

CORRESPONDENCE

OF THE NATURAL SCIENCE SECTION OF THE ANTHROPOSOPHICAL SOCIETY IN AMERICA

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BRIDGING NATURAL SCIENCE AND SPIRITUAL SCIENCE

Public Lectures and Conference

with Dr. Peter Heusser

Of Witten/Herdecke University, Germany

Author of *Anthroposophy and Science*

November 7 – 11, 2018

Threefold Educational Center,
Chestnut Ridge, NY.

visit www.naturalsciencesection.org

- Is there a place for the spirit in physics and chemistry? – On the importance of epistemology for modern science.
- Is there a chemical or genetic explanation for life? – A closer look on causality and agency in modern biology
- Does the brain cause consciousness? – A way out of neurobiology's current doctrine.
- From natural science to spiritual science. – Rudolf Steiner's contribution to the evolution of science.

Editor's Note

In this issue we again feature the upcoming “Bridging Natural Science and Spiritual Science” conference in Spring Valley in November with Prof. Dr. Peter Heusser of Witten/Herdecke University, Germany. From the Science Group in Great Britain, we received permission to reprint a review by Michael Evans of Prof. Heusser’s book, *Anthroposophy and Science*. John Barnes provides an essay on Prof. Heusser’s treatment of Rudolf Steiner’s epistemology and its importance for human freedom. Human freedom is also the concern of Nicanor

Perlas’s book, *Humanity’s Last Stand*, reviewed here by Andrew Linnell. Further Notes and Commentary relate to the conference theme, as well.

We also offer a report on the first Geology Group conference back in 2015. We will be catching up, issue by issue, with reports from their subsequent annual meetings.

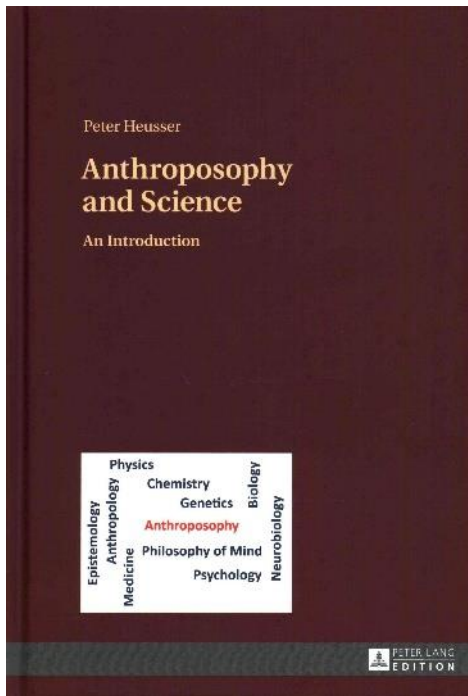
We give a picture of the course work offered by the Natural Science Section at the Goetheanum, the Maths Group in the UK, and The Nature Institute sends word of their next year-long, low-residency foundation course in Goethean Science. The Michael Wilson book, *What is Colour?* is now in stock, and we run again the announcement of Wolfgang Schad’s *Understanding Mammals*, available in January from Adonis Press. You can order now!

The *Correspondence* welcomes pilot research reports, comments on current scientific research and news, book and article reviews, letters from readers, reports on meetings and workshops, and announcements. There will be editorial review. **For submissions**, click [here](#).

We look forward to hearing from you. Please send **feedback** [here](#).

And please consider our fundraising appeal on page 10.

Barry Lia, Ph.D.
Correspondence Editor



2018 Conference Update

BRIDGING NATURAL SCIENCE AND SPIRITUAL SCIENCE

As you may have read in our last issue, a revolution is afoot *within* Science itself, seeking to break through boundaries laid down centuries ago.

We have invited Prof. Peter Heusser of Witten/Herdecke University, Germany, author of *Anthroposophy and Science*, to give public lectures (titles on the front page) and work with us on the epistemological foundation of Anthroposophy as empirical spiritual science.

We believe you will find that this approach, bridging matter and spirit, surmounts those very boundaries orthodox science had imposed upon itself and offers

a complementary extension of what and how we know.

Our conference in Spring Valley, NY next month is inspired Prof. Heusser’s recently translated book. You can read in our last issue about the significance of this work and its potential audience.

The conference will feature four lectures by Prof. Heusser each evening, setting the next day’s theme. These lectures will be open to the public.

We also want you to know that you need not be a member of the Section to register for the conference itself. You need not even be a ‘scientist’! It is

important today, not only to be scientifically literate to some degree, as our whole culture faces rapid developments in science and technology, but it is also vital for us to be conversant in the philosophical/scientific foundation of Anthroposophy—to know not only that there *is* a scientific basis for a monistic science of spirit/matter but to know *what* that basis is. We feel this conference is important for anyone in the Society or anyone interested in anthroposophy.

There will, however, be early sessions each morning for members of the School for Spiritual Science only. These will be open to Class members not attending the conference, but it should be known that they will not be formal Class Lessons, but rather creative work with those present based upon the Lessons. Blue cards will be required.

The conference itself begins with dinner in the Threefold Café on Wednesday evening *before* the public lecture. We have found that taking meals together affords conversation time and fosters camaraderie. (We'll miss out on cooking and washing up together this time, however.)

Each morning we will begin with breakfast in the Café. Then we rise for a session of eurythmy with Dorothea Mier! Dorothea is former Artistic Director of Spring Valley Eurythmy. Inspired by Prof. Heusser's book, she wants to contribute to our work. We are honored and grateful that our work with Prof. Heusser will be furthered through daily eurythmy with Dorothea.

Then following a break (with refreshments), we will gather for a short recap of the previous evening's

lecture, and Prof. Heusser will field questions and lead discussion until lunch time. Some of our questions may come from viewers of the live-stream during the previous evening's public lecture.

After lunch, we will have sessions of experiential exercises and activities focused on the theme of the previous evening's lecture. Please bring clothing for the outdoors as well.

After another break (and more refreshments), we have designated an "open work space." At previous meetings, people reported appreciating free time for walking conversation and reflection on the conference activities. During this open work space time we may also schedule presentations offered by participants. This time also affords us the opportunity to set up impromptu discussion groups, perhaps in a conversation café style, on special topics in response to the day's activities.

Then we break for dinner in the Café in preparation for the next evening's public lecture.

On the Sunday morning, there will be no eurythmy session. We will recap the conference, and then have a short Section Business meeting.

We hope many attendees will be able afterwards to carry back to their local communities the message Prof. Heusser brings.

For those of you who cannot attend, we will arrange a live-stream and archive of Dr. Heusser's public lectures. We encourage you, however, to make every effort to bring your presence and contribute to the conference.

Information on registration and video service fees and details will be posted [here](#).

Call for Participation: Possible presenters may send a one-page description related to the book to JAndrewLinnell [at] yahoo dot com. We are looking especially for experiential exercises (15-30 minutes) to enliven each day's themes of physics-chemistry, biology, and neurobiology-psychology. Acceptance notifications sent by November 2018.

Planning: John Barnes, Judith Erb, Jennifer Greene, Barry Lia, Andrew Linnell, Gopi Vijaya.

Proceeds from the public lectures will benefit Threefold Educational Center.
Tickets at the door. (Included for conference attendees.)

We thank the Threefold Café and the Threefold Educational Center for a discount on our meals.

BRIDGING NATURAL SCIENCE AND SPIRITUAL SCIENCE

Public Lectures

(fundraiser for Threefold Auditorium)

and Public Conference

with Prof. Peter Heusser

Author of *Anthroposophy and Science*

Is there a place for the spirit in physics and chemistry? –

On the importance of epistemology for natural science

Is there a chemical or genetic explanation of life? –

A closer look on causality and agency in modern biology

Does the brain cause consciousness? –

A way out of neurobiology's current doctrine

From natural science to spiritual science. –

Rudolf Steiner's contribution to the evolution of science

Eurythmy sessions with Dorothea Mier

November 7 – 11, 2018

Threefold Educational Center,

Chestnut Ridge, NY.

4 Lectures: \$15 each/\$45 series (at the door)

Students & Seniors: \$10 each/\$30 series

visit www.naturalsciencesection.org/

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Read more in our latest newsletter, *Correspondence*.
www.naturalsciencesection.org/correspondence

SCHEDULE

Beginning Wednesday Nov. 7 with Public Lecture

Closing Sunday Nov. 11 at noon

First Class meeting (Class Members) 7:30

Breakfast together 8:30

Eurythmy with Dorothea Mier 9:30

Break 10:30

Recap of previous evening's lecture 11:00

Lunch together 12:30

Experiential exercises on lecture's theme 1:30

Break 3:00

Open work space for the day's theme 3:30

Dinner together 5:30

Public Lecture Threefold Auditorium 7:30

Peter Heusser and the Importance of Epistemology

by John Barnes

It was at a conference in Portland on Dick van Romunde's book *About Formative Forces in the Plant World*. After about 10 hours of drawing leaves of all kinds there came a moment when everyone stopped, mouth open, and the room filled with the realization of what Goethe meant by the archetypal plant. It was a palpable "Aha!" moment! The history of science is full of anecdotes describing such moments. To fully appreciate their significance, however, we need to gain an understanding of the cognitive process that leads to such moments of heightened insight.

The science that investigates how we know what we know is called epistemology or theory of knowledge. It is the foundation upon which all specialized sciences rest. Whether we are aware of it or not, our worldview, indeed the trajectory of our entire civilization—how we raise our children, heal our sick, grow our food—is based on the conclusions reached by this seemingly arcane science of knowing. It is therefore no wonder that already as a high school

student, and especially in his early 20s while editing Goethe's scientific works, Rudolf Steiner wrestled hard with the fundamental questions of how we arrive at our knowledge of the world, whether we are actually capable of insight into reality, and what the nature of that reality is.

Thus Peter Heusser rightly begins his book *Anthroposophy and Science* with a chapter on epistemology. Following Steiner, he takes an empirical scientific approach in his investigations of the cognitive process. A thorough empirical analysis of this process shows that all knowledge is gained through the confluence of two fundamentally different sources: One comes to us either from outside through our senses as perceptions of the outer world or as inner experience: as feelings, moods, dreams, etc. All such experience—outer and inner—is simply given to us. The other source comes to us through our own thinking activity—an activity that brings concepts that illuminate our percepts. Without thus conceptualizing our experience, we simply do

not understand what we are experiencing. Examples of such pure experience are listening to a language we do not understand and hearing a cascade of sound, or waking up slowly in the morning and seeing patches of color, darkness, and light; then, after a moment of puzzlement, realizing that we are looking at objects in a familiar room.

Modern science is based on a critical epistemology that claims to be empirical, yet, strangely, denies the validity of our human experience. The following example illustrates its line of thought: Inquiring into the propagation and perception of sound, it investigates the ear, the auditory nerves, and related brain activity, as well as sound waves in the air and in the vibrating body that seems to be emitting the sound. It concludes that sound itself exists only in our consciousness, for that seems to be the only place where it exists. Sound is therefore thought to be subjective and to have significance only for the hearer. This conclusion, however, is based on the naïve assumption of the objective existence of all the processes involved in the propagation of sound. However, an investigation of how we know the vibrations in the air, for example, will have to conclude that, as we experience them, they, too, exist only in our consciousness. The *conclusion* of this critical analysis (that our human experience is subjective) undermines its *foundations* (the naïve assumption of the objectivity of our perceptions).

Modern science nevertheless naïvely awards objectivity to the purely physical aspects of the world that can be measured, weighed, counted, and detected by scientific instruments while critically rejecting the validity of its qualitative aspects. By severely limiting objective reality to its quantifiable attributes, this unjustified epistemological premise of modern science has finally led to the theoretical reduction of all human experience to entities such as molecules and atomic particles whose behavior can be explained through quantum mechanics, of which physicist Richard Feynman famously said, “I think I can safely say that nobody understands quantum mechanics.” In other words, we have a severely limited, instrumental scientific worldview that achieves spectacular technological results but is incapable of real insight into the world that we ourselves experience.

In his early philosophical works Rudolf Steiner rejected the critical analysis and subsequent elimination of human experience described above and insisted that initially *all* our perceptual

experience is simply given and must be acknowledged as a valid source of human cognition. In doing so, he not only restored the validity of the rich world of sensory and soul-spiritual perception, but also restored thinking to its full potential as an organ of insight. He recognized that, without our thinking activity, the world as we perceive it remains a meaningless maze and that thinking actually constitutes reality as we know it. It comes as a surprise to our naïve sense of reality, but it is our focused thinking, guiding our organs of vision, that grasps the spatial aspect of the world: that recognizes things as solid objects, sees stairs as 3-dimensional risers and treads, and recognizes smaller objects as more distant. Thus, far from simply mirroring the external world, thinking actually inwardly re-creates it. Beyond establishing the structure of the external world, thinking penetrates to its inner lawfulness, its essential nature, which we grasp as idea. Even more jolting to our habitual materialistic mindset is the realization that, *in its essence*, what we are accustomed to experiencing as the physical world is actually *spiritual* in nature. Again: thinking is not merely a mirror of the external world but is capable of seeing through it to its ideal spiritual reality. This realization underscores the full depth of what Steiner wrote in his introductions to Goethe’s scientific works in connection with the “Aha!” moments mentioned above: “Beholding the idea in external reality is the true communion of the human being.”

This broad-brushstroke description of epistemology is elaborated in far greater detail in the first chapter of Heusser’s book. In subsequent chapters, he explores the paradigm-changing implications of Steiner’s epistemology for the physical, biological, neural, psychological, and spiritual sciences. With compelling clarity he shows how, when understood in the light of Steiner’s epistemology, all of these disciplines constitute a comprehensive, multi-faceted, fully integrated whole based on a spiritual understanding of the world. This is an extraordinary accomplishment.

When asked which of his books would have the most enduring significance, Steiner said it was *The Philosophy of Spiritual Activity*. He clearly believed that this book, in which he laid out his epistemology and its implications for human freedom, had a greater transformative potential than his later books on spiritual science. Peter Heusser’s *Anthroposophy and Science* renews this potential for our present time. It cannot be recommended highly enough.

Review of *Anthroposophy and Science* by Peter Heuser

[Reprinted from the March 2018 Newsletter of the *Science and Mathematics Group of the Anthroposophical Society in Great Britain*, by permission of the editor, Prof. Judyth Sassoon.]

Anthroposophy and Science is a remarkable state-of-the-art milestone in exploring the relationship of natural science with spiritual science as originally represented by Rudolf Steiner (1861-1925). The book reflects the author's a high standard of scholarship and reviews the latest concepts in physics, chemistry, biology, genetics, medicine, neurobiology, psychology, philosophy of mind or cognitive science, anthropology and epistemology, all in their relationship to anthroposophy. To write an up to date overview of one of these fields is a significant task, but to provide a comprehensive overview of them all is a magnificent achievement of a very high order.

The reductionist materialistic world view not only characterises conventional natural science, but our current whole world culture and understanding. To penetrate this thinking and really explore alternatives I found exciting and even disturbing! I became aware of how deep this reductionist science sits in my own consciousness, in spite of 50 years study of anthroposophy.

The fundamental realisation expressed in Steiner's Philosophy of Freedom, is that world reality meets us through the combination of sense perception and thought. A modern philosopher Nagel points to the realisation that the world is intelligible and includes human beings with intelligence. (*Nagel, T. 2012 Mind and Cosmos. Why the Materialist Neo-Darwinian Conception of Nature is Almost Certainly False.* Oxford University Press, Oxford.) So intelligence has a double part in existence. The realisation that the universe is lawful and potentially understandable is implicit in ordinary science. So thought and the laws of nature are part of the natural world. Thought itself is not a physical object. Steiner equates thought, intelligence and spirit. In which case we can say that spirit is the foundation of the material world and every layer of existence including the phenomena of life, sentient beings (animals) as well as human beings who think about the world.

As the starting point of knowledge (epistemology) is thought and perception, theories of sensory physiology or neuroscience have no primary role in epistemology, as they are themselves the products of thinking and sense perception. Neither can atomic theory be assumed to be a primary reality, (based on non-perceptible atoms) which often used in science as a basis for rejecting the prime reality of perception.

A fundamental and recurring theme of the book is the way Peter Heuser considers the various levels of complexity in the world. He points out that with higher levels of complexity new characteristics and lawfulness emerge which would not be predictable from the most complete knowledge of the characteristics of the constituent parts. Indeed many of the characteristics of the parts disappear or are "sublated" in the more complex structure. The simplest physical and chemical example is water H₂O a combination of hydrogen and oxygen. Detailed knowledge of hydrogen and oxygen he says would never lead to a prediction of the characteristics of water and the laws of hydrodynamics. So the qualities of water cannot be reduced to the qualities of its component parts in spite of the fact that without hydrogen and oxygen water could not exist.

At a more complex level proteins in living organisms although composed of a series of amino acids, have characteristics which cannot be extrapolated from knowledge of the amino acids and their sequence. For example their tertiary structure which is critical to their functioning as enzymes cannot be predicted from the amino acids and their sequence alone. So on the one hand, new properties emerge – the concept of *emergence* and on the other the properties of the components to a significant degree submerge or are *sublated* in the qualities of the new structure and its functioning.

Historically a Swiss Physician Troxler 1780-1866 (Beethoven's physician) observed that behind the sense perceptible phenomena of life was a real but not directly perceptible something, behind feelings a real not directly perceptible soul (Seele) and behind human self-conscious thought a real not directly perceptible spirit (Geist). He attempted to sketch out a medical anthropology that would understand development, physiological functions and pathological processes as not simply physical interactions but as the expression of a harmonious or disharmonious interaction of material-physical, bodily-living, soul and spiritual forces in an organ or organ system. He went on to predict that in future a new sense was needed to develop, for the reality that stands behind life phenomena and the development of cognition of soul and spirit. He called such cognition anthroposophy as distinct from anthropology. A name with Steiner would subsequently use for his perceptions and researches. Troxler gave an opening address at the opening of the

University of Bern where he became the first professor of philosophy. Biographically, I found it interesting that Peter Heusser shared one of the first chairs in Integrative Medicine with responsibility for the subject of Anthroposophic Medicine at this same University of Berne.

The work is referenced as expected of an academic publication and points to advances in natural science that

make sense of many of Steiner's puzzling statements as well as the many way anthroposophy can holistically contextualise and make sense of the findings of natural science. It also provides a rational and philosophical framework that can integrate conventional and complementary approaches to medicine.

Michael Evans

Notes and Commentary

Note:

In regard to Michael Evans' review above, it may be noted that Prof. Heusser relates in Chapter 6 that in the history of European science, Immanuel Hermann Fichte (1796-1879) was also compelled, as was Troxler, by the limits of the scientifically-based "anthropology" of his day to speak of a further "anthroposophy." I.H. Fichte was the son of the Johann Gottlieb Fichte, to whom Steiner often referred and whose philosophy was the subject of Steiner's doctoral dissertation. It is fascinating to read of Troxler and I.H. Fichte as expressions, over a century ago, of "a revolution afoot *within* science itself" already seeking to break down orthodox science's boundaries, such as we have spoken of above in relation to our own time. It may also be noted that Steiner has a footnote about Robert Zimmermann's book, *Anthroposophy* (1881) in the opening chapter of *Riddles of the Soul*, "Where Natural Science and Spiritual Science Meet." –Barry Lia

Note:

In his introduction, Heusser states: "Using an epistemological basis following Goethe and Steiner, I shall first develop a scientific concept of substance which enables the matter in physics, chemistry and biochemistry to be thought of in such a way that it is not at odds with the spiritual but in a certain respect already contains it." [p.21.5¹] This is conveyed later, saying: "So spirit exists *in* matter, as its lawful essence, but also *outside* manifest matter, in a realm beyond space and time. In its essence the cosmos is spiritual: it only adopts a sense-perceptible form when it becomes manifest." [author's *italics*; p.80.6] After substantial exposition and examples in physics and chemistry, he writes: "An important consequence of this holistic view of substance is the *updating of the Aristotelian concept of substance*: substance, *true* substance, is not simply the world of subatomic particles, "subsensible" force elements which can be inferred experimentally from their effects on what can be observed by the senses and in contrast to which the world of sensory phenomena is a mere illusion." [author's *italics*; p.91.5] He also then argues that "It is clear that this holistic or Aristotelian view of substance which arises from ontological empirical idealism also entails a *review of the concept of causality*, in other words, an updating of the Aristotelian understanding of causality." [author's *italics*; p.92.6] These are some vital touchstones. –Barry Lia

Note:

Continuing the neo-Aristotelian theme, Heusser states: "According to Steiner's epistemological view, the reality of a thing therefore lies not only in what we perceive of it, but also in the law which constitutes the phenomenon. The reality is the totality, the unity of the phenomenon and law. *The law is part of the reality*. In fact it is its *important, essential* part." [author's *italics*; p.56.3] Then of both epistemology and ontology, he writes: "Steiner's view of knowledge and the concept of reality which arises from this provide the epistemological basis of a modern *objective, ontological idealism* which is also known in the history of philosophy and science as "*idea or law realism*" or *universal realism*..." [author's *italics*; p.56.4] Note that this is both an idealism *and* a realism; it is not a dualism. I am reminded of a small book by Hugh Barr Nisbet, *Goethe and the Scientific Tradition*. Nisbet characterizes Goethe's approach to science as *at once both* idealistic [as say a Leibniz] and empirical [as say a Newton]. Later Heusser remarks that "A *purely spiritual* form of laws and ideas is rejected by nominalism, does

¹ The decimal after the page number means the following: 1 is at top, 9 is at bottom, 5 in the middle, etc.

not correspond to habitual ways of thinking and is therefore difficult for many scientists to accept.” [author’s *italics*; p.79.3] –Barry Lia

Note:

I first encountered the concepts of epistemology and ontology in my biodynamic training with the late Dr. Andrew Lorand.² For his doctoral dissertation in Agricultural and Extension Education, Andrew had drawn from Egon Gupta’s paradigmatic model for inquiry, in order to compare biodynamic, organic, traditional and industrial agriculture. These three paradigmatic concerns are illustrated in an Outstanding Research Presentation paper, based upon his dissertation, published in 1997³: 1. The beliefs about the nature of reality with regard to agriculture (ontological beliefs). 2. The beliefs about the nature of the relationship between practitioners and agriculture (epistemological beliefs). 3. The beliefs about how the biodynamic practitioner should go about working with agriculture (methodological beliefs). As this treatment of biodynamic agriculture is somewhat analogous to Heusser’s campaign for integrative medicine, I include this knowledge map from the paper.

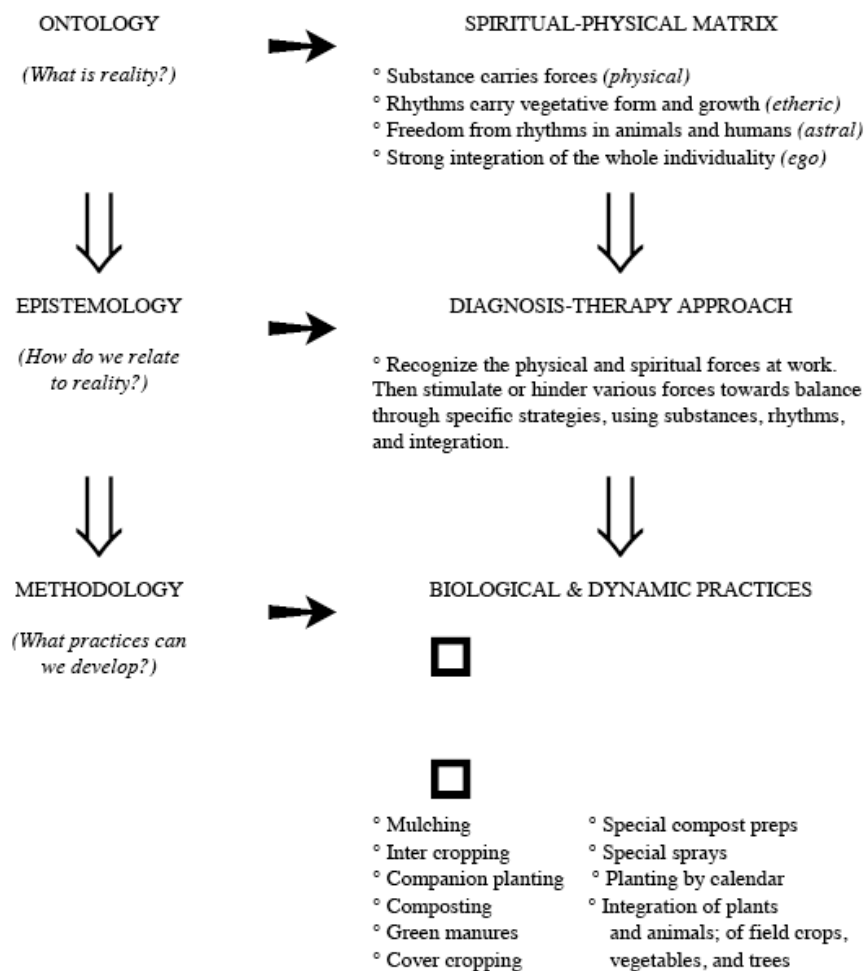


Figure 1. Knowledge Map of the Paradigm of Biodynamic Agriculture

Another concept that sticks with me from my training with Andrew was a notion of “the separation of technique and morality” in modern science and technology. As I remember, he told of how the craftsmen of the old guilds had to uphold strict moral codes. With the advent of the objective, value-free pursuit of science, there arose a strict separation of technique and morality. Your methodological practice, and moral stance, will reflect your ontological and epistemological beliefs. –Barry Lia

² His work can be found at <https://drlorand.wordpress.com/>

³ Lorand, Etling, and Yoder (1997) *Journal of International Agricultural and Extension Education* 4:57-66.

Book Review:

Humanity's Last Stand

Written by Nicanor Perlas

Reviewed by Andrew Linnell

Perhaps the chapter that most describes the purpose of this book is Chapter 16 entitled *The Second and More Spiritual Scientific Revolution*. Here the author, Nicanor Perlas, describes how the various fields of science have all reached their materialistic boundaries. If Anthroposophy can shine a light on the bridge over these boundaries to Spiritual Science, then the way over the bridge will be found. This bridge is the true image of what constitutes the human being.

Knowledge of the fullness of the human must come soon and with it also an inner drive to become fully human. Nicanor gives as little as 12 to 20 years for this bridge to be crossed. If not crossed, then what is coming will be catastrophic for human evolution. Nicanor uses the term “extinction” on a number of occasions. But if humanity can meet this challenge, then AI can “confer tremendous benefits to society.” Clearly, Nicanor’s intention was to light this fire for a new scientific revolution.

Nicanor speaks of five attributes of the current situation:

1. Radical discoveries have been made that have moved mainstream science towards the spiritual. He gives many examples coming from Quantum physics, Astrophysics, Neuroscience, Epigenetic Biology, Near Death Experiences, the Global Consciousness Project, and the science of meditation.
2. This new scientific revolution reinforces what Anthroposophy brought a hundred years ago.
3. What Spiritual Science can reveal has not stood still and recent scientific discoveries advance this science of the spirit.
4. Crossing this bridge will allow science to adequately respond to the challenges and temptations coming from technology and especially Artificial Intelligence.
5. When science crosses this bridge, it will do so with its enormous infrastructure and stature so that such challenges and temptations can effectively be met.

Starting from the Preface and carried throughout his book, Nicanor stresses that there is little time left for the arrival of spiritual science into the mainstream of human evolution. To support this, Nicanor cites many scientists, entrepreneurs, and politicians who express the urgent need for ethics, safety, morality, and control by society on this burgeoning technology. For example, Elon Musk remarked, “with AI we are summoning the demon.” Stephen Hawking feared that humanity will be “the architect of its own destruction if it creates a super intelligence with a will of its own.” Expressions from Bill Gates, Thomas Dietterich, Jack Ma, and Stuart Russell help to show that one need not be a spiritual scientist to foresee dire potential. The beacons of Gondor have been lit, will the Rohan respond?

The book examines the existential threat from AI’s potential. To make this clear, Nicanor describes how AI can affect:

- Human interaction with the economy
- Use of video merging and animation to create fake news or postings that promote lies or egotistical or group-egotistical goals
- Use of AI and data gathering to influence popular opinion and elections (or even to alter the vote counts during the election itself)
- The cameras of smart cities can already track down and assist the arrest of a wanted person – this can also be used to stop protests by the unemployed or the unsatisfied
- Use of AI facial recognition and drones to assassinate undesirable individuals
- Use of AI for patient screening, exams, and diagnosis at medical clinics, even for surgery
- Use of AI in legal clinics replacing para-legalists
- Digital teachers within cyber classrooms teaching from a standard, approved curriculum
- Further techno-addictions deployed for monetary gains
- The higher experience of music and art if these are given over to AI-generation

Technology has the funding to advance very quickly. Its historical pace was a doubling in speed for the same cost every 18 months. By some measures, what was an exponential growth rate has become hyper-exponential. Artificial intelligence is expected by many experts to progress for its simple forms today to General Intelligence (AGI) and then to Super Intelligence (ASI) within as little as 25 years!

Much of Nicanor's book is directed at possible places from where the counter-balance to AI and AGI and ASI may arise. He expects the daughter movements of Anthroposophy to each play a major role. And he expects that the "second generation" of the daughters (new banking/monetary, threefolding, environmental, green-political, ELIANT, and MysTech) will also play a critical counter-balancing role. Nicanor points to the development of a collective human intelligence (CHI) as an important counter-balance to where AI would otherwise carry humanity.

Nicanor believes the "culmination" that Steiner spoke about that was to occur for the Anthroposophical Society at the end of the Twentieth Century was a failure. But he calls on us not to be despondent over that. He tells us that we can and should learn from our failures and forge ahead with the Spiritual Scientific response to this Challenge from AI. It is not an avoidance or defeat of AI; rather, it is a surging of spiritual science to properly counter-balance it. Complacency and seeking comfort by Michaelites would ensure that this will be Humanity's Last Stand.

The 232-page book was published by Temple Lodge. Nicanor is a global activist, writer and speaker who addresses UN agencies. In the homeland of the Philippines, Nicanor sits on a number of government panels including the Senate Task Force on Artificial Intelligence. He has received numerous awards for his tireless work for humanity.

Section Fundraising

Please consider making a financial contribution in support of our mission to bring a discerning and unique perspective on developments in science and technology into today's culture.

Your donation of *any amount* will help us better serve the Society.

To donate, click [here](#).

Or mail check payable to "Natural Science Section" care of our Treasurer:
Barry Lia, 9314 40th Ave NE, Seattle WA 98115-3715

Thank you kindly for your consideration.

The *Correspondence* will keep you posted on our longer-range plans as well. We are considering, among other things, 1) a reformulation, together with the Goetheanum Section, of the long-running *Elemente der Naturwissenschaft* into an English-language journal of Goethean/Anthroposophical science reaching an international audience and 2) conferences, working groups, and other outcomes on the theme of evolution and development in response to Adonis Press's publication of Wolfgang Schad's *Understanding Mammals: Threefoldness and Diversity*. (Please see book announcement on page 20.)

For a copy of our Case for Support, contact Jennifer Greene: jgreene at waterresearch dot org.

We want to acknowledge a special donation in memory of Jerry Haslett. Jerry was a professor of physics at the University of Illinois-Chicago. Many will remember Jerry's wise council on email lists. He kept a bibliography of everything by Steiner in English. Jennifer Greene remembers him always asking "What's new with you?", fully expecting you'd have a new thought or task or discovery.

Geology Group

Editor's note: The steering committee welcomes members to step forward to organize specialty groups. Geologist Jonathan Swan was instrumental in the formation of the Geology Group back in 2015, bringing the impulse to meet in various regions of the continent in order to study the local geology. They can share this living geology with local farmers and educators. Watch for announcements.

With this issue of the Correspondence we begin to catch up with reports of their meetings, starting with the group's inaugural conference in 2015 in Nova Scotia with Duncan Keppie, one of the most influential geologists of our time.⁴

THE DELICATE BALANCE OF GAIA

Conference/Workshop Report

6-10th August, 2015

Oakdene Centre, Bear River, Nova Scotia

Duncan and Maggie Keppie, Jennifer Greene, and Jonathan Swan

This unique conference brought water and rocks together as subjects of Goethean observation of the processes common to water and the earth as a step towards a deepening understanding of the “Living Water and Earth of Gaia”.

The stage was set by presentation of a beautiful puppet production of Goethe's *The Fairy Tale of the Green Snake and the Beautiful Lily* by a group of South Shore Waldorf



parents under the direction of Monika Wildemann.

Goethe regarded the Fairy Tale as his way of presenting his most profound observations of nature in the transformation of the soul. The Fairy Tale is set in a landscape divided by a river that depicts the boundary between two lands: the land of our normal ‘daytime’ consciousness and the land of the super-sensible, which is not accessible to our normal sense perception. By the end of the Fairy Tale, there is a permanent bridge spanning this river, joining these two Lands together. In this context, we “read the

water and rocks” using experiments and excursions around Bear River. Workshop themes centered around the ring vortex and archetypes of form.

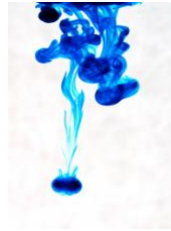
Successive days followed a rhythmic pattern of welcoming the day with water- and earth-related songs led by Maggie Keppie, followed by a morning field trip, an afternoon experiment, a shared dinner on the banks of Bear River, an evening lecture, ending with a dance depicting the water/earth movements with Maggie and a Scottish slow air on the piano accordion played by Duncan Keppie. These activities were supplemented by molding clay from a sphere to a ring, an exercise that Rudolf Steiner used in embryology, and drawing vortex patterns on paper. Our last day together involved a walk to view the patterns in the river and in the rocks along its banks, followed by a meal in the park and concluding offerings.

Following the workshop, some of us visited Blue Beach to see the Carboniferous sedimentary rocks deposited by estuarine currents, rain drop imprints, and fossil plants and animals. On the return trip Jennifer and Jonathan stopped at Joggins Fossil Cliffs, a UNESCO site, in order to see the fossil trees.

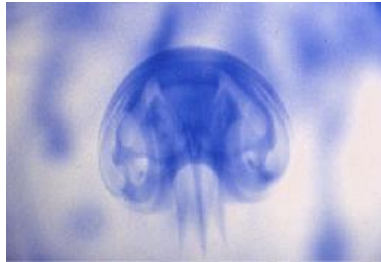
⁴ gsa.confex.com/gsa/2012CD/finalprogram/abstract_201221.htm

Experiments

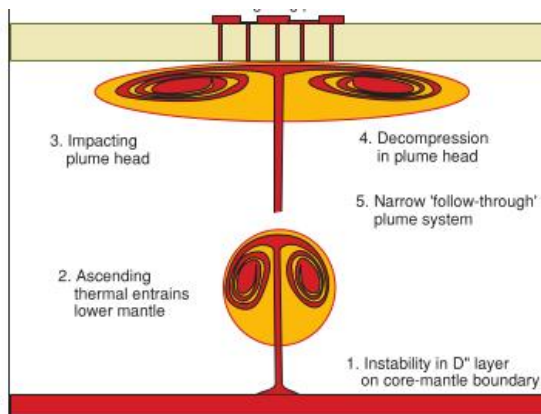
The first water experiment, “The Drop and Drop-Fall”, showed how, out of the unity of a single drop of water, the drop metamorphosed as it hit the water surface. Surface waves radiated out from the center to be reflected off the glass walls back to the center – the analogy was drawn with tsunami waves and led to an awareness of the rapidity of the movement and their speed. Beneath the surface, a spectra of vortices around the descending colored ring vortex were observed. The phenomena of this event gave us a way of discovering the “art of placing a series of questions to Nature,” such that a step by step detail of water’s intrinsic nature could be seen.



The second water experiment involved small scale fluid dynamics in the formation of a “rising ring vortex”. Once again, we could see what happens when water meets a surface within or at the water-air interface. So “surfaces” as boundaries, as opposed to layers, create a place of generative activity.



These ring vortices can be compared to mantle plumes within the earth and to rising granite intrusions.



(after J. Tarney lecture)

The third water experiment created a “train of vortices” by drawing a small rod through a viscous solution on which lycopodium powder is sprinkled.



(Water Research Institute)

The vortices alternate on either side of the trace of the rod and may be comparable to mushroom-shaped fold interference patterns in rocks.

The fourth water experiment we worked with a “water trickle” that showed the vortices produced in the inner bends of the river.



The trickle experiment gave insights into the deposition of sedimentary rocks from river systems.

Field Trips



Mushroom vortices below the Annapolis Tidal Power dam

The first field trip visited the Annapolis Tidal Power Plant where the enormous power of the water flows through restricted channels, which ran the turbines. The surface flow patterns of the rising water included ring vortices, and despite the enormous pressures generated, they were cohesive in form. The comparison was subsequently made between man-made flow and flow forms generated out of water itself.

The second field trip took us to the Triassic and Jurassic rocks, 225 – 190 million years old, formed in a desert similar to the present-day Afar region. These rocks were formed in a rift valley (Bay of Fundy) during breakup of the supercontinent, Pangea. The rift was invaded by plateau basalt lavas erupted above a mantle plume, produced by a ring vortex, located off Florida. The presence of quartz, feldspar and mica was observed in the Triassic sedimentary rocks, whereas pyroxene and feldspar were seen in the basalts.



Black plateau basalts overlying Desert red beds.

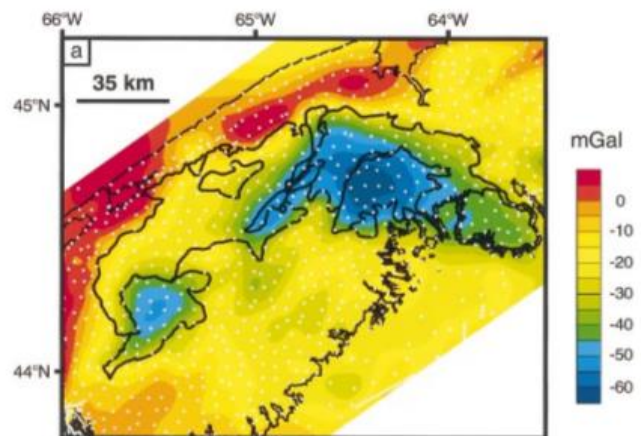


Cooling columns and oxidation rings in basalt.

The third field trip was along the southern margin of the Annapolis Basin where ca. 500 million-year-old, folded greywackes and slates intruded by basalt sill were to be seen. Again quartz, feldspar and mica were encountered in the greywackes, whereas

amphibole and feldspar occur in the basalt. The field trip ended at an outcrop of granite and porphyry containing quartz, feldspar and mica.

Discussion ensued about whether “granite” is an archetype, and how it relates to the sedimentary rocks observed on previous field trips. Goethe’s definition of an archetype includes both something, variants of which are common to all rocks AND which appeared first - “food for further thoughts”.



Gravity map of SW Nova Scotia: blue = low gravity & represents stems of two mushroom shapes, a remnant of ring vortices

For the final field trip, we walked onto the Bear River bridge to observe the currents, vortices, wave patterns, and interweaving wave movements as the tide changed from high to low tide. A short further walk took us to conglomerate deposited on a 440 million-year-old shoreline.

Lectures

(1) Goethean Scientific Methods

by Jonathan Swan

Jonathan began with some anecdotes that shed light on the reverence with which Goethe approached

Science and Nature. One of the moments described from Goethe's life, was when he was seven years old making an offering to God using a magnifying glass to catch the first rays of the morning to ignite incense on an altar of natural objects. A key event in Goethe's life occurred in his 19th year when he fell deathly ill and had to return home to Frankfurt Germany. At that time, Goethe came very close to a Rosicrucian Stream and underwent a lofty and remarkable initiation from an unnamed personality. This initiation flashed forth in his soul in the poem "The Mysteries" and in his "Fairy tale of the Green Snake and the Lily" (Reported by Dankmar Bosse's and Rudolf Steiner's research into Goethe's initiation). On an excursion in the Harz Mountains to examine a granite contact, his friend Von Trebra urged Goethe to be careful not to break his neck as he rushed over large, slippery boulders to "arrive at the great honor" of beholding the outcrop. Through repeated observation Goethe arrived at his ideas on the Metamorphosis of Granite.

To set the stage for the Gaia workshop, the remainder of the lecture focused on a discussion of Goethe's Scientific Method, which is illustrated in the following quotes by Goethe:

"I had to continue on in my old way, which required me to observe natural phenomena in a certain sequence of development through which I become aware of transitions as I accompany them backwards and forwards. Then through this I arrive totally alone to a living overview out of which a concept forms and in an ascending line I thus encounter the Idea." (Goethe Leopoldina Ausgabe, "Die Schriften zur Naturwissenschaft").

"If I look at the created object, enquire into its creation, and follow this process back as far as I can, I will find a series of steps. Since these are not actually seen together before me, I must visualize them in my memory so that they form a certain ideal whole. At first I will tend to think in terms of steps, but nature leaves no gaps, and thus, in the end, I will have to see this progression of uninterrupted activity as a whole. I can do so by dissolving the particular without destroying the impression [....]. If we imagine the outcome of these attempts, we will see that empirical observation finally ceases, inner beholding of what develops begins, and, at last, the idea can be brought to expression" (Goethe. "Studies for a Physiology of Plants").

The lecture ended with a reading of Goethe's poem "The Song of the Spirits over the Waters" (1779).

(2) The Intrinsic Nature of Water

by Jennifer Greene

The Gaia workshop explored the intrinsic qualities of water, as best as our inner capacities could bring forth. Jennifer indicated that in order to study water, to come to know it on its own terms, one needs to become more fully human, to awaken inner capacities that are not unlike the very nature of water itself: to become inwardly mobile, open, flexible, selfless and true to purpose, to task. To work in this way is to develop exact observation skills of something that is not static, but rather, is evermoving, everchanging. Our starting point was that water has "a story to tell" about its nature, which is exhibited through the phenomena it shows and how it behaves. In the Goethean sense of "reading the Book of Nature", our task was to discover, through careful and exact observation and a systematic series of enquiries, the qualities in water's intrinsic nature that deem it as an "element for life". The principles of water's intrinsic nature include form, rhythm and movement as gestures. Jennifer illustrated her talk with a number of movie clips showing the drop, the drop fall, the train of vortices, and metamorphosis in the rising ring vortex. When water moves it generates organic movement forms that are integrated, flexible, and organized. Water teaches us to be flexible, to be open, to be inclusive and share, to serve all who come into our midst, selflessly, to keep moving, and to remain in the cycle. Understanding the intrinsic nature of water allows us to change the social paradigm from considering water as a commodity towards a service orientation to secure a future for "good" water.

"We look a long time before we can see...the question is not what we look at, but how you look and what you see" (Henry David Thoreau).

(3) The Body, Soul and Spirit of the Earth & Archetypes in Geology

by Duncan Keppie

Duncan started by asking the audience if the Earth was alive: most affirmed that it is alive. This raises another question as to how it is alive: as defined by Lovelock (1979) "...a complex entity involving the Earth's biosphere, atmosphere, oceans, and soil; the totality constituting a feedback or cybernetic system which seeks an optimal physical and chemical environment for life on this planet;" or the whole earth? This question was answered by examining up-to-date scientific knowledge in the light of spiritual science and showing that the whole

earth is a living being consisting of a body, soul and spirit corresponding to lithosphere, asthenosphere and core. A route into spiritual science was illustrated by thinking in 2D, 3D and 4D, where the fourth dimension involves time.

Duncan then moved on to the topic of archetypes in geology starting with Goethe's definition of an archetype or archetypal phenomenon as both: (1) a hidden relationship between parts that explains how one form can transform (metamorphose) into another form whilst being part of an underlying archetypal form, AND (2) first or primal appearance, i.e. sequences of forms moving through time are the field marks of an archetype. The field trips demonstrated that silicates such as quartz, feldspar, mica, pyroxene and amphibole and variants thereof are common to most rocks and appear in a complete range of ages of rocks. Vortices and ring vortices as processes in geology were illustrated, suggesting that they are archetypal processes.

(4) Effects of Fracking on Earth, Water and Man

by Duncan Keppie

Duncan illustrated this topic using the Windsor-Kennetcook Basin in Nova Scotia as a reference example showing that: (i) the size of the gas resource was grossly over-estimated due to the complex of many faults and fractures in the rocks that may have allowed the hydrocarbons to escape over the past 350 million years—over-estimating the resource is a tactic used to solicit financing for exploration and drilling; (ii) the presence of faults and fractures provides channel ways for contamination of ground and surface water, especially when fracking sets off small earthquakes resulting in opening up the faults and fractures; (iii) an exponential increase in small earthquakes has been documented in places subjected to fracking and re-injection of fracking fluids, e.g. Oklahoma; (iv) 60% of hydrocarbon wells are shown to leak after 15-29 years; (v) shale gas exploration is coincident with the best soils in Nova Scotia; (vi) hydrocarbon reserves will be exhausted by the end of the century; (vii) by 2100 temperatures are forecast to increase above those record over the last 7 million years, and carbon dioxide levels will show a tenfold increase since 1900 causing extinctions and food supply disruptions.

The Council of Canadian Academies has produced a comprehensive report on the effects of fracking: *The Report on the Environmental Effects of Shale Gas Extraction in Canada*, a peer-reviewed

paper located at:

www.scienceadvice.ca/uploads/.../shale%20gas/shale_gas_fullreporten.pdf

The Quebec provincial government has banned fracking based on an extensive report on the shale gas resource in Quebec:

<http://www.bape.gouv.qc.ca/sections/rapports/publications/bape307.pdf>

What sort of world do we want to leave our grandchildren? Other sources of clean, renewable energy need to be investigated, such as deep geothermal energy and artificial photosynthesis.



This Gaia workshop provided many lines of enquiry for further research: (i) is a ring vortex an archetypal process in water, rocks and many other places? and (ii) What is an archetype in geology? These topics will be pursued in ongoing research.

There were twelve participants at the Gaia workshop, together with 4 leaders and seven puppeteers. The evening lectures were attended by several local people. We are grateful to Shirley and Klaus Langpohl for providing accommodation in their cottage for the leaders and several other participants, and their help in facilitating local logistics. We thank Marcella Edwards for taking photographs at the workshop. Several Bear River residents also helped in publicity and logistics. We are grateful for such local support. The Gaia workshop was sponsored by the Anthroposophical Society in Canada, the Nova Scotia Group of the Anthroposophical Society in Canada, and the Natural Science Section of North America. For their foresight we offer our deep gratitude. It is hoped that this conference will be the first of others as we seek to understand the delicate balance of Gaia.

From the Goetheanum Section

Editors Note: In the last issue we announced the Evolving Science 2018 conference in Dornach and the experienceCOLOUR exhibition in Stourbridge, UK—both under the auspices of the Natural Science Section at the Goetheanum.

You will notice in their current activities below that the “Part-time Course in Natural Sciences” series is integrated into the Goetheanum Studies program, as are contributions from other research Sections of the School for Spiritual Science at the Goetheanum.

www.forschungsinstitut.ch/en/conferences-colloquia/conferences-events/

3 - 7 October 2018 Autumn Conference

Evolving Science 2018

More information can be found [here](#).

15 - 21 October 2018 Excursion to Weimar

What is Goetheanism?

With Wolfgang Schad and João Felipe Toni.

Flyer for download [here](#). (German only)

26 October - 27 October 2018 Part-time course in natural sciences

Elements of color in nature observation and experiment

with Laura Liska and Matthias Rang

In cooperation with the [Goetheanum Studium](#).

Flyer [here](#). (German only)

9 - 10 November 2018 14th meeting of the working group on Technology & Spiritual Science

In cooperation with the [Mathematics-Astronomy Section](#) and the [Paul Schatz Stiftung, Basel](#)

Details [hier](#). (German only)

7 - 8 December 2018 Part-time course in natural sciences

Metamorphoses of the plant. Goethe's philosophy of the living and modern biology

mit Ruth Richter und Renatus Derbidge

In cooperation with the [Goetheanum Studium](#).

Flyer [here](#). (German only)

15 - 16 February 2019 Part-time course in natural sciences

From the phenomenon of electricity to the understanding of modern technology - in search of a responsible approach

with Matthias Rang and Johannes Kühl

In cooperation with the [Goetheanum Studium](#).

Flyer [here](#). (German only)

15 - 16 March 2019 Part-time course in natural sciences

Medicinal plant knowledge: flowers, soul gestures and landscape experiences

In cooperation with the [Goetheanum Studium](#).

Flyer [here](#). (German only)

16 March, 13 April, 18 May, 22 June, 17 August, 12 October 2019 Impulse of the Beehive

Practice and background to a proper beekeeping with Martin Dettli, Johannes Wirz, Hugo Löffel and Sibylle Probst

Program to be published soon. (German only)

3 - 4 May 2019 Part-time course in natural sciences

Flower morphology and the organic architecture of the Goetheanum

In cooperation with the [Goetheanum Studium](#).

Flyer [here](#). (German only)

31 May - 1 June 2019 Part-time course in natural sciences

On bee life and bee mortality. The animal in man and the unleashed animal in society

mit Johannes Wirz und Renatus Derbidge

In cooperation with the [Goetheanum Studium](#).

Flyer [here](#). (German only)

5 - 17 August 2019 International Summer University

This is a provisional date (subject to change).

For further inquiries contact our office.

From the Maths and Science Group of the AS in GB

Editors Note: In this issue we have with permission reprinted a review of Prof. Heusser's book which appeared in the Newsletter of the Maths and Science Group of the Anthroposophical Society in Great Britain. As for the announcements from the Goetheanum Section above, we will make an effort to keep readers abreast of activities beyond North America.

Their biannual Newsletter can be found [here](#).

This below comes from the Maths Group.

Workshop:- **Introduction to Projective Geometry**

With Oliver Conradt, Paul Courtney, Simon Charter.

February 19th to 22nd 2019

Location: Wynstones school Gloucester UK

We will introduce this geometry of imagination with simple drawing exercises designed to give both an appreciation of this activity for education. as well as a good grounding for taking it further either in teaching or in one's own researches.

Further details to follow soon

Coordinated by Simon Charter

Seminar :- **Universal forces in mechanics**

With Charles Gunn PhD

February 22 til 1 pm February 24, 2019

Location: Wynstones school near Gloucester UK

This seminar will explore the polarity of kinematics and dynamics in physics and its relation to the polarity of thinking and willing in the human being. George Adams' research from the 1950s, grounded in projective geometry, will provide the framework for our exploration. There will be lectures, text study, eurythmy, and time for social interaction. Some familiarity with projective geometry will be assumed

Description: Kinematics and dynamics stand in a polar relationship to one another in physics that is an "outer" partner of the "inner" polarity of thinking and willing in the human being. Inspired by the emphatic statements of Rudolf Steiner regarding the importance of the former for a renewal of physics, George Adams made fundamental researches in the 1950's devoted to this theme that we want to "warm up" during this seminar. On the one hand, the seminar will include several lectures to introduce the mathematics of geometric mechanics as presented in his essay "Universal forces in mechanics" (with roots in projective geometry); on the other hand, there will be text study focused more on the inner aspect. In between there will be time for individual contributions related to the theme. Conversation and morning eurythmy round out the program.

A more detailed invitation will be sent out soon

Later in the fall, we plan to distribute study materials to help prospective participants prepare for the seminar. In this way I intend to work against a phenomenon that can afflict weekend seminars: by the time people begin to warm up to the subject, it's time to leave. That would be a shame, especially considering how timely/relevant and mathematically beautiful the subject matter is.

Charles Gunn, Ph. D. (Scientific organizer) cgunn3@gmail.com

Falkensee, Germany

Simon Charter (practicalities) simon.charter@live.co.uk

Announcements

From
The Nature Institute
natureinstitute.org



Dear friends,

We're happy to announce that in June 2019 we'll start our next year-long, low-residency foundation course in Goethean science called *Encountering Nature and the Nature of Things*.

The course will begin with a two-week residential intensive from June 24 - July 6, 2019, followed by long-distance study and mentoring throughout the year, and culminating with another two-week intensive in the summer of 2020. The course is intended for people who are deeply interested in nature and serious about developing an understanding and practice of the science of phenomena, an approach that is contextual, qualitative, and holistic.

As many of you might know, we began our first foundation course this past July with 22 participants. Reflecting on the first two-week intensive, a science teacher wrote: *"This course opened a door for me on how to see the world. I was wondering how I lived these years without noticing so many amazing phenomena. This course also refreshed me and inspired me for my teaching."*



You can find out more about the course on our [website](http://natureinstitute.org). Apply by February 15, 2019.

Please do pass along this information to anyone who you think might be interested.

Thanks so much!

Seth Jordan
Program Coordinator

From



Melding Morality and Technology Collaboratively

MysTech is dedicated to the difficult destiny humanity has with our technology. We seek to understand our relationship with it, both moral and immoral through a new scientific approach based on Goethean observation and spiritual insight. The future of humanity will involve an intertwining with technology that prompted Rudolf Steiner over 100 years ago to strongly state that this would be an issue occupying us for the rest of our earthly evolution. What shall be our path forward from here. And how will we make our way along that path? This is what MysTech aims to answer.

The name MysTech combines the words Mystery and Technology with the Tao symbol at its center. In the lectures cycles of the *Temple Legend*, Rudolf Steiner says this about the Tao: *“In the future, machines will be driven ... by spiritual force, by spiritual morality. This power is symbolized by the Tao sign.”* What is this spiritual force, this spiritual morality? This also is what MysTech aims to answer.

Computer technology has developed over the last century from punch cards to massive mainframes to a tiny watch size device on your wrist that can access all of the information from all the worlds libraries combined and do it almost instantly.

Pop culture through movies has been warning us of impending doom from the threat of Artificial Intelligence (AI). Software applications are tailored for human weaknesses resulting in addiction. Revenue and profit have driven the sale of personal, private data – what’s next? Nearly weekly, new research reveals changes in the soul life, especially of our youth, resulting from heavy screen-time use.

Yet no one can deny its remarkable advantages, some of which are lifesaving. How can we participate in what comes to help steer the soul so that the moral can operate in the machine? How can we find the right counter-balances so that technology does not pull humanity into the abyss. MysTech wants to answer these questions as well.

Please join us through all or part of what we offer:

- **MysTech Membership:** Membership helps build up funding for research and development as well as supports the ongoing efforts of maintaining our activities which include a Journal, Website and a full-time school curriculum into the matter of moral technology for the future. To become a member, go to: [MysTech Membership](#)
- **MysTech Journal:** is published twice a year to support research. To purchase the latest MysTech Journal or a Subscription, go to: [MysTech Journal](#)
- **MysTech School/Study Groups:** a syllabus is available for ongoing, online Zoom study group where participants converse and see each other for an hour weekly. Periodically, ‘graduates’ comprise an advanced study group. To join a study group, please email: jandrewlinnell@yahoo.com.

See also the following for more information:

- MysTech operates the website <https://mystech.co> as a repository for research and lecture slides.
- Coming soon will be <https://mystech.org> which will be the public and membership facing website.
- MysTech volunteers administer the Facebook group [Anthroposophy and Mechanical Occultism](#)

MysTech is a not-for-profit 501c3 organization under the Center for Anthroposophical Endeavors (CFAE) located near Seattle, Washington. PO Box 338, Mountlake Terrace, WA 98043 – [cfae\[at\]outlook.com](mailto:cfae[at]outlook.com)
CFAE supports MysTech and Rudolf Steiner Bookstore, which is handling the sale of the Wilson book below, and is building a new endeavor called Local Commons, built on a Threefolding foundation.

Book Announcements

What is Colour? The Collected Works

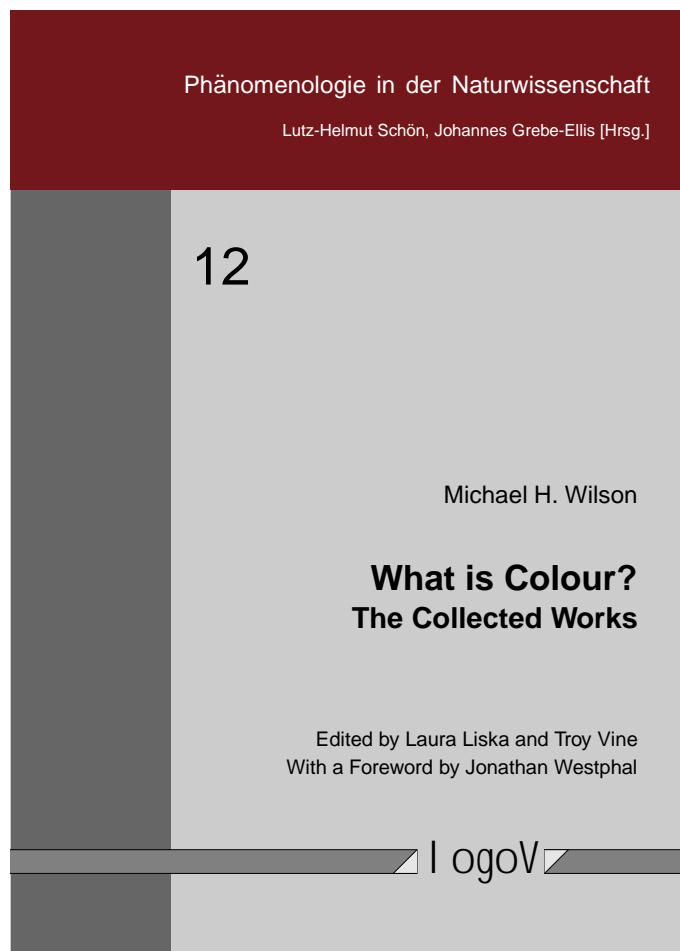
Michael H. Wilson

Edited by Laura Liska & Troy Vine

Foreword by Prof. Jonathan Westphal

[Michael Henry Wilson](#) was a man of many interests and talents who felt the main theme of his life was in the understanding of light and colour. He expanded Goethe's theory of colour with his own experiments in coloured surface reflection, coloured shadows and after-images. Wilson did not merely repeat what Goethe did, but found in Goethe's methods a sound scientific way to study colour phenomena. He brought Goethe's work into contemporary themes, using it to address the theory of colour vision put forward by Edwin Land, and leading him to develop a Goethean approach to several complex questions in optics and colour theory.

Michael H. Wilson published a monograph in 1949 entitled 'What is Colour? A Goethean Approach to a Fundamental Problem'. Throughout his life Wilson pursued this question from multiple perspectives. The results of his investigations published in leading scientific and Anthroposophical journals are brought together in this new book with 27 articles written by Wilson and a biographical Epilogue by Ralph Brocklebank, a co-author of many of the early articles, along with his monograph for the first time in one volume. The book is 344 pages long.



The Section at the Goetheanum and the Center for Anthroposophical Endeavors have made available a limited number of copies at a pre-order discount of 10% (\$51.30).

Now in stock. Order [here](#), using coupon code: colour

[Ed. While you are there, check out the wonderful selection of children's wooden toys through the [Bookstore](#).]

Understanding Mammals: Threefoldness and Diversity

(The new, revised 2-volume edition of *Man and Mammals*)

by Wolfgang Schad

[Adonis Press](#), available January 2019

2-volume set, 6.5 x 9.25 inches, 1313 pages

\$125



Within the approximately 5,400 species of mammals there is a baffling diversity: from the Etruscan shrew, barely an inch long, to the 100-foot-long, over 200-ton blue whale. And yet all mammals, including the human being, share a common organizational structure: They all have a sensory and nervous system centered in the head, through which they perceive their surroundings and process their perceptions, and they have a metabolic-limb system, through which they take in and digest nourishment and move through their environment. And mediating between these two systems, which are polar opposite in nature, all mammals have a rhythmic respiratory and circulatory system.

In *Understanding Mammals*, Wolfgang Schad shows how the multiplicity of shapes, sizes, and coloration, of behaviors, preferred habitat, and embryonic development among the mammals can be understood as a manifestation of how this dynamic threefold structure plays itself out: whether the nerve-sense system predominates as in the shrew, the metabolism as in the blue whale, or the rhythmic system as in the leopard for example.

Overall, readers will come away with a new perspective on the expression of form and pattern in the world of mammals and how human beings play a central role in illuminating relationships among all the diverse forms.

Stay tuned for announcements of conferences, working groups, and other outcomes as a result of this landmark work.

Calendar of Events

2018

October 3-7: *Evolving Science 2018* (Goetheanum; Dornach, Switzerland)

<http://www.forschungsinstitut.ch/en/conferences-colloquia/evolving-science-2018/topics/>

October 5-7: Annual Conference and Meeting of the Anthroposophical Society in America; *Here and Now: Transforming Ourselves, Transforming the World* (New Orleans, LA)

<http://www.anthroposophy.org/neworleans>

November 7-11: *Bridging Natural Science and Spiritual Science* (Threefold Educational Center; Chestnut Ridge, NY)

<https://www.naturalsciencesection.org/2018-annual-conference-bridging-natural-science-and-spiritual-science/>

November 14-18: *Transforming the Heart of Agriculture*: Biodynamic Association Conference (Portland, OR)

<https://www.biodynamics.com/conference>

2019

April 27-May 4: *IPMT 2019* - International Postgraduate Medical Training (Chestnut Ridge, NY)

<https://paam.wildapricot.org/International-Post-Graduate-Medical-Training/>



Natural Science Section

www.forschungsinstitut.ch/en/

Mathematics-Astronomy Section

mas.goetheanum.org/en/mas/

School for Spiritual Science

Anthroposophical Society in America

www.naturalsciencesection.org

anthroposophy.org

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