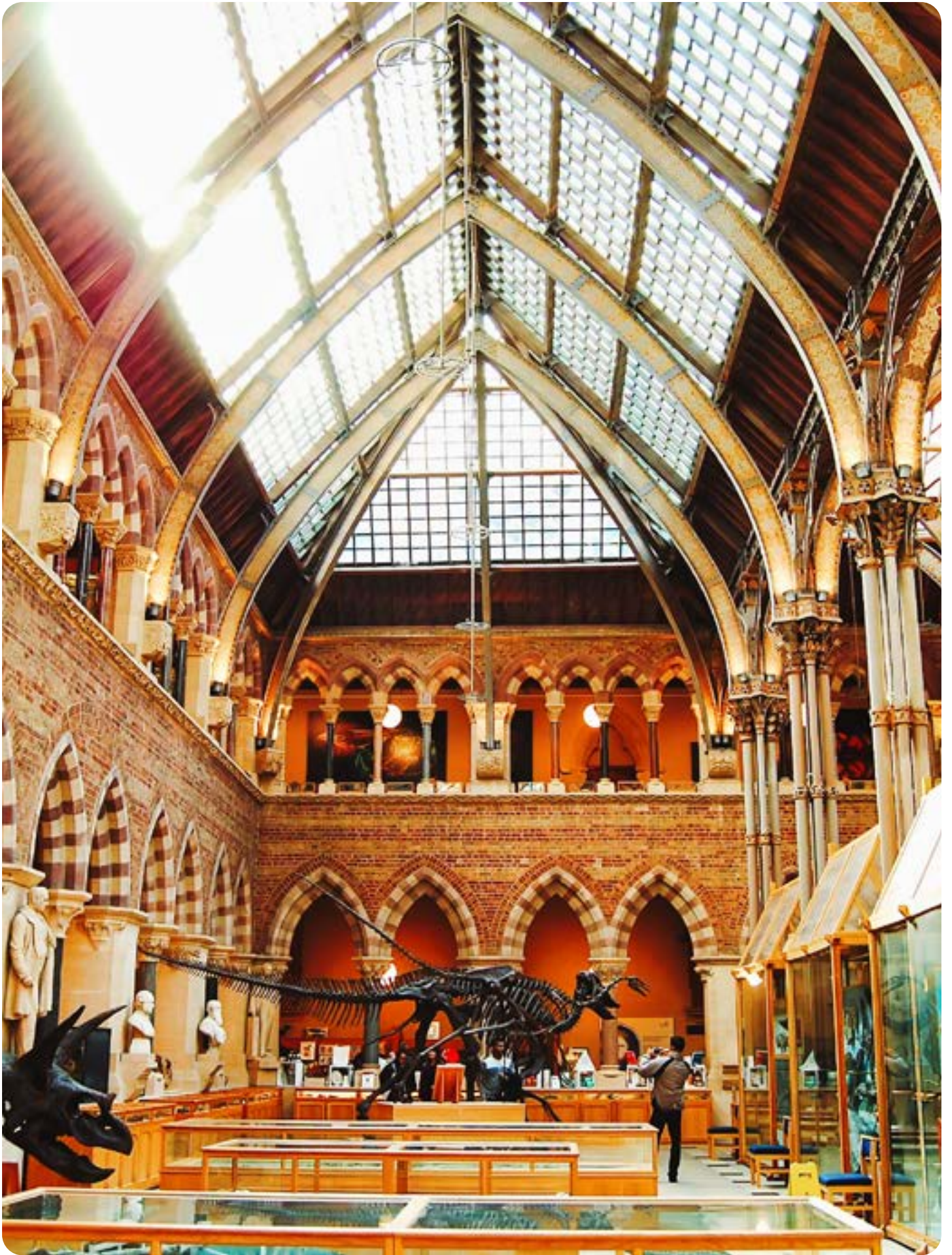
At first glance, one might not see the similarities between Ruskin Mill Trust's Field Centre in Gloucestershire and the Oxford University Museum of Natural History. The Field Centre stands in a rural setting. It follows a modest, sweeping architectural design, spreading horizontally and caressing its surroundings with gentle curves. Its roof flows into the landscape and dips earthwards at the northern and southern extremities, while to the east and west the roof rises slightly towards the heavens. By contrast, the Oxford Museum is a striking Neo-Gothic edifice standing at the edge of the University's science precinct. Its architecture stretches vertically upwards. Like other Gothic structures, it appears to pierce the heavens, demonstrating that the spirit need not be confined within the kingdom of heaven, but can also live powerfully on Earth, within human achievement. Though clearly different in their outward presentations, the Field Centre and the Oxford Museum are nevertheless united by an architectural philosophy associated with the creative spirit of John Ruskin.

For Ruskin, architecture was a way of instantiating nature's creative force into purposeful form, through manual labour and craftsmanship. Both the Field Centre and the Oxford Museum buildings unite their different purposes with their surroundings through the vigour of human endeavour. Human creativity draws metaphorical lines of purpose, much like the governing lines of movement that Ruskin discusses in *Elements of Drawing*, and these imaginary lines flow through both buildings uniting context, content and functions.

The context and functions of the Oxford Museum live within its structure and design. The natural surroundings provided the materials and setting of the building, while inside it is illuminated by natural light from a glass roof. This light reflects off walls and pillars, built from carefully selected local British stone. A cast iron framework adds a powerful skeletal framework to the building, whose stone and iron pillars are heavily ornamented with carvings of natural structures, such as leaves and branches. Glass cases contain specimens from Oxford's biological collections. These displays along with freestanding or suspended skeletons, are strangely embellished and brought to life by the play of light at different times of day and in different seasons. The supporting iron and stone provide a dark and pale skeleton that harmonises with the dark and pale specimens on display. The overall quality within the museum is one of light-driven movement, which resurrects the specimens into vitality.

The Oxford Museum was built between 1855 and 1860 out of a collaboration between four Victorian personalities from the sciences and arts: Henry Acland (Regius Professor of Medicine), Benjamin Woodward (designer and architect), John Phillips (geologist and Keeper of the Museum 1857–1874) and John Ruskin. Its purpose was to provide a permanent repository for the University's extensive natural history collection. The specimens had to be displayed to maximum effect and, most importantly, the building had to offer students the best possible opportunity to learn from the "book of nature". Ruskin's main role in the design and decoration of the building was as a mentor to Woodward and as a guiding spirit for the building. His *Nature of Gothic* was the inspiration behind its design, architecture, decoration and ideology. Ruskin himself designed the windows in the main façade and their intricate, finished decorations have a characteristic "Ruskinian" signature, in as much as they appear to be living and growing. Ruskin wrote the well-known phrase "There is no wealth but life" (*Unto This Last*, 1860) and his designs always point to that particular source of boundless wealth.

Ruskin Mill's Field Centre also embodies a "Ruskinian" gesture of design, architecture, purpose and human effort. Life is expressed through its flowing "liquid" architecture which, like the Oxford Museum, embodies the context, present function and emerging purpose of the building. The Field Centre was created in response to a need for a research centre within Ruskin Mill Trust and, at its chosen location, it was built as a visually associative structure in harmony with the landscape. Like the Oxford Museum, the inside of the Field Centre building is brought to life by an interplay of light with the colour and



The interior of the Oxford University Museum of Natural History



The Field Centre interior



texture of its building materials, such as lime, wood, clay, metal and glass, all building materials from the immediate environment. Perhaps even more than the Oxford Museum, the Field Centre arose out of a deliberate collaborative effort between contractors, designers, Ruskin Mill staff and volunteers (details are on the boards exhibited in Ruskin Mill Café).

The Field Centre's immediate purpose is to provide a focal point for collaborative research on Ruskin Mill Trust's methods in education, Goethean science and associated spiritual research, where phenomenology and qualitative approaches as well as exact picturing in imagination (which is different from fantasy) form legitimate areas and subjects of research. In contrast to the Oxford Museum, whose non-living specimens in light-filled surroundings point to a future resurrection, the Field Centre is a home for the vitality and life-filled passion of collaborative research between human beings. There one experiences the turmoil and artistry of living activity in thought, communication and creativity. The Field Centre is a house of life, a sacred space for the processes of human meeting and working.

The final purpose of the Field Centre is still a mystery. Unlike the Oxford Museum, it does not yet have the benefit of history and hindsight. Its future purpose is still being formed daily out of the various activities taking place within it. For the present, it is a creative core for Ruskin Mill Trust's research, but over time it may ultimately achieve John Ruskin's ideal which he himself never witnessed – a true unification of the sciences, arts and spirituality through collaborative work.



A visit to the Golden Triangle

THE LIFE SCIENCE CENTRE

SUNFIELD
RESEARCH CENTRE

THE CASTELLIZ CENTRE

THE FIELD CENTRE

Johannes Kühl

By invitation from Ruskin Mill Trust, my wife and I had the opportunity to visit the Golden Triangle this summer. We had visited the Life Science Centre in Scotland (research centred on plants) previously, and this time we were able to visit the Field Centre (research centred around animals) and the Castelliz Centre in Wales (research centred around earth and minerals). These three, together, constitute the Golden Triangle. In the centre of the country at Sunfield College (close to Stourbridge) a fourth research centre is planned focusing on the human being. So there are the four realms (kingdoms) of the world as themes, always with research based on Goethe's holistic method: what a wonderful imagination for the future!

Connecting the impressive method of education provided by Ruskin Mill Trust with different research activities is a very good and important initiative. Teaching can be developed not only by the application of known methods: the method itself, and the content of learning – the world view – can become alive and evolving. In addition, the attention placed on the genius loci will help researchers become aware of their place in nature and what the culture might need.

Over the last century the Goethean method has had its biggest impact in the field of education. Many important publications have come out, which are of great benefit to Waldorf schools and others all over the world. So working with this method throughout the Golden Triangle is quite appropriate for the intentions of education within Ruskin Mill Trust and the Hiram Trust, and may even make further development of this method possible.


It was a great gift to meet the people and these places! My only concern is this: will it be possible to find the right people for this task, people who can use the space they are given and who can work together? Research needs space and time on the one hand, and on the other needs gifted individuals who can work together communally. This is something difficult to plan in advance and it may be a question of karma. So I hope with all my heart that these people find each other and come together in the near future.

In addition, I want to mention the very impressive trip to North Wales. Under the insightful guidance of Paul Garnault, who became a real friend during these days, we visited Trigonos, several ancient sites and finally Penmaenmawr where Rudolf Steiner gave lectures in 1923. It was there that he was asked the question by Ita Wegman which led to the Christmas Foundation meeting and the new institution of the School of Spiritual Science. What a gift to experience these places in person!

So with deeply felt gratitude both from my wife and myself for this trip,

Johannes Kühl





Goethe, granite and his search for Earth's beginnings

Maarten Ekama

Here on the oldest and everlasting altar,
raised directly on the ground of creation,
I bring the being of all beings a sacrifice.

J.W. von Goethe

Goethe developed his ideas on the origins of the Earth over a period of ten years, from his arrival in Weimar in November 1775, until the summer of 1785 when he wrote his best known geological essay *On Granite*.

Although he kept up his geognostic¹ studies throughout his long life, by 1785 he had established his own unique approach to understanding the origin and structure of the Earth's surface, from which he never departed. At the centre of his convictions stood his deep and lifelong interest in granite. Looking back in 1820, the 71-year-old recalled:

At the time when the body of the Earth began to interest me scientifically, and I tried to get to know its formations (*Gebirgsmassen*)² as a whole as well as in their parts, both internally and externally – in those days we were shown a fixed point of reference where we could stand: a better one we could not have wished for. We were shown granite as both the highest and the deepest rock. We respected it in this sense and made an effort to get to know it better.³

At the end of the 18th century it was generally accepted by geologists that granite was the oldest type of rock on Earth. This idea had a special attraction for Goethe. For him, this ancient and original rock provided him with a secure guarantee which promised to give him – unsettled by revolutions in political thought and upheavals in scientific thinking – solid ground under his feet. Granite became for Goethe a metaphysical stability. His literary colleague Karl Böttiger⁴ once commented on the far-reaching ideas Goethe associated with granite that he had ‘found in the organisation of granite the divine trinity, which can only be explained by a mystery’. In the *perfect trinity of its parts* (quartz, feldspar, and mica), it became the symbol of an overarching order valid beyond life and death.

1 *Geognosy* was the term generally used by 18th-century *geognosts* (=geologists) for their study of the rocks, minerals and fossils of the Earth's crust. *Geology* was first used as a definitive term by the Swiss geologist Horace-Bénédict de Saussure in 1779 in his book *Voyages dans les Alpes* (which Goethe read with great interest), and by the end of that century *geology* was the preferred term. Although Goethe met de Saussure in 1779, and used his insights in his own geological writings, he continued to refer to his studies of the mineral kingdom as *geognosy*, which he considered an empirical science based on observations, as opposed to *geology*, which he considered a purely speculative science based on theories.

2 *Gebirge* is a traditional mining term referring to the body of rocks from which metals and their ores were extracted, but by the middle of the 18th geocentury had a broad range of meanings not necessarily related to mining, from a local assembly of rocks to an entire mountain range. In geology a ‘formation’ is a rock unit distinctive enough in appearance to be distinguished from adjacent rock layers. I have usually, but not always, used ‘formation’ to translate *Gebirge*.

3 “About Geology, in particular the Bohemian”, *Zur Naturwissenschaft überhaupt* (1820) Vol 1, Book 3.

4 Headmaster of the Weimar Gymnasium from 1791 to 1804.

Arrival and first years in Weimar

In the autumn of 1775 Goethe visited Weimar at the invitation of Duke Karl August. Just 18 years old at the time, Karl August had been introduced to Goethe by the tutor of his younger brother Prince Constantin, and they had formed an immediate and lifelong friendship. Goethe arrived in Weimar with little or no understanding of nature. He had grown up in the free imperial city of Frankfurt, studied in Leipzig and Strasbourg, had briefly practised law in Wetzlar, and was very much the young and privileged city gentleman.

Born and reared in a large city, I acquired my first schooling in the study of ancient and modern languages, to which rhetorical and poetical exercises were soon added. My further education I likewise owe to rather large cities; hence it followed that my intellectual activity was directed towards the manners of polite society, and to the pleasant activity which at that time was called 'polite literature'. On the other hand I had no understanding of external Nature in the strict sense of the term, nor the slightest knowledge of her so-called three kingdoms...⁵

A prolonged illness interrupted his studies and forced him to return to Frankfurt from Leipzig. During his convalescence he became interested in alchemy, studied the works of Paracelsus and von Helmond, and carried out experiments with *liquor silicium* (sodium or potassium silicate) which he believed at the time to represent a kind of "virgin Earth". This was the beginning of his lifelong search for primal (*Ur*) beginnings, whether mineral, plant or animal.

As a 75-year-old, he took stock of the rich experiences nature had afforded him: "I came to Weimar highly ignorant in the study of Nature, and only my wish to be able to give practical advice to the Duke in his various ventures, buildings and investments, drove me to study Nature. [The mine at] Ilmenau cost me a great deal of time, effort and money, but I also learned something from it, and acquired a conception of Nature, which I would not want to exchange at any price."⁶

The decision to reopen an abandoned mine at Ilmenau was made in July 1776. Goethe took his first geology lessons from Johann Gottfried Schreiber (1746–1827), a graduate from the Freiberg Mining Academy in 1773, who had been appointed mine surveyor and supervisor. He learned that granite

5 "The Author relates the History of his Botanical Studies", in *Goethe's Botanical Writings* (1952) translated by Bertha Mueller, University of Hawaii Press, p. 150.

6 In a conversation with Chancellor Friedrich von Müller on 16 March 1824, quoted in Manfred Wenzel (1987) *Der Ilmenauer Bergbau und sein Einfluß auf Goethe als Dichter und Naturforscher*, *Medizinhistorisches Journal* 22,1 pp. 3–27. Also at [http://www.zeno.org/Literatur/M/Goethe,+Johann+Wolfgang/Gespräche/\[Zu+den+Gesprächen\]/1824](http://www.zeno.org/Literatur/M/Goethe,+Johann+Wolfgang/Gespräche/[Zu+den+Gesprächen]/1824).

is a mixture of quartz, mica and feldspar, and that it underlies all the other rocks in Thuringia. As part of the preparatory discussions for the opening of the mine in Ilmenau, Schreiber had written a report stating that granite forms not only the highest crags in the region, but is also found in mines as the deepest bedrock.

It is known from historic reports that in most of the regions in Germany the highest crags consist of granite. In mining areas where shafts have been sunk into the depths, different rock layers have been noted, but none have been found lying deeper than this one. It is, as far as we can tell, the deepest lying of all rock types. All other rocks and formations rest on it as their foundation.⁷

Geognostic research in Switzerland

In the autumn of 1779 Goethe accompanied the Duke and his entourage to Switzerland. Intended as a ‘Grand Tour’ (*Bildungsreise*) for the young Duke, this was Goethe’s second journey into the Swiss Alps⁸, and the Duke’s first. On 3 October he wrote about his impressions in the Birs Gorge in the Swiss Jura⁹, not far from Basel, his first detailed description of exposed rocks in a landscape. Here, at the very beginning of his geognostic observations, he makes clear his firm belief that the rocks making up Earth’s surface were laid down without great commotion or upheavals:

One darkly intuits the origin and the life of these singular forms. However and whenever it might have happened: these masses must, according to their weight and the similarity of their parts, have assembled themselves grandly yet by simple means. Whatever revolutions may subsequently have upheaved, split, and separated them, these were only single convulsions; and even the idea of such mighty commotions gives one a deep feeling of eternal stability. Time too, bound by the everlasting law, has had here greater, there less effect upon them.¹⁰

The “revolutions” refer to epochs of Earth’s development described in a book by the French naturalist Georges-Louis Leclerc, Comte de Buffon (1707–1788), a book which Goethe had read while a student in Leipzig.

In Switzerland he came across exposed granite (which he had failed to notice on his Brocken adventure two years earlier) high up in the Lauterbrunnen

7 Quoted in Margrit Wyder (2013) *Gotthard, Gletscher und Gelehrte: Schweizer Anregungen zu Goethes Naturwissenschaftlichen Studien*, p. 42. Zurich Open Repository and Archive. https://www.zora.uzh.ch/id/eprint/91863/1/Wyder_Goethe.pdf

8 He had shown no interest in geology during the first.

9 Limestone rocks of the Jurassic period between 200 and 145 million years old.

10 Letter to Charlotte von Stein, 3 October 1779.



The Roßtrappe
A 400 m high granite
crag towering over
the Bode Gorge in the
Harz mountains.

Photo © Philipp Guttmann

Valley “... all the rocks and stones are granite” in a region otherwise dominated by limestones.

In Geneva he met Horace Bénédict de Saussure¹¹ who had recently completed his book *Voyages dans les Alpes* (it was published in January 1780) in which he outlined his geologic discoveries, and was the ideal person to approach for guidance to the rocks and minerals of the Alps. Later, Goethe’s careful geognostic studies of a rock’s components, the inclination of their strata, their fossils and minerals, were inspired by de Saussure.

De Saussure explained to them the underlying structure of the Alps, and the nature and occurrence of granite. The highest Alpine peaks consist of granite with subsequent strata resting steeply against this first and original mountain range, becoming more and more horizontal the further away they are from the central mountain chain – a simple but basically correct description of a folded mountain range after long ages of weathering and erosion, one which had a ring of truth for Goethe, and which he would use in his later writings.

¹¹ Horace Bénédict de Saussure (1740–1799) was a Genevan geologist, meteorologist, physicist, mountaineer and Alpine explorer. He believed the Alps to be the key to a true understanding of Earth’s formation, and his mountaineering skills gave him the opportunity to study geology in a manner not previously attempted.

First field trip into the Harz mountains

In September 1783 Goethe undertook his first proper geognostic field trip. Freed from court visits and administrative responsibilities, and unencumbered by a courtly entourage, he was able to explore the geology of the Harz mountains at leisure, visiting many of the places he had passed through in the depth of winter six years earlier. In Claustal he met up with von Trebra who joined him for a four-day hike across the Brocken to Andreasberg. Goethe had with him a 28-page summary of de Saussure's *Voyages*, which they discussed on their journey, and to which von Trebra added notes explaining his own views. Goethe was by now familiar with the sedimentary formations of Thuringia. Now for the first time he explored and studied granite formations in Germany. These make up a major part of the landscape in the valleys and on the summits of the Harz mountains, landscapes which would have been familiar to him from his journey through the Alps four years earlier.

On 20 September they passed the *Torfhaus* where Goethe met again the forester who had guided him to the summit six years earlier. They reached the summit that afternoon, and spent the night in a hut on the Heinrichshöhe, originally built as a shelter for peat diggers. The next day they set out for Andreasberg along the *Rehbergergraben* (Rehberg canal).

Contact at the Rehbergergraben

The *Rehbergergraben* is an eight-kilometre canal dug to supply the local mines with water for the waterwheels which generated the power needed for hoisting spoil, ore and groundwater up the shafts. On 22 September Goethe and von Trebra visited the site of an old quarry from which rocks used to line the canal had been excavated. Here Goethe believed that he had found conclusive evidence for Neptunism.¹² Von Trebra had earlier discovered an unconformity¹³ in the exposed rock face, and knew that Goethe would be keen to see it at close hand. In fact, Goethe was so enthusiastic when he saw it, that he insisted on climbing on von Trebra's shoulders to reach up high enough to knock off a specimen with his hammer. Von Trebra reported that Goethe called out: "We still have to achieve great honours before we break our neck!"¹⁴

12 Neptunism was the theory taught at the Freiberg Mining Academy in Saxony that all rocks either crystallised from the water of a primal ocean, or were deposited as sedimentary rocks on its floor. Although it fitted comfortably with his geognostic views (he intensely disliked violent events), Goethe was always ambivalent about whether he fully accepted Neptunism, which by the end of his life had been completely superseded.

13 An unconformity is a break in the continuity of a rock face, a meeting or contact of two different rock types.

14 Johann Wolfgang Goethe, *Die Metamorphose des Granits* (1985) edited by Dankmar Bosse. Verlag Freies Geistesleben, p. 13.

What the two men observed on the exposed rock face was a very hard and tough hornfels¹⁵ overlying granite. The contact between the granite (which Goethe believed had crystallised first) and the hornfels (which Goethe believed had been deposited later) is clearly visible. It was, and still is, a basic geologic principle (the principle of superposition) that lower formations preceded higher ones, so Goethe can be forgiven for drawing the wrong conclusions. He believed that he was looking at direct evidence of Neptunism; granite as the primal rock crystallised from the primal ocean, overlain by hornfels, a secondary rock which crystallised later.

What Goethe didn't know was that molten granite had intruded into much older greywacke¹⁶ formations deep under the surface of the Earth. Hot viscous magma (a pluton) had pushed up into ancient sedimentary rock (greywacke) to within four kilometres of the surface 300 million years ago, slowly cooling and solidifying over many thousands of years at temperatures between 700°C and 800°C. The hornfels is in fact metamorphosed greywacke. The heat of the intruded granite had baked and hardened the parent greywacke, changing it without melting into hornfels (a process known as contact metamorphism).

Erosion over many millions of years brought the unconformity to the surface, where it was exposed by quarrying for the canal. Today the old quarry is a Geopark site, and the nearby *Goetheplatz* is a popular tourist attraction.

Friedrich von Trebra later arranged for two slabs showing the granite-hornfels contact to be excavated, and presented them to Goethe, who had them made into coffee tables.¹⁷

Granite I

Back in Weimar, Goethe made his first attempt at ordering his geognostic ideas in a coherent form. In January 1784 he began by dictating some short paragraphs based on his recent experiences in the Harz. It remained an untitled fragment, today known as *Granite I*¹⁸ and translated in this issue of the *Journal*.

15 From the German word *Hornfels*, meaning “hornstone”, because of its exceptional toughness and texture, both reminiscent of animal horns.

16 Greywacke (from German *Grauwacke*, signifying a grey, earthy rock) is a variety of sandstone generally characterised by its hardness, dark colour, and poorly sorted angular grains of quartz, feldspar, and small rock fragments, set in a compact, fine clay matrix.

17 One is in the mineral collection of the University in Jena, the other in Goethe's Garden House in Weimar.

18 Previously known as “Der Granit als Unterlage aller geologischen Bildung” (Granite as a foundation for all geological formations). This brief text was never published in Goethe's lifetime. It was first published in the Weimar ‘Sophien’ edition (1891–1896), together with other geognostic texts Goethe wrote during this time, brought to light and edited by Rudolf Steiner.

Goethe's text follows closely the notes made by von Trebra in de Saussure's *Voyages dans les Alpes* the previous summer.¹⁹ It explains, in agreement with de Saussure, that granite is the deepest lying rock making up Earth's crust. It has three constituents, quartz, feldspar and mica, which do not appear to have been assembled separately, but as a whole, and are not visibly held together by anything else. No one constituent appears as the groundmass²⁰ holding the others in place.

He then moves on to the question of how granite might have arisen, strongly disagreeing with the ancient poets, who described a tumultuous creation, and with Buffon, who had imagined a comet striking the sun, thereby breaking off molten fragments which cooled to form the planets of the solar system.

Goethe rejected such tumultuous beginnings and based his explanation of granite's origins on his understanding of natural processes as he had imagined them in the Birs gorge and described them in his letter to Frau von Stein: Nature always made use of "grand and simple means". He therefore proposed to ask granite itself how it might have been formed.

Exploring the Thuringian Forest

Today we took a mineralogical walk and heartily enjoyed ourselves like good mining folk. The simple thread which I have spun for myself is a splendid guide through all these underground labyrinths, and gives me an overview even in the confusion.²¹

It is evident from his letters during this time that Goethe is making good progress with his geognostic "speculations", and is on the point of making an important discovery, establishing a "simple principle", which will bring order into the wide range and "confusion" of his observations. The structure of the "underground labyrinths" could be ascertained by their rocky outcrops which no longer appeared to him as a confusion of haphazard crevices and shapeless forms. Goethe believed he had found order in the confusion. As he explained in a brief essay the following year, the large blocks had not cracked because of cooling, but were themselves crystal structures.²² He believed that their vertical surfaces were not placed randomly, but followed an inherent order, the discovery of which needed further observations.



Granite rocks in the Oker valley, pencil drawing by Goethe, 2 September 1784. Source: Goethezeitportal.de

19 Wolf von Engelhardt (2003) *Goethe im Gespräch mit der Erde*, p. 88.

20 The groundmass or matrix of igneous rocks is fine-grained material in which larger crystals are enclosed.

21 Letter to Charlotte von Stein, Eisenach, 12 June 1784.

22 See Goethe's fragmentary treatise "Epochs of Rock Formation", translated in this issue.

My rock speculations are making good progress. I see much more than others who sometimes accompany me and are also attentive to these things, because I have discovered a few basic principles of rock formations, which I keep as a secret, and which enable me to evaluate the evidence more easily.²³

I have been diligently climbing about on the rocks, and have discovered a lot that is useful for me. I believe I have discovered a very simple principle, or rather applied it in such a way that it completely explains the formation of the larger stone masses.²⁴

In August and early September he was able to tour the Harz region for the third time. In the course of this journey he collected the evidence he needed to continue the treatise on granite he had started in January.

On the Brocken again: discovering the order of nature

Goethe and Kraus began their excursion at the slate quarry near Goslar on 1 September. By measuring the strike (compass bearing) of the crevices, Goethe noted that the slate blocks formed rhomboids with an acute angle of 80 degrees. They visited the mines at Rammelsberg, the oldest continuously worked mines in Europe.²⁵ They walked through the Oker valley where Goethe sketched the granite cliffs, carefully detailing the blocks created by weathering of the original outcrop.

On the second day they climbed the Brocken. On the summit Kraus drew the *Witches' Altar* and the *Devil's Pulpit*, while Goethe measured the strike of the vertical gaps and fissures between the granite blocks in order to determine their orientation.

He believed that he had found confirmation that these huge granite blocks were themselves enormous crystals, the first to appear as the Earth gradually solidified. He hoped to be able to show that these 'crystal' blocks were not aligned haphazardly but followed an ordered rhomboidal system aligned with the cardinal points of the compass.

Granite II

The second, and longer, of the two fragmentary texts on granite was composed during the summer of 1785. It was intended as the introduction to what appears to have been planned as a substantial scientific work on

23 Letter to Charlotte von Stein, 17 June 1784.

24 Letter to Johann Gottfried and Caroline Herder, Eisenach, 20 June 1784.

25 The last pit closed in 1988 after more than 1000 years of continuous ore extraction. Today the mines are a World Heritage Site.

geognosy. He was now confident enough to present his recent discoveries in the form of a textbook or primer outlining Earth's genesis. But finding the appropriate form and language for his geognostic book presented him with a major challenge. When he was faced with a similar challenge many years later, he expressed it as follows.

When we speak of primal beginnings, we should speak primally, that is, poetically. For everything that is subject to our daily language, experience, reason, judgment, all is inadequate. When I immersed myself into these desolate chasms, it was the first time that I envied the poets.²⁶

If he, Germany's greatest poet, envied the ancient poets their powers of diction, where could he find the words to describe his own vision of the genesis of Earth's rocky surface? Goethe's geognostic conceptions were deeply personal, and what he was attempting to describe in 1785 were his encounters with the very ground of existence.

Granite II (translated in this issue of the *Journal*) opens with a discussion of the use of granite by the ancient Egyptians, and a reminder to his readers that there was complete agreement among geologists that granite "makes up the very foundation of our Earth". De Saussure had first written about the belief that the Egyptians manufactured granite artificially because handling such large masses appeared to defy human strength. The travellers referred to were all geologists: de Saussure, von Charpentier, and others.²⁷

Following a physical description of granite as broad as it is brief, Goethe puts aside his role as a geognost and apologises for introducing a personal note, in which he explains why the author of a wildly popular novel²⁸ is now writing about his geognostic beliefs and discoveries; why his interests have changed from the human heart, the "most vulnerable part of creation" to granite, the "most unshakable son of Nature".

The vision he goes on to describe was not speculation, but a far reaching Imagination. The images he used to describe his Imagination – bordering on a super-sensible experience – he took from the literature he had studied: Buffon, de Saussure, Charpentier, and others.

26 Wolf von Engelhardt (2003) *Goethe im Gespräch mit der Erde*, p. 324. These were the words Goethe used to introduce his dictation of a short piece directed against the ideas of Cuvier in November 1826. The challenge was to avoid postulating the cataclysmic events imagined by Cuvier, and to think about primal elemental forces and events not as catastrophic, but as more energetic, gravity as stronger, chemical attraction as more vigorous. Georges Cuvier (1769–1832) was a French naturalist and palaeontologist.

27 Wolf von Engelhardt (2003) *Goethe im Gespräch mit der Erde*, p. 106.

28 *The Sorrows of Young Werther*, first published in 1774, revised in 1787.

He imagined himself sitting high up on a mountain, between the “forces of Earth and the influences of heaven”, overlooking a wide vista, much as he would have experienced it on his first ascent of the Brocken in 1777, when he had been surrounded by low cloud in the valleys with only the highest summits visible above an endless sea of white, illuminated by the sun. Recalling the scene eight years later, he saw before his mind’s eye a primal world before the primal ocean had begun to recede. His description took on a highly personal and religious note, sitting as he was as close as possible to the canopy of heaven. The granite cliffs were “before all life, and are above all life”, and he felt the need to “bring the being of all beings a sacrifice”.²⁹

From this high observation point at the beginning of time he (following the epochs of Buffon) journeyed through geological time until he arrives in the present age. The “all encircling” ocean is taken from Buffon’s third epoch, and the “scenes of destruction” from his fourth.

Descending from sublime visionary heights down to Earth again, the text ends with a warning to geologists that they learn to clearly distinguish granite from other rock types. The vision he describes in *Granite II*, which he had hinted at in his poem *Harz Journey in Winter* and on other occasions, had become a part of his life. Just how important this vision continued to be is shown by a letter Goethe wrote many years later. In 1815 he sent two pieces of granite to his friend, the art historian Sulpiz Boisserée: “Two talismans, one for you, the other for giving away. They are the first formations of the emerging world known to us. Trebra calls them crystallised granite; I agree. No one will understand them. Whoever looks at them attentively is protected from common thoughts, the true hallmark of a talisman!”³⁰

More thoughts and contemplations

During the summer of 1785 Goethe also wrote four shorter texts on granite, in which he outlined details intended for his treatise. He made additional notes in the form of extracts and summaries of several books by leading geologists which supported the ideas expressed in *Granite II*. He had not discussed the actual origins of granite in *Granite I* and *Granite II*, and in these additional texts he attempted to bring clarity to this all-important question. They deal mainly with the crystallisation of granite from a “universal” or “general” solution, a kind of primal substance, a *prima materia*³¹ from which all physical matter was derived. He had searched for this “virgin Earth” as he then called

29 This is what he wrote to Charlotte von Stein after his first ascent of the Brocken, when he “offered on the devil’s altar dearest thanks to my god.” Letter to Charlotte von Stein, 10 December 1777.

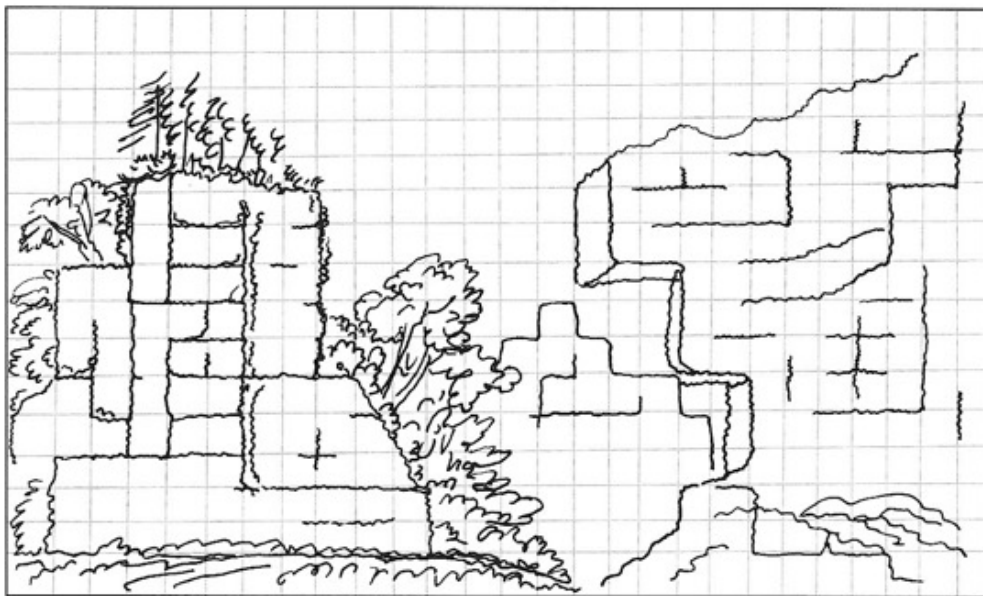
30 Letter to Sulpiz Boisserée (1783–1854), 21 December 1815.

31 A formless primeval substance regarded by alchemists as the original material of the universe.

it, in the experiments he had carried out during his convalescence in Frankfurt in 1769. In the texts he composed in 1785 he referred to this primeval state as the Greeks did, as *Chaos*. It contained as a potential everything we find on Earth today, but Goethe was unsure how to describe its consistency: “Wet and dry solutions. The same solution of the first Chaos. Not only of the first Earth, but of all salts and metals.”³²

Goethe’s most detailed attempt to describe the genesis of granite is given in “Epochs of Rock Formation”, a set of notes bearing testimony to his struggle to describe in words the state of granite before it became physically manifest. An intimate association of Fire and Water with no sign of “enmity” between them, somehow gave birth to Earth-granite and Air-atmosphere.

It contained the components of granite in a state of solution. They began to crystallise in the first epoch of rock formation. Goethe did not assume crystal formation as a result of cooling, nor did he agree with Buffon that the cracks and crevices we see in the rocks today were caused by cooling: they are themselves a sign of crystallisation.



Goethe’s chart for an idealised fissuring of granite (1824)

A three-dimensional lattice cuts the rock into imaginary cubes. The actual fissures are drawn in thicker lines.
From Bosse (1985) p. 177

There is no mention of Chaos in this set of notes. Here Goethe appears to have been thinking of a “more or less liquid state”, whose constituent parts were “intimately dissolved” and held in equilibrium by an “internal fire”. This hot, viscous, primordial fluid must not be confused with a hot magma. Fire and Water co-existed, as there was no enmity between them. After granite had appeared, “the enormous ocean was still a long way from becoming clear and pure”. The fiery liquid gradually cleared as gneiss, schists, and slate (*Tonschiefer*) were deposited, and the ocean gradually became *clear and pure*.

32 In “Form und Bildung des Granits” [Shape and Formation of Granite].

Mountain ranges like the Alps or the Harz were for Goethe formations of enormous crystals which precipitated from the waters of a primal ocean – this being no ordinary ocean, but one imbued ‘with natural powers, pregnant with life’. The peaks of these mountains (Mont Blanc, the Brocken) protruded from the waters as they began to recede.³³

“Cracks and crevices due to crystallisation, not due to cooling” rejects Buffon’s hypothesis that granite crystals were formed from an initially hot, but gradually cooling magma, (which is how granite formation is understood today – slow cooling deep under the Earth allowing large crystals to grow). Goethe had in mind a different crystallisation process, one having its origin in Chaos, in which neither cooling nor gravity played a role.

“Granite was formed by crystallisation. There is no evidence of gravity in it. So also the rocks immediately next to it. The further away rocks are from granite, the more gravity takes over, until finally stratified rocks show only a trace of crystallisation.”³⁴ There is a gradual change from the granular composition of granite, on which gravity had no effect during its formation, to the stratified composition of sedimentary rocks, whose horizontal beds reveal the effects of gravity.

In Goethe’s vision the genesis of granite crystals took place before gravity could have an effect on them, i.e. before they became physical. The “universal solution” from which granite formed was a potent one. It contained not only potential substances, but also the potential “simple Earthly qualities” of these substances: see the text fragment *Theory of Rock Formations*, translated in this issue.

33 Goethe initially imagined that granite mountain ranges had existed even before the primal ocean had been created, but later accepted the first stage of Werner’s Neptunist theory – granite crystallising from the primal ocean.

34 Quoted in Margrit Wyder (2013) *Gotthard, Gletscher und Gelehrte: Schweizer Anregungen zu Goethes Naturwissenschaftlichen Studien*, p. 56. Zurich Open Repository and Archive. https://www.zora.uzh.ch/id/eprint/91863/1/Wyder_Goethe.pdf
See also <https://elischer-goethe.mtak.hu/de/notiz-und-zeichnung-uber-den-granit/>

A large, stylized white quotation mark icon consisting of two curved shapes facing each other, positioned at the top left of the page.

Here nothing is in its
first, original condition,
here everything is
rubble, disorder,
and destruction.

J.W. VON GOETHE

Goethe's Fragments on Granite

Translated by Maarten Ekama

Goethe wrote his first piece on granite in 1784. His interest in geology had been sparked by a 'grand tour' of the Swiss Alps during the autumn of 1779. After many local excursions in the hills of Thuringia during the following years, he finally had an opportunity to undertake a geological field trip into the Harz mountains during the summer of 1783. During the following January he felt confident enough to put his thoughts on paper.

Granite as a Foundation for all geological Formations (Granite I)

Johann Wolfgang von Goethe, 1784

Since we want to talk about rock formations in the order in which we find them, lying on and next to each other, it is natural that we start with granite. For all the observations, so many of which have recently been made, agree that it is the deepest lying rock of our Earth, that all other rocks are found above and next to it, but that it does not rest on any other, so that, even if it does not make up the entire core of the Earth, it is at least the deepest crust known to us.

This remarkable type of rock differs from all the others in that it is not homogenous, but consists of visible parts; however, a first glance shows that these parts are not bonded by any third medium, but only exist adjoining each other, and mutually hold each other in place. We name these parts, which are easily distinguishable from each other, quartz, feldspar, and mica, to which is sometimes added tourmaline.

If we look closely at these components, it seems to us as if they did not exist before the whole, as one must usually think of components. They do not seem to have been put together separately, but to have emerged together with the whole which they constitute. And although only mica often appears in a six-sided, sheet-like crystallisation, and quartz and feldspar, because they lacked the space to take on their own forms, one can clearly see that granite was created by a lively crystallisation process, inwardly very crowded together when it originated. Permit us to draw some conclusions about its origin, and about the substance from which it arose.

Since human beings only notice the kind of effects that arise from great commotion and violent forces, they are always inclined to believe that nature needs violent means to produce great things, even though he could daily teach himself to the contrary by means of the same (observations). Thus the poets have fashioned a quarrelsome, disjointed, raging Chaos for us.

Enormous masses have supposedly been siphoned off from the body of the Sun, and hurled into the void, thereby creating our solar system.

My spirit has no wings to swing into such primordial beginnings (*Uranfänge*). I stand firmly on granite, and ask it if it wants to give us an opportunity to think about how the body (*Masse*) from which it came into being was constituted.

The following summer (1784) Goethe went on a second field trip into the Harz mountains, and returned with the firm conviction that he had uncovered Nature's secret of rock formation. The following essay (his longest piece of geological writing) was probably intended as the introduction to an extended treatise on Earth's origins, along the lines of Buffon's Epochs of Nature, which he had read while a student in Leipzig, and reread with great enthusiasm on his return from Switzerland.

Goethe wrote this essay in 1785, but left it untitled, and did not publish it. It was discovered more than 50 years after his death by Rudolf Steiner while he was editing Goethe's scientific writings for the Weimar edition of Goethe's collected works. Steiner gave it the title 'On Granite' (Über den Granit). Recent research into Goethe's legacy showed that it was in fact the second piece he wrote about granite, hence the title 'Granite II'.

On Granite (Granite II)

Johann Wolfgang von Goethe, 1785

Even in antiquity granite was recognised as a remarkable mineral, and it has become even more so in our own times. The ancients did not know it by this name; they called it syenite after Syene, a town on the border of Ethiopia. The enormous masses of this stone inspired the Egyptians with the idea of creating monumental works. Their kings erected obelisks of it to honour the Sun, and because of its variegated red colour it was soon named the Fiery-Coloured. The sphinxes, the statues of Memnon, and the enormous columns continue to amaze travellers, and in our own time the powerless lord of Rome is raising up the remains of an ancient obelisk, which his omnipotent predecessors brought intact from foreign lands.

Because of its granular appearance, this type of rock was more recently given the name by which it is known today. In our own day it was subjected to a brief period of humiliation before it rose to the reputation in which informed natural scientists now hold it. The tremendous mass of the obelisks, and the extraordinary variations in their granularity, misled an Italian scientist into believing that the Egyptians had moulded them artificially from a fluid mass.

But this view was soon abandoned, and the dignity of this rock was finally secured by the excellent observations of many travellers. Every journey into unknown mountains reaffirmed the long-standing experience, that the highest and deepest lying rocks are granite; now better known and more easily distinguished from others, it makes up the very foundation of our Earth, upon which all other mountains were laid down. It lies unshaken in the deepest bowels of the Earth, its high ridges ascending to summits which the all-encompassing waters never reached. This much we know of granite, and little more. Composed of familiar materials, assembled in mysterious ways, its origins can be traced back neither to fire nor to water.

Highly diverse in its great simplicity, its components intermingle in an infinite variety. The location and relationship of its components, its durability, and its colour, vary from mountain range to mountain range, and the rocky masses of each range in turn often vary every few paces, although the whole always remains consistent. And so anyone who knows the fascination natural mysteries hold for human beings will not be surprised that I have departed from my usual field of observation, and turned with a truly passionate fervour to this one. I do not fear the accusation that it must be a contrary spirit which has led me away from my contemplation and depiction of the human heart – the youngest, most diverse, most flexible, most fluctuating, and most vulnerable part of creation – to the observation of the oldest, firmest, deepest, and most unshakable son of Nature. It will happily be conceded that everything in Nature stands in precise relationships to one another, and that the questing spirit resists being denied what it can attain. Yes, grant me, who has suffered much, and suffers still, from the inconstancy of human sympathies, from their sudden changes in myself and others, that sublime serenity afforded us by the solitude and silence of vast soft-spoken Nature. Whoever has a sense of this, follow me.

Filled with these sentiments I approach you, most ancient and worthiest monuments of time. Sitting high up on a barren summit, and overlooking a wide area, I can say to myself:

“Here you rest directly on ground which reaches down into the deepest regions of the Earth; no newer strata, no accumulation of alluvial debris has been deposited between you and the solid foundation of the primal world. You do not pass over a perpetual grave as you do in those beautiful fertile valleys; these peaks have never given birth to anything living, and have never engulfed anything living; they were before all life, and are above all life. At this moment, when the inner attracting and moving forces of the Earth have as it were a direct effect on me, and the influences of heaven float closer about me, I am attuned to higher reflections on Nature; and just as the human spirit brings life to everything, here too a parable is stirring within me, the majesty of which I cannot resist.”

“This mood of solitude”, I say to myself, as I gaze down from the barren heights, and barely discern a faint patch of low growing moss in the distance below, “this mood of solitude”, I say, “will affect all who desire to open their souls only to the oldest, original, deepest feelings for the truth.”

“Yes”, he can say to himself, “here on the oldest and everlasting altar, raised directly on the ground of creation, I bring a sacrifice to the Being of all Beings. I feel the first and most enduring origins of our existence, I survey the world with its harsh and gentle valleys, and its distant fertile meadows. My soul is exalted beyond itself and over all the world, and yearns for heaven which is so near.” But soon the burning sun will call back thirst and hunger, his human necessities. He will seek out the valleys over which his spirit

has soared; he envies the inhabitants of these more fertile plains with their abundant springs, who have built their happy homes on the debris and rubble of error and opinion, scratching open the dust of their ancestors, and quietly meeting the meagre needs of their daily existence within their narrow bounds. Prepared by these thoughts, the soul penetrates into past centuries, recalling all the experiences of careful observers, all the assumptions of fiery spirits.

“This cliff,” I tell myself, “rose more craggy, more jagged, and higher into the clouds, when its summit still stood as an island encircled by the ancient waters. Around it surged the spirit brooding over the waves. In their vast depths the higher mountains were formed from the rubble of the primeval mountains, and from their debris and the remains of its own denizens the later and more distant mountains. Already the moss begins to spread; already the shelly inhabitants of the sea start their decline, the water ebbs, the higher mountains become green, everything begins to teem with life.”

But soon this life is countered by new scenes of destruction. In the distance, raging volcanoes rise into the air; they seem to threaten the world with extinction. But the bedrock on which I rest remains secure and unshaken, while the inhabitants of the distant shores and islands are buried under the faithless land. I turn away from these far-ranging contemplations, and look at the rocks themselves, whose presence lifts my soul and makes it safe. I see their masses, here standing upright, there inclined, intersected by complicated cracks; here arranged in an orderly manner, there in casual heaps as if thrown on top of each other.

At first sight I am almost driven to exclaim: “Here nothing is in its first, original condition, here everything is rubble, disorder, and destruction.” This is exactly the opinion we will meet when we turn from direct observation of these mountains into the library, and open the books of our predecessors. Here we find it asserted on the one hand that the primal mountains are an indivisible whole as if cast in a single piece, on the other that they are separated by fissures into layers and benches which are criss-crossed by many veins in all directions. Sometimes it is said that this rock is not stratified, but occurs as individual masses irregularly separated in a completely random fashion; at other times observers claim to have found strong stratification alternating with muddled confusion. How do we unite all these contradictions and find a guideline for our further investigations?

This is a task which I presently intend to undertake. Should I not be as fortunate in this as I would wish and hope, my efforts will nevertheless give others the opportunity to go further; for in observations even errors are useful, by drawing attention to themselves, and giving the sharp-sighted opportunities to hone their skills. Here however a caution may not be unwarranted, more for foreigners if this treatise should come to them, than for Germans: Learn to clearly distinguish this rock type from others. To this day the Italians confuse a fine grained granite with a type of lava, and the French confuse it with

gneiss, which they call foliated or second order granite. Yes, even we Germans, conscientious as we usually are in such things, have until recently confused granite with a conglomerate of quartz and varieties of hornstone chiefly found among layers of schist, as well as with the greywacke of the Harz mountains, a younger mixture of quartz and schist.

Goethe also wrote four shorter pieces in 1785, probably intended as preparatory notes for his intended treatise, two of which are translated below. The other two pieces are lists of key words in which it is difficult to find the thread of his thoughts. He wrote nothing more about granite until he began to bring order to his papers in 1820.

In 'Epochs of Rock Formation' he most clearly expresses his view (against that of Buffon) that cracks and crevasses in granite are due to crystallisation, not due to cooling. The original 'liquid' was not a molten mass of magma, but neither was it water in which the mass was dissolved. Goethe finds a middle ground by postulating a solution held by an inner fire. This solution gradually cleared as gneiss, schists, slate, and shales precipitated.

Theory of Rock Formations

Zur Theorie der Gesteinslagerung (1785)

When one sees how intimately Nature unites, one can deduce the intimate solution in which it must have held the substances before they became firm and solid. How difficult it is for analysis to separate what Nature has united, and how much is lost in each separation. Would one therefore stray far from the goal if one imagined all known and unknown Earthly substances or simple Earthly qualities, existing in a universal solution within the first Chaos? What we roughly refer to as elements, ores and other solids, were once intimately conjoined (*innig verbunden*).

This was all the more possible and necessary, since one element combined with another dissolves more of a third, and so forth, so that a general solution seems both possible and essential.

Epochs of Rock Formation

Epochen der Gesteinsbildung (1785)

When our Earth formed into a solid body its mass was in a more or less liquid state.

This mass was not simple, but its constituent parts were intimately (*innigst*) dissolved.

The solution was brought into being by an internal fire, or rather the mass was kept in an equilibrium solution by an internal fire that cannot be compared to a melting fire.

The core of the Earth crystallises itself, and is probably the heaviest mass.

The outermost crust of the core is granite.

It is likewise crystallised, in its innermost... [gap]

The different parts of the mass have drawn together and stayed together. Quartz, feldspar, mica.

In its external aspects, because it shows itself in regular forms.

What has been observed.

Cracks and crevices due to crystallisation, not due to cooling.

The internal fire appears not to have had such an enmity with the water as that which stemmed from it (*das Entbundne*).

The water helped keep the first groundmass (*Grundmasse*) in solution; it covered all the mountains of the world.

From this general solution granite was the first to precipitate, it crystallised itself first. But the enormous ocean was still a long way from becoming clear and pure.

All the components that make up granite, with as many volatiles, still clouded the water; the most ephemeral hovered in the atmosphere above the waters, alternating from time to time [with the dissolved volatiles].

The first epoch of granite is simple and widespread all over the world.

After granite the next formation to precipitate was a tremendous mass of clay and mica [appearing as gneiss and slate], which covers the granite to a certain height everywhere. This was also very widespread but not as simple.

This precipitation took place in water. It happened right after the granite had crystallised itself, because we find this type of rock grown into the granite, even alternating with it.

Gneiss is the granite which precipitated from the water after the first base foundation, hence its banded appearance.

A large, stylized white quotation mark icon consisting of two curved shapes facing each other, positioned at the top left of the page.

This mood of solitude will affect all who desire to open their souls only to the oldest, original, deepest feelings for the truth.

J.W. VON GOETHE

Sue Reed, 1953-2023: an appreciation

*Keith Griffiths and
Laurence Cox*

*With many thanks to Aonghus Gordon,
Helen Kippax, Sue Smee and Sofie
Rasmussen for their comments
and additions.*

Dr Sue Reed, who died in January, made a unique and significant contribution to Ruskin Mill Trust over many years as a teacher, craftswoman, researcher and mentor.

In the many conversations that have happened since her death, it has become clear how many different, often invisible, contributions she made. No one individual knew everything that Sue contributed, because it was always done unobtrusively. Her work with people, like that with wool, was always about connections; in some ways her greatest presence is in the gap between the stitches of connected strands she created.

This obituary tries to bring some of the visible strands of her work with the Trust together, but these too were only part of a very generous life. A telling example is where, seeing a student who needed something quite specific, she opened up her own home and became a home provider for a time.



Sue grew up as a policeman's daughter in the North of England and would often show a photo of striking miners facing lines of police to introduce herself. From the late 1970s until 2001 she taught in primary, secondary and further education in Bath, Dorset, Stroud District and Stroud School of Art.

Living in Nailsworth, she became an indefatigable community volunteer: one of the organisers of many Nailsworth Festivals, a governor for the primary school, a Nailsworth town councillor and Stroud District councillor, eventually Mayor and Deputy Mayor of Nailsworth. In 1995 she edited *Travelling Along the Trail: a Collection of Stories for the People of Nailsworth*.

Fleece and place

In the Horsley Valley and Nailsworth, and far beyond across the North Sea, Sue was interested in the connections between people, places, communities and textiles through fleece – the signature material of Ruskin Mill College and a central material from Yorkshire and Scotland to Norway and Iceland. Sue came to embrace fleece as the guiding thread through which she explored theory, practice and connection. Fleece enabled her to physically touch theory and to understand the process of understanding. The richness of our engagement with wool, from the sheep to the garment, from therapeutic education to research, owes so much to Sue's work over the decades.

Sue mastered many related skills – dyeing, spinning, felting, weaving and of course knitting – and was always able to connect the external process of each craft with the internal transformation needed in the staff members she mentored. In many different guises, situations and communities, she would intuit a concern or an area for development in the Trust and find the most appropriate practical task to enable a colleague to experience through the craft a means to resolve or develop the element of concern, consciously and unconsciously.

Sue was a trained artist and art teacher and an excellent draughtswoman. A good example of this is as illustrator of the book cover for *Creative Place-Based Environmental Education* by our Norwegian colleagues Jorunn Barane, Aksel Hugo and Morten Clemetsen.

At Ruskin Mill Trust

Sue was involved with Ruskin Mill from its inception, in many different ways. For example, in the late 1980s she ran evening painting classes with another remarkable artist, Kay Wedgbury. Between 2002 and 2006 she developed a community art programme for Ruskin Mill College engaging students, staff and the wider community. Also, in 2002, she took on developing quality assurance for the Trust. While she is best known now for her work with staff, in the early days she did a lot of work directly with students. One colleague remembers her



putting up the end of year student exhibition and the loving interest she had in every single piece of craft and art, and her immediate connection with the person who had made it.

From 2007 to 2011, Sue was the lead for the new Hiram Education and Research Team (HEaRT), where she made a crucial contribution to developing practice-based research in staff education. Sue formulated the first staff induction in *Practical Skills Therapeutic Education* (PSTE) and wrote the first HEaRT programmes. She then moved into becoming a researcher and mentor for staff education and development across the Trust, notably on our Master's degree programmes where she supported many members of staff, past and present.

From 2017 she led Ruskin Mill Trust's contribution to the joint Master's degree in Special Educational Needs in partnership with the Inland Norway University at Lillehammer. Sue's special gifts enabled her to both academically mentor the students and provide personal support and guidance throughout their studies. She supervised many Master's degree theses, all of which completed successfully.

Over these years Sue's work created a directional thread towards the bringing into being of the Ruskin Mill Centre for Practice and our designed and delivered Master's degree in PSTE, for which she was reflective practice lead, a member of the faculty and a mentor. We thank her for her guiding light in this. More widely she leaves a legacy in the community of craft practitioners around the Trust that she nurtured personally, in the skill and understanding of those whose work has helped our students in so many ways through the years.

Research

Sue was a lifelong action researcher, an impulse that strengthened as the years progressed, from her 1995 Bachelor's degree in visual and cultural studies, through a 2001 Master's degree by Research, *Community practice along Stroud Valleys Pedestrian-Cycle Trail*, to her 2017 PhD, *Creative Journeys: Enlivening Geographic Locations Through Artistic Practice*.

Her PhD was one of the first in the social sciences to be balanced between craft practice and academic enquiry: 20% of the thesis consisted of her knitting a storytelling dress, connecting different communities around the North Sea and their knitting traditions. Sue was delighted to be a 'Doctor of Knitting' and this is believed to be one of the first knitted PhDs.

Her ultimate research interest centred on communities of practice and practice-related research, weaving connections between practice and academia, with equal respect for many different ways of knowing.

A central manifestation of Sue's being as a researcher is her journals. They hold all her thoughts, all the connectivity she sought, many of her inspirations and methods of knowing and understanding. She was a disciplined and prolific journaler, producing many journals a year. The physical books were always purposefully chosen to represent the theme or area of interest she was exploring. They are full of pictures, writing, diagrams, doodles – a cornucopia of different means of expression. The purposeful and accurate nature of her observations in the journals meant that she could track backwards and forwards a specific thread of exploration over many years, potentially decades. They were truly an artistic and intellectual resource of her life experiences and work.

This issue of the *Field Centre Journal* contains Sue's last article, co-written with Julie Woods. She was a regular contributor to the journal, writing about creative journeys (issue 2), communities of learning (issue 5), meaning-making with fleece and wool in the Nailsworth valleys (issue 7), as well as contributions to Run of the Mill. She presented to the Field Centre research seminars on communities of practice and on wool. With Julie she had planned a presentation on the Student Study for December, and with Laurence Cox she had planned a conversation on ways of knowing for July.

She presented in many other academic, artistic and community fora, including the Golden Fleece festival in Ruskin Mill's Gallery (2012–2016), a celebration of ten years of collaboration with Aurland (2017), Staithes Art and Heritage Festival (2017), wool fairs in Yorkshire, Bristol and Shetland (2015), the Nailsworth Festival, an annual partnership with Kingston University (2017–2021) and the Royal Geographical Society's annual conference (2014, 2016) among others.

The Northern stream

Her PhD and collaboration with Lillehammer were two manifestations of a wider 'Northern stream' that was very important for Sue. She responded deeply to the island of Iona and elsewhere in Scotland, with Iceland and different parts of Norway, places that she connected through their traditions of wool and textile crafts, through the exploration of the myths of place, local sainted women such as St Brigid/St Bride and St Sunniva, and through her interest in the work of Rudolf Steiner and esoteric Christianity of different kinds.

For eight years she was part of Erasmus+ projects geared towards ecopreneurship, re-making places sustainably, including Ruskin Mill in the same Northern stream. The first involved the Norwegian University of Life Sciences at Ås and the Sogn School of Organic Agriculture and Horticulture in Aurland, Norway. The second also involved the School of Organic Agriculture along with Snæfellsnes Regional Park, Iceland; Alta planning and sustainability consultancy (also Iceland) and Nord University in Bodø, Norway. This project will be completed in November this year, where Sue's contribution will be acknowledged and recognised.

Appreciation

Despite holding many roles, Sue was uninterested in titles. She did everything consciously; there was nothing superfluous, nothing flamboyant; it was purposeful. She understood the power of space and silence, and used silence as a space for revelation, awe and making connections: she was there, but not there.

Sue was selfless, courageous and had a delicate strength that enabled her to point out a gap without directly saying so. She had a strong personality, but never leveraged it for herself. When she felt something was being done wrong – for example, if processes and structures were taking priority over people – she would say so clearly, but without criticising them. Often too she would think far longer than anyone else about a particular situation or suggestion before bringing her reflections.

She never used the word feminism, but she felt that there was still a battle for equality to be fought and that there were tasks done by women that went unseen. The simplest of these tasks had great impact – and of course her own work, often happening quietly or invisibly in the background, exemplifies that.

She was a humble, generous, kind soul whose day-to-day energy was motivated by others' needs. Colleagues say that in the last two years, though undergoing unbelievably challenging treatments, she would never speak of herself and would spend hours with colleagues only wanting to help. Even in the last few months that was still true.

We thank her husband Leo and children Peter, Sarah and Robert for sharing Sue with us.

CREATIVE JOURNEYS

GEOGRAPHIC LOCATIONS
THROUGH THE ART OF EMBODIED KNITTING

DR SUE REED



Issue 2, pages 31–41

Community of Learning

and Communities of Practice in Service

Dr Sue Reed



Issue 5, pages 20–33

Meaning Making with Fleece

Dr Sue Reed

Issue 7, pages 41–50

An Experiential Journey

through the Principles
of the Student Study

Dr Sue Reed and Julie Woods MSc



therapeutic education

Practical Skills Therapeutic Education is underpinned by the concepts of human phasic development and sensory integration. Missed developmental stages can be identified and a curriculum developed to provide opportunities for learners to re-step hitherto missed stages that have become barriers to learning and progress.

An Experiential Journey

through the Principles
of the Student Study

Dr Sue Reed and Julie Woods MSc

“...human beings are a whole world, a microcosm... All the laws and secrets of the world are to be found in them”

Rudolf Steiner (2007) “Man as Symphony of the Creative Word”, Lecture I
19 October 1923

The following is an account of collaborative research developed by Sue Reed and Julie Woods, in an evolving process over a period of several months (September 2020 – July 2021). This involved exploring a creative approach to introducing new staff to some of the key ideas and essential qualities of the Student Study. This is not intended to be a how-to guide, but offers an account of reflective practice from two practitioners. Sadly, this is Sue Reed’s last article.

The Student Study is not just another meeting. It is an event. An encounter. An attempt to connect with the 'being' or unique individuality of the student in a way that transforms and deepens one's perception and understanding. A re-imagining of what seems possible through engagement with the therapeutic affordances of our Ruskin Mill Trust method, *Practical Skills Therapeutic Education* (PSTE). In the opening words of his book *Being Human* (1989) Karl König recommends that for efficacy in therapeutic education the utmost effort must be sincerely made to understand the child/student 'through and through', and to seek the necessary 'guiding images' and 'personal qualities' to work 'artistically' and 'formatively'.

For many people new to Ruskin Mill Trust, the Student Study is unlike anything they have come across before. How can we best introduce the Student Study to new members of staff in a qualitative way? How is it possible to help people to find a way in and make a genuine heartfelt connection to the purpose of understanding the student? What do staff need to know and appreciate in order to make a connection to the keystone of our method? How do we introduce the idea, experience and value of making observations through four different lenses? How can a group working together facilitate an experience that will engender some insight into understanding how best to work therapeutically with individual students? These were some of our research questions as facilitators wishing to encourage an evolving artistic approach to education.

So why do we do Student Studies at Ruskin Mill Trust? How do we approach the meeting? What exactly do we do? Our exploration of these questions was layered with practical tasks giving experiential insight and descriptive narratives of how the Student Study works in practice.

Our aim in the artistic process described below was to create a qualitative experience through which a journey of discovery would help participants experience for themselves the qualities of consciousness and awareness required to undertake the Student Study: Openness, Attention, Attunement, Exact Observation, Empathetic Listening, Layering of Meaning and Understanding, Connection and Cooperation. We attempted to introduce and facilitate new ways of seeing through giving people the opportunity to experience a different perspective in a non-directive, non-judgmental, openly inclusive learning process.

We used reflective and reflexive practice, interlaid with observation from experience and its connection to the Student Study process. This was a way of exploring perception and self-awareness in a seven-step mark-making exercise which created rich layers of meaning through experiential practice. Our hope was that these ways of seeing would afford the space and time for people to be able to connect to a Student Study in a personally meaningful way.

The process became a journey of research and development for both the facilitators and the participants. An invitation to experience what

Otto Scharma refers to as ‘presencing’ (Sharma 2009) in harmony of inner and outer – the art of ‘being with’ a person or group; sensing, feeling or empathising with future potential, rather than doing something to them.

We began by working with small groups in PSTE Induction Holistic and Support and Care (HoSC) seminars and culminated with a whole day session with an all-staff group at Grace Garden School (GGS). On this latter occasion we rounded off by facilitating a Child Study using Ruskin Mill Trust’s standard practice and prepared in advance by GGS staff. This afforded an immediate opportunity to put into practice experience and insight gained from the artistic exercises.

Working with this process enabled both writers and participants to discover ‘ah ha’ moments of new ideas to treasure and an openness for possibilities. We discovered opportunities to see more clearly with greater openness and were ‘moved’ or transformed by the process. Insights often informed reflections and actions.

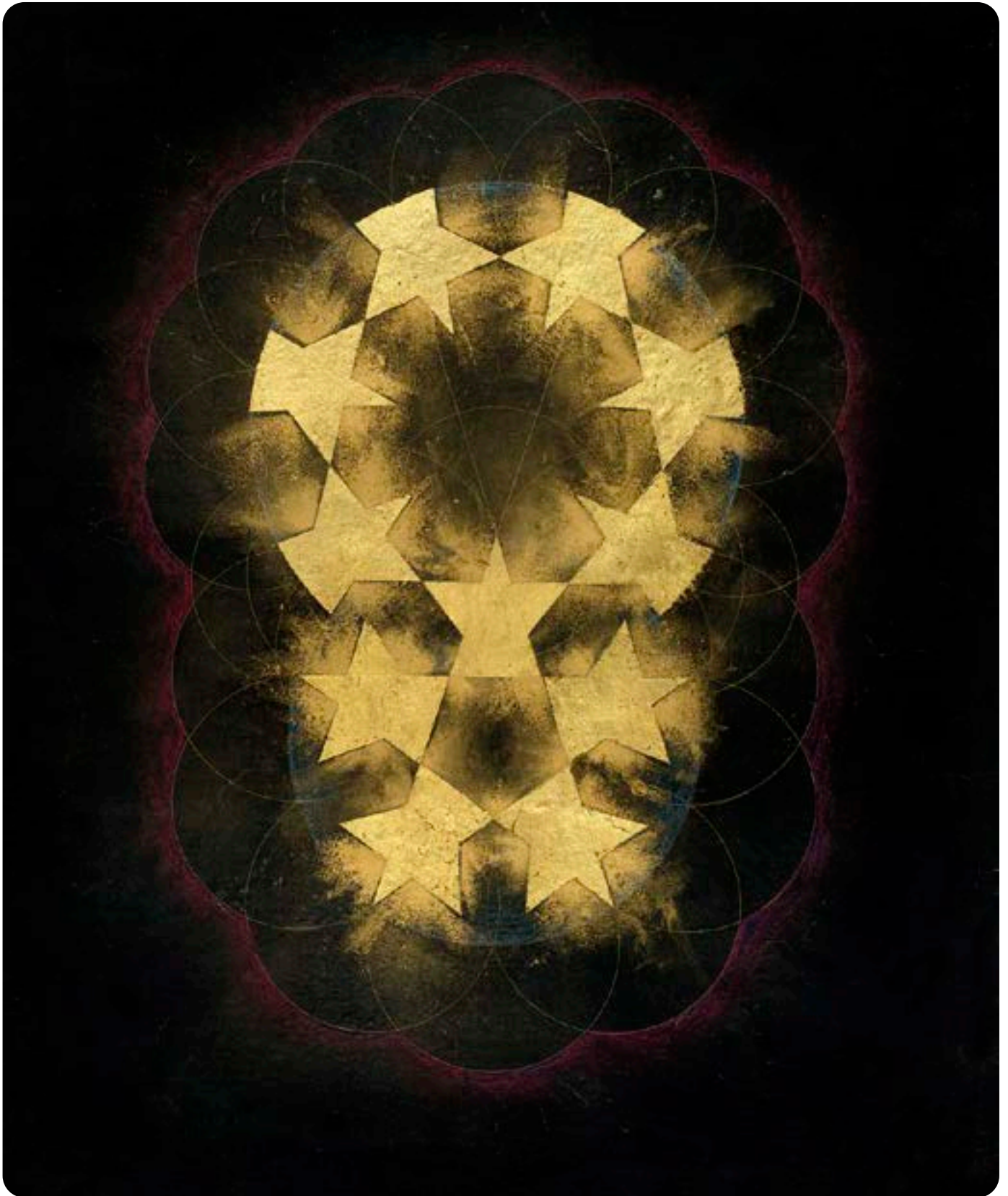
The Experiential Process

A key concept in the Student Study is the potential of making a therapeutic connection between the inner constitution and experience of the student and matching this with appropriate therapeutic practical activity involving the materials of the outer world – mineral, plant, animal. We thereby come to a PSTE ‘prescription’ from the ‘medicine chest’ of the PSTE curriculum. How might we understand this therapeutic connection between the inner world and outer world?

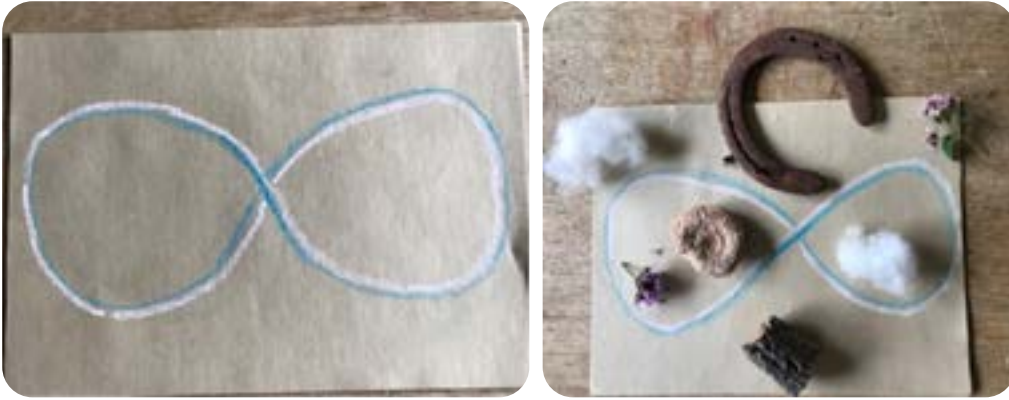
Inspired by the work of Rudolf Steiner’s lecture on ‘The Human Heart’ (1922), Frank Chester’s research (2010 & 2010/11), and by our own lived experience of encountering the crossing point between inner and outer when walking a figure of eight or lemniscate, we began by facilitating an experience of walking this figure on the ground.

We went out into the garden/landscape to collect objects from the mineral, plant and animal kingdoms, and constructed a lemniscate on the ground with stones. We each walked the lemniscate, depositing our collected items at will but always to the same side, as we walked. As we journeyed around we experienced how inner becomes outer and outer becomes inner at the centre crossing point – a space which can be experienced as a ‘heart space’ representing the human heart mediating between activity and reflection, inner and outer worlds. We used this ‘heart space’ experienced at the crossing point of the figure of eight or lemniscate as a metaphor to explore and expand the practical outdoor walking process through artistic activity.

Moving indoors, we translated the lemniscate and objects onto drawing paper, as illustrated on page 55.



Frank Chester's *New Star*: a vortex of transformative energy. This can be seen as an image of Rudolf Steiner's concept of the human being in relationship to the world, the transformative nature of PSTE and also of relating theory and practice. This constellation inspires many imaginative and ever-changing responses. Image from the cover of *New View* magazine (Summer 2010)



Student Study Exercise in Easy Steps

From here we moved through an exercise working with reflective practice, conversation and using simple drawing tools. We used reflection as a process to help gain insight into our professional roles and our own biography. The insights developed and experiences learned can be applied to daily life to maintain and further develop good practice in developing relationships with students and colleagues through use of the spoken word, movement, listening and observation. The deep interpersonal skills of human/nature and spiritual communication were named by Martin Buber (1878–1965) as I–Thou.

The multi-layered experiences and principles of the following exercise were designed to develop such reflective and reflexive practice. It was important to note, in order to calm any anxiety, that skill in drawing was unnecessary for the exercise. We placed the objects we had gathered on the table for reference and worked with paper and drawing materials. It is important to remind readers and participants that whilst this is written as a process for ease of reading, individual experiences are different. Every journey in this exercise changes. The exercise changes depending on the group of participants and where they are, the atmosphere of the space, conversation, listening, silence and noise, whether a participant has an experience which resonates with an event in their biography and whether they want to share a story of that event. This reflects the experience of attending Student Studies. Each Student Study is a unique experience.

The following narrative is shared through two perspectives: Sue Reed as artistic facilitator and Julie Woods as reflective practitioner. It is important to say that the perspective of each individual participant in the process is a one-off event that cannot be repeated. Each step is a matter of choice, to think and see out of the box. In his 2005 Stanford University address to new students, entrepreneur, designer and media investor Steve Jobs (1955–2011) noted that even if you can't see where each decision and choice is leading, "you must have faith that your curiosity and intuitions are guiding you along the right path". Sometimes this Student Study exercise may be completed

in a five-step process and in other circumstances, ten. As this exercise is an exemplar related to the *Seven Care Qualities*, we commence with seven steps. Each person will need seven sheets of paper and four to five different drawing materials.



Image above: each person was given a blank piece of parcel paper which we explored through our sense of touch with eyes closed. How does the paper feel on each side? What can we learn through our sense of touch?

Image 1 (next page). Choose a side to draw a lemniscate on the paper, keeping eyes closed. (relating to the care quality of Breathing, described below).

Image 2 (next page). Continue on the same side of the paper and create a series of mark-making layers (example in yellow, below).

Choose three or four of the objects on the table you would like to draw. Choose four mark-making materials of various colours and textures – crayon, chalk, oil pastel, etc.

We built layers of mark-making through observation and representation from four different perspectives, corresponding to the four layers of observation in the Picture Building section of the Student Study:

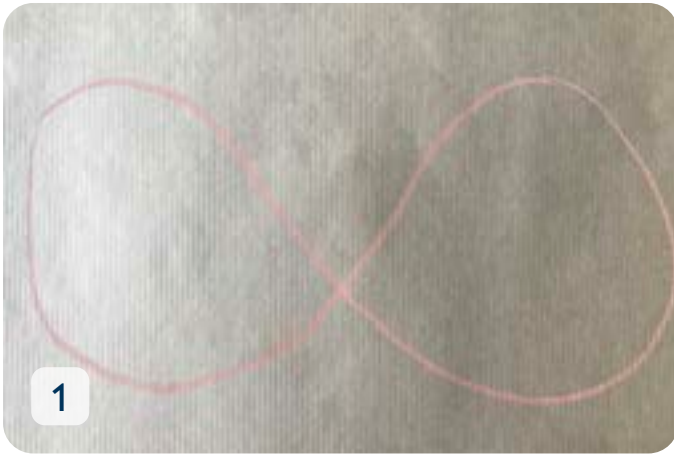
Physical: draw the shape of the objects (medium one – example in yellow)

Life: draw a continuous line linking each of the objects (medium two)

Soul: draw the space between the objects (medium three)

Self: represent the texture of the objects (medium four)
(relating to the care quality of Warming)

Repeat the texture representation process above but this time make a mark on another person's sheet of paper. Reflect on this process. How did you feel? How does this experience relate to your life or role? (Collaboration/Empathetic Listening: encountering the challenge of contextualising my point of view with that of others in the Student Study. Related to the care quality of Nourishing).



Images 3 and 4 (previous page). Take another blank sheet of paper. Fold it in half and randomly tear a shape from the folded edge.

Images 5 and 6 (previous page). Use this new window to frame your multi-layered original drawing. Try out different possibilities and choose a pleasing composition (Discrimination: Making sense of it all. In the Student Study: Coming to an Understanding – What ails thee? Related to the care quality of Secreting).

Images 7 and 8 (previous page). Take a third sheet of paper and making an enlargement of the framed space, transform the original drawing into something new. Something inspired by the original but quite different from it. Use this time (about 20 minutes) to experience creativity, play and transformation. This final process develops reflexivity which is multi-layered. (This relates to Ruskin Mill Trust's phrase 're-imagining potential': corresponding to the final stage of the Student Study, What can we do? Related to the care qualities of Maintaining, Growing and Generating).

The Journey of Researchers' Learning with Participants and Students

As we worked with the exercise, reflected on it and developed it over time, deeper senses of connection and meaning began to emerge.

Some insights:

ONE: The journey of participants may reflect our students' journey through the Three-Stage Process

Barriers to learning (Steps 1&2)

- Facing a blank piece of paper – fear/anxiety of the new and unknown
- Challenge of being faced with an artistic/practical process – fear/anxiety – I can't draw! I can't do it. I don't have the skill
- Disorientation of having eyes closed and not knowing what to expect

Becoming skilful (Steps 3&4)

- Wonder of discovery of different perspectives layered upon one another – settling the process carries me
- Meeting the challenge of marking the paper of another and of accepting intrusion onto one's own work. An experience of boundary, standing one's own ground but appreciating an alternative perspective. Meeting: I to I

Making a contribution (Steps 5, 6 & 7)

- Exercising powers of discrimination
- Re-imagining potential

The novice to Ruskin Mill Trust's Student Study may perhaps also go on a similar journey in relation to making a connection to the Student Study. At first the process may seem odd and unfamiliar – perhaps anxiety-provoking and initially off-putting. Some experience of attending and familiarity with the process builds confidence and appreciation. Honing over time personal qualities of attentiveness and objective compassion; opening up and cultivating observational, reflective and listening skills – all this makes it possible to contribute in the circle of collaboration at a Student Study.

TWO: The journey of the *Seven Life Processes* and the journey of each Student Study.

There also emerged a correspondence between the Seven Steps of the Life Processes – illuminated in the stained glass windows at Freeman College by Johannes Steuck and applied to the Student Learning Journey (Run of the Mill 2009) – with the process of our artwork and the process of each Student Study.

Breathing: Observations from four perspectives: Body, Life, Soul, Self

Warming: Questions: What are we curious about? And how do I feel?

Nourishing: Observation of students' art and craft work; listening to biography through storytelling.

Secreting: Forming an Understanding: What ails thee?

Maintaining: }
Growing: } What can we do?
Generating: }

THREE: The Student Study, the life processes and the Student Journey

In 2009 seven stained glass windows, created by Johannes Steuck and inspired by the unfolding of the Student Journey in relation to the life processes were installed in Freeman College.

The following brief synopses, which relate to a student's or staff member's journey, are abstracted from Steuck's commentary on the windows given at their inauguration.



Breathing

We breathe through our senses. We create a relationship with the outer world and with each other. This life process is one of give and take; it is social as well as creative. The student enters into a relationship with others and on their journey there begins a sense of belonging.



Warming

By entering the body of an organisation the student begins to gain confidence, needs to adapt, adjust; perhaps certain individual tenacities need to be modified.

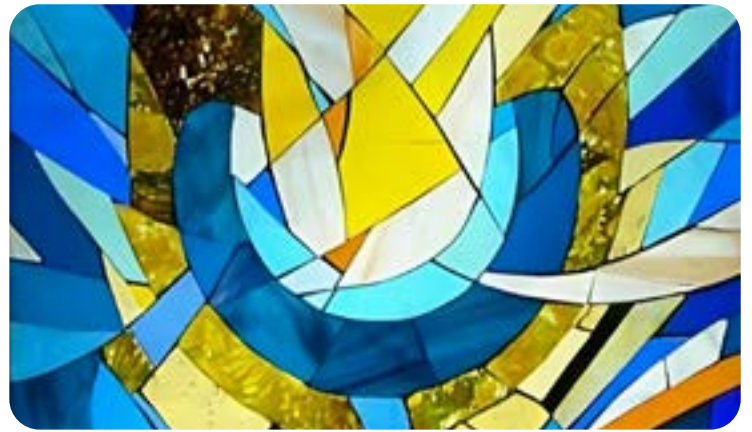


Nourishing

The guidance and skill imparted to the student becomes individualised, indicated by growing skills, competence and empowerment. The relationship that the things of the outer world have to each other becomes meaningful, such as clay to pottery, sheep to wool, tree to stool; transformation of raw material by human effort.

Secreting

Entering this gateway, the student awakens to their purpose with a sense of vocation. Guidance and skill has led to discrimination and discernment – we might experience that ‘aha’ moment, a flash in which we realise what we are here for, the purpose of our lives.



Maintaining

In cooperation we can sustain and care for each other.



Growing

The student becomes good at what they do. It is in human relationships with others that our true worth is realised.



Generating

The student is now ready to enter the world and maintain their sense of autonomy. What I am can exist within a greater social network, the wider community. Generation can also be understood as regeneration, reinvention; new and fresh ideas should lead a student’s journey onwards.





Each Student Study represents a snapshot of a stage on each individual student's journey through the college. Each study provides an opportunity to reset the compass of our orientation towards our collaborative therapeutic approach. Engaged in rightly, it offers a reflexive opportunity par excellence and can with justification be characterised as the 'cornerstone of our method'.

Reflections on our process of introduction to the Student Study

We valued the process for creatively exploring through the drawing exercise. Processes and qualities are interchangeable and resonate:

- Group exercise
- Trust
- Respect
- Empathy
- Withholding judgment
- Transformation
- Transitions

It is possible to analyse these processes in relation to the experiential drawing journey described above. They are a tool with which to engage critical debate and conversation. Transformation, for instance, can be a route to an awareness of growth, understanding personal leadership approaches and self-generated conscious action.



When we connect the above exercises to our daily professional roles we can develop our reflexive practice with students and colleagues. There are many definitions for this phase of human development. In our context, a Rudolf Steiner-inspired specialist college, this process is multi-layered, complex and holistic.

John Dewey and Donald Schon both put forward the notion that reflection is a critical underpinning of growth and learning (Ryan, p. 1). Ryan quotes Dewey's position that "all direct experience is qualitative and qualities are what make life experiences itself directly precious". Perhaps this is understandable in relation to experiencing the seven steps above?

Ryan then develops Schon's position; he "discovered that being reflexive is not a straightforward matter". There are, and have been for many years, practices of reflexivity in various disciplines such as anthropology, psychology, sociology, education (and in our context the Seven Fields of Practice, Goethean phenomenology and Steiner's human development insights).

In education, being reflective and reflexive is good conscious practice; this process can be quite exhausting so time needs to be allocated to think, digest, sleep and reflect. Quoting Sandelowski and Barroso (2002), Ryan explains that "reflexivity is a hallmark of excellent qualitative research and entails the ability and willingness of researchers to acknowledge and take into account the many ways they themselves influence research findings and thus what comes to be accepted as knowledge. Reflexivity implies the ability to reflect inward towards oneself as an inquirer (researcher, professional role and biography); outward to

the cultural, historical, linguistic, political and other forces that shape everything about inquiry”. At Ruskin Mill Trust this is between researcher, staff role, student, our method (PSTE), our lived experiences and critical capacities.

Learning

If facilitating this process again, one thing we would do differently, in order to enable a more authentic and impactful experience of the process of walking the lemniscate and discovering the connection of outer and inner, would be to have mineral, plant and animal craft objects, made by students, already laid out around the lemniscate. Participants would be invited to lay their objects in relation to the prepared ground work. This would facilitate a more natural experience rather than giving specific instructions to lay objects down always using the same hand. People did not find this instruction straightforward and it seemed to detract from the experience of the process. Moreover, the process of engaging with craft and the lemniscate highlighted the essential nature of material and storytelling (*Field Centre Journal*, Summer 2022, pp. 41–59). In every moment of engagement and reflection the participants shared their knowledge and the story of their journey in relation to their lived experience.

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Openness and inclusion in education

Kathryn Kelly

The dilemma of inclusion, in a world of rising awareness and experience of children's complex needs, becomes even more complex in practice.

In my Masters research I investigated attitudes towards inclusion, and the idea that 'openness' towards each child engendered by the teacher enables the necessary presence for fruitful inclusive working. My study pursued this recognition of the importance of the child (or student's) relationship to the teacher. This is equally important in a parent/child relationship.

Although it is clear that to an extent such a relationship is reciprocal, and that development and learning happens on both sides, the ultimate responsibility lies with the teacher to support and enable the development process.

It soon became apparent that real inclusion means not only welcoming a child into an existing setting, but that the situation needs to evolve, change and adapt to enable all children. Most of these dynamics concern the teacher/child relationship.

Do we adapt norms, and create a space to allow free development of each individual – without losing our coherence? How do we understand the experience of a child who doesn't fit or feel safe, leading to anything from challenging dysregulation to unnoticed quietness? How do we create an open non-judgmental relationship with parents?

The gestures of opening up and closing down

I am aware of 'opening up' and 'closing down' as gestures. Closing down means trying to encapsulate phenomena, so they can be captured and documented and preserved. It is the kind of approach that can rigidify and contract.

I experience the opposite when I attempt to look more widely, to take a step back to enable a wider, higher and deeper perspective. This is connected to meaning and spiritual experience. Closing down, at its worst, engenders a materialistic viewpoint where everything needs to be proven.

In studying, there is also a tension between these two. It is tempting to try to capture all concepts and neatly bundle them. Then I feel the need to open up and allow a more creative approach. However, I also recognise the forming or protective potential of the closing down, and the vulnerability or undefined tendency of opening.

I connect all this with the challenge of teaching: for example, do you try to control the situation or open yourself to new possibilities?

When am I open to the child?

This leads to my main question 'When am I open to the child?' Carol Rodgers (2020) includes a discussion about morality in the section entitled 'Love'. She describes how she is in awe of the learning journey any child has undertaken before being met by the teacher, and how she trusts in the child's capacity to learn and therefore can be fully open to them.

Openness is vital in inclusive and moral practice. Unless there is openness towards a child then all other training, efforts, knowledge etc. will have little consequence.

Openness is mentioned as a key aspect in many different self-development approaches: for example, one of Steiner's subsidiary exercises focuses on

the practice of openness. Openness appears in Buddhist teachings and mindfulness to enable transformation through awareness and openness to experience.

So too, Carl Rogers' core conditions were advocated to ensure a positive approach to relationship in education, through empathy, unconditional positive regard and congruency (Rogers, 1994). In his view, "the mark of a mature person is fearless openness to both inner and outer experiences however disturbing that might prove to previously held convictions" (Thorne and Sanders, 2012).

Similarly, Dan Hughes' 'PACE' is another strategic way to enable a supportive attitude and enable relationships, which means embodying the following qualities:

Playfulness: being light, open, calm and relaxed; **A**cceptance: actively communicating your unconditional acceptance; **C**uriosity: wondering about the meaning of the behaviour; and **E**mpathy: giving a sense of compassion. Openness pervades this approach (Hughes, 2006; Golding, 2017).

Siegel's (2019) 'Yes Brain' state is another way to enable a loving relationship, which begins by being present and "open and receptive to the child's experience, and our own". Dewey (1933) names open-mindedness as one of the necessary attitudes for reflection, alongside directness, wholeheartedness, responsibility and curiosity.

Openness is creating the space; the 'open receptive state' of social engagement described by Porges (2017). Similarly, strengthening the forces of attention, cultivating open awareness and cultivating a kind intention enables a calm open state of presence (Siegel, 2010). A strong and deep perspective is brought by Carol Rodgers, who again links openness with the moral aspect:

We can have a life-giving or a deadening impact on students. We can humanise or dehumanise. Staying open, disciplining the urge to diagnose, requires a stance of humble "not knowing". (Rodgers, 2020)

What can get in the way of an open attitude?

Judgment is the antithesis of openness; and whatever judgment the teacher makes is perceived: "behind the words hides a moral message mediated through the teacher's body language, facial expression, or simply by the teacher's look – or non-look" (Henriksson, 2012).

It is especially relevant here that the teacher needs to feel secure. Porges (2017) talks about the social engagement system which is a key awareness for the teacher of their own state of being, as well as being open and to and having awareness of the state of being of the child. He describes how, if someone feels

secure, centred and confident, they inhabit the space of social engagement, or ‘the window of tolerance’ (Siegel, 2010), a space which enables open awareness and responsiveness rather than reactivity or rigidity.

There are many aspects of teaching life which can cause anxiety, stress or fear of loss of control, not being successful, non-compliance, of inspections plus tiredness and overwhelm. It is clear that a negative attitude towards inclusion results in stress.

And here comes responsibility again: not only does “the attitude affect the teacher’s ability to manage the classroom setting, but also the ability to manage engenders good role modelling from which children can emulate the ability for self-management” (Jennings and Greenberg, 2009).

However, it is also the case that ‘moral sensitivity’ can lead to ‘moral stress’ where the teacher knows what is right for the children, but is unable to carry that out, maybe due to policies or school culture. This unfulfilled sensitivity, which is in fact of benefit to their teaching practice, can lead to burnout.

My research

My practical research involved practitioners, advisers/trainers and students. I listened to their experiences. I was interested in how the experience of openness was perceived and whether a simple focus on self-observation, particularly of the body, would enhance awareness. They recorded their observations via journalling. Contemporary validation of lived experience and embodiment fuelled this exploration.

I took all the experiences I had gathered as a wholeness and tried, through a process of phenomenological discovery, to enable new light to shine through them. I will use some of their observations to demonstrate the experiences.

The process resulted in the discovery of three main areas for attention.

Holding the space

The main area, ‘Holding the Space’, arose mostly from those participants who were directly writing their experiences of openness from their practice. Creating space concerns experiences of awareness and body awareness of openness and the consequent effect on the space around, hence a picture of creating inner and outer space:

“I’ve experienced openness as very much a kind of, open chest, open heart, open to them.”

“It’s kind of in the heart centre.”

“When I close, I tighten up and it’s really hard to just let go of that.”

“Closedness can sometimes really go straight in the heart, like a, really a real experience of some zum [indicated closing in with hands]... I experienced, something is not quite all right. Uh, sometimes there’s a tightness in the stomach.”

“In the tension that I feel like in my body and often that sort of in my chest or in my throat, so sometimes I’m quite calm, in my classes and I have quite a soft voice and I will sometimes feel my throat kind of tighten if I’m not sure what to do, which affects my voice. I notice that.”

“When I feel good, I manage an open gesture because I feel good and safe in general. I feel in my voice, my ability to stand comfortably in my own body and also in the way the relationships during the lesson go, when there is a flowing and positive energy around.”

“Even if it’s not good for everybody, I can access different situations in a quite, spontaneous way, because of the flow.”

“When I get blocked, then I get feelings that I cannot breathe and I need to take a deep breath... I get very tired and lacking patience.”

In observing this openness, you don’t ‘know’ it, you ‘feel’ it; it is a subtle awareness. Opening was felt as a relaxed opening of the heart and an expansive feeling, whereas the closedness was more closing the space and related more to lack of flexibility and critical thinking. With an open gesture, any thinking had a different quality.

“If I experienced myself being closed usually there is a lot of reasoning, holding on to my own ideas and plans, a certain fixedness that causes this holding of breath.”

Those who undertook the reflective exercise could easily identify where in the body they felt openness or closedness. However, the comments also made clear that this awareness was not so often practised and that carrying out the exercise heightened their awareness:

“I feel like I’ve worked on my areas of openness, towards things like race and gender, but it’s other more subtle areas I find myself having a problem... I’ve only become aware since doing your exercise of how subtle it is.”

“When you’re not open, you don’t feel like you’re not including them. We manage to persuade ourselves that it’s another issue.”

“It was really helpful, because it’s really opened reflection, which before was not really clear. It was not named. More perception, more overview it, more awareness, I believe, starts to act.”



“And really to relate, I really valued it.”

A similar experience was noted by Kresin-Price (2007): “as I take in information without making judgments, I begin to feel a heart warmth for each of them”. It seems that as it is possible to notice bodily perceptions of closedness or openness, it could be useful to work further to develop and refine such awareness, and similarly to work in this way on awareness of suspending judgment.

The reflective work also enabled experience of how open or closed participants were in different situations and they found it helpful to observe themselves in relating that openness to their practice, as in the examples above and:

“I get a sense of when I’m doing it well (openness) is when there’s a certain energy in the room, it’s just quite enlivening.”

Another used body awareness to check about using her planned activity:

“There is no tightness in my stomach or heart region, there is strength in my intention. They go away refreshed and we have a great end to our lesson.”

“If I’m open as it were, or when I’m well, when I can just be there for them, they probably perceive that, or when I see that, you know, they are in a better mood, then we can fly and we can create together.”

The previous experiences demonstrate the difference between being open and closed, in what happens in the body and what happens in the room. This relates to enabling a harmonious classroom atmosphere and how the teacher holds the space. This is the basis of a positive attitude and the space to enable the forming of relationships and enabling change and growth.



From an advisor: “Openness is when a child is given time and space to become different without cajoling or threatening. This means creating a warm inviting space for something new to happen. Some teachers really hold back on their wishes from the child and create that space and it is marvellous to behold”.

I feel this is a useful awareness when being mindful of inclusion: the atmosphere is a reflection of how the teacher creates and holds the space as described by Van Manen (2015), Hansen (2001) and Rodgers (2020), and was also evident in participants’ contributions. This area also warrants further attention.

Inclusion as noun and verb

Another thread in holding the space was ‘Inclusion the noun, inclusion the verb.’

As a noun, inclusion is more akin to when a child is ‘included’ physically, but not really actively or effectively. So inclusion means actively making space for the child, and concerns what enables them to flourish. It is not enough that they are just physically present.

“I feel very mixed about the modern issue of inclusion... I dislike the word ‘inclusion’. In gemmology ‘an inclusion is material that is trapped inside of another mineral while that mineral forms’ and I often feel that is what happens at school. A child is trapped in an environment that often does not really suit or fit them.”

“I recognise that inclusive teaching is a challenge for the teacher. It obligates you to change your plan, to stop your practice and to think twice.”

The part and the whole

This was a third thread which addressed the dilemma of supporting the needs of one child at the expense of the whole. It seemed that many experiences reported the benefits for the whole class of sensitively making space for an individual's needs, for an individual who either was not able or not willing to participate. Remarks indicate that following such an intervention, there is a resulting positive experience of cohesion and harmony.

Reflections

Being open is not enough in itself, but the interpretation of my study suggests it is a necessary precursor to active participation in teaching, and especially to enable meaningful relationships and therapeutic responses to all children in the class.

Here the work of Dewey is worth revisiting. My exploration also confirms the value of Steiner's self-development processes, for example as outlined by Zajonc (2008, Chapter 3). Dan Hughes' PACE model (Golding, 2017), and Carl Rogers' (1967) core conditions are other approaches which are a useful check for self-reflection in relation to inclusivity.

An experiential approach in training could magnify this awareness; self-study is also relevant here.

Relational trust is a fundamental quality described by Palmer in relation to a healthy school community; he advocates inner work to be supported by the school community (Palmer, 2017). I included this aspect to validate the need for individual self-development and self-awareness in order to realise such collaborative working. Collaborative working was the final thread in 'Holding the Space':

“I am wondering with colleagues about what changes might be helpful in opening doors wider.”

The responsibility of the individual is important in all interactions and relationships, with colleagues and parents as noted by Rodgers (2020). Modelling collegial relationships is also formative for children as example (Jennings and Greenberg, 2009). They put forward a similar thought which underlies the projects based on the Prosocial classroom. Here wellbeing training results in well regulated, supported teachers who then can model the social and emotional competencies, as they are more resilient and therefore less likely to be overwhelmed and challenged in the classroom. They would therefore be more likely to be open and present for the child.

Attard (2017) states that “Teachers inevitably learn through daily experience”, but increasing efficacy needs self-study, especially as “one-shot, sit and get

workshops are increasingly deemed to be ineffective for teacher development”. He advocates reflective self-study in order to learn from experience and that individual reflection requires openness as it may be necessary to unlearn, i.e. create the space before new learning can take place.

The starting point is unclear: is it the nourishing space created by meditation, mindfulness and reflective practice that enables openness which gives the potential for appropriate attitudes and therefore enables inclusion? Or an awareness of embodiment, the sensing through the body? Or does the practice of openness support finding the inner space needed for meditative inner work?

Whatever the pathway, it requires persistent effort. However, the simple exercise practised for a short time did have effect. It enabled a personal, lived self-reflection to take place which is worth pursuing as one tool of self-development.

Opening myself to the contributions of participants, I can experience through their words that the teacher’s example is the most powerful educating influence for the child in relation to inclusion; a deeply personal immediate process. It is not only the pursuit of satisfying policies, and not analytical or judgmental, it is a different level of experiencing. In relationship it is openness with consciousness.

However, aspects of present educational practice can either support or hinder inclusivity, and the real morality lies in the responsibility of the teacher in self-development and developing open and positive relationship with, and attitude towards, each child. This helps foster the free development of each individual.

A realisation from the study is how morality is a subtle undertone that pervades all the teacher does, how they do it and how their conscience speaks to them in reflection. I suggest that developing work on a relational approach, with openness as a guiding principal and imbued with morality as a creative possibility as posed by Dewey (1933), has enormous transformative potential in relation to inclusion.

Deliberating the responses clarified a further nuance of morality in education; how the policies of a school are a strong driving influence, which if not imbued with ethics of inclusivity may have the opposite effect. For example, behaviour policies unless they are based on a relational approach are not demonstrating openness to all children.

School behaviour policies should be regarded as powerful learning contexts and need, in many cases, to be re-thought in terms of their own intrinsic moral characteristics and better linked with opportunities elsewhere in the school which provide authentic moral reflection and dialogue, an essential element in the development of moral responsibility (Rowe 2006).

This is another area for exploration: to study inclusion and behaviour policies as they should serve as a living and guiding light in a school or college community. In my study the tension between culture and agency demonstrated this dilemma.

Conclusion

In conclusion, the realisation that openness enables a lively curiosity and interest, and stimulates energy and flow, would validate any effort to cultivate that subtle awareness. Personally my awareness of openness to others has been greatly magnified by this process of reflection, and as a result the ability to more often 'catch' myself in the moment.

My sense of inclusion has been amplified but also complicated: the process brings deeper questions of what education is aiming to do, and how to enable the child's destiny path to be sufficiently supported to enable the dignity of being part of community rather than excluded from an alienating society, through the empowerment of agency.

I feel that there are possibilities in further investigating the practical application of awareness of openness and other attitudes such as equanimity as posed by Rodgers, 2020 and Burroughs (2013 and 2011) and of course Steiner. I have gained awareness that I can bring to my experience as movement therapist to enable a more wakeful relationship between bodily states, attitudes and intentions as a fundamental preparation for inclusivity or self-awareness training.

My study has involved contemporary educational and psychological thinking and was informed by neuroscience; however I constantly find myself returning to the guidance of Rudolf Steiner who encapsulates much of what has been discussed here.

Steiner's six subsidiary exercises are worth the effort, particularly with regard to equanimity, positivity and openness. What is vital here is to take the exercises from concept to experience.

Some practical suggestions following this study:

- Cultivate awareness of openness through body awareness, and similarly practise grounding and centring for self-management to enable 'sturdy openness', rather than being in a 'defensive vulnerable place' (Dana, 2022).
- Remember that whatever attitude you hold is conveyed to the child.
- All efforts to manage yourself and situations are a worthy effort, including meditative work. Your agency enables the development of agency in the child.

Such self development enables collegial and community working.

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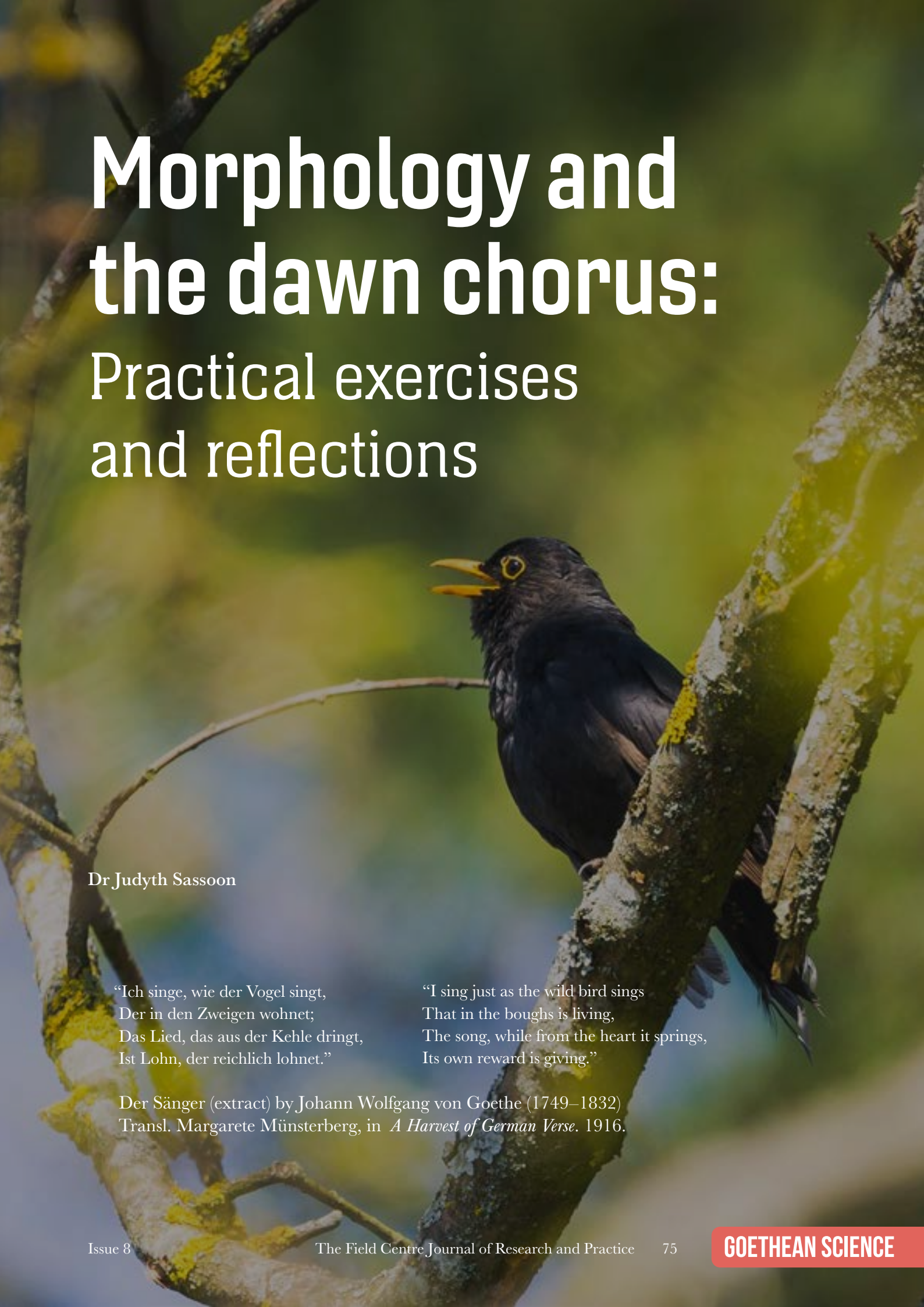
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goethean science

The work of the Field Centre is to undertake research into Ruskin Mill Trust's educational method and its underpinning influences. Within this, Goethean science offers an extended qualitative research method.

Goethean methods of research are premised on the idea that knowledge of the world is inseparable from self-knowledge of the human being, which are in a process of co-becoming.

Goethean methods are based on an empathic and participatory approach to inquiry.



Morphology and the dawn chorus: Practical exercises and reflections

Dr Judyth Sassoon

“Ich singe, wie der Vogel singt,
Der in den Zweigen wohnt;
Das Lied, das aus der Kehle dringt,
Ist Lohn, der reichlich lohnet.”

“I sing just as the wild bird sings
That in the boughs is living,
The song, while from the heart it springs,
Its own reward is giving.”

Der Sänger (extract) by Johann Wolfgang von Goethe (1749–1832)
Transl. Margarete Münsterberg, in *A Harvest of German Verse*. 1916.

Preamble: Self and World

In Goethe's *Zur Morphologie*, he expresses his conviction that human beings unite with the world by forming ideas about the world. To this one might add that forming true ideas about our objects of study is essential to establishing healthy relationships with them. The key point is that Goethe's science strives towards knowledge as a reciprocal disclosure of the essential identities of subject (scientist, self) and object (world) concurrent with the revelation of *identity* (union) between self and world:

In the present volume... I have followed this path: to express how I view nature, simultaneously to reveal, to a certain extent, my self, my interior, my way of being, insofar as that would be possible... In this I admit that I have always been suspicious of the great and so portentous sounding phrase "Know thyself"... A person can know himself only insofar as he knows the world, which he perceives only in himself, and himself only in it. Every new object, well investigated, opens up a new organ in one's self.

J.W. von Goethe, *Zur Morphologie* (1817–1824)

The quotation is from one of the essays comprising Goethe's *Zur Morphologie* [On Morphology]. This work is in six parts written in 1817, 1820 (2 pieces), 1822, 1823 and 1824, reflecting intensive periods of Goethe's activity and thinking about morphology. *Zur Morphologie* is an unusual work, being both scientific and somewhat autobiographical. While reporting on Goethe's biological studies, it also tracks the formation and reformation of his ideas, and shows his commitment to morphology as a lifelong pursuit. The volume also includes some poetry, opinions on aesthetics and sections that are both self-reflective and self-revelatory, as with the quote above. The dynamic exchange of ideas between scientist and nature is tangibly present within *Zur Morphologie* and reveals how the self becomes expressed by immersion in the pursuit of knowledge about the world and how, reciprocally, the world takes on aspects of the self as ideas are formed and instantiated.

Section I: Morphology as a new biological discipline

First let's look at the background to "morphology" and especially try to understand what Goethe meant by the term. Is *Goethean morphology* different from morphology in the usual sense?

Goethe was not the first to bring the term *Morphologie* to print. In 1800 Karl Friedrich Burdoch (1800) used it in a footnote within a fairly minor work on medicine. There Burdoch introduced two neologisms – *Biologie* and *Morphologie* – and used "morphology" to describe the general form of a

human being. His intention was that *Morphologie* should be a principal division in a larger, systematic discipline called *Biologie*.

However, Goethe had first coined the term less officially four years before. In a letter to Friedrich Schiller written in November 1796, he mentioned that he was working on his “*berühmte Morphologie*” (“famous morphology”) which he intended to apply to the study of all natural forms. In scattered notes and brief essays written between 1796 and 1798, it is possible to follow the development of Goethe’s project to ground morphology as an important science.

Below are three quotations from Goethe reflecting how he developed his ideas on the subject.

QUOTE 1

Scientific men at all times have displayed a drive to comprehend living forms as such, to grasp the connections of their external visible and tangible parts as indicative of the internal parts, and so to control the whole, to a certain extent, in an intuitive perception [*Anschauung*]. How close this scientific urge is connected to the artistic and imitative drive we do not go into. One finds thus in the course of art, of knowledge, and of science several attempts to ground and develop a doctrine, which **we would like to call morphology**.

J.W. Goethe, “Die Absichte Eingeleitet” (1807) in *Zur Morphologie* vol I, no. 1 (1817). Collected in *Die Schriften zur Naturwissenschaft*, 1st division, vol. 9: *Morphologische Hefte* ed. Dorothea Kuch (Weimar: Böhlau Nachfolger, 1954), 7.

Thus Goethe says morphology is the study of form with the eyes of a scientist and an artist. He also maintained that living forms are not constant, and continuously transmute over time. In this way, Goethe’s morphology brought aesthetics and exactitude to the study of living forms in dynamic development.

QUOTE 2

When we consider all forms, especially organic, we never find them stationary, at rest, fixed; rather they all shimmer in constant movement. That is why our language customarily employs, quite fittingly, and appropriately, the word formation [*Bildung*] for that which has been produced as for that which is in the process of being produced.

J.W. von Goethe, “Die Absichte Eingeleitet” in *Morphologische Hefte*, 7.

QUOTE 3

Morphology rests on the conviction that everything that exists must express and indicate itself. The first physical and chemical elements to the spiritual

manifestation of the human being serve to confirm this fundamental principle. We turn immediately **to what has form**. The inorganic, the vegetative, the animal, the human – each expresses itself, each appears as that which it is to our outer sense and to our inner sense. **Form is a moving, a becoming, a passing thing. The doctrine of form is the doctrine of transformation. The doctrine of metamorphosis is the key to all signs of nature** [my emphases – J.S.]

J.W. von Goethe, “Morphologie”, in *Sämtliche Werke* 4.2:188.

The essays and notes that eventually constituted *Zur Morphologie* were written over a period of around thirty years, during which Goethe refined and evolved his ideas, and it is possible to follow the development of his ideas through the work. The essays only began to appear as publications in 1817, with the first instalments of a two volume collection called *Zur Morphologie* (1817–1824). In the first number of the first volume, Goethe intended “morphology” to apply *especially to living organisms rather than inorganic forms*. It was to include the study of both external and internal structures and also their development. This is more or less what is understood by *biological morphology* today. However, a reading of *Zur Morphologie* shows that Goethe attributed far more meaning to the term.

Goethe’s morphology

Initially Goethe intended to include geological formations in his morphology project (see Quote 3 above, where he mentions “inorganic forms”). However, as he established his thoughts, he came to the conclusion that a fundamental distinction was needed between living (organic) and non-living (inorganic) systems.

In living organisms, growth, development and change are to some degree self-driven by the organism. They are part of the organism’s “autonomy”. Living organisms are said to be somewhat “emancipated from their environment” (Rosslénbroich, 2014). This is in complete contrast to non-living forms. For example, rock shapes and formations arise passively as their component minerals are subjected to external forces. Accordingly, Goethe concluded that by virtue of the way they come about and because they lack dominion over their parts, the “morphology” of geological structures must fall into a different category from that of living organisms. Despite producing beautiful shapes and forms, Goethe decided that rock formations should not be bracketed together with living organisms in his *Morphologie*. This demonstrates that morphology for Goethe was more than a question of form, and also more than the changes in form over time. It also required an self-initiated capacity to make changes.

Thus something is morphological in Goethe's sense if it *changes and develops its form through time* and if the development of the parts and shaping of the whole *is to some degree self-determined*.

Box 1 contains my summary of what Goethe meant by the term morphology.

BOX 1. Goethe's "Morphologie" as an account of form in time and space

Here are some points summarising "morphology", as established by Goethe (*Zur Morphologie*, 1817–1824).

1. To be able to express itself "morphologically", something must have a degree of autonomy and dominion over its own parts. So up to the present day, Goethean morphology can only apply to living systems and their parts (see Goethe, "Betrachtung über Morphologie", *Sämtliche Werke*, 4.2:197).
2. It must include an understanding of shape change during development.
3. It must include an understanding of the way something expresses its identity through its shape (form).
4. To understand morphology one must grasp that something is expressing its quality of being through its form. Thus morphology is also a qualitative and aesthetic science. However the qualities perceived and understood by the observer must truly belong to the organism and not be superimpositions of the observer's own dispositions. So great care must be taken with projections and symbolic interpretations.

How was "Morphology" developed in the wake of Goethe and Burdock?

In 1908, Hans Driesch wrote "It is form particularly which ... furnishes the foundation of biology." Thus, 100 years after Goethe first coined the term, morphology was held to be an important scientific discipline. In fact it was a major stream of biological research throughout the 19th century and engaged with some of the most central philosophical mysteries of life. Some of these are listed here.

1. What is the relationship between the animal as a unified whole and its parts?
2. What is the relationship between body structures and the mode of life?
3. Are there one or more basic plans to which all animals conform? Are these distinct from one another or do they merge?
4. What is the relationship between the adult form of an organism and its earlier stages? i.e. do earlier stages predictably *cause* the adult to come about? How does an egg know to turn into a chick rather than something else? To what extent are organisms predetermined?
5. How does the organisation of an animal's form capture its identity and lifestyle? This question goes beyond straightforward correlations between form and function. It addresses *form and "being"*, asking how form captures the core of an animal's existence, i.e. its "beingness". It touches on whether it is possible to separate function from "being". Most significantly it addresses whether the "being" of an animal can be explained if the form and function of all its parts are completely understood.

Modern biologists still grapple with these questions and morphology as a sub-discipline of biology lives on. It too has been divided into specialisations: e.g. comparative morphology, functional morphology, molecular morphology, phylogenetic morphology.

There are those who have argued that morphology is a "backward facing enterprise, connected to a long-discredited idealistic view of nature and its associated bankrupt methods" (Nyhart, 1995). However, the fact that today there are so many specialisations within the field suggests quite the opposite.

So I would argue that biological morphology is alive and well.

But is modern biological morphology the same as Goethean morphology? Is it the *Morphologie* that Goethe spent so much of his life trying to understand and communicate to his peers?

Please refer back to Box 1 to decide for yourselves and then continue with the exercise that follows.

Section II: listening to the dawn chorus

Here is an exercise which encourages you to test your understanding of Goethean morphology by experiencing a beautiful springtime phenomenon.

The question to explore is:

Can we legitimately speak of a morphology of the dawn chorus of birdsong?

Please read the information in Box 2 which discusses birdsong at sunrise. Then do the exercise that follows.



The volume of a bird's song bears no relation to its size. The shout of a wren, one of the smallest garden birds, could fill a concert hall.

BOX 2. The dawn chorus: A symphony of spring

In Britain, birds perform their dawn chorus between March and the end of June. It is usually at its clearest and best in late April and May, fading as summer progresses. Many people notice how August is a very quiet month for morning birdsong. At the time of writing (May 2020) the dawn chorus is very audible and with the general stillness in the atmosphere resulting from travel restrictions and human lockdown, it comes across magnificently.

A few daytime songbirds begin their recitals in the twilight period between dawn and sunrise and you might hear a consistent sequence of different birds pitching in as the wall of sound intensifies up to mid-morning. In some areas there is an audible transition from night birds (owls, nightjars, nightingales) to daytime birds, while in areas with high light pollution song thrushes sometime accompany the owls by singing through the night. As the morning wears on the chorus fades out, often coincidentally with increasing human activity.

The dawn chorus sequence varies over the spring months. As summer migrants add their voices to resident birds, you might hear the distinctive call of a cuckoo or warblings of the blackcap or skylark. There are perhaps 15 to 25 common bird species contributing to the dawn chorus, depending on habitat and environment.

Exercise

This exercise consists of two parts.

PART 1. On three different days (more if possible) listen to the dawn chorus in your area. Try to hear it in its entirety, from the opening tones (about half an hour before sunrise) until it fades away in the mid-morning. Focus on the experience and try to grasp it whole. You may recognise the songs of different species, but you do not need to concern yourself about their names. Just be aware that there are a variety of contributors to the chorus.

Notice the different qualities and volumes of sound that birds produce. You are likely to hear the melodious tones of passerines (perching song birds) along with other accompaniments: the raspings of corvids, drummings of woodpeckers or purring of pigeons. Listen to their extraordinary orchestration as if it were a musical score and follow the form, structure, cadences,

fluctuations, modulations, rhythms, arrhythms, harmonies, discords etc. Listen out for consistent repetitions or slight variations.

Immerse yourself fully in this phenomenon. If you wish, note down any immediate thoughts or feelings. Make notes as you listen and add further insights after reflecting on the experience.

PART 2. After familiarising yourself with the overall form and presentation of the dawn chorus in your area, please think about these questions:

- During a single recital, some birds will make refrains or thematic repetitions. Are the repetitions exactly the same every time?
- What about the spaces between the bird calls? Do they matter?
- Are the songs of the birds superimposed on each other randomly?
- Is there a thematic shape or characteristic “sound-form” to the dawn chorus in your area or is it merely a series of random, fragmented, unrelated sounds running concurrently?
- Is the dawn chorus a huge cacophony or a masterful symphony?
- Is the dawn chorus in any way like music?

Finally, and most importantly for this exercise:

- **Can the dawn chorus be said to exhibit “morphology” in the Goethean sense?**

To answer this, you can look back at the information in Box 1 and the “Guiding thoughts” below.

Guiding thoughts: Birds are organisms whose morphology (form and development) can be perceived to some degree and described. The ideas defining Goethe’s morphology (Box 1) apply to birds. I would further argue that the songs birds sing are as much part of their beingness (inner and outer morphology) as is their shape. Therefore the songs they produce must also be incorporated into a morphological perception of songbirds. One cannot separate the song from the songbird without changing the bird fundamentally.

In my thinking, song and bird together comprise an extended organism and the birds have dominion over their songs. How can we prove this? Because we can demonstrate that birds change their songs according to their own preferences. They adjust their songs in response to those of other birds, and not just other birds of their own species. Also, some birds imitate sounds they find attractive or re-configure their songs into new compositions. These activities are the instinctive but nevertheless self-determined activities of individual birds.

When groups of birds sing together, there is a complex interaction of audio-communication between individuals, and the whole system (birds and



birdsongs) takes on the aspect of a larger, extended, self-adjusting and self-determining organism. The dawn chorus that we hear is, in my opinion an expression of this extended organism.

But note this: if you become entranced by the dawn chorus and focus entirely on the songs, forgetting that living beings lie behind them, then one cannot legitimately say that the dawn chorus *per se* exhibits morphology in Goethe's sense. For Goethe's meaning to apply, one needs to be able to perceive the living, self-determining and self-adjusting quality of the system. If the human mind isolates the dawn chorus from its living composers then the dawn chorus becomes like a secreted shell: beautiful in its form (traditional definition of morphology) but without real life (Goethe's extended, living definition of morphology).

Can we extend these thoughts further? If we briefly return to Goethe's reasons for not including rock formations within *Morphologie*, rocks have no dominion over their parts. But while the geological earth *per se* cannot be said to act in a self-determined way, if the organisms living on it are included in the picture, then the inorganic *plus* organic earth takes on the character of a self-perpetuating living entity. This is what the Gaia hypothesis proposes: that life takes hold of non-life (in this case the inorganic earth) to form a self-regulating system, that perpetuates the conditions of life. So life brings life to non-life and the Earth is fundamentally morphological.

This extension section provides more background on the aesthetics of birdsong. It may be of general interest and can also help you form your ideas.

Extension reading: The musicality of birdsong

For humans, birdsong has an otherworldly quality and it is not something we can reproduce very easily in our own music. Male passerine songbirds spend much of their lives learning, producing and listening to complex vocal sequences. Like humans, birds perform their songs for others, or practise for themselves because a good birdsong must attract attention and stand out above the noise of other singers. To the human ear, many birdsongs have an appealing, aesthetic quality. Research suggests that birds too have an aesthetic sense of their own “music”, preferring some song phrases or sequences over others and exercising choice in creating personal repertoires (Rothenberg *et al.*, 2014).

It is important to distinguish between bird songs and calls. Calls are specific signals with simple, direct meanings such as “feed me”, “watch out” or “go away”, while songs are performances, independent of concrete messages. Songs are produced to instigate emotional and behavioural responses in other birds e.g. pair-bonding, aggression or avoidance. Bird songs are organised sequences with a clear beginning, middle and end and an overall structure. Within the song structure there are sub-structures of elements and phrases. The birds bind these elements into a dynamic whole, a melody that becomes a cohesive percept for other birds. For birds and people alike, melodies are easier to remember than random selections of notes.

It has been proposed that birdsong is driven by general “musical” principles, similar to those that affect human emotions (Rothenberg *et al.*, 2014). These include changes of rhythms, inflexions, pitch transitions, flourishes, gradual escalations and graceful modifications of sounds. The emotions of listeners are affected because musical sequences create expectation, anticipation, tension, catharsis or surprise. Music drives emotional responses through complex, non-semantic sound streams and there are powerful parallels between human music and birdsong. Charles Hartshorne (1973) proposed that nearly every attribute of human music could also be found in birdsong e.g. *accelerando* (dunnoek, wren), *ritardando* (yellow billed cuckoo) *crescendo* and *diminuendo* (robin), *glissando* (blackbird) also harmonic relations, themes and variations (members of the thrush family). Some birds such as the nightingale include all these complex elements in their songs.

Birds learn songs by cultural transmission, and juveniles learn from adults. In Britain, it is more usual for males to sing and perform, but some tropical birds sing duets and female canaries exposed to testosterone are known to burst into song. Once learnt, songs are personalised by birds. In the next section, you can find out more about bird compositions and hear an example.

Section III: how blackbirds compose their songs

Below please find a summary of a study made on blackbird song composition, which may be of interest as you think about the morphology of birdsong (Hall-Craggs, 1962).

BOX 3. The aesthetics of song composition in blackbirds

Birds belonging to the thrush family (e.g. song thrush, mistle thrush, nightingale, blackbird) have very distinct, variable and audible songs. Studies have shown that their songs are both means of communication and aesthetic performances, over which the bird exercises decisions and choices (Hall-Craggs, 1962). Individual birds deliberately select, reject and change musical phrases according to their own taste and preferences. In studies of wild blackbird songs, Joan Hall-Craggs observed how the birds compose, develop and vary their song over a spring season. The mature song of an individual bird at the end of the breeding season presented a sharp contrast to that of the early season.

In early spring, blackbirds begin to sing characteristic song sequences, which they repeat and practice rather than perform. At this stage, they form compound phrases and decide on the contexts in which they will use particular musical elements.

Hall-Craggs' study uncovered that an individual blackbird established 26 phrases which it used at the outset of the breeding season. These constituted a basic set of musical elements which it developed as the season progressed. Once a repertoire was established, the bird made variations in several different ways: whole phrases and extracts were combined to form new phrases; new material was added to existing phrases; notes contained within the phrase were repeated; phrases were embellished with newly learnt sounds; some phrases were contracted by the note omission. The bird also organised separate phrases into a recurring series, created and extended combinations of phrases and added terminal flourishes. It also abandoned some phrases completely, replacing them with new ones. It is well known that blackbirds learn the sounds of other birds and even imitate human machinery. The blackbird in this study added the "churr" of a blue tit as a terminal embellishment to one of its phrases. The study also showed how the bird responded to the compositions of other blackbirds by counter singing, communal singing and antiphonal singing.



The mellifluous song of the blackbird is often audible at the crack of dawn, before the sun rises. Photo © hedera.baltica

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A Morphology of Goethean science

Part II Into the Compost Heap

Simon Reakes MSc

Part 1 of this essay, published in issue seven, discussed an approach to Goethean science developed from the work of Rudolf Steiner, and how this was developed up to the 1980s in purely anthroposophical contexts. Part 2 takes up the story from the 1990s on, as a new generation of Goethean researchers re-engaged with academic research.

The first part of this essay focused on a fourfold way of knowing the world, one that drew on the model of the four classic elements in the Western tradition. I foregrounded the work of Bockemühl and Maier, focusing on their interpretation of, and the modes of knowing associated with each element. A brief glance back to the four elements will help with orientation, as we continue to follow the history of the morphology of Goethean science into Steinerian Goethean science.

In alchemical practice, both ancient and modern, the doctrine of the four elements plays a fundamental role. The doctrine can be traced back to Empedocles of Agrigento (c. 500–430 B.C.E.), whose poem *On Nature* describes four “invisible basic materials,” “the principles of solidity (Earth), fluidity (Water), vaporosity (Air) and combustibility (Fire)” (Haage, 2006, p. 18). The four root powers are animated by the basic polarity of Love and Strife/Conflict. In the following century, Aristotle (384–322 B.C.E.) took up the doctrine of the four elements. Such was the influence and coherence of these four invisible basic materials that, through the Aristotelean texts, the doctrine was prominent in the natural sciences and medicine until the late Middle Ages. (Haage, 2006)

Reading the Book of Nature

Just as Aristotle looked back to Empedocles, so Steiner looked back to Aristotle. In the wake of World War I, in a radically changed Western European atmosphere, Steiner argued that “The blundering, inadequate, and frequently repulsive attempts of modern natural science must be transmuted by a spiritual world-conception...” Steiner proposed (2022) that if such a spiritual world-conception could intervene in the natural sciences then there could “arise from them a true reading of the book of nature.” The book of nature is an old and telling metaphor. In drawing on the metaphor, Steiner can be seen to place value, not only on first person experience and empirical knowledge, but on doing so with spiritual eyes, and through a particular mode of observation. Steiner, again standing on the shoulders of giants, proposes (2022) that “[Paracelsus] was convinced that only by reading the book of nature first-hand and through personal contact with those who work with nature can one come to anything like truly natural scientific knowledge.”

In developing the model of the four elements as “modes of observation,” Bockemühl bases his approach not only on Steiner’s epistemology, but also Steiner’s imperative to undertake a transformation of the sciences, and to do so through reading the book of nature. Bockemühl’s reference point for this is the lecture given by Steiner as part of *Karmic Relationships Volume 3* in 1924¹ quoted above. Bockemühl’s Goethean approach is congruent with Steiner’s proposed transmutation of the natural sciences, both by way of reading the book of nature, and by actively transforming or guiding a transmutation.² Bockemühl argues that spiritual science “makes us aware of the invisible aspect of reality. It teaches us to perceive the things that cannot

1 The lecture, *Ahriman’s Fight Against the Michael Principle. The Message of Michael* was given on Aug 1 1924. See: <https://rsarchive.org/Lectures/GA237/English/RSP1977/19240801p01.html>

2 On Bockemühl’s reading the book of nature see Amrine’s “Goethean Method in the Work of Jochen Bockemühl”, in *The Perennial Alternative – Episodes in the Reception of Goethe’s Scientific Work* (pp. 223–240). Adonis Press, 2021.

be perceived if the scientific approach remains untransformed.” (Bockemühl, 1992, p. 296) Integral to this perceiving of the invisible aspect of reality is a Goethean method, infused with Steiner’s meditative approach and spiritual worldview. Bockemühl aims to arrive at the perception of the invisible aspect of reality through the cultivation of inner perception/inner vision, arguing (1992, p. 7) that “In the interplay of the formative movements, which are only visible to inner perception, we can discover an invisible temporal body or body of formative forces³.” Invisibility, then, turns out not to be a permanent category, but more something that can be brought into visibility through an appropriate approach.

The transmutation, or put another way the spiritualisation, of the natural sciences is just one aspect of Steiner’s larger perspective on transmutation and transformation. In Steiner’s work, and consequently Steinerian Goethean science, we can find the view that not only should particular fields or disciplines undergo a transmutation, but the Earth itself must undergo such a process. This is complex territory, and one that involves Steiner’s esoteric worldview, an examination of which is beyond the scope of this essay.⁴ It is worth noting, though, that Steiner’s philosophy embraces both ends of a spiritual-material spectrum. For whilst concerned with the esoteric matters such as the evolution of consciousness, cosmology, an arcana of spiritual beings and gods, and pre-birth and post-life existence, Steiner’s philosophy is eminently practical, and concerned with everyday matters. The invisible, the esoteric, the spiritual are not transcendent but immanent. For example, Steiner’s insights and indications have influenced practical domains such as agriculture, education, therapeutic education, medicine and social forms.

“Our Task is the Transformation of the Earth”⁵

This second part of the essay explores key ideas promoted by Bockemühl and Margaret Colquhoun (1947–2017). After Bockemühl, Colquhoun can be considered one of the most significant individuals in the morphology of Goethean science into Steinerian Goethean science, and one who exemplifies the spanning of the spiritual-material spectrum.

3 Formative forces are also referred to etheric forces. See Bockemühl, J. (1985). “The Formative Movement of Plants” in *Elements and Ethers: Modes of Observing the World. Towards a Phenomenology of the Etheric World* (pp. 73–88). Anthroposophic Press.

4 This topic is too large to address here. Readers are directed to chapter four of Steiner’s *Occult Science* (Steiner, 1997), “The Evolution of the Cosmos and Man” and chapter six, “The Present and Future of Cosmic Evolution”.

5 Steiner, R. (1918). *How is Knowledge Of The Higher Worlds Attained?* https://rsarchive.org/Books/GA010/English/RSPC1947/GA010_c01.html. Retrieved October 2022, from Rudolf Steiner Archive

One of the key ideas picked up by Colquhoun⁶ is Steiner's transformation of the Earth. Both the directive to read nature as a text and to consciously guide a process of transformation of the Earth, the latter through working the landscape, are present in the work of Colquhoun. Having studied with Bockemühl at the Goetheanum (Dyson, 2017, p. 108), Colquhoun would further the Goethean approach, grounding it in the Pishwanton Project, which she set up in 1996.⁷ For Colquhoun, the idea of the transformation of the Earth through working with the landscape requires a method. One year later, in her article "An exploration into the use of Goethean science as a methodology for landscape assessment: the Pishwanton Project" (1997), Colquhoun introduces a synthesis of Goethean, Spinozan and Steinerian terminology in a three-stage method, with a proposed fourth stage to bring them all together. As there is no evidence that Bockemühl drew on the work of Spinoza, it can be conjectured that Colquhoun's interest in Spinoza has, if not its source, then a very strong footing in Steiner's early work on Goethean science.⁸

Presented using terms drawn from Goethe and Steiner, Colquhoun's initial framing of the Goethean method is articulated through three levels of inquiry (Figure 1). A summary of the process is given here, but the reader is directed to the paper for a fuller understanding. For Level 1, general data, such as "height above sea level, aspects of slopes, orientation in the points of the compass, prevailing wind direction, rainfall, soil types" (Colquhoun, 1997a, p. 151) are collected in a group. Findings are shared. For Level 2, how the landscape has come into being over time is studied. This coming into being explores not only the landscape's recent history, but also its geomorphology. Again, findings are shared in the group, and "[o]nce each person has reconstructed as much of the history of his or her place as possible we try together to build imaginative pictures by living within the stream of time." (Colquhoun, 1997, p. 155) At Level 3, "We approach the 'spirit of the place' and, given space and a listening

6 Colquhoun's *Reading Nature as a Text – Goethe's Science Today* (Colquhoun, n.d.) is prefaced with Steiner's quote, "Our task is the transformation of the Earth."

7 In 2019, following the death of Margaret Colquhoun in 2017, the Life Science Trust which manages the Pishwanton Project entered into partnership with Ruskin Mill Land Trust, working in collaboration with the Field Centre. See: lifesciencecentre.co

8 Consider for example, this passage from Steiner's *Goethean Science* (Steiner, 1988) from which Colquhoun draws in her depiction of Spinoza. "The first kind is that in which upon hearing or reading certain words we recall certain things and form certain mental pictures of these things which are similar to the pictures by which we represent the things to ourselves pictorially. The second kind of knowledge is that in which, out of sufficient mental pictures of the characteristics of things, we form general concepts for ourselves. The third kind of knowledge, however, is that in which we advance from an adequate picture of the real being of certain attributes of God to an adequate knowledge of the being of things. Spinoza calls this kind of knowledge *scientia intuitiva*, knowledge in beholding. This last, the highest kind of knowledge, is that for which Goethe strove." (Steiner, 1988, p. 33)

ear, it will speak within us.” (Colquhoun, 1997, p. 155) Poems and other artistic activities can aid this process.

A point of emphasis for Colquhoun is the vertical movement towards a higher level of knowledge and encounter undertaken in the Goethean inquiry. It is an “ascent from material phenomena to reach the underlying but invisible spiritual being of the place, the Genius Loci.” (Colquhoun, 1997b, p. 156) Having undertaken the ascent, the descent follows and Colquhoun’s indications for a fourth level are that all the previous three levels are brought together so as to explore future possibilities for the place/landscape. “Out of a state of ‘becoming one with’ (or ‘being the being’) the place we are able to develop an assessment or decisions leading to action.”

	Level	Spinoza	Goethe + today’s terminology	Colquhoun
1	This level is highly appropriate for the world of physical things, separate parts in a landscape or a plant	That which upon hearing or reading certain words we recall certain things and form mental pictures of these things which are similar to the things themselves	Exact sense perception It might be described today as ‘seeing the “is now”’	Meeting the ‘is now’ – the physical Level 1
2	At this level we ‘live’ in between the physical parts with a more fluid type of alive thinking which connects all the parts of a living whole together in a way in which we recreate inwardly their development in relation to one another	Out of sufficient mental pictures of the characteristics of the things, we form general concepts for ourselves	Exact sensorial fantasy This could be called today ‘seeing “becoming” or “relationship”’	Living into the ‘becoming’ – in time and relationships Level 2
3	This is the level at which we experience an intangible deep feeling of what meets us in a landscape – or touches us in its essence out of the whole	We advance from an adequate picture of the real being of certain attributes of God to an adequate knowledge of the being of things (Scientia Intuitiva)	Knowledge in beholding This could be described today as ‘seeing “being”’	Seeing ‘being’ or meeting the genius loci Level 3

Figure 1. Colquhoun’s “The levels of knowledge according to Spinoza [sic] and Goethe”

Colquhoun would later go on to develop “a methodology that combined Goethe’s approach to Natural Science with her deep understanding of the *Seven Life Processes*⁹, as originally outlined by Steiner.” (Dyson, 2017, p. 107) The seven stages of Colquhoun’s revised Goethean method give a far clearer and more directive approach for sensing and planning future landscape developments on a specific site. In summary, the seven stages of Colquhoun’s revised Goethean method are:

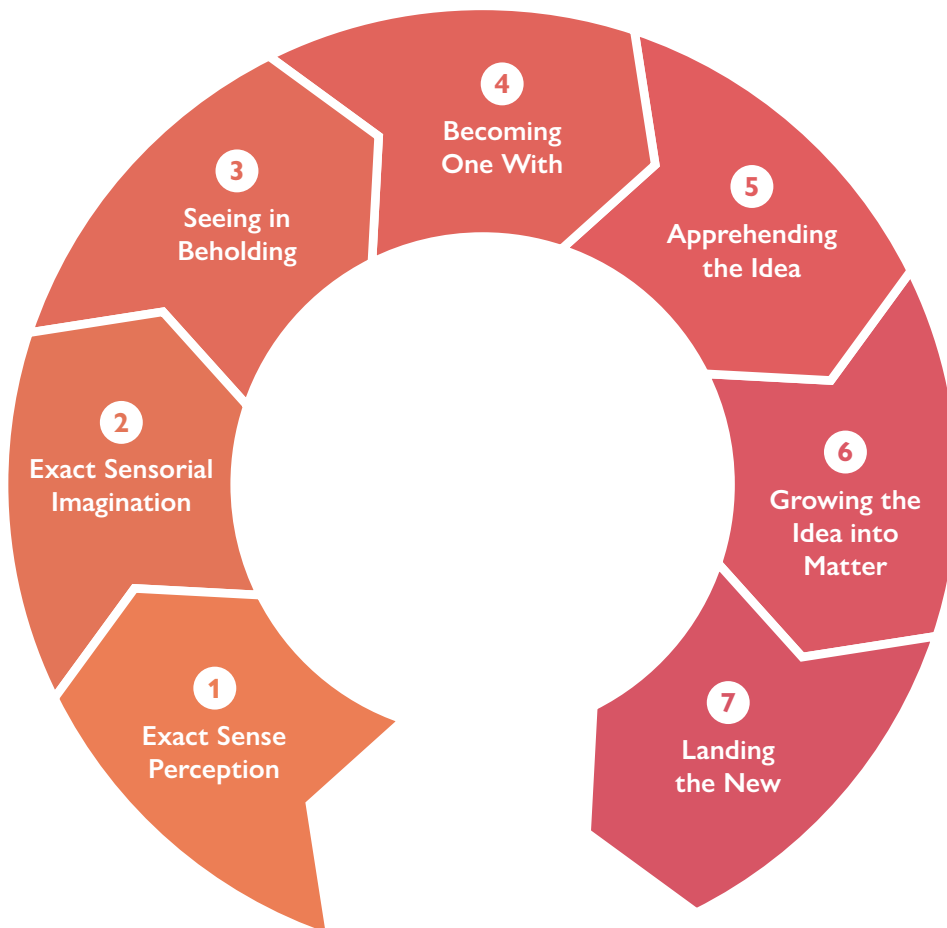


Figure 2. Colquhoun’s Seven Stage Goethean Process

Stage One: Exact Sense Perception

Stage Two: Exact Sensorial Imagination/Fantasy

Stage Three: Seeing in Beholding or the Revelation of Character/Gesture (Inspiration)

Stage Four: Becoming One With or Intuition

Stage Five: Apprehending the Idea, Atmosphere or Gesture

Stage Six: Growing the Idea into Matter

Stage Seven: Landing the New¹⁰

9 See Steiner’s lecture of 12 August 1916, Dornach: <https://rsarchive.org/GA/GA0170/19160812p01.html>

10 (Colquhoun, n.d.)

Readers may also be familiar with Colquhoun’s seven stage process through the work of Christopher Day. Day’s seven stage process, which he refers to as *Incarnating project out of place-study*, (Day, 2003, p. 44), is credited to Colquhoun.¹¹ Such a schema is a guide for the transformation of the past of a place to a future vision, enacted through a project. Day states that, “Scientifically – that is, with a Goethean scientific approach – we can work towards understanding the forces, physical and spiritual, temporal and atmospheric, that make a place.” (Day, 2003, p. 44). Throughout *Consensus Design* (Day, 2003), Day foregrounds terms with distinctly theological connotations, *redeeming* and *incarnating*. The former applies to an “already-formed place”, whilst the latter applies to an “undeveloped ‘site’” (Day, 2003, p. 44).

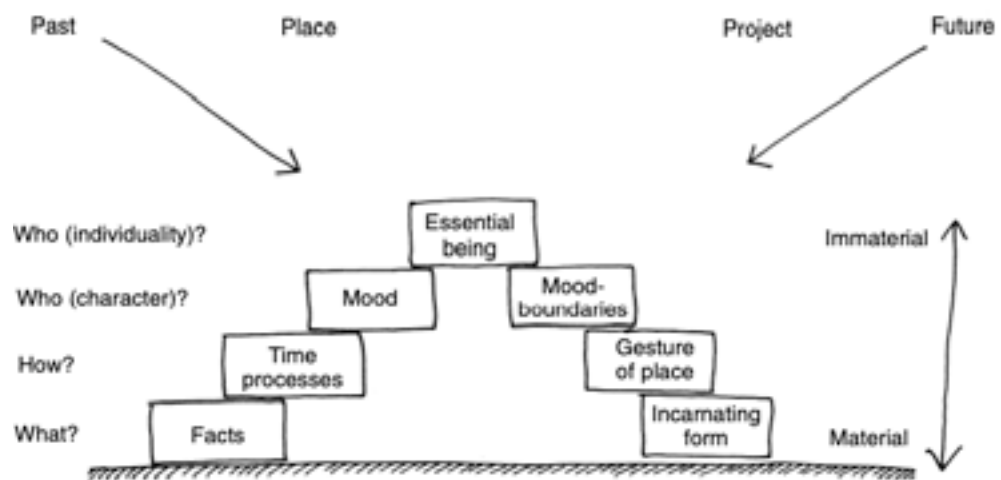


Figure 3. Day’s Incarnating project out of place-study. Reproduced from Day, C. (2003). *Consensus Design: Socially inclusive process*. Architectural Press.

Colquhoun’s seven stages are directed to co-shaping and endeavouring to collaborate with the landscape, for “growing the idea into matter” and “landing the new” (Colquhoun, n.d.a). For Colquhoun, “The whole journey is one of inserting oneself as a human being into the Will of the World.” (Colquhoun, n.d.) Furthermore, “The Journey of the Goethean Science process can be regarded or experienced as a journey through the elements to the World Spirit/Logos or Christ being.”¹² (Colquhoun, n.d.) Such a journey brings with it “a renewed experience of responsibility for our actions on

11 “After Colquhoun” (Day, 2003, p. 48).

12 Terms such as the World Spirit and the Will of the World, distinctive in Colquhoun’s lexicon, are most likely attributable to Steiner. Consider for example, Steiner’s emphasis on the cultivation of inner experience that can bring about a sense for “the eternal language of the *world spirit* and understand the mysterious riddles of creation.” ([my emphasis – S.R.] Steiner, 1994, p. 23)

earth.” (Colquhoun, n.d.) The Goethean science process that Colquhoun is referring to, whilst being informed by both Goethe and Steiner, is also informed by the times in which Colquhoun undertook her work, which coincides with the birth of the ecology movement in the 1980s.¹³

The Germination of a New Earth

Having briefly examined Colquhoun’s Goethean method that concretely relates to the idea of the transformation of the Earth, I will now examine an instance of how this was applied in Colquhoun’s own hands-on practice.

Colquhoun’s proposes “we can take full responsibility for the handling, care and future evolution of the earth, with which we are so intimately bound up and co-dependant [sic] upon.” (Colquhoun, n.d.b).” No small task indeed. And yet, despite, or maybe because of the boldness of Colquhoun’s cosmically charged claims, what she offers is remarkably down to earth. In her article, *The Living Earth as a Spiritual Being*, Colquhoun, (2008), like Bockemühl before her, points to the practice of making of biodynamic compost heaps, based on the recommendations of Steiner. In June 1924 at Koberwitz, Germany, Steiner proposed (2004, lecture 4) that “In compost we have a means of kindling the life within the Earth itself.” Colquhoun would work with this idea, reframing it in her own way.

“When we make a [biodynamic] compost heap and put in these preparations we create a kind of embryonic mother ground. If we can do this on however small a scale, we are making seed spaces for the germination of a New Earth.” (Colquhoun, 2008, pp. 40–41) Colquhoun’s image of the embryonic mother is striking. In his *The Forge and the Crucible, The Origins and Structures of Alchemy*, Eliade proposes (1978, p. 52) that “The image of the Earth-Mother pregnant with every kind of embryo” is an “exceedingly ancient symbolism.”¹⁴ An exceedingly ancient symbolism, combined with the practical concern of biodynamic compost making, Colquhoun’s approach, emblematic of the morphology of Goethean science into Steinerian Goethean science, synthesises the often separate domains of the sacred and the profane. It is just such an approach that leads Colquhoun to claim (2008, p. 37), “Goethe’s way is like a kind of modern Druidism – a shamanic journey in the Celtic tradition – an entering deep into matter, consciously seeking or being open to the spirit within.”¹⁵

13 The first Gaia conference, *Is The Earth A Living Organism?*, which explored James Lovelock’s Gaia hypothesis, took place in 1985.

14 For Eliade’s discussion on the “Multiple Meanings of the Symbolism of the Embryo” see his *Rites and Symbols of Initiation, The Mysteries of Birth and Rebirth* (2nd ed.). Harper & Row. (1975) pp. 57–60.

15 For an exploration of Goethe and Shamanism see Flaherty, G. (1989) Goethe and Shamanism. *MLN*, (Modern Language Notes), 104(3), 580–596. 10.2307/2905047. It is not known whether Colquhoun was familiar with Flaherty’s paper. An exploration of Colquhoun’s likening of Goethe to “modern Druidism – a shamanic journey in the Celtic tradition” merits further research.

Concluding thoughts

Our brief exploration into the continuing morphology of Goethean science into Steinerian Goethean science started with the imperative to read in the book of nature. Such reading, it was argued, requires not only active engagement through first person experience, but the development of spiritual eyes. If a renewal of reading in the book of nature could be undertaken, then the transformation of the domain of the natural sciences was possible. Further, this transformation could extend into the domain and context of human beings. That context being the Earth. For “Our task is the transformation of the Earth.” Colquhoun’s approach to taking up this task was to develop a methodology in landscape studies, modelled on Steiner’s *Seven Life Processes*, that would enable the projects to develop that are resonant with the genius loci. Extending the task of the transformation of the Earth into the everyday practice, Colquhoun points to the very Earth beneath us, the biodynamic compost heap. Dark, decaying matter, that through transmutation, brings fertility and new life to the Earth. “If we can do this on however small a scale we are making seed spaces for the germination of a New Earth.” (Colquhoun, 2008, p. 41)

Whether one agrees or not with Colquhoun’s comparison of Goethe’s way to modern Druidism or shamanism, what is evident in the above exploration is a reorientation and reframing in the morphology of Goethean science into Steinerian Goethean. The imperative for the transformation of the Earth has arrived. What Colquhoun has emphasised, perhaps beyond all else, is complementing the ascent of the Goethean method with a descent into a new form: a growing, or incarnating, of the spiritually apprehended idea into matter.

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Goethe's Scientific Method and Paradigm Change

The Example of Projective Geometry

Dr Troy Vine

“No phenomenon can explain itself through or out of itself; only many, seen together, systematically ordered, eventually give what could be considered a theory.”

J.W. von Goethe¹

I. Introduction

In “The Metamorphosis of the Scientist”, Frederick Amrine claims that Goethe not only “anticipates many of the central tenets of the most recent philosophy of science, he also offers solutions to its central dilemmas in both theory and practice”.² The central tenets Amrine has in mind in this bold claim are those of Thomas Kuhn’s conception of a scientific paradigm presented in *The Structure of Scientific Revolutions*; the dilemmas are that this work “cannot account for the structure of scientific revolutions because they are ultimately unstructured and extra-scientific”.³ Remarkably, despite being written three decades ago, Amrine’s essay remains one of the few attempts to bring Goethe’s scientific studies and Kuhn’s philosophy of science into dialogue. It thus provides a welcome starting point for a promising endeavour that will be taken up here.

In his account of scientific revolutions, Kuhn remarks that scientists receive a “narrow and rigid education”.⁴ As a result, “scientific training is not well designed to produce a man who will easily discover a fresh approach”.⁵ Because of the rigidity of the individual scientists working within a paradigm, a new paradigm is generally introduced by a young scientist or someone new to the field. For Kuhn, then, there is no real need to develop a method or training for paradigm change. For while the individuals working within a particular paradigm will generally not switch paradigms, the community as a whole does by training aspiring scientists according to the new paradigm: “Given a generation in which to effect the change, individual rigidity is compatible with a community that can switch from paradigm to paradigm when the occasion demands”.⁶

This is precisely here where Amrine locates Goethe’s scientific contribution. By training the scientist “*not* to reduce phenomena to a scheme but, rather, to remain inwardly mobile”,⁷ Goethe’s method provides “the ground from

This article is based on a lecture and workshop given at the Field Centre in 2022. In addition to participants of these events, for helpful comments I would like to thank Charles Gunn, Olaf Müller, Thomas Raysmith, Michael Beaney and his students.

- 1 Johann Wolfgang von Goethe, *Hamburger Ausgabe*, vol. 12 (München: Beck, 1981), 434. This edition will be abbreviated to HA in subsequent citations. All translations from German are my own.
- 2 Frederick Amrine, “The Metamorphosis of the Scientist”, in *Goethe’s Way of Science*, edited by David Seamon and Arthur Zajonc (Albany, NY: State University of New York Press, 1998), 36.
- 3 Amrine, “The Metamorphosis of the Scientist”, 35.
- 4 Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 2012), 165.
- 5 Kuhn, *Structure*, 165.
- 6 Kuhn, *Structure*, 165.
- 7 Amrine, “The Metamorphosis of the Scientist”, 38.

which all our *Vorstellungsarten* – all scientific ‘paradigms’ – arise”.⁸ Goethe focused his scientific activity on botany and chromatics “above all because of their propaedeutic value”.⁹ The propaedeutic value of these examples is to lead the scientist to what “moves *between* the paradigms, the source of the revolutions themselves” and thereby develop the “mobility of one’s thinking and imagination, upon which the ‘metamorphosis of the scientist’ and, with it, the growth of science depend”.¹⁰

In *The Metamorphosis of Plants*, Goethe gives an account of the growth of the plant by showing how a given stage in its development is the metamorphosis of the previous stage.¹¹ But Amrine gives no such account of the growth of science. His response to the question of how “can there be progress in science in any real sense”¹² is the development “in a rigorous and controlled manner [of] new ways of seeing”.¹³ But this can only be half the answer. Amrine does not show how developing a new way of seeing can bring about a *progression* from one paradigm to the next, rather than merely *replacing* one paradigm with another. In short, what is missing is an account of the metamorphosis of the paradigm. In the following I present an example of the paradigm change from Euclidian to projective geometry in order to exemplify Goethe’s method and thereby show how a scientific revolution brings about just such a metamorphosis of the paradigm.

2. Goethe’s Scientific Method

In the final chapter of the three-volume *Farbenlehre*, published in 1810, Goethe describes his experience of looking through a prism that led to his rejection of the Newtonian paradigm in colour science. He recounts that he wrote his *Contributions to Optics*, the first part of which was published in 1791, in order to “produce the *aperçu* in another that had had such a vivid effect on me”.¹⁴ In short, Goethe’s intention was to bring about what Kuhn calls a “scientific revolution”.¹⁵

The method employed in *Contributions to Optics* is outlined in “The Experiment as Mediator between Object and Subject”, written in 1792. Goethe concludes this essay with the following methodological summary:

8 Amrine, “The Metamorphosis of the Scientist”, 47.

9 Amrine, “The Metamorphosis of the Scientist”, 44.

10 Amrine, “The Metamorphosis of the Scientist”, 47.

11 HA 13: 64–101.

12 Amrine, “The Metamorphosis of the Scientist”, 34.

13 Amrine, “The Metamorphosis of the Scientist”, 36.

14 HA 14: 264.

15 See Nora Löbe, Matthias Rang and Troy Vine, *Seeing Colour: A Journey Through Goethe’s World of Colour* (Edinburgh: Floris Books, 2022), 12–15.

My intention is to collect all experiences [*Erfahrungen*] in this subject, carry out all experiments myself and do so in their greatest manifoldness [*Mannigfaltigkeit*] so that they become easy to reproduce and are not inaccessible to so many people; then to establish the theorems [*Sätze*] in which the experience of a higher kind can express itself and see if they can be brought under a higher principle.¹⁶

We can discern three stages in this method, namely 1) manifolding phenomena, 2) establishing theorems and 3) bringing them under a higher principle.¹⁷ And although he does not say anything about the third stage other than it is a “higher principle”, it is clear from the experimental presentation in *Contributions to Optics* that this higher principle is that of polarity.¹⁸

It remains unclear, however, what distinguishes the theorems of stage two from the higher principle of stage three – polarity is a good candidate for both. In the *Farbenlehre* we find the same three methodological stages, with the theorems of stage two described as “scientific categories [*Rubriken*] that point further upwards”.¹⁹ These are subsumed in stage three “under higher rules and laws that reveal themselves [...] as phenomena to seeing [*Anschauung*]”.²⁰ Goethe calls such phenomena “archetypal phenomena”.²¹ Here, instead of “theorems” and “higher principles” we have “scientific categories” and “rules and laws”, but this does not clarify what distinguishes them.

These methodological descriptions show that Goethe’s method has three distinct stages, which he also calls “the empirical phenomenon”, “the scientific phenomenon” and “the pure phenomenon” respectively.²² In order to gain some clarity on what distinguishes the second and third stage, it is instructive to consider a concrete example.

16 HA 13: 20. Goethe’s mathematical analogy here is precise; in mathematics, theorems (*Sätze*) are derived from higher principles, i.e. axioms or postulates.

17 I disagree here with Eckart Förster that the methodological description in “The Experiment as Mediator” has only two stages. See *Die 25 Jahre der Philosophie: Eine systematische Rekonstruktion* (Frankfurt am Main: Klosterman, 2012), 128–129.

18 For an overview of these experiments and how they show the principle of polarity, see Troy Vine, “Newton, Goethe and the Mathematical Style of Thinking: A Critique of Henri Bortoft’s *Taking Appearance Seriously*”, *In Dialogue* 1 (2020): 83–86.

19 HA 13: 368.

20 HA 13: 368.

21 HA 13: 368. The shift from the singular “higher principle” before to the plural here is because Goethe now sees two higher principles expressed in colour phenomena, namely polarity and enhancement.

22 HA 13: 25.

3. The Polarity of Space

To exemplify Goethe’s method we will consider an example that illustrates the paradigm change from Euclidean to projective geometry. Goethe’s *Contributions to Optics* is not a historical account of his own paradigm change, but rather, as Amrine notes, a presentation chosen for its “propaedeutic value”.²³ The example we will consider here, taken from German mathematician Immo Diener’s introduction to projective geometry, is similarly didactic rather than historical in nature.²⁴

3.1 The Empirical Phenomenon

Diener begins his introduction by observing a cube and an octahedron, shown in figure 1.

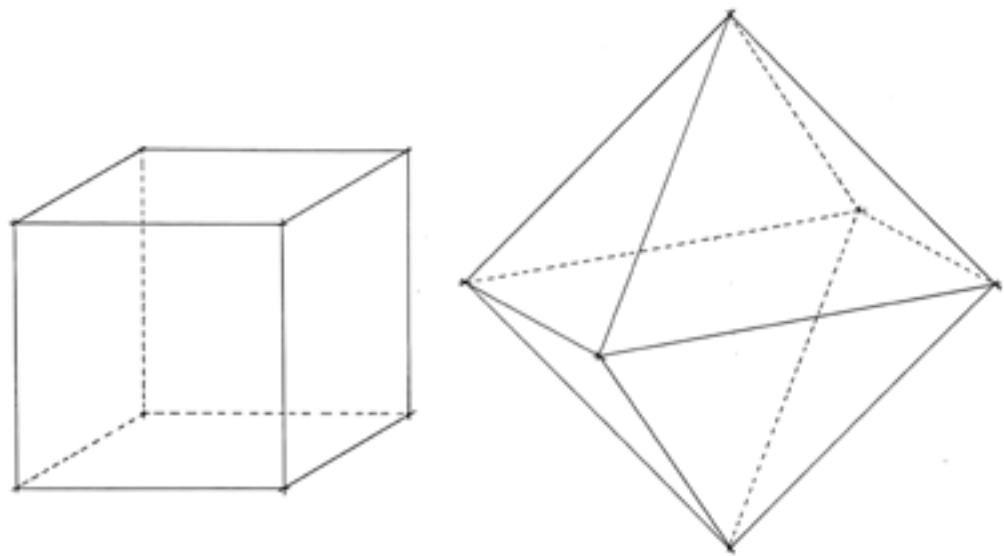


Figure 1. Cube and octahedron.

Goethe describes the first stage as the “manifolding of each experiment”,²⁵ so we begin by collecting observations. Statements about the cube are listed on the left, corresponding statements about the octahedron on the right:²⁶

23 Amrine, “The Metamorphosis of the Scientist”, 42, 44.

24 This section is a summary of Immo Diener’s introduction in *Projektive Geometrie: Denken in Bewegung: Eine Epoche in der 11. Klasse* (Stuttgart: Pädagogische Forschungsstelle, 2017), 11–38.

25 HA 13: 18.

26 Diener, *Projektive Geometrie*, 18.

There are 6 faces, 8 vertices, 12 edges.

Each vertex has 3 edges.

Each face has 4 edges.

Each vertex has 3 faces.

Each face has 4 vertices.

The face with which a given face has no edge in common is the opposite face.

? (Each point has 4 such points.)

There are 8 faces, 6 vertices, 12 edges.

Each vertex has 4 edges.

Each face has 3 edges.

Each vertex has 4 faces.

Each face has 3 vertices.

? (Each face has 4 such faces.)

The vertex with which a given vertex has no edge in common is the opposite vertex.

This list would be greatly expanded in the first stage of investigation, but suffices to illustrate the general point. Characteristic of the first stage is that “no consistent systematic can be seen in the sense that one immediately knows what will be on the other side when one knows what is on one side”.²⁷ Also, as Diener notes, “for some of the observations there is nothing corresponding on the other side”.²⁸

3.2 The Scientific Phenomenon

In the list above we could not see a connection between a statement on one side and the corresponding statement on the other. However, if we compare statements in which the same numbers appear we might notice a connection between statements about faces and statements about vertices.

Based on this correspondence, we could rearrange the right-hand column of our list as follows:²⁹

There are 6 faces, 8 vertices, 12 edges.

Each vertex has 3 edges.

Each face has 4 edges.

Each vertex has 3 faces.

Each face has 4 vertices.

The face with which a given face has no edge in common is the opposite face.

There are 6 vertices, 8 faces, 12 edges.

Each face has 3 edges.

Each vertex has 4 edges.

Each face has 3 vertices.

Each vertex has 4 faces.

The vertex with which a given vertex has no edge in common is the opposite vertex.

27 Diener, *Projektive Geometrie*, 21.

28 Diener, *Projektive Geometrie*, 21.

29 Diener, *Projektive Geometrie*, 22.

When our observations are placed side by side in this manner we can see that a statement on one side can be transformed into a corresponding statement on the other by interchanging the terms “vertex” and “face”. The term “edge”, however, does not change under such a transformation.³⁰ Also, all statements on one side now have a corresponding statement on the other.

We can see that each transformation is the expression of a “theorem” – we have reached the second stage of Goethe’s method. The polarity of point and plane seems a good candidate for what Goethe characterises as “scientific categories that point further upwards”.

We can continue the process of manifolding and add increasingly more complex observations. The edges and faces of the solids can be extended as lines and planes. The further geometrical relationships these extended lines and planes produce can also be included in our observations. For example:³¹

There are 8 planes in space in which lie exactly 3 vertices of the cube.

These 8 planes form the faces of an octahedron, which lies inside the cube.

There are 8 points in space that lie in exactly 3 planes of the octahedron.

These 8 points form the points of a cube, which lies outside the octahedron.

These last two statements, shown in figure 2, reveal an incredible polarity between not only the two solids themselves but the space in which they are embedded – notice how “inside” transforms to “outside” and *vice versa*.

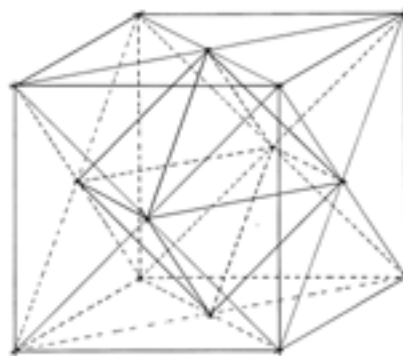


Figure 2. The 8 planes in each of which lie 3 vertices of the cube form the faces of an octahedron. Conversely, the 8 points each of which lie in 3 planes of the octahedron form the vertices of a cube.

30 Mathematicians usually call this symmetry between points, lines and planes – i.e. three elements – a “duality”. I am calling it a “polarity” to distinguish it from the two-dimensional case, which only has points and lines – two elements – that are *stricto sensu* dual.

31 Diener, *Projektive Geometrie*, 26.

After making more observations that correspond in this manner, we might be tempted to conclude that our scientific category has now become the higher principle – i.e. we have reached stage three and our Goethean observation is thus complete. We could express this principle by unifying the two solids into a single solid, shown in figure 3, in which each element of one original solid is uniquely related to an element of the other in a fully polar way. We might then claim that this solid is the archetypal phenomenon.

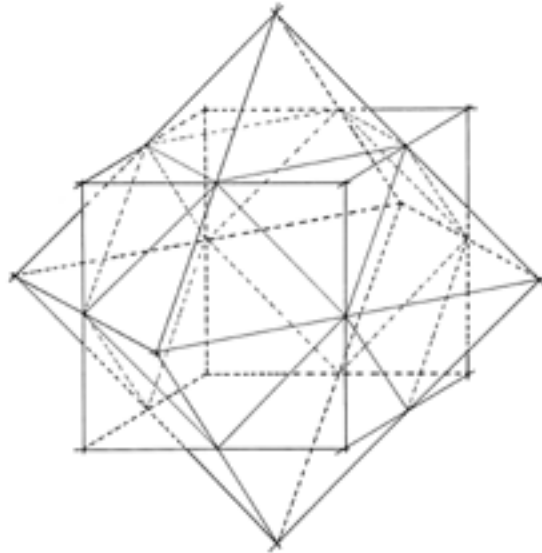


Figure 3. The cube and octahedron unified into a single solid such that each element of one original solid is uniquely related to one element of the other in a fully polar way.

What is instructive about this particular example is that such a conclusion would be premature. If we continue manifolding our observations, we will sooner or later end up with the following:³²

The 12 edges form 3 groups of 4 lines that are parallel to each other.

Not true!

Not true!

The 12 edges form 6 groups of 2 lines that are parallel to each other.

Through the process of manifolding, we have discovered observations that do not appear to express the polarity seen so far; we have found statements that are not true of both solids, because, according to our substitution rules, edges remain edges.

³² Diener, *Projektive Geometrie*, 25.

The concept of parallelism breaks the symmetry between cube and octahedron. We are thus able to reach stage two of Goethe’s method, but unable to progress to stage three. There is an element of our conceptual system – the parallel postulate – that prevents polarity from being a higher principle. At best we could say that there is a partial polarity between the two solids, but it would actually be correct to say that what looked like a polarity turned out not to be a polarity after all.

We have now reached what I consider to be the crux of the transition from stage two to stage three. If we want to see a particular domain – e.g. geometry – as the expression of a higher principle – e.g. polarity – we have to transform our conceptual system, we have to change the paradigm. Diener’s basic idea to bring about this transformation and progress from the second to the third stage is to hold on to the idea of polarity and explore the implications – i.e. see whether what we have discovered so far can be subsumed under “higher rules and laws”.

Diener’s basic idea can be illustrated in the following way. First, we omit the word “parallel” from the problematic statement about the cube:

The 12 edges form 3 groups of 4 edges that...	?
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We then see if we can find a corresponding statement about the octahedron. Considering the planes that pass through four vertices gives us:

The 12 edges form 3 groups of 4 lines that...	The 12 edges form 3 groups of 4 lines that <i>lie in a plane</i> .
---	--

This, in turn, allows us to complete the statement for the cube:

The 12 edges form 3 groups of 4 lines that <i>meet at a point</i> .	The 12 edges form 3 groups of 4 lines that lie in a plane.
---	--

This shows that holding on to the idea of polarity entails a conceptual transformation resulting in parallel lines that pass through a point. But where is this point? Proceeding in the same manner as before, we can extend the statement about the lines of the octahedron on the right-hand side:

The 12 edges form 3 groups of 4 lines that meet at a point *and the 3 points lie on the plane at...*

The 12 edges form 3 groups of 4 lines that lie in a plane *and the 3 planes meet at the point in the centre.*

It remains unclear what the counterpart is to the point at the centre. We have seen above that “inside” transforms to “outside”, so this plane must be outside the solid, but where? Although we might have an idea, we cannot *show* where it is proceeding as we have been.

3.3 The Archetypal Phenomenon

At this stage, Diener introduces movement into the process by taking the image in figure 3 and moving it in our imagination.³³ In what he calls “the great metamorphosis”,³⁴ we view with our mind’s eye the polar movement that occurs when we take the unified solid shown in figure 3 and contract first the octahedron considered as points (first statement, right-hand side) and then the cube considered as planes (second statement, left-hand side).³⁵

The 6 planes expand to a single plane at the periphery.

The 6 points contract to a single point at the centre.

The 6 planes contract to 3 planes that intersect at the point at the centre.

The 6 points expand to 3 points that lie on the plane at the periphery.

These movements thus reveal further features of the polarity of point and plane: the polar movement of the contraction of one solid to a point at the centre is the expansion of the other to the plane at the periphery. Moreover, two points moving towards each other and forming a single point at the centre is polar to two planes moving away from each other and forming a single plane at the periphery. Conversely, two planes moving towards each other and forming a single plane at the centre is polar to two points moving away from each other and forming a single point at the periphery.

The movements of expansion and contraction described above are better thought of as two aspects of a single movement. If we consider the movements of the points of the octahedron, we can see that they actually move in a straight line throughout the whole expansion and contraction. When the

33 For an insightful study of the use of imagination in Goethe’s method, see Dennis Sepper, “The Farbenlehre and Goethe’s Nonromantic Scientific Imagination”, *In Dialogue 2* (2022): 56–71.

34 Diener, *Projektive Geometrie*, 51.

35 Diener’s more detailed account of this movement and two preliminary exercises that I have omitted due to lack of space is in *Projektive Geometrie*, 39–53.

octahedron contracts, opposite points move towards each other, pass each other – momentarily becoming a single point at the centre – and continue in the same direction when the octahedron expands. They then pass each other again – momentarily becoming a single point at the periphery – and continue in the same direction as the octahedron contracts again, which is now towards the centre from the opposite side. The same is true for the planes of the expanding and contracting cube.

We can now see that it is not the unified solid shown in figure 3 but its polar movement that is the archetypal phenomenon of space. It is archetypal because it is not dependent on the cube and octahedron. Indeed, it can be done with any solid and its polar counterpart. The only reason for using the cube and the octahedron is the propaedeutic value.

Having found the archetypal phenomenon of space, we can now apply our understanding to the transformation of the problematic statements about the cube and octahedron in the second stage. As we have seen, the plane that is polar to the point at the centre is at the periphery. Completing our partial transformation for the cube gives the following:

The 12 edges form 3 groups of 4 lines that meet at a point and the 3 points lie on the plane *at the periphery*.

The 12 edges form 3 groups of 4 lines that lie in a plane and the 3 planes meet at the point in the centre.

We can see these three points on the plane at the periphery if we redraw the cube in perspective, shown in figure 4.

We can also transform the problematic statement about the octahedron in a similar manner, giving the statement on the right-hand side:

The 12 edges form 6 groups of 2 lines that lie in a plane and the 6 planes meet at the point in the centre.

The 12 edges form 6 groups of 2 lines that meet at a point and the 6 points lie on the plane *at the periphery*.

The transformed statement about the octahedron on the right-hand side now has a corresponding statement about the cube on the left-hand side that is also true. By transforming the conceptual system, the two seemingly corresponding, problematic statements about the cube and the octahedron have been resolved into two separate statements, each with its own polar statement.

4. Paradigm Change

Using the example in the previous section we can characterise the three stages of Goethe's method as follows:

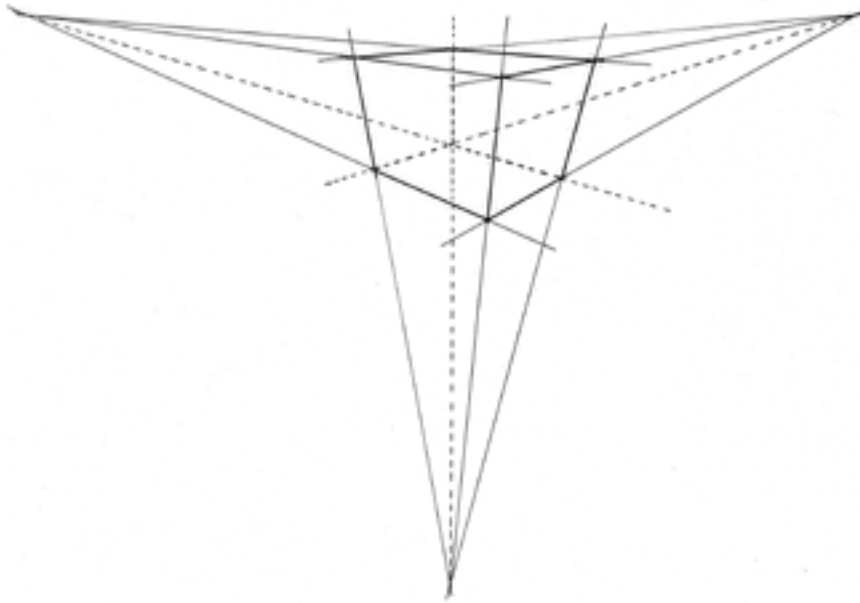


Figure 4. A cube drawn in perspective showing the three points at which the parallel lines meet at the peripheral plane.

- 1) In the first stage we collect observations within a particular domain. We transition to the second stage when we see a lawfulness to our observations, in this case a polarity between point and plane.
- 2) In the second stage we look systematically for instances of this lawfulness. In doing so we also become aware of the paradigm in which we are operating. In particular, at some point we find that the lawfulness we discovered contradicts elements of the current paradigm, here the parallel postulate. This lawfulness is thus not a higher principle in the current paradigm. We have now reached as far as we can go in the current paradigm.
- 3) In order to reach the third stage, we need to hold on to the idea of polarity – and shape a new paradigm around this lawfulness, making it into a higher principle in the new paradigm. An aspect of the old paradigm is rejected and the old paradigm is transformed into the new paradigm. In this example Euclidian geometry is transformed into projective geometry by rejecting the parallel postulate, which then leads to the plane at infinity being included as a geometrical element.

The example of the transition from Euclidean to projective geometry considered here illustrates what happens when we progress from the second to the third stage of Goethe's method: we change the paradigm. This example also shows that this transition is a *transformation* of the old paradigm, not its rejection. Amrine rightly notes that scientific revolution requires a new way of seeing and thereby the metamorphosis of the scientist. But if there is to be growth in science, this revolution also needs to be a metamorphosis of the paradigm.

steiner research

The work of the Field Centre is to undertake research into Ruskin Mill Trust's educational method and its underpinning influences.

Research on the life and works of Rudolf Steiner is central to this.



‘Tvorchestvo’: the creative process

Moving in Colour

Paul Garnault

This article presents three exercises from a set of twelve practices designed to allow the actor to develop their performance senses and build a concept of what acting and theatre could be – in turn laying out a framework for teaching. They are designed to develop what Stanislavski calls ‘tvorchestvo’, the creative process, and to build an empirical knowledge of the origins of acting and performance as a ‘threshold’ to the imagination. It is imperative that theatre stands, as Stanislavski states, at this ‘threshold of the Subconscious’; it operates at the creative threshold to, as Steiner might phrase it, ‘higher worlds’.

Theatre's function has no less of an objective than to change us and our perception of the world at the soul level. Theatre exists at the threshold between conscious and unconscious states of existence. The higher states and lower states of humanity are opened by the soul forces and held open in a collective understanding and thus bring purpose to the 'sacred circle' of the stage, through catharsis and a metanoia of the human being. Here we clearly see the connection between the Indo-European words drama and karma, which reveals one of drama's true functions, to change our karma. Drama is always a collective art that facilitates collective awakening in the social community and in the individual.

All actors work with the fundamental awareness of the duality of acting and the threshold on which they stand: between two worlds, between stage and onlooker, between reality and imagination, between self and other, between Ego and soul. Not all actors will have understood its significance, but it is not necessary that they do. The doing is all.

It is too simple to say 'I put on a character' and it is 'not me', because that simply is not true. It is either an aspect of you, a mask of you, a variation of you, a memory of you, an incarnation of the shamanic 'other higher you' or a reimagination of yourself. What is certain is that all these positions reveal 'you' very publicly and more importantly they reveal yourself to you. The higher states that theatre affords us are a gift. They do not separate us from humanity; they are humanity perfected through our imperfections. Humanity is able to see its highest and lowest states of being and through catharsis change karma. So uniquely theatre can hold both states safely, it can change the will of the karmic action of humanity, and it can do it collectively, celebrating our failings as well as our heroic ventures.

Shakespeare's 'infinite faculty' of imagination, incarnating through the actor and onto the stage, changes the karma of volitional action. This process starts by saying 'What if?', 'Let us play!' 'Let's be!' That is the healthy way forward to deal with these powerful effects of true drama. It is also the most human way to perform. We allow the imagination to 'play' and 'be'. Drama incarnates in collective human imagination and initiates people into the mysteries of humanity and the universe, immersing them in mythic and symbolic theatrical forms of reality.

This 'living nature' of the word is a portal to other states. Steiner describes a mental picture as an intuition or thought related to an individual percept or word, defined as an individualised concept. To understand this 'living nature' of the creative state, we need to remember that the word 'tree' is not a tree. We need to find the essence of tree beyond the word. We need to find the reality behind the original image in order to create original material.

On the threshold of the sacred

There is one main reason for all of these exercises to be undertaken and that is to achieve the state of inspiration, of ‘subconscious intervention’. In Hindu culture it is prajna, or transcendental insight. In native Brythonic culture it is the Awen, the spirit of inspiration. Rudolf Steiner presents exercises for his *Knowledge of Higher Worlds* as part of the creative process. Stanislavski teaches that creative success is to reach the state where the subconscious mind functions without interference or transcends the conscious mind allowing inner inspiration to flow. When we achieve this state of flow we need to be relaxed, we need to have no fear of failure, and we need to transcend our conditioning. We just ‘play’ or let the character flow. This is at the threshold of the inner and outer states as described in the following exercises and workshops.

There is no theatre without the audience’s imagination on which to work. The following exercises are designed to build creative responses, build resilience and openness of heart, all of which leads to these creative states. All these exercises should be taught with correct theatre workshop disciplines in place.

“We achieve inner freedom as well as physical relaxation.” (Stanislavski)

“Thinking lies beyond subject and object.” (Steiner)

Being alone: not acting but being

This exercise is sometime called ‘removing the first mask’. Grotowski talked of the layers of masks that make up a performer. This exercise can be performed without feedback very simply for students, just instructing a student to cross the stage and ask them not to act. This is a first jump into what acting is and is not. However, this exercise is primarily for teachers, advanced practitioners, and directors. It is a good re-set of their approaches to teaching acting. No matter how experienced, all tutors should undertake this from time to time, just to blow the cobwebs away. The tutor must know their students and the exercises must be done with humour, good fun and differentiation.

First establish the space, the ‘stage’: this is a circle of chairs, with a chair or a stool in the middle. The participants sit on the chairs.

Ask a group member to stand and walk to the centre. There they will sit in front of the group. They must walk to the chair in front of the others and imagine they are alone and that no one is watching them. This is extremely hard because the mind is aware of the watchers.

Note that the muscles stiffen, the heart rate goes up, as does the breathing rate. Sweating and shaking may occur in extreme cases. This fight or flight state is good to observe in each person, as it reveals what happens to people



when asked to act or to speak publicly. The effect is very individual and diverse. There is no right or wrong response.

An image to help the student is to ask them to imagine they are alone in their own room. They can *drop* the ‘mask’ and truly show us who they are when alone in their room. They are not to move until they can walk to the chair without ‘acting’. If they feel that they are acting, they should start again. Physically miming removing mask after mask can help, like wiping a smile off one’s face.

They need keep trying to show the group how they are when they are alone. Of course, this is such a difficult, if not impossible exercise *because* we cannot help but ‘act’ in front of others. This is the point of the exercise: to show how much of our day is acting. People will prevaricate, argue, and refuse to do it. They will even claim it is in fact impossible – or worse, that they are not acting, when clearly they are. The group can see the ‘mask’ but the student cannot. All this must be non-judgmental. This is the modern human state.

This is the actor’s duality, the state of inner and outer. Actors will also often not pick an imperative or objective or reason for being there on the chair in the middle, so they will wander on to the stage with no aim, no being. Layer by layer the actor must lower the shields of self to a neutral position. This is



being oneself. The director should be able to talk the actor through this and the group should be able to clearly see the actor struggle in their attempt. The bigger the struggle, the more honest the actor. The struggle or resistance is very important. It clearly shows the forces on the ‘threshold’ between being and the stage. Watching a person divesting themselves of their mask as they struggle not to act is the heart of theatre itself. It is the fundamental state of acting. It is beautiful to behold the human mind in resistance, struggling to express the truth of itself; it is the drama itself.

Now ‘act’ the same scenario. Move to the chair, deliberately over-‘acting’. Have fun with it. This too is very hard as the ‘acting’ is clearly seen by the onlookers.

Next do the same exercise with a clear objective with a strong imperative – ‘I must sit down! The floor is melting!’ – and just do it and *do not act it*. Practising the imperative will strengthen the will and draw the imagination with it. And then as we know the obstacle becomes the drama. This is physical method; it is the opposite of acting and yet it is also true acting. Imagine taking a mask off whenever you feel fake acting. Feel the masks arise, then strip down to the impulse only. Move with and in the breath. The understanding of ‘neutral’, then, is to strip back to the place that precedes action and ends action. It is the place you come home to.

The group should gather at the end and ‘clear’ the day’s work in the designated neutral position. And breath in and out slowly through the nose until breathing five/six breaths a minute. This will clear the body to ask, “Who am I?” The answer, “This is me.”

The seed: incarnating colour

Influenced by Rudolf Steiner

- 1) Place a small seed in your hand. Study this insignificant object, its form and potential. Intensely focus on the seed. Allow impressions to form thoughts, and through these thoughts note any developing feelings. Use your body to explore what it is to be this seed, closed up tight in a ball, and feel the impulse and potential for growth.
- 2) Clearly grasp what you really see with your eyes and feel with your senses. Describe the shape, colour and all other qualities of the seed. Feel what it is to be full of potential, to need to grow. Write down these impulses and thoughts as a list. Allow the mind to dwell upon the following train of thought: ‘Out of the seed, if planted in the soil, a plant of complex structure will grow’. Build up this plant in your imagination.
- 4) Reflect as follows: ‘What I am now picturing to myself in my imagination will later be enticed from the seed by the forces of Earth and light. If I had before me an artificial object which imitated the seed to such a deceptive degree that my eyes could not distinguish it from a real seed, no forces of Earth or light could avail to produce from it a plant.’
- 5) Focus on this thought so that it becomes an inward experience. You will also be able to form the following thought: ‘All that will ultimately grow out of the seed is now secretly enfolded within it as the force of the whole plant. In the artificial imitation of the seed there is no such force present. And yet both appear alike. The real seed, therefore, contains something invisible which is not present in the plastic imitation.’
- 6) It is on this *invisible something* that thought and feeling are to be concentrated, for here is the essence of acting and theatre. The intention is not to investigate the physical nature of the object, but to use it for the development of understanding the will forces. We need to see or intuit the essence of the seed. The will forces drive the body to move; it is the essence of the character we need to play. We can reach this essence from inward will and also from outward performance. Acting is not mimicry, but a playing of the truthful essence.
- 7) Thus we fully realise that this *invisible something* is the objective, the will force will transmute itself later into a visible plant, which will have shape and colour. Your body, full of will force, grows into a plant or rather, in a

theatrical sense, into a character, only if you understand the essence. What is this essence of the seed? We are to play that essence of the seed and therefore attain the character of the plant. Not the outward plant, not the seed, but its very essence.

When we take on a role, we are looking for the essence and then playing that essence. This is what makes great art. The Mona Lisa is not the best representation of a female face we have ever seen but its essence is phenomenal. Therein lies the secret of creativity: seeking the truthful essence.

8) The invisible will become visible. Stress must be laid on the following point: what you think, you must also feel with intensity. As you focus deeply on the essence of something, your full response will seem to intuit a luminosity. It will be felt as a kind of flame. The centre of this flame evokes the same feeling that one has when under the impression say of the colour lilac, and the edges as when under the impression of a bluish tone. This is to see the essence as colour and to assign feelings to that colour. We often say we feel blue, or green with envy, or yellow in fear or seeing red with anger. Playing colour can help move away from one-dimensional emotion. This is the point where we can work with students.

9) What was formerly invisible now becomes visible, for it is created by the power of the thoughts and feelings we have stirred to life within ourselves. The plant itself will not become visible until later, so that the physically invisible now reveals itself as a spiritual truth. These specific colours can then inspire character and movement. If we see the colour around people and in people, we can play with that to create the essence; the youngest child can play with colour.

Colour movement: becoming colour

Allow students to choose a colour for their character. For instance, breaking it down and playing how the colour red moves and feels. The intensity of that observational process must use differentiation and decrement when working with neurodiverse actors. But otherwise, the exercise is simple: to move like a colour, or to move as if you were a colour. It's that simple.

For example: playing red. Red is often associated with danger and fire, but it is also the slowest wavelength. So it is a fire that consumes slowly and grows slowly, becoming more fiery as it spreads. The student can move across the space, warm and slow, consuming all around them.

What is physically red slowly grows and spreads itself. Red is anger but it smoulders. In nature, yellow is often a warning, not red. Red is also warm blood and fresh meat and berry foods. It has a consuming warmth. If we see a character as red, we should move slowly and with warmth, consuming

the space before us; our feeling is almost to seethe. Green in contrast has a meandering wave line moving forward.

If we want more danger in our red, we need to add yellow.

Playing yellow: Yellow shines and radiates, and is quicker and livelier than red. It is like the sunshine. The movement is expansive and quicker than the reds, radiating but also able to poison with its yellow venom. Nature often uses yellow to warn, like a wasp. Yellow sparks quicker emotions of joy and love. Mixing with red, that joy can ignite red into orange. The yellow flame is quicker. It has a straight line with open arms moving forward. Yellow and red blending make orange, passionate and warm.

We can move with all these colours. We can use eurythmy or movement studies to facilitate this. We can allow the students to move and interact with the colours to make emotional connections with colour and temperature and build on the character's true inner will force.

Exploring the character this way allows us to perform the essences of character in a sophisticated and complex way, whilst delivering with great simplicity. It does not involve psychology or personal emotional memory but allows the actor to 'paint' characters and the stage with incarnated performance colour.

Steiner takes the same thought experiment into the human realm with profound results.

The mind temple

Probably the simplest and yet most powerful and far-reaching entry into effective imagination is the following series of exercises, developed over thirty years of teaching acting.

The basic function of this exercise is to reach into the active imagination and bring or incarnate into the material world concepts and objects that arise in the imagination. This quite controversial but highly effective technique has many variants, but actually we all do this every day and are not aware of it.

Younger students are used to doing this in play, but as always you need to know the biography of the students well. It is not hypnosis, or any kind of mind control; it is the opposite – guided play. Students are encouraged to be aware all the time of how the mind is imagining whilst being fully awake. They are being encouraged to play with images. One person, who should be experienced in guided imagination, takes on the role of guide.

To walk across the stage and over the threshold

The guide should talk at a steady pace, not giving the mind a chance to wander or become distracted by the process. The guide should enter the visualisation giving detailed descriptions of the 'flight' sections (this prepares the visual imagination to run fast) but being more obscure and less descriptive and prescriptive in the 'city visualisation' and when meeting the imagined people. If they see anyone in distress a pre-arranged exit strategy should be arranged. A tap on the shoulder means sit up and move to the side. This distress is usually caused by outside influences rather than the visualisation, but just relaxing can trigger some people.

Diaphragmatic breathing (tummy breathing) – focus and concentration. Lying comfortably on the floor, knees raised, hands to the side or on the belly. Focus on diaphragm breathing. The guide leads the students on a body check, listening to the heart, the pulse, the breath, gurgling tummy, then moving the focus to the nearest sound and the room sounds, outside the room and the furthest sounds they can hear. This already has the student in an aware state. Place a hand on the heart and feel the warmth radiating from it. Pass that warmth through the body.

Visualisation

Bring them to an imaginary warm beach. Ask them to imagine that they are lying on white sand in sunlight, relaxed and free of worries and care. (There are variations on this beach visualisation, such as lying in a meadow or by a stream, but I find the beach the best as it has fewer variables; it is also a known therapeutic visualisation.) As the student relaxes, the clear blue water of the sea very slowly rises and very slowly lifts the body off the beach. Above is an endless clear blue sky. Allow the warm water to rise. The student floats slowly up. They are lifted off the beach and into the air.

Turning, they see the beach recede below and beyond the beach a forest. In the distant are blue-hazed mountains. The student is now flying fast over the trees toward the forest. Detail this flight: below are flashes of rivers and small villages and towns. Near the mountains is a city. Detail the city if period is important to your production. This section should let visual images arising in the mind to flow freely.

Floating above the city or landscape, they see the roads and houses below, people walking and rushing. The time period of the city does not matter, but if you are doing a period specific play, focus in on that. Notice the shift in grammar. 'One of the figures walking below takes your interest. You fly lower; they are walking in the crowd, you descend to the pavement and follow them, from behind as you follow, observe what they are wearing, how they move, how they wear their hair.' At this point you can suggest to the student that this

is the character in the play or they can allow the visualisation to run free. If you go with the character, allow the visualisation to change as they see fit.

Ask them to remember what they observe. If they are experienced, later you can again ask them to stand and demonstrate the physical walk and stance they saw. 'Follow the character. The character speeds up, aware you are following; they turn to confront you. Study the face. Look into their eyes. What are they saying to you? Now very quickly step into the person and turn around, look through their eyes, what colour are they, what is the emotion you feel from them?' Do this quickly so that the mind does not have time to reject the absurdity of the idea.

'It's raining; you are now running down the street toward a house, taking keys (see the keys in detail) you open a door and enter. It is their/your home. You enter a room that is theirs but now yours. What do you see? Look around the room.' Question quickly. 'Find a place in the room to sit or lie down, what do you feel? Who are you? Where are you? Take out a notebook and write in it a message. The message is to you. Put it in your pocket. There is a picture in a frame. Remember it. Go to the window and look out.'

'There is an old wooden box on a table. It contains a very important object. It is the most important object of this character. Open the box and take out the object. What is the emotional feeling? Look at it in detail and place it gently in your pocket or a bag if it is too big. Take one last look around the room. What does it feel like? Is it warm or cold?' Make it very detailed: 'look up; look down. Leave the person and face them, they talk to you and walk away. What did they say?'

We then reverse the visualisation, stepping out of the person's life, saying goodbye, walking the city street, lifting into the sky and then zooming across the forest to the sea. Gently landing on the beach, warm water receding, listen to distant sounds, near sounds, your own breath and cup your hand back over the heart and feel the warmth. Now the student is back fully in the room. Sitting up.

The exit from the visualisation is a point of sharing and demonstration, questioning what they saw and felt.

Showing the object they found in the box, reading the message they had in their pocket. Demonstrating how the character looked and walked. It is important to now get students to physicalise what they saw and felt, to walk around the space. Expressing what they felt about the person and what was essential to the person. Was this someone they have ever met? Most often they have not. Asking 'what did you feel meeting this person? What was their essence?'

It is important also to stress how important this ability to imagine is, just how full and detailed it can be and that it is not hypnosis but a natural ability of the mind that we are often unaware of.

As a demonstration of this, ask the student to stand up and to show us their own house with a walk through. Point out where the furniture is, the doors and the windows. We see that we have in us a fully working virtual model of all the spaces we have ever been. Ask the student to change the colour of the walls and floor. See how natural it is to walk in one's imagination.

If students are amazed at their own capacity to imagine and feel, then a great deal of the job of acting is done. They now know they can have access to creativity and can incarnate it into the world. At any given point, months after the exercise, they can return to the object or character and add more detail. The mind is the augmentation. It is after all, according to quantum physics, a participatory universe. These exercises have many variants and uses. The guide's ability to lead the collective imagination is a central skill. As the ability to do this grows, groups can do this standing up, walking on to the stage and creating directly from the imagination into the atmosphere and into the performance.

Theatre un-caged

Doing this exercise in nature produces more powerful focus and inspiration than, say, in a breeze block rehearsal room in London. Stand the characters up and allow them to come alive in the elements and interact with both the atmosphere and others in the circle. This is theatre un-caged, stripped of its paraphernalia, taken out of its container and allowed to be its own sense, to explore in the world of form, shape and intention. The audience too can come on this journey and allow the actors to make the elements and landscapes conscious. There is no stage but the symbiosis of actor and audience.

updates | events | courses

In this section you can read research updates from across the Trust, and find out about upcoming events and courses.

Research Round-up



Presented by Dr Gill Nah

Ruskin Mill Trust provides a wide range of professional development opportunities for staff working in many roles across the Trust. Some professional development experiences could be described as ‘light touch’: for example, *Practical Skills Therapeutic Education* (PSTE) days when staff are invited to engage in practical activities that form the curriculum for Ruskin Mill students. Others are courses that offer a deeper engagement with specific aspects of the student curriculum, for example nutrition, homemaking, biodynamic ecology and practical skills¹. All these courses require participants to demonstrate how they will apply what they have learned on the course to their professional practice. This requirement continues when staff are sponsored to participate in academic courses at Master’s and doctoral degree level. This is where the exploration of PSTE moves into higher academic fora and the Ruskin Mill Trust aspiration for practice enhanced research and research enhanced practice comes into its own.

Professional development courses within higher education (university level), designed for staff employed in professional contexts, are referred to as work-based learning (WBL). Such courses view ‘work-based knowledge as knowledge produced in the context of application’ (Costley & Abukari, 2015, p. 3). They ‘provide practitioners from a range of professional backgrounds with the knowledge and skills ... and respond to emerging workforce needs’ (Stewart et al, 2012, p. 638).

At doctoral level, there are programmes of study designed specifically for staff working in educational contexts who work toward an award of EdD, doctor of education. Currently, there are three doctoral candidates at Ruskin Mill Trust who are moving towards achievement of the EdD award. The Ruskin Mill Trust/University of Huddersfield collaboration, Master’s in Practical Skills Therapeutic Education (PSTE) (and its antecedents), is also designed as

1 For details of all of these course please see the Ruskin Mill 2022–2023 *Practical Skills Therapeutic Education* course brochure.

a professional (work-based) course. Staff at Ruskin Mill Trust who are working towards PhDs are also developing their doctorates from a work-based/role perspective but may be studying with others whose focus is research- or policy-oriented.

At Master's and doctoral degree level, WBL emphasises a learner-centred approach and the ability to reflect on one's practice at an ever-deepening level (Costly & Abukari, 2015; Stewart et al, 2019). Studies on the impact of work-based courses at Master's and doctoral level (Boud & Solomon, 2001; Costley & Abukari, 2015; Stewart et al, 2012; Stewart et al, 2019) identified the following benefits:

For employers:

- 'advancing ... and underpinning practice with critical discourse on existing knowledge' (Stewart et al, 2019, p. 9)
- producing a return on investment as staff remain longer in the organisation
- positively impacting the work of the organisation

For employees:

- developing 'research, evaluation, synthesis and critical thinking' abilities (ibid)
- enabling employees to articulate their professional context and area of practice from the perspective of a practitioner-researcher
- developing personal and professional expertise and confidence (growth)

It was also noted that higher education itself benefits from running WBL courses because they expand 'the frontier of the higher education knowledge base' and apply the benefits of higher education research directly to work-based settings (Lester and Costley, 2010).

In the most recent study by Stewart et al (2019), many challenges for WBL courses were reported. These included the need for different types of teaching and pedagogic approach; the importance of managing sometimes complex participant/professional relationships; the importance of the teacher/participant relationship; the amount of support entailed in participants' need to achieve successful outcomes and the extent of the resources necessary to provide adequate support is frequently the case.

Research on work-based learning such as this will provide a useful comparator for the Ruskin Mill Trust/University of Huddersfield Master's degree once the current group completes in 2025.

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Candidate/Completer	Name Job title	Title of Research Project
EdD candidate Sheffield Hallam University School of Education	Matt Briggs Senior Researcher, Lecturer and Manager in PSTE Hiram Education and Research Team (HEaRT)	Can engaging with crafts help learners with additional needs develop executive functioning? A multi-modal analysis.
EdD candidate University of Sheffield School of Education	Constantin Court Director of PSTE	How can Ruskin Mill Trust ensure coherence of understanding of its educational method (PSTE), which is informed by Rudolf Steiner's educational insights, through all levels of the organisation and what should the training for governors and senior leaders be?
PhD candidate Coventry University Centre for Agro Ecology and Water Resilience	Berni Courts	Can biodynamic ecology create the right conditions for the education, health and wellbeing of individuals and communities?
EdD candidate University of Huddersfield School of Education and Professional Development	Chloe Hindmarsh Higher Education Quality Assurance Lead Hiram Education and Research Team (HEaRT)	(Title under development) Ruskin Mill Centre for Practice, Master of Arts in Practical Skills Therapeutic Education: An exploration.
PhD candidate Kings College, University of London Institute of Psychiatry, Psychology and Neuroscience, based in Neuroimaging Research but currently working primarily in Psychological Medicine	Elaine Holt	Neuroscience of creativity and wellbeing: A new approach to mental health targeting adult hippocampal neurogenesis
PhD candidate Coventry University Centre for Agro Ecology and Water Resilience	Ricardo Pereira Researcher	Community Supported Agriculture and the de-commodification of land: A critical analysis of the Temple Wilton Community Farm concept.

Candidate/Completer	Name Job title	Title of Research Project
PhD candidate Royal Holloway University of London School of Philosophy	Simon Reakes Head of Publishing	What can Goethean science contribute to genius loci studies?
PhD candidate University of Exeter Medical School, Children and Young People's Mental Health Collaboration	Victoria Reakes Training Advisor and Mentor, Ruskin Mill Centre for Practice	Exploring the effect of nature-based practical craft education on children and young people.
Completer Inland Norway University and Ruskin Mill Trust Masters in Special Education: Practical Skills Transformative Learning	Caitlin Bently Weaving Tutor Ruskin Mill College	The experiences of group flow and weaving.
Completer Inland Norway University and Ruskin Mill Trust Masters in Special Education: Practical Skills Transformative Learning	Layla Maclachlan Weaving Tutor Garvald Edinburgh, a day centre providing creative opportunities through craft, land-based work and food production	What, if any, is the transformative potential for adults with learning disabilities of selling their craftwork?
Completer Inland Norway University and Ruskin Mill Trust Masters in Special Education: Practical Skills Transformative Learning	Sarah Spencer Drama Tutor Merlin Theatre Freeman College	Is the master-apprentice relationship reciprocal? If so, what does the master learn from the apprentice through rehearsal and performance? A heuristic inquiry.
Completer Inland Norway University and Ruskin Mill Trust Masters in Special Education: Practical Skills Transformative Learning	Tamzin Titford-Mock Weaving Tutor Glasshouse College	The to-and-fro of play: weaving a heuristic study
Completer Open University MEd (Inclusive Education)	Mark Higgins Head of Quality (qualifications and PSTE assessment)	A qualitative exploration of the opportunities and possibilities of inclusive practice in a practical curriculum

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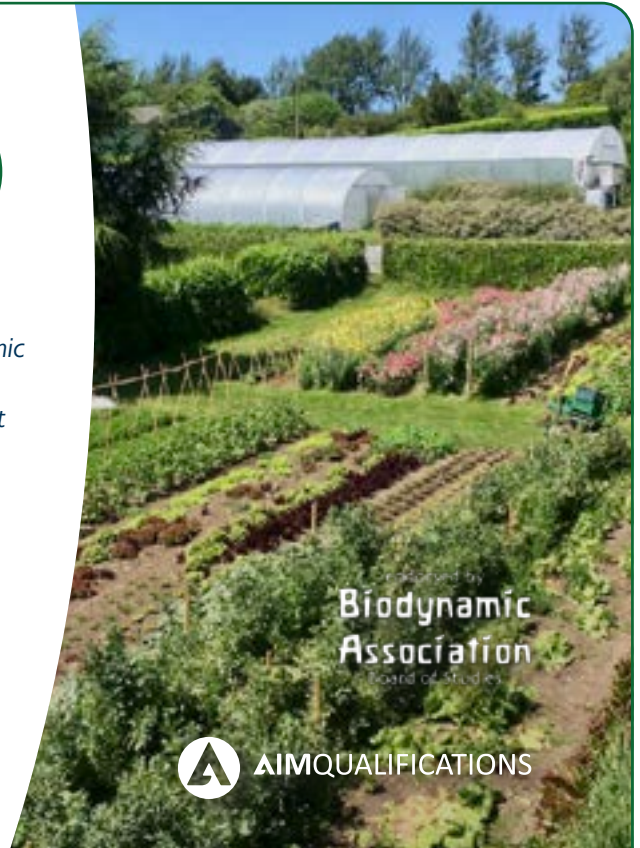
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Nora Löbe
Matthias Rang
and Troy Vine

Foreword by
Arthur Zajonc

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