

# CORRESPONDENCE

## OF THE NATURAL SCIENCE SECTION OF THE ANTHROPOSOPHICAL SOCIETY IN AMERICA

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### **Steering Committee Of the Natural Science/ Mathematics-Astronomy Section**

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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](http://www.naturalsciencesection.org)

*Dr. Heusser's Public Lecture titles:*

- 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

**Only this inaugural issue** of *Correspondence of the Natural Science Section of the Anthroposophical Society in America* **will be distributed to all Society members.** The Section and allied initiatives are grateful the Society can afford us the opportunity to reach you all, in order to introduce you to our newsletter and our work as an emerging activity of the Society. Future issues will be posted on our [website](#). You can also subscribe to monthly email delivery in PDF form by registering on our website. Sign up [here](#).

Why would you want to subscribe and stay in touch with our activities?

In our culture today, we are all fish swimming in a sea of science and technology, and no matter our particular anthroposophical endeavor—be it education, biodynamics, social science, or the arts—we are impacted. Yet at the same time, most of us might confess to a lack of science literacy, if not outright disinterest or even hostility. We hope to help remedy that.

Science and technology give us great comforts, but on the other hand they severely affect everything from our climate to our moral lives. In actuality, the human-centered, Goethean/anthroposophical science we foster may be of most value in its effect first of all upon one's moral compass.

To take up an analogy Rudolf Steiner often used, the direction in which the compass needle points is not inherent to the needle itself, but to the context of the earth's magnetic field. We all need to be able to read the bearings of our moral compass in the context of today's scientifically-oriented world—which, for far too many, is eclipsing the natural world.<sup>1</sup>

The *Correspondence* is to serve members of the Natural Science/Mathematics-Astronomy Section of the School for Spiritual Science **as well as other colleagues** in the interest of cultivating Goethean, participatory, and anthroposophical approaches for the evolution of science. We also aim to offer a broader range of readers a discerning and unique perspective on developments in science and technology in today's culture.

The *Correspondence* is intended not so much as an official newsletter of the Section, but rather as true working correspondence—hosted by the Section—among a wider range of colleagues to proffer ideas and share news. This larger, inaugural issue is weighted toward conference announcements and meeting reports, but we anticipate an active, multi-authored Notes and Commentary section in future (please see editor's preview on page 22).

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 and peer-review. **For submissions**, click [here](#).

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

*And please consider our fundraising appeal on page 21.*

Barry Lia, Ph.D.  
*Correspondence* Editor

## About our Masthead Photo



Photo credit: Tom Walsh | Bangor Daily News (ME)

The background photo for our masthead was taken off the coast of Steuben, Maine by Bangor Daily News photographer, Tom Walsh. Jennifer Greene of the Water Research Institute of Blue Hill, Maine was floored when she saw this photo on the front page one day of a train of vortices in this cloud bank. If you know Jennifer, you know she immediately went to obtain permission for our use. We thank the Bangor Daily News.

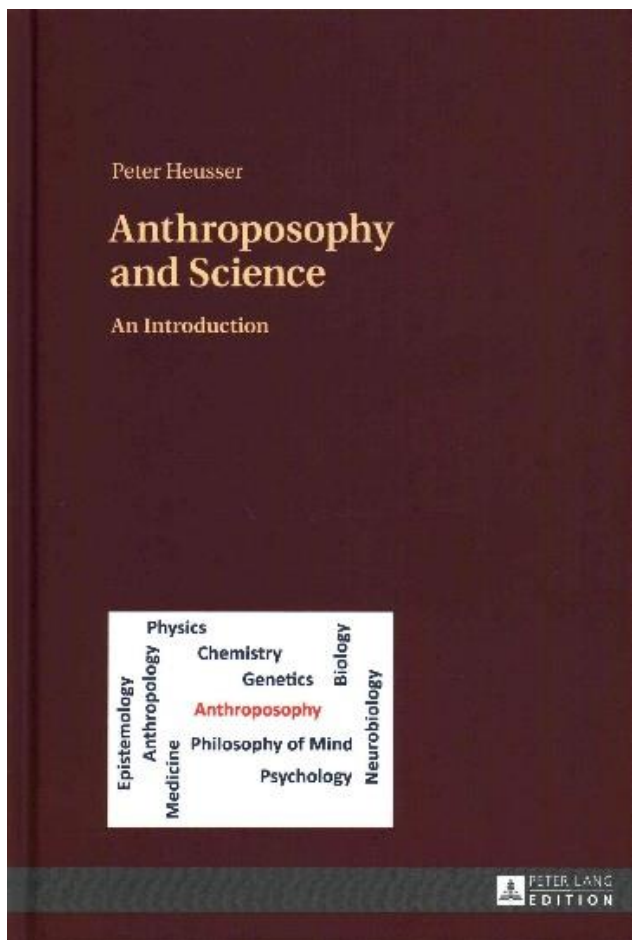
[Here](#) is a link to another view from over Moosabec Reach on that Christmas morning in 2012.

These are “[billows](#)” or, more formally, Kelvin-Helmholtz clouds, caused by velocity shear between air masses.

<sup>1</sup> E.g., George K. Russell, “Children, Screen-Time and Nature,” *New View*, Issue 88, Summer 2018.

## 2018 Conference Announcement

### ***BRIDGING NATURAL SCIENCE AND SPIRITUAL SCIENCE***



Our conference in Spring Valley, NY this November is inspired by the recently translated book, *Anthroposophy and Science*.<sup>2</sup>

Working in anthroposophical activities, we naturally meet with resistance from mainstream culture. If calls for scientific evidence and validation can sometimes feel like being struck on the cheek, in order to turn the other cheek, it is important to know that there *is* a scientific basis for a monistic science of spirit/matter and to know *what* that basis is. This book lays it out.

A revolution is actually already afoot *within* Science, seeking to push back the previous centuries' boundaries. One may be so bold as to say that Natural Science itself unwittingly seeks Spiritual Science.<sup>3</sup>

Univ.-Prof. Dr. med. Peter Heusser, of Witten/Herdecke University, Germany, wrote this book originally for a medical audience, justifiably advancing anthroposophical medicine as an ideal model for the emerging field of Integrative Medicine.

To do so, he had to begin by establishing a valid epistemological basis for a renewal of science which does not limit itself to the almost universally accepted doctrine of materialist reductionism.

A scientific world view emerges—objective ontological idealism—that is both empirical and lawful, and that is capable of encompassing spiritual science as described by Rudolf Steiner.

This book then examines developments in the various fields of modern science from this foundation in Rudolf Steiner's epistemology, such that "[t]he general scientific principles of epistemology, physics, chemistry, genetics, morphogenesis, biology, neurobiology, psychology, philosophy of mind, anthropology, and anthroposophy presented in this book are developed in such a way that they are valid outside the field of medicine." Indeed, he tells us in his preface to this English edition that the German edition [transl. *Anthroposophical Medicine and Science*] had met with particular enthusiasm among teachers!<sup>4</sup> The title was changed to reflect this.

<sup>2</sup> Reviews are accessible for registered users at the bottom of our conference [page](#).

<sup>3</sup> See the selected excerpts from "Supersensible Knowledge: Anthroposophy as a Demand of the Age" that follow.

<sup>4</sup> E.g., Forum - Anthroposophy and science <http://www.rosejournal.com/index.php/rose/issue/view/4/showToc>



And rightly so. We expect that readers of all stripes will find that this epistemological foundation which Heusser builds upon is also the foundation of Steiner's anthroposophy. As Jennifer Greene has been saying, Heusser treats each scientific discipline "as if *The Philosophy of Freedom* mattered."

The scientific fields Heusser will survey at the conference apply to all our anthroposophical endeavors, and we can address them now without the limitations imposed by a deadening view of science. It is important today, not only to be scientifically literate, but it is also vital for us to be conversant in the scientific foundation of Anthroposophy. We feel this conference is important for anyone in the Society.

We are honored that our work with Dr. Heusser will be furthered through daily eurythmy with Dorothea Mier, former Artistic Director of *Eurythmy Spring Valley*. We hope attendees will be able afterwards to carry the message Dr. Heusser brings back to their local communities. For those of you who cannot attend, we will arrange a live-stream and archive of Dr. Heusser's public lectures. (See titles below.)

*Proceeds from the public lectures will benefit Threefold Educational Center.*

**Registration, Meals, and Housing:** Forms and information 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.

## BRIDGING NATURAL SCIENCE AND SPIRITUAL SCIENCE

### Public Lectures and Conference

with Dr. Peter Heusser

Of Witten/Herdecke University, Germany

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

November 7 – 11, 2018

Threefold Educational Center, Chestnut Ridge, NY.

visit <https://www.naturalsciencesection.org/>

## GENERAL SCHEDULE

Beginning Wednesday with Public Lecture  
Closing Sunday 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

with Dr. Peter Heusser

Selected excerpts from a Lecture by Rudolf Steiner (26 September 1923),  
**“Supersensible Knowledge: Anthroposophy as a Demand of the Age,”**  
 in *Esoteric Development*, Anthroposophic Press, Spring Valley NY.

“Anyone who speaks today about supersensible worlds lays himself open at once to the quite understandable criticism that he is violating one of the most important demands of the age. This is the demand that the most important questions of existence be seriously discussed from a scientific point of view only in such a way that science recognizes its own limitations, having clear insight into the fact that it would undoubtedly become degenerate fantasy if it were to go beyond these limits. Now, precisely the type of scientific perception about which I [shall speak today] lays claim not only to being free from hostility toward scientific thinking and the scientific sense of responsibility of our times, but also to working in complete harmony with the most conscientious scientific demands of those very persons who stand on the ground of the most rigorous natural science” (p.55).

“We see, as this thinking develops, that a standard is set for this thinking, and it is set precisely for the most earnest of those who take up this research: the demand that this thinking must develop as selflessly as possible in the observation of external nature and in experimentation in the laboratory, in the clinic, etc. And the human being has achieved tremendous power in this respect. He has succeeded in setting up more and more rules whose character prevents anything of the nature of inner wishes of the heart, of opinions, perhaps even of fantasies regarding one’s own being such as arise in the course of thinking, from being carried over into what he is to establish by means of the microscope and the telescope, the measuring rule and the scales, regarding the relationships of life and existence” (p.57).

“Here we have to look back to the times when there existed still only a mystically colored astrology. Man then looked into the world of the senses in such a way that his perception was far removed from the exactness which we demand of science today. Because he did not demand of himself in his sense life that complete clarity which we possess today, he could discover in a mystical, half-conscious state something from which he could draw inferences. This we cannot do today. Just as little as we are able to derive today, from what natural science gives us directly, anything other than questions regarding the true nature of man, just so little can we afford to remain at a standstill at the point reached by natural science and expect to satisfy our supersensible needs in a manner similar to earlier times.

“That form of supersensible knowledge of which I shall speak here has an insight into this demand of our times. It observes what has become of thinking, feeling, and willing in man precisely through natural science, and it asks, on the other side, whether it may be possible by reason of the very achievements of contemporary humanity in thinking, feeling, and willing to penetrate further into the supersensible realm with the same clarity which holds sway in the scientific realm. This cannot be achieved by means of inferential reasoning, by means of logic; for natural science justly points out its limitations with reference to its own nature. But something else can occur: the inner human capacities may evolve further, beyond the point at which they stand when we are in the realm of ordinary scientific research, so that we now apply to the development of our own spiritual capacities the same exactness which we are accustomed to applying to research in the laboratory and the clinic” (p.61-2).

“Moreover, it is good for a person who has some practice in scientific work to use the findings of scientific research as material for concentration; these prove to be, indeed, the most fruitful of all for this purpose” (p.64).

“But from all we hold back, as we meanwhile investigate dead nature with the forces from which one rightly withdraws one’s inner activity, from the very act of holding back is created the ability to develop further the human soul forces. ...He who is a serious scientist in this sense has within himself the germ of imaginative, inspired, and intuitive knowledge... What I mean to say is that everyone who speaks in the spirit of natural science speaks also in the spirit of supersensible research, only without knowing this” (p.78)

## Striking Similarities

Collected by John Barnes

In his book *Mind and Cosmos—Why the Materialist Neo-Darwinian Conception of Nature is Almost Certainly False*, Thomas Nagel states his case with refreshing common sense, modesty, humanity, and courage.

In reading it I was struck by similarities with another book I have been reading: *Anthroposophy and Science—An Introduction*, by Peter Heusser, Professor of integrative medicine at the University of Witten/Herdecke, Germany. I can only attempt to indicate these similarities here.

- Like Steiner, Nagel recognizes the capacity of human thought to penetrate to the realities underlying the world: "... in a case of reasoning, if it is basic enough, the only thing to think is that I have grasped the truth directly (p. 80)." ... "and when we reason, ... something has happened that has gotten our minds into immediate contact with the rational order of the world... the final court of appeal is always reason itself (p. 83)." ... "The view that rational intelligibility is at the root of the natural order makes me, in a broad sense, an idealist ... an objective idealist in the tradition of Plato and perhaps ... Schelling and Hegel... (p. 17)"
- Similarly, Heusser writes: "The law (something ideal, spiritual) is therefore recognized as part of reality and in fact as its more important i.e. essential part, because it is through the law that the other part, the phenomenon, is constituted. This gives rise to the foundation of an objective ontological idealism which has repeatedly been represented in the history of western thought since Plato ... to Schelling and Hegel, Goethe and Steiner and latterly by 20th century physicists... (p. 60)"

This epistemological point of departure – the insight that the world is in its essence spiritual but is physical when approached from the outside so to speak – becomes the basis for understanding the world in its various aspects.

- In his book Nagel is chiefly concerned with a theoretical understanding of evolution. After dismissing neo-Darwinian attempts at explaining the origins of life as the product of chemical processes governed by the laws of physics as verging on a superstitious belief in miracles, he writes: "The tendency for life to form may be a basic feature of the natural order... Some form of natural teleology ... would be an alternative to a miracle. (p. 124)"
- In discussing genetic processes, Heusser speaks of orchestrating forces that guide the bio-chemical processes: "The cause of the orchestration [of the complex genetic processes] is therefore not the cascades of regulatory proteins but their "conductor," as it were, i.e. that active entity which – in a top-down process – gives all the individual "instruments" their entry in accordance with the "symphony" of the whole... (p. 110)." Similarly, an anthroposophical view of evolution would recognize the activity of orchestrating spiritual forces within evolutionary processes. This view, also, bears some similarity to Nagel's "natural teleology."

Then there is the mind-body problem.

- Nagel writes: "Conscious subjects and their mental lives are inescapable components of reality not describable by the physical sciences (p. 41)."
- Heusser concludes: "The spatial phenomena of the physical prove to be constituted from their laws, the temporal processes of the living realm prove to be determined by theirs, the psychological phenomena follow psychological laws, and the purely spiritual phenomena which are reached by thinking, the actual content of the laws, follow purely logical laws, i.e. are of a logical nature (p. 170)."

# Evolving Science 2018

## *Dear Friends of the Natural Science Section*

We would like to invite you to our International Conference «Evolving Science 2018» at the Goetheanum in Dornach, Switzerland, from October 3-7. The conference theme will be:

### **Ways to the spirit in nature:**

**In the idea:** In coming to knowledge, man connects the spiritual in the world with the world of the senses. Through thinking he enters the spiritual realm and in the oscillation between observing and thinking he comes closer and closer to insights which reunite inner and outer experience: «The awareness of the idea in reality is the true communion of man» (Rudolf Steiner, GA 1). This process is related to the motif of «spirit-remembering» in the first stanza of the Foundation Stone Meditation.

**Through symbolizing:** A rhythmic shift of attention between sensory observation and inner experiencing can be developed into an inner training in the natural world, fostering a deeper experience of one's own soul in its relation to the «soul-essence» of the world. The soul «will first become aware of this, the delicate but meaningful threads which exist, connecting it and the world into which it is born» (Rudolf Steiner, preface to the Soul Calendar, 1918). This process can be enhanced through the practice of symbolizing, as indicated in the lectures of October 2nd and 3rd 1920 (GA 322). Various colleagues have attempted this in different ways, using different methods. Thus, a connection between these practices and the motif of «spirit-contemplation» in the second stanza of the Foundation Stone Meditation can be brought to light.

**On the path to the threshold:** On the path of inner training as it is sought in Anthroposophy, one repeatedly encounters the indication that the sense world becomes – or must become – dark if one wants to progress, and that, conversely, the sense world darkens the spiritual world: «Where sense-knowledge ends, / only there is the gate, / the realities of life / opened to the soul-life» (Rudolf Steiner, May 22, 1915, GA 272). How does this motif relate to a scientific training that deepens the relationship to the sensory world? Here it is worthwhile to seek a relation to “spirit-beholding” in the third stanza of the Foundation Stone Meditation.

With this sketch, we suggest that we might look at different working directions in anthroposophically oriented science with an awareness that different approaches are not only possible but valid. During the three days of our conference, we would like to use these questions or working directions to trace potential paths to the spiritual in nature and see if we can bring into view a common foundation of Goetheanism. The relationship to the Foundation Stone Meditation – a working theme of the Anthroposophical Society in current years, as we approach the 100th anniversary of the Christmas Foundation Conference – offers a fruitful addition to such work.

As we did during «Evolving Science 2015» we will offer a platform for **research presentations** where participants will have the opportunity to report on their current work. Please register online until August 15, 2018: <http://www.forschungsinstitut.ch/en/conferences-colloquia/evolving-science-2018/research-presentations/> If participation is not possible for financial reasons, please do not hesitate to contact us: [science@goetheanum.ch](mailto:science@goetheanum.ch)

Updates can be found on our homepage: <http://www.forschungsinstitut.ch/en/conferences-colloquia/evolving-science-2018/topics/>

*-Johannes Köhl with the team of the Science Section in Dornach*





## Report on the *Evolving Science 2015* conference in Dornach

—Barry Lia

[Editor: This *is indeed* a report on the *previous* Evolving Science conference *three years ago*. It is hoped by the editor (author) that you will at least enjoy the closing paragraph.]

I went through Hell to get to the Goetheanum for the Natural Science Section's *Evolving Science 2015* conference, September 30 through October 4. No, not the airport security lines and overnight flight from Seattle, but through a small picturesque train stop, on the trip from Oslo to Trondheim, named Hell.<sup>5</sup> I was on my way to visit Soili Turunen at Camphill Rotvoll. After a day of wonderful Michaelmas festivities, Soili told me the biography of Lili Kolisko—which she is writing—as she showed me many of Kolisko's original Steigbilder first-hand.

Then just a couple days later at the conference in Dornach, I sat in the Glashaus with leading European representatives of the Steigbilder as well as the sensitive crystallization and drop picture methods. I had the opportunity to speak to Jürgen Fritz of a possible application of cognitive science to the picture work. This working group on Picture Forming Methods was a great help in my own preparation for our upcoming conference in Chicago on the subject, co-sponsored by the Biodynamic Association and the Natural Science Section in North America.

My steering committee colleagues from the Section in America attended other working groups: John Barnes joined the group considering how the life sciences and *Goetheanism* are approaching one another, Andrew Linnell was with the group contemplating etheric and astral perception, and Jennifer Greene co-led the working group on water phenomena with European colleagues from the Institut für Strömungswissenschaften in Herrschried.

During a preparatory conference in 2014, the three-part theme of this year's *Evolving Science* was explored and defined: "*Shaping Goethean Science in relation to Nature, to Society, and to Anthroposophy.*" To this end the Glashaus team—Johannes Kühl, Laura Liska, Matthias Rang, and Johannes Wirz—organized this year's keynote speakers, panel discussions, professional meetings, research presentations by participants, World Café discussions on the three related themes, various working groups—from the more scientific to the solely intuitive—and artistic courses and local tours. We were able to survey the three themes as listeners, co-workers, and participants. That made for a very rewarding and thought-provoking conference. Personally, I came away spurred to elaborate some day on my own short presentation—the ontophyletics of the "occult" [literally "hidden"] morphology of the retina at the back of the human eye—inspired by the Goethean spirit of evolutionary biology shared by so many presenters.

Living as I do in the far Northwest corner of America, I see our Goethean "center of gravity" weighted toward the East of our continent. In the Southwest, Mark Riegner and Martin Lockley apply Wolfgang Schad's three-fold theme in their academic work on birds and dinosaurs. In the Midwest, Walter Goldstein does vital seed work at the Mandaamin Institute and True Botanica employs Lili Kolisko's germination experiments in validating potencies. But in New York State there is The Nature Institute and the Saratoga Experiential Natural Science Research Institute. And up in Maine there is The Water Research Institute of Blue Hill. Most of our Section members live in the East as well. Even so, America is yet a frontier in the Goethean work.

Meeting participants at the conference gave me a look further east across the "Pond" to England. There one finds Margaret Colquhoun's Life Science Trust at Pishwanton Wood, the Field Centre of Ruskin

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<sup>5</sup> The Norwegian word "hell" comes from Old Norse for "cave," but can also mean "luck."



Mill Trust near Stroud, and many other active sites. Goetheanism inspires Judyth Sassoon's work in paleontology at the University of Bristol. Alasdair Gordon strives to inspire Waldorf science education with a morphological thinking approach. I was able to participate as an American visitor in a professional group which met during the conference to work on the Collaborative Research Programme under the aegis of the Natural Science Section in the UK and the Ruskin Mill Field Centre. Their aim is to build a research collegium in the English-speaking world in collaboration with the Research Institute at the Goetheanum.

And finally, even further east over the horizon, is all the long-established fundamental work emanating from the Goetheanum since Rudolf Steiner's time and continuing in numerous other research centers across Europe as well. Standing in the Glashaus library, looking at stacks of reports and books, I felt like any of my questions have probably already been addressed! Nowhere in America or England do we have anything like the Research Institute at the Goetheanum, the Ita Wegman Clinic, the Universität Witten/Herdecke, or the Louis Bolk Institute. Although there are a few excellent academic researchers studying biodynamic agriculture in the US, there exists no university department as at Kassel. I was thrilled by the number and quality of intriguing doctoral theses from the Institut für Evolutionsbiologie outlined by Wolfgang Schäd in the closing presentation Sunday morning.

All in all, it made quite an impression on an American to see so many people gathered in the historic Schreinerei in support of Goethean and anthroposophical science.

Throughout the conference, a balance of German and English presentations was ably translated by Bernard Jarman and Jara von Lupke, making for a truly international event accessible to all participants. English-speakers—and we slow German-readers—often find ourselves on the periphery, eagerly awaiting translations of the few books that make it our way. On that note, I am pleased to announce that just after the conference Adonis Press released Johannes Kühl's book in English, *Rainbows, Halos, Dawn and Dusk*. And our Natural Science Section in America is planning an academic conference to follow the upcoming publication by Adonis Press of an English edition of Wolfgang Schäd's expanded *Man and Mammals*.

It happened to be a mammal from the American backwoods which figured in the English keynote speech by Craig Holdrege from The Nature Institute. Craig told of naturalist Aldo Leopold's experience of the "fierce green fire" in the eye of a dying wolf shot in the wilds of the American West—one of the experiences in Nature which led Leopold from a conventional scientific stance to eventually call for a "land ethic" in which we become members of the larger community of life. The experience of that wolf-presence was a step for Leopold as a scientist on a rather Goethean path of transformation of experience, which Craig characterized as moving from 'thinking about' to 'thinking with,' then to 'pictorial thinking,' and ultimately to 'perceiving-thinking.'

The next English keynote speaker, Diana Pauli (daughter of Goethean color scientist, Michael Wilson) referred to Craig's four levels of thinking, and told us how her own meditative work led to insight about autism. Considering the weakness of ego in these persons, she finds that *changes* in the color of the illumination of the room can free up the astral body at key points during intensive work with the therapist. Diana emphasized the practical application of such anthroposophical science; she suggested that if we are to work within Society, such observation and meditation needs to be followed by conventional validation.

Fred Amrine, from the University of Michigan, then stood up for the last English keynote speech only to challenge just that which is conventionally held as validation. He brought thoughts from American philosopher Thomas Nagel's succinct and important book: *Mind and Cosmos: Why the Materialist Neo-*

*Darwinian Conception of Nature Is Almost Certainly False*.<sup>6</sup> Diplomatically, Nagel writes: “My aim is not so much to argue against reductionism as to investigate the consequences of rejecting it—to present the problem rather than to propose a solution” (p.15). Towards such a solution, Fred then led us through a “genealogy” of scientists and philosophers—Spinoza, Goethe, Jakob von Uexküll, Maurice Merleau-Ponty, Jesper Hoffmeyer, Victor Zuckerkandl, Ronald Brady—and on to Rudolf Steiner’s *Grundlinien einer Erkenntnistheorie der Goetheschen Weltanschauung*. Fred declared that this foundational work of Anthroposophy, unrecognized in contemporary scholarship, lays out a much-needed epistemology for the contemporary search for understanding the “emergence” of life and consciousness, which Nagel shows reductionism cannot. Fred barely sat down before he then had to leave for New York to speak at a conference of the Goethe Society of North America—devoted this year to Goethe’s *scientific* work.

My steering committee colleagues and I are also now back home in the US, resuming our weekly conference calls, feeling inspired for greater ambition, and striving to build stronger connections with the Goethean culture in Europe.

But Goethean inspiration *can* be found in America! Soon after returning from Dornach, I watched a clever car commercial on TV during Sunday Night Football.<sup>7</sup> With a background of wordless, ethereal music, it portrays a crash test engineer carefully and concernedly loading the test car with dummies that look just like himself and his family members. Yet he confidently presses the launch button. Then as the car speeds towards the crash wall, we are shown that the car’s occupants are actually the usual faceless crash test dummies buckled in the seats. At impact the screen goes black and silent, and before extolling the resulting safety of their cars, we read: “When you don’t think of them as dummies, something amazing happens.” This struck me as an *accidental* analogy contrasting reductionist science and the science for which we strive—how phenomena *are* conventionally treated like mere crash test dummies, but that something amazing *could* happen if we *didn’t* think of them so.

## experienceCOLOUR

Open 29 August – 14 October at Glasshouse Arts Centre, Stourbridge, UK, experienceCOLOUR is a remarkably beautiful, hands-on exhibition, inviting visitors of all ages and abilities to explore the fascinating science and art of colour through large scale installations, displays and experiments. Come and discover the world of colour, find out how different colours influence us all, and ask new questions about the meanings of colour in the world around us.



Visitors are invited to act as researchers – to play and be creative with experimental exhibits ranging from colour appearance in nature to its scientific explanation and the application of colour in technology and art.

The exhibition, developed in Switzerland by a team of scientists and artists at the [Goetheanum](#), explores many strands of science, philosophy, art and education theory. It is a fascinating exploration of the science of colour, how different colours affect us all, and the power of colour. Exhibits designed by Nora Löbe and Matthias Rang at the Science Section of the Goetheanum, Johannes Grebe-Ellis of the University of Wuppertal, and others.

In addition to lectures, teacher conferences, and research group meetings, there will also be a book release of Michael Wilson’s major work, edited by Laura Liska and Troy Vine (pre-order information on page 27).

A genuine festival of art and science has been arranged!

<sup>6</sup> Reviewed by Amrine in the US Society newsletter, *being human*, Fall 2015, pp. 46-50.

<sup>7</sup> [https://youtu.be/SkpaSe\\_Zj60](https://youtu.be/SkpaSe_Zj60)

## 2017 Annual Section Meeting Reports

### ***Interdisciplinary Astronomy: The Human, being in the Cosmos***

—Barry Lia

Foremost in my thoughts at the close of our conference was the recognition that Newton's clockwork universe of 'celestial mechanics' was actually born out of Kepler's vision of 'celestial harmony,' of a dynamic cosmos alive with spirit. Newton had plucked the fruit of Kepler's work and shrewdly appropriated it in such a way as "to avoid being baited by little smatterers in mathematics."

The reality of this story of the birth of the mechanical model of lifeless celestial motion, the model which we all are taught in school, was brought home to us by Gopi Vijaya during his stimulating talk on the closing evening of our conference and annual meeting of the Natural Science/Mathematics-Astronomy Section of the Anthroposophical Society's School for Spiritual Science, held at Rudolf Steiner House in Ann Arbor, MI, November 8-12, 2017.

The backdrop for our conference was the 'Astronomy Course' (CW323) given by Rudolf Steiner in January of 1921. We worked with Professor Fred Amrine and his recent translation of these eighteen lectures, entitled *Interdisciplinary Astronomy*, available now through Fred's Keryx editions and soon to be published by SteinerBooks.<sup>8</sup>

John Barnes had opened our proceedings with a public presentation on Wednesday evening, eloquently relating the Foundation Stone Meditation to the polarity in the threefold human being between head and limbs, between the spherical and the radial—themes carried throughout this, Steiner's 'Third Scientific Course.'

Steiner seeks to revive in us a spiritual conception of the cosmos, but now founded in a new way upon anthroposophical insights and methodology. He aims to move us from the abstract stance of the detached observer's mathematized astronomy into the intimacy of what one might call a 'cosmonomy'—a rightly anthroposophical astronomy incorporating the reality of the lived experience of the human, being in the cosmos.

Already in the second lecture, the human *Gestalt* is related in a Goethean manner to the polarity between the polar regions and the tropics. Steiner portrays various phenomena by which we are led to "see that humanity participates in the universe in such a way as to be coordinated more closely with the cosmic surroundings of the Earth in our heads, our nervous systems and senses; and coordinated more closely with the life of Earth in our metabolic systems."<sup>9</sup>

These considerations lead to a statement indicative of the intent of the Course: "Since through earthly conditions [the course of the year] finds different expression in the tropics, in the temperate zones, and at the Poles, this yearly course must be connected in some way with the nexus of forces shaping the human constitution [...] If we're able to take that into consideration, then we acquire a wider basis upon which to build, and hence we can perhaps arrive at something quite different from what we reach when we merely measure the angles that one telescopic vector forms with another. It's a matter of finding broader foundations for our judgments regarding the facts."<sup>10</sup>

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<sup>8</sup> Page numbers cited here are for the currently available Keryx edition (see text box below). Fred has also prepared a valuable companion volume in which he has translated Steiner's notebook for the first six lectures, translated the German commentary and added notes of his own, and collected related passages from various other volumes of Steiner's work. Fred has continued translations of Steiner's books and lectures in Keryx editions. Of particular note is *The Essential Philosophy of Freedom*, an abridged version aiming to "remove the distractions and make the gems stand out."

<sup>9</sup> *Interdisciplinary Astronomy*, Keryx edition, 2017, p.26.5. (Lecture 2)

<sup>10</sup> *Interdisciplinary Astronomy*, p.27.2. (Lecture 2)

Cut off as we are by the schoolbook materialism of our modern culture, how then do we overcome and reimagine those facts we are taught, and then go on to gain a recovered sense of living spiritual connection with a divine cosmos, such as had survived even until Kepler's time? After all, was not the 'apple' Newton nabbed actually the *fruit* of Kepler's spiritual outlook?

In the third lecture, we are told that "shining through Kepler's works there's still an awareness of a universal life. [...] that behind all that's manifest to ordinary astronomical observation there ultimately stands something like the gesture of a life expressing itself. If we encounter someone and see her move a hand or an arm, we don't just start calculating the mechanics of the movement, right? We recognize it as the outer revelation of an inner life of soul and spirit."<sup>11</sup>

As a city dweller visiting a rural setting, I have certainly been struck with awe upon stepping out on a clear night into the actual majesty of the Milky Way spanning the felt depth of space. I still feel in my bones having been stunned just so as I left the building after our first evening session at our meeting some years ago when Jennifer Greene hosted us at the Water Research Institute of Blue Hill on the coast of Maine.

But besides such a circumstantial surprise in happening to find myself in a 'dark sky' area, there is little in the regularity of our heavens by which nature delivers a more telling "revealing surprise"—such as Craig Holdrege speaks of in a recent *In Context* article.<sup>12</sup> He writes of happening along the path to come upon an anomalous blossom, which for him was unveiling hidden potential and declaring, "Do you see all that I am capable of?"

Little in the heavens, that is, except comets perhaps—the last celestial phenomenon Steiner considered in this lecture course. For the next public offering on the evening after John's talk, Oliver Conradt, leader of the Mathematics-Astronomy Section at the Goetheanum, fascinated us with the natural history of these "rebels of the cosmos," as Steiner called them. Their effulgent display arises from a sublimation in the solar wind, evident by the curve of the jetting dust tail stretching for several astronomical units through space. Comets are more ephemeral process than they are substance; a process very unlike the clockwork movement of law-abiding planets against an apparent eternity of fixed stars.

It took ages to establish that comets actually were not mere denizens of the meteorological chaos of our own earthly atmosphere, but rather true astronomical events. There is now even evidence that comets orbit other star systems. In fact, the recent mysterious interstellar visitor, 'Oumuamua, is considered to have indeed been such a comet cast off from another solar system.<sup>13</sup>

Within the bright coma, the miniscule nucleus of the physical comet itself has only been imaged in modern times by means of spacecraft.<sup>14</sup> Having actually landed a craft on one a few years ago, we are confirming their typical dusty-icy core and carbon-rich crust and gaining understanding of planetary origins. We are learning from them that organic material pervades our universe—if not outright biological life itself.<sup>15</sup> As for *intelligent* aliens, there may be "quite probably no one out there to rescue or to care about us,"<sup>16</sup> but these anomalous celestial bodies seem to be declaring that Kepler's cosmos may indeed be alive, *not only* with spirit.

For the following public evening, Oliver doffed his astronomer's hat and donned his mathematician's hat, so to speak, first to address the concept of 'counterspace.' In lecture fifteen of this Course, Steiner introduces the idea of counterspace (*Gegenraum*) in an effort to liberate us from our schoolbook notion of the heavens as an 'outer space' of Cartesian dimensions and Euclidean geometry.

Contemporaneously, of course, Einstein had certainly accomplished this in a different way in physical terms, but Steiner's aim is to do this in an anthroposophical sense related to the human being. It was stimulating to follow

<sup>11</sup> *Interdisciplinary Astronomy*, p.38.6. (Lecture 3)

<sup>12</sup> <http://www.natureinstitute.org/pub/ic/ic38/bergamot.pdf>

<sup>13</sup> <https://www.scientificamerican.com/article/interstellar-mystery-object-now-thought-to-be-a-comet/>

<sup>14</sup> [http://www.esa.int/spaceinimages/Images/2018/08/Comet\\_horizon](http://www.esa.int/spaceinimages/Images/2018/08/Comet_horizon)

<sup>15</sup> <https://www.nbcnews.com/mach/science/are-we-truly-alone-cosmos-new-study-casts-doubt-rise-ncna891286>

<sup>16</sup> <https://www.theguardian.com/p/9xtac>



along with Oliver to reimagine dimensionality and see how infinity is generally unrecognized in our thinking about space. Such flexibility is needed, as when Steiner challenges us in these lectures to see the cranial bones as inversions of the long bones.

Then Oliver showed us how principles of counterspace were applied in determining the rate of rotation of the centrifugation disc in the machine used to intensify the effectiveness of the Iscador cancer remedy. By spinning at 10,000 rpm at the latitude of Institute Hiscia in Arlesheim, Switzerland, the summer and winter mistletoe extracts are mixed under conditions imitating the enhanced etheric ‘counterspace’ of the tropics, where the earth bulges to some degree due to its rotation. Compared to simple mixing, sap extracts treated this way do show significant biological effects in a botanical test system.<sup>17</sup>

In these lectures, Steiner also poses another mathematical challenge, asking us to imagine replacing the constant of a Cassini curve with a function—no doubt mind-bending even for a mathematician’s thinking. Such a metamorphosis of the lemniscate could introduce a polar asymmetry by which one pole remains more spherical and the other pole opens towards the radial. Imagining such a curve, that breaks open graphically, calls upon our thinking even to “go out of space” in the usual sense. This polarity of the spherical and the radial, Steiner relates to the human constitution—as for the cranial bones of the head and the long bones of the limbs.

Each afternoon, Henrike Holdrege of The Nature Institute supplied us with compass and straightedge in order to work out the geometric principles of the family of Cassini curves and experience them first hand. As she told us, to hold to a line of thought is a training toward confidence in knowing inwardly. The teaching experience evident in the deftness by which she guided us will surely be present in the book for self-study of projective geometry which she is nearly ready to release. [In looking back to my notes, I notice that even my handwriting is more orderly during her sessions!]

Each morning, participants also enjoyed *moving* through Cassini curves in eurythmy with Susann Eddy, from the Detroit Waldorf School. See Susann’s separate article that follows for an interesting story of the two eurythmists asked by Steiner to attend the original lectures. At the close of the Course, Steiner says “What we need to do, as I said before, is devise new experimental protocols. Thus ideally we should begin not with a fully equipped physics laboratory, but as far as possible with an empty room.”<sup>18</sup> Yet a room *filled* with the spirit of eurythmy, surely, and only apparently empty.

On the first afternoon, during the time set aside for an Arboretum walk after lunch, I myself led those willing to endure the chill air *outside* to an open grassy space nearby Rudolf Steiner House to set up a Human Kinesthetic Tychonic Orrery. (An orrery is customarily a table-top mechanical device which models the movements of the planets orbiting the sun, named for the 4<sup>th</sup> Earl of Orrery in the early 1700’s.)

A ‘Sun pole’ is held by one person, with strings attached of scaled length for each of the planets up to Mars, for at this scale—with Earth at twenty feet away and Mars at thirty—Jupiter and Saturn would be traveling out across the street somewhere (and yet the moon would circle within Earth’s hand). The planet persons march in scaled steps holding the other ends of the outstretched strings, representing the movement of the planets (a maypole of sorts). Everyone else can stand around on the outside and watch the Copernican *heliocentric* system in action (assuming uniform circular motion)—Mercury marching around the Sun and Mars dawdling along.

On the other hand, the ‘observers’ can huddle together ‘on Earth’ and remain stationary. The ‘Sun pole’ person then can move *around* Earth at *their* end of the Earth string, and the planet persons can then *continue* to orbit the Sun as it rotates through the seasons (quite an exercise in relative motion).

Now the planets are moving in the *geostatic* system of Tycho Brahe, who’s observational data Kepler used. This is *not* the old *geocentric* system of Ptolemy, in which the planets orbit earth. Holding Earth stationary in the way we did is geometrically—mechanically, we might say—equivalent to the accepted and well-known heliocentric

<sup>17</sup> Flückiger and Baumgartner (2003) *Der Merkurstab* 56(3): 114-121.

<sup>18</sup> *Interdisciplinary Astronomy*, p.200.4. (Lecture 18)

system of Copernicus, and it is the system actually used for calculating astronomical ephemeris and the trajectory of near-Earth asteroids—and a certain red Tesla Roadster<sup>19</sup> launched from Earth this year as personalized space junk,<sup>20</sup> its radio senselessly blaring David Bowie's "Space Oddity" into *soundless* space (soundless, that is, excepting one note of B flat at about 57 octaves below middle C<sup>21</sup>).

This kinesthetic orrery exercise could be useful for teachers.<sup>22</sup> It accords with the view we have from Earth. As the planetary movements were marched out, retrograde motion of the planets unfolded before our eyes. Biodynamic farmers would experience that the 'outer' planets never pass between us and Sun, as do the 'inner' planets. For the theme of our conference, it also illustrated, in an experiential manner, the contrast of the abstract detached observer standing outside the Copernican system (great achievement of imagination that it is!) with the more participatory perspective from our own experience "on Earth" within the Tychonic orrery.



The first morning, Judie Erb had given a delightful presentation on Cosmic Rhythms in Embryology and Physiology, incorporating both art and science. She opened with a pair of slides juxtaposing Dore's illustration of Beatrice and Dante viewing the 'Cosmic Rose'—the dwelling place of God in the highest heaven—with an image of a circular nebula captured by the Hubble telescope. She then referenced a recent physics paper theorizing "The Cellular Universe," according to which "nearly all that exists in the macrouniverse is mirrored in a biological cell as a microuniverse."<sup>23</sup> This presents an unwitting update of sorts for Steiner's similar suggestion in the first lecture of the Course.

Judie then paired slides of biological forms, such as embryos, kidneys, and brain cells, with the forms of nebulae, galaxies and threads of cosmic structure. In addition, as an example of our intimate physiological relation to the rhythms of the cosmos, she presented some of her own research on the daily rhythms of stress hormones and

<sup>19</sup> [https://www.washingtonpost.com/national/health-science/heres-what-will-happen-to-space-xs-red-tesla-roadster-in-space/2018/02/08/7fd4499e-0c2d-11e8-8b0d-891602206fb7\\_story.html?utm\\_term=.e671b05d2de8](https://www.washingtonpost.com/national/health-science/heres-what-will-happen-to-space-xs-red-tesla-roadster-in-space/2018/02/08/7fd4499e-0c2d-11e8-8b0d-891602206fb7_story.html?utm_term=.e671b05d2de8)

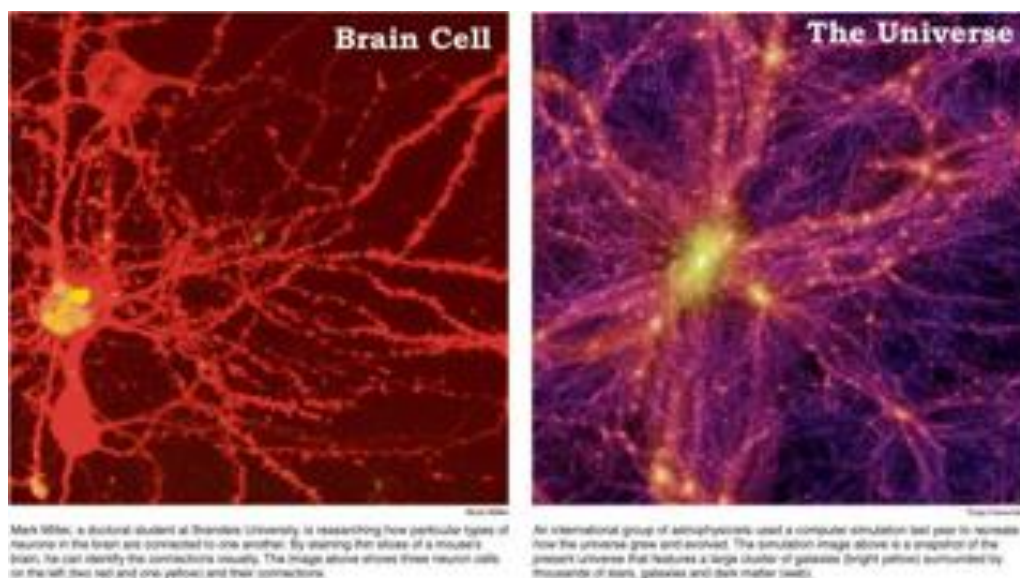
<sup>20</sup> <https://gizmodo.com/hey-artists-stop-putting-shiny-crap-into-space-1828299936>

<sup>21</sup> <https://gizmodo.com/the-only-known-sound-in-space-is-this-singing-black-hol-1828219019>

<sup>22</sup> Only the Copernican heliocentric kinesthetic orrery is to be found online, not the Tychonic version here, but some sites may be useful for setting up.

<sup>23</sup> Anjamrooz et al. (2011) *Intl. J. Physical Sciences* 6(9): 2175-2183.

their disrupted coordination in schizophrenics. In closing, as she has done at prior meetings, Judie brought out her guitar and sang us a song she'd composed about how the long bones produce platelets and red blood cells!



White blood cells, on the other hand, were a topic at “The Living Solar System” conference held last summer in the U.K., another recent conference revolving around the Astronomy Course. Leucocyte activity correlates with sunspot activity cycles, as do other human physiological and pathophysiological measures. Gopi reported to us that first morning what he had learned of their meeting, which covered several other themes from the Astronomy Course in inventive ways.<sup>24</sup> Their aim was to start a research group. As one outcome, Gopi has been involved in publishing a translation of Roland Schrapp’s work on lemniscatory and spiral aspects of planetary motion suggested in the Astronomy Course.<sup>25</sup>

Gopi also gave a presentation the following morning on Polar Geometry in Astronomy. In speaking of the cosmic background radiation, inversion layers of the sun, double-star systems, and stellar evolution, he related here and there to Dewey Larson’s Reciprocal System of Physical Theory.<sup>26</sup> He has an appointment at The Larson Research Center in Salt Lake City, Utah.<sup>27</sup>

Gopi opened this offering with reference to Steiner’s remarks in the sixteenth lecture about a polarity of terrestrial and solar phenomena, putting volcanos and sunspots in contrast: “...you would have to say that if causes on the Earth are such as to bring about the upward [volcanic] eruption of an active crater, for example, the cause on the Sun will be such that if there is anything analogous to such an eruption, it will happen from without inward.”<sup>28</sup>

One indeed finds that modern helioseismography, using solar acoustic tomography, has documented a *downward* flow of plasma into the umbral core,<sup>29</sup> amid a complex whirlpool pattern of flows over and around sunspots.<sup>30</sup> Magnetic flux keeps drawing surrounding plasma inward, which cools and plunges at around 3,000

<sup>24</sup> See September 2017 Newsletter of the Science and Mathematics Group of the Anthroposophical Society in Great Britain, p.8-10; [www.sciencegroup.org.uk/sgnl/Science\\_Group\\_Newsletter\\_2017\\_Sept.pdf](http://www.sciencegroup.org.uk/sgnl/Science_Group_Newsletter_2017_Sept.pdf)

<sup>25</sup> For fabulous animations of current astrophysical view: <https://www.forbes.com/sites/startswithabang/2018/08/30/our-motion-through-space-isnt-a-vortex-but-something-far-more-interesting/-175a241c7ec2>

<sup>26</sup> <https://www.reciprocalssystem.com/>

<sup>27</sup> <http://www.lrcphysics.com/rst/>

<sup>28</sup> *Interdisciplinary Astronomy*, p.177.7. (Lecture 16)

<sup>29</sup> Zhao et al. 2001 *Astrophysical J* 557:384-388.

<sup>30</sup> Sheeley et al. 2017 *Astrophysical J* 836:144.



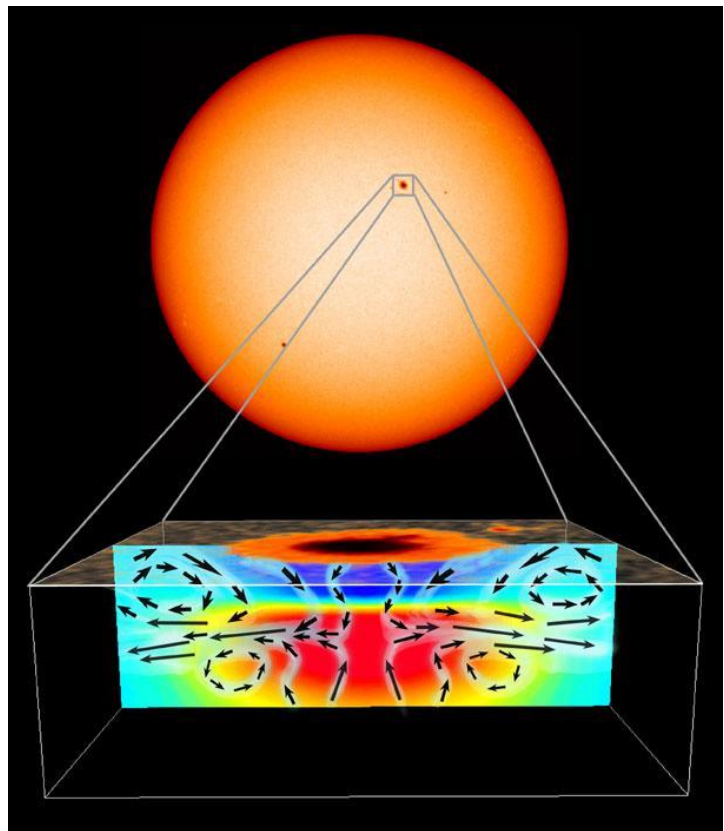
miles per hour to a depth of some 3,000 miles (still shallow for the sun). This disc of cooler plasma blocks convection beneath, which builds up heat and fuels a redistribution of energy laterally into the surrounding convection zone, resulting in slightly more intense sunshine about every 11 years at sunspot maximum.<sup>31</sup>

Steiner had framed his sunspot remarks pointing out that astronomers “always take their start from premises derived from the earthly realm. And if you haven’t first made an effort to refine and expand your range of concepts, in the way we have done by conceiving curves that exit space; if you haven’t cultivated your inner life by doing something like that, well then I would say that nothing else is possible.”<sup>32</sup> Indeed, one of the researchers who discovered this downward plasma flow within the sunspot commented, “We needed better mathematical tricks, so we put together ideas from classical and quantum physics, and also from a recent advance in seismology on the Earth.”<sup>33</sup>

And Steiner cautions us here, not only about applying concepts we derive from earthly life to the constitution of the Sun, but more generally about the tendency “to persuade ourselves that [our] geometrical construct clicks—that the outer reality really *is* like that.”<sup>34</sup> Nevertheless, the animations derived from the solar tomography calculations above *certainly are* very fascinating (link in footnote).<sup>35</sup>

Steiner concludes his remarks on sunspots saying, “You see, what would be needed in such a case would be first of all to get to the bottom of the phenomena, to understand them, and then to allow them to explain each other. And we’ll make real progress only if we enter into the qualitative aspect in this way—only if we’re prepared, in the widest sense of the word, to unfold a kind of qualitative mathematics.”<sup>36</sup>

His discourse on sunspots and the constitution of the Sun was actually occasioned in the first place to illustrate “...what characterizes anthroposophical spiritual science generally: it seeks to attain a true phenomenology—to explain phenomena in terms of phenomena instead of making abstract concepts to explain them.”<sup>37</sup> It may have taken that NASA researcher’s “better mathematical tricks” to ‘unearth’ the inward flow of plasma in a sunspot, but it’s another matter to intuit a polar relation between Earth and Sun from the broader phenomena: “...we



Artist's conception of cross-section of flux flow beneath a sunspot. Red is hotter, blue is cooler. Credit: NASA/ESA.

Links to animations may be found at

[https://sohowww.nascom.nasa.gov/hotshots/2001\\_11\\_06/](https://sohowww.nascom.nasa.gov/hotshots/2001_11_06/)

<sup>31</sup> <http://sci.esa.int/soho/28320-soho-reveals-how-sunspots-take-a-stranglehold-on-the-sun/>

<sup>32</sup> *Interdisciplinary Astronomy*, p.176.5. (Lecture 16)

<sup>33</sup> <http://sci.esa.int/soho/28320-soho-reveals-how-sunspots-take-a-stranglehold-on-the-sun/>

<sup>34</sup> *Interdisciplinary Astronomy*, p.176.7. (Lecture 16)

<sup>35</sup> Links to animations: [https://sohowww.nascom.nasa.gov/hotshots/2001\\_11\\_06/](https://sohowww.nascom.nasa.gov/hotshots/2001_11_06/)

<sup>36</sup> *Interdisciplinary Astronomy*, p.178.1. (Lecture 16)

<sup>37</sup> *Interdisciplinary Astronomy*, p.175.2. (Lecture 16)



first have to develop the will to proceed in the way we have been doing here; we first have to develop the intention to really penetrate a phenomenon. It's just this intention that's so often neglected."<sup>38</sup>

As a paradigmatic example of this neglect, if not outright refusal, Owen Barfield was asked about C.S. Lewis's difficulty with Steiner. "Well, he had a pretty sharp line between his intellectual self and imaginative self: he accepted the conventional scientific basis of knowledge and that all real knowledge depended on scientific evidence drawn from sense experience. Lewis would not admit that the kind of experience that came through imagination had anything to do with knowledge of reality [...] when it came to converting that imaginative subject matter into actual knowledge you had to go back to the ordinary scientific method, to put it on the laboratory table, so to speak."<sup>39</sup>

In the closing lecture Steiner does ask us to consider that, "In representing a science of this kind to the outer world the question may easily arise, to what extent the higher powers of cognition—Imagination, Inspiration, and Intuition—are needed for the discovery of these relations between phenomena."<sup>40</sup> The conventional sunspot research reported above supports the notion that "There's still this possibility—if it's really so that there's a great reluctance to cultivate higher modes of knowledge—there's the possibility of simply taking the results of such research and testing them against what's found in the field of external empirical fact."<sup>41</sup> Yet Steiner exhorts us that, indeed, "if we don't shrink from developing the forces within the human soul, depths of reality which would otherwise remain concealed will be ever more unveiled."<sup>42</sup>

True to anthroposophical science, Steiner intends in these lectures "to show concretely that certain [expanded] modes of cognition are justified. ...that the prevailing paradigm... needs to be put on a far wider basis, so that not only a part but the whole of our human nature becomes the 'reagent' for a deeper penetration of the heavens."<sup>43</sup>

It was encouraging that several new younger members, besides Gopi, brought their human nature to the conference. Many of the rest of us 'reagents' have seen 'many moons' now. In fact, from his own days in the frat house across the street, Andrew Linnell remembers the one-time frat house that is now Rudolf Steiner House—equipped therefore with a wonderful large kitchen in which Andrew now years later has found himself serving as Chief Cook and Bottle Washer for a couple of our meetings there.

Thanks to Andrew's initiative,<sup>44</sup> having meals together (and pitching in to chop vegetables and wash the dishes) has become a vital part of our companionship. We continue our networking and conversation at table and at sink. And the comradery is even greater for those who stay in the guest rooms at Rudolf Steiner House. We can be more than grateful for this meeting venue at the Society headquarters.

Over the days, we also had impromptu presentations and lively discussion sessions. On the closing morning we looked back upon the conference—the 'cultural therapy' that Steiner was attempting, the balance of activity and talk, the time set aside to reflect, and much more. We also looked forward—to reaching the public and academia and the younger generation, to starting a newsletter and video working groups, to envisioning our next conference based on Peter Heusser's book, *Anthroposophy and Science* (see announcement in this issue).

Fred's skillful translation and knowledgeable editing and extensive commentary will help, but *Interdisciplinary Astronomy* is a challenging lecture cycle. And no wonder—the main point Steiner is trying to make is "that the

<sup>38</sup> *Interdisciplinary Astronomy*, p.175.4. (Lecture 16)

<sup>39</sup> Barfield, Owen (G.B. Tennyson, ed.) 1989, *Owen Barfield on C.S. Lewis*, Wesleyan Univ. Press. P. 135.3.

<sup>40</sup> *Interdisciplinary Astronomy*, p.203.5. (Lecture 18)

<sup>41</sup> *Interdisciplinary Astronomy*, p.203.6. (Lecture 18)

<sup>42</sup> *Interdisciplinary Astronomy*, p.203.8. (Lecture 18)

<sup>43</sup> *Interdisciplinary Astronomy*, p.64.3. (Lecture 6)

<sup>44</sup> When not our chef de cuisine, Andrew lectures on the Christian Mysteries: <http://thechristianmysteries.com> and the Mysteries of Technology: <https://mystech.co> [N.B., that is .co, not .com].

whole methodology underlying science as it's currently practiced needs to be transformed."<sup>45</sup> We are not schooled for it; we need build inner capacities to transform our thinking habits. Yet it is a very rewarding lecture cycle just for this purpose. And working with its themes of polarity between earth and cosmos in relation to the constitution of the human being will enrich your work in many fields of anthroposophical activity, from the Class Lessons to biodynamics. There is so much more which could be presented about the Astronomy Course. We would welcome articles for the *Correspondence*!

### Keryx Editions

Fred Amrine has been translating and editing other works by Rudolf Steiner, including *The Essential Philosophy of Freedom*. They are available through Amazon. Search "Keryx."

## Eurythmy for the Natural Science Conference at Rudolf Steiner House in Ann Arbor, November 2017

—Susann Eddy

*In the "Astronomy Course" (CW323) Rudolf Steiner said; "So you see, mathematics itself provides us with facts which oblige us to go out of space if we would preserve the continuity of the idea. The reality itself demands of us that in our ideas we go out of space. Even in mathematics therefore we are confronted with something which shows us that in some way we must leave space behind if the pure idea is to follow its right path. Having ourselves set going the idea in beginning to think the process through, we must go on thinking in such a way that space is no longer of any help to us. If this were not so, we should not be able to calculate all possibilities of the equation."* (*The Relation of the Diverse Branches of Natural Science to Astronomy, undated typescript*)

I brought two eurythmy movements related in particular to this lecture cycle for the conference participants.

**CONTRACTION AND EXPANSION** are experiences in waking and sleeping, birth and death, breathing in and breathing out. It is expressed in poetry and mantras, i.e. Calendar of the Soul verses by R. Steiner and an excerpt from one of the poems by William Blake to which the participants moved during our conference sessions:

To see a world in a grain of sand  
And heaven in a wild flower  
To hold infinity in the palm of your hand  
And eternity in an hour.

Through movement from expansion to contraction and back to expansion, we discovered how to move from the periphery to the center and back, from out to in, from outbreathing to inbreathing. It allowed us to move out into the world, into the cosmos, out of space, as well as into to the center, to the tiniest places on earth. We had to be aware of the two opposites that are mirrored and reflected and yet at the same time within each other. "There is something expansive and something that centers itself" (R.S). It is the interplay between the sun and the earth, periphery and point, cosmos and earth moving and coming back to us from the other side.

<sup>45</sup> *Interdisciplinary Astronomy*, p.199.6. (Lecture 18)

**THE CURVE OF CASSINI** is described in the Astronomy Course by Rudolf Steiner in 1921. It is also a eurythmy form that was given to the first eurythmists. (The drawing of the form can be found in the book “Entstehung und Entwicklung der Eurythmie” which is, “Emergence and Development of Eurythmy”, but as far as I know it has not been published in English).

I would like to point to some history of the connection between the Curve of Cassini with eurythmy and the Astronomy Course from 1921. Two eurythmists were invited to take part: Elisabeth Baumann (Dollfuss) and Erna Wolfram (van Deventer). As Erna van Deventer recalls, both of them were not scientists and were there more as visitors. Here is a recount of their story: “...even if we did not understand it all—our enthusiasm for the astronomical drawings made up for it. And one day Dr. Steiner drew something on the blackboard that made us fall on top of one another and nearly jump into the air, and that was the curve of Cassini. This was the *external* occurrence that we needed to make us aware that the paths of the stars and the flow of forces *within* us, both sprang from the same source! For this curve of Cassini that Dr. Steiner was now describing in connection with natural science and astronomy, why, we eurythmists knew it too!” (Curative Eurythmy, reference to the fourth German edition)

Rudolf Steiner gave the following words to the eurythmist when they move the Curve of Cassini:

		English Translation
<b>Oval:</b>	<b>Wir wollen suchen</b>	<b>We will to seek</b>
<b>Lemniscate:</b>	<b>Wir fuehlen uns</b>	<b>We sense/feel one another</b>
<b>Two smaller circles</b>	<b>Wir kennen uns wohl</b>	<b>We know one another well</b>

### **Oval**

- Moving an oval form with two focal points connected and aware of each other

### **Transforming into lemniscate**

- Moving into lemniscate from two sides

### **Two smaller circles**

- Moving into two separate circles, the two groups from the two circles facing each other (the midpoint or crossing point from the lemniscate is between the two circles that are now facing each other)

When we moved the forms, we had a copper ball in our hand to help us with the experience of the center/inside and periphery/outside as well as the opposite point of the form.

We started to move the **oval without dip clockwise (and the with dip on the narrow side also)** and held the ball in our right towards the center of the oval. Then we tried to experience the periphery by holding the ball in our left hand.

The **lemniscate** followed, we then held the copper ball in our right hand which meant that the focus was towards the center of the first loop of the figure eight or lemniscate. Then we kept the ball in our right hand which brought our attention to the periphery of the loop after the mid crossing.

The **two small circles** that followed brought the two groups into relation towards one another. The straight lines were there through relationship of opposites, visible and invisible.

(When the form is done with four people a straight line becomes more easily visible.)

It was wonderful to do eurythmy with the people who participated in this contemporary conference on the Astronomy Course, many of whom were enthusiastic to move together and discover these eurythmy forms. Doing the eurythmy in this way can contribute to coming closer to many fields of studies, perhaps including one's own field, in an imaginative way. It is my hope that many of the participants were able to have such an experience.

## 2017 Section Business Meeting Report

**Attendees:** Austin Abigt, John Barnes, Oliver Conradt, Judith Erb, Branko Furst, Henrike Holdrege, Snetu Karania, Joshua Kelberman, Barry Lia, Andrew Linnell, Ted Petrenko, Anouk Tompot, Gopi Vijaya (notes).

Sunday morning of the conference, the NSS/MAS business meeting was held. The first topic was planning for 2018 Section conference with Dr. Peter Heusser. Spring Valley is favored. With 19 registrants here in Ann Arbor, we'll need draw twice as many to afford Threefold Educational Center venue. Fundraising efforts were discussed.

Another topic was communication: the lack thereof between Sections and with the Society. Even with the banner on the ASA home page, the event listing gets buried several webpages down the list. There used to be the newsletter of the Society for the Evolution of Science. We also drew a picture of First Class responsibility, on Section and individual levels, to reach the general public. Medical doctors present at non-anthroposophical conferences.

The Steering Committee continues to hold conference calls every Monday morning. After solicitation for new members, and recommitment from current members, there was a vote.

**Treasurer's report:** As of the close of the year 2016, we had \$7,011.45 in Savings and \$1,697.50 in Checking, for a total of \$8,708.95.

In January, we finally wired Johannes Kühl's travel reimbursement to settle accounts for the 2016 conference. That conference closed with a \$106.96 net gain.

We had \$1,184.64 in web site expenses for the year. We paid Rudolf Steiner Fellowship Foundation \$240 for Jennifer Greene's food and lodging at the Collegium meeting.

We received a \$200 donation in July from Thomas Newkold toward the 2017 conference. At the conference we received another \$150 from Ted Petrenko, \$100 from Judie Erb, plus in-kind donations from Andrew Linnell, Gopi Vijaya, and Henrike Holdrege equivalent to \$750.

As of November 10<sup>th</sup>, we have \$2,017.24 in Savings and \$4,372.86 in Checking (prior to 2017 conference financials), for a total of \$6,390.10. This is earmarked for a planned conference following the publication of the English edition of Wolfgang Schad's expanded *Man and Mammals*.

We anticipate a net shortfall on the 2017 conference of about \$1000.

**Steering Committee:** John Barnes, Judie Erb, Jennifer Greene, Barry Lia, Andrew Linnell, Gopi Vijaya, Joshua Kelberman (as available).

**Approved:** Katherine Thivierge, the Society's Director of Operations, be added as a co-signer to the Section account held by the Treasurer, Barry Lia, at his local credit union.

We want to acknowledge our donors in 2017,  
who contributed cash and in-kind donations worth \$1260:

*Judith Erb, Andrew Linnell, Henrike Holdrege, Thomas Newkold, Ted Petrenko, Gopi Vijaya*

**For Johannes Kühl, for your birthday festivities at the Goetheanum on October 3<sup>rd</sup>:**

*The Natural Science Section of North America wishes you many happy returns on your 65th birthday.*

*With this we send our deep gratitude for your leadership and guidance all these years.*

*It has been our pleasure and honor to work with you.*

For the Steering Committee:

John Barnes, Judie Erb, Jennifer Greene, Barry Lia, Andrew Linnell and Gopi Vijaya



## Section Fundraising

The Steering Committee—the shepherding group for Natural Science Section activities—has been working on strategic planning and has written a Case for Support for our immediate activities in 2018 as well as Long Range Planning.

*Our immediate urgent need is for two key upcoming activities:*

We are looking for \$1800 to fund attendance by at least three Section members from America at the Goetheanum Section’s international conference, *Evolving Science* 2018, this October in Dornach, Switzerland. This personal interaction is vital for building collaboration with colleagues in Goethean/Anthroposophical science in Europe and for reporting back on their activities.

For our American Section’s upcoming *Bridging Natural Science and Spiritual Science* conference in Spring Valley, NY, this November, we are in need of \$3600 for video services and other expenses greater than covered by registration fees. We have already received \$1200 in pledges toward this end. Through live-streaming and archiving Dr. Heusser’s public lectures, and by participants returning to their communities to spread the word, we aim for outcomes beyond the conference itself.

These two conferences are described in the announcements above.

*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 40<sup>th</sup> 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 28.)

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

### **Sponsors and Donors thus far this year:**

**Threefold Educational Center, Threefold Café,  
Physicians’ Association for Anthroposophical Medicine, The Nature Institute,  
Water Research Institute of Blue Hill, Center for Anthroposophical Endeavors,  
John Barnes, Dwight Ebaugh, Judith Erb, Jennifer Greene, Barry Lia, Andrew Linnell, Gopi Vijaya.**

## Notes and Commentary

**Editor's preview.** This section is to be populated by colleagues' shorter notices and larger commentary on scientific news, published articles, videos, passages in books and articles, observations in nature, etc.

Please try to be constructive, furthering our mission. Look for the 'pregnant point.' Avoid mere criticism of reductionism and materialism. We don't want this to be an outmoded form of Twitter! Find boundaries, bridges, productive comments about something learned, something you are grappling with, connections made, something to bring to others' notice.

A Note might be just a passage or a notice of something to read, see, or listen to. A few words of context might be called for and an iteration of the point made.

A Commentary would entail the colleagues' own thoughts and reflections in addition, in the course of reviewing books, articles, film, art works, etc. When warranted, source material, such as scientific articles, may be posted for reference under educational fair-use in the registered members section of the website.

Examples of Note material might be the closing paragraph of the *Evolving Science 2015* report in the middle of page 10, or the Barfield on Lewis paragraph of the report on our 2018 meeting near the top of page 17. Craig Holdrege's *In Context* [article](#) on his experience of "Nature's Revealing Surprises" would serve as a longer example.

I have a copy of the latest *New View* magazine on my desk. In this issue of *New View* there are a few pertinent articles deserving Commentary. I've even asked permission to reprint a couple.

For the next issue, however, we are especially looking for notes and commentary on Peter Heusser's *Anthroposophy and Science*, in preparation for our upcoming conference. You are, of course, reading his book.

Who should contribute? Perhaps you have been to one of our annual meetings. Perhaps science isn't your main concern, but something comes up—perhaps just a question to pose? Or you may note an instance where technology may impact you in a remarkable way? Or you notice something in nature, like an unusual blossom? Photos are welcome as well. This area of the *Correspondence* is a place for *all* our reader community to participate, to reflect upon science and technology in our lives. We look forward to your [submissions](#).

As you and our fellow colleagues begin contributing, we'll build a productive culture of correspondence.

## Webinars

The Society website affords the possibility of webinars. Should a particular issue develop a critical momentum, we can organize a webinar around the topic.

### Soon to be announced WEBINAR

Look for an announcement in the next issue for a Webinar in preview of the *Bridging Natural Science and Spiritual Science* conference and the importance of Dr. Heusser's work on the scientific foundation of Anthroposophy.

*We'll say what we think is in it for you, and we'll ask you what you are looking for.*

# Announcements

From  
**The Nature Institute**  
[natureinstitute.org](http://natureinstitute.org)



♦ **Whole Organisms and Their Evolutionary Intentions** — Steve Talbott has posted an article summarizing some themes of his new book project. While these depart radically from conventional thinking, they might also be considered mere commonsense. Stay tuned for some of the individual chapters, as they are written. You will find the summary article [here](#).

♦ **In Context #39 is now online!** Feel free to engage the question of the feature article: "Do we live in a meaningless and indifferent universe?" Or read "Nature Playful," where you can view the remarkable variety of color and form in the flowers of *Hepatica americana*. Or, again, focus your mind upon a simple geometrical exercise. And, as always, read about the latest news and goings-on at The Nature Institute. You can browse the entire issue [here](#).

♦ **Our first podcast and our "Other Media" page** — as you might have noticed, in the last year we've started to put some of our talks online as videos. Now we've taken a new talk that Craig gave this March and made it into our first podcast. You can find all of those resources on our new "[Other Media](#)" page. Enjoy!

♦ **Diversity in Human Fossil History** — a new teaching kit on human evolution, prepared by Craig Holdrege. The kit is designed to bring evolutionary teaching into closer correspondence with the available evidences, which are never as neat as the textbook theories might suggest. The kit is described and made available [here](#).

♦ **Do Frogs Come from Tadpoles? Rethinking Origins in Development and Evolution** — Craig Holdrege's new Nature Institute Perspectives booklet on the stunning development and metamorphosis of the frog, together with an elucidation of the puzzles of its evolutionary development. The booklet is available [here](#).

**Mission:** Nature around us is whole and interconnected. Though we are part of nature, we do not yet fathom her depths, and our actions do not embody her wisdom. A fundamental shift in our way of viewing the world is necessary if we would contribute to nature's unity rather than dissolution. At The Nature Institute, we develop new qualitative and holistic approaches to seeing and understanding nature and technology. Through research, publications, and educational programs we work to create a new paradigm that embraces nature's wisdom in shaping a sustainable and healthy future.

**Who We Are:** The Nature Institute, founded in 1998, is a small, independent not-for-profit organization in upstate New York with a proven track record for incisive and thoughtful research studies, publications, and education programs. The Institute serves as a local, national, and international forum for research, education, and the exchange of ideas about the re-visioning of science and technology in an effort to realign humanity with nature. Staff members and adjunct researchers/faculty (see below), have authored books and articles while also speaking at conferences, leading workshops, training teachers, and lecturing widely.

From  
**SENSRI**  
*Saratoga Experiential Natural Science Research Institute*  
[www.sensri.org](http://www.sensri.org)



### **A New Science Integrating Humanity and the Environment**

Our mission is to promote research, education and the exchange of ideas growing out of a new science based on active human perception. By developing new capacities of sensing and thinking we envision and design creative environmental technologies, in harmony with nature, meeting human needs.

*Since 1999 SENSRI has worked as a non-profit research institute in Saratoga Springs, New York, to develop practical solutions to questions of science, technology and the environment by working from a new understanding of human perception and experience. You can read more about our [history](#) here, or meet our researchers and board members by clicking [here](#). In 2014, we moved to our present address in Keene Valley New York in the heart of the Adirondack Mountains where we have a small center to host conferences and workshops.*

On our [Research](#) web page you can learn about our past research activities, such as the Living Waters project, or the behavior of artesian springs in Saratoga Springs, or how current explanations of global warming focus so much on a single atmospheric constituent - carbon dioxide - that we ignore important elements of the larger picture. Our present research focuses on how a *Living Thinking* approach to science as well as a *Living Sensing* perceptive ability help us to overcome our preconceptions. This helps us to more fully and completely experience even the most subtle experiences as educators, scientists and in our everyday human life.

SENSRI also provides educational courses and science workshops, as well as resources for educators; you can learn more about these on our [Education](#) page.

Our work at SENSRI involves learning new ways of perceiving, freeing ourselves from fixed or static concepts, and applying new approaches to experiencing our world. In this, we find we have much in common with artists who also seek to free themselves from conventional viewpoints, to see our world in new ways. Here, on our [Art and Environment](#) pages, we invite you to experience the perspectives of artists whose work demonstrates new ways of seeing the world.

SENSRI [Publications](#) and [Newsletters](#), as well as descriptions of some of our [Past Events](#), can also be found here. Please read on and explore our site to learn about how SENSRI and you can work together to develop new perspectives on our world that will integrate humanity and environment into a seamless, sustainable unity.

Michael D'Aleo and staff just completed a Summer course, [Living Thinking - Living Sensing - Living Doing](#), in the Keene Valley of the Adirondack High Peak Region in upstate New York.

[Upcoming Events](#) will be posted on the SENSRI website and announced in the *Correspondence*.



From  
**Water Research Institute of Blue Hill**  
[waterresearch.org](http://waterresearch.org)



The Water Research Institute's (WRI) approach to water has been inspired by the work of Theodor Schwenk, author of *Sensitive Chaos*, and the pioneers in this work at the Institute for Flow Sciences in Herrischried, Germany.

The Water Research Institute operates as an incubator for ideas and new directions in the applications of the knowledge of water acquired through empirical research, development of practical applications, and education.

Our mission is to awaken, through education and phenomena research, a new awareness of water's role as an element of life and to develop new criteria and directions for the improvement, protection and management of water quality.

The basis for WRI's work is to seek a definition of water based upon its *positive* qualities, rather than the absence of pollutants and such. From this standpoint we work to:

- Discover a deeper understanding of water and its fundamental qualities.
- Articulate and disseminate findings about the relationship between water's inherent qualities as a fragile, life-giving resource and the ways of managing it.
- Advocate, support and facilitate projects that arise out of this deepened understanding of water.

Our mission at the Water Research Institute of Blue Hill (WRI) is to discover a definition of good water that is based upon the nature of water itself. This can be observed through water's behavior and the conditions water needs in order to serve life. The laboratory is equipped for the Drop Picture Method of water quality assessment.

WRI has been working with the water and wastewater industry, bringing another view of the nature of water, while working on helping municipalities deal with their sludge treatment programs. A method of drying and treating sludge, first suggested by Dr. Kathe Seidel at the Max Planck Institute in the late 1960's, was picked up by my colleagues, taken from the laboratory to the field, and refined. We now have a combined experience with this technology of 80 years and roughly 6.5 million square feet of "constructed wetland" experience under our belts for many different treatment needs. We have 98% success of "nature serving nature," saving municipalities hundreds of thousands of dollars in costs. Right now, we are planting 275,000 square feet of sludge area in Wisconsin, Nebraska, Pennsylvania, New Jersey and some other states. Our reputation is stellar.

To this work I bring to the public a new way of looking at water and conceptualizing water. We are creating a little manual for the public, to be handed out by municipalities to residents: "A Citizen's Manual on Water." Along with the usual picture of water, we describe where water is to be found, how it is delivered, used, and treated after use. This manual will bring attention to our work and our concept of working with water in the public sector.

From  
*MysTech*



### Melding Morality and Technology Collaboratively

MysTech is a two-year-old, not-for-profit organization devoted to cultivating a healthy relationship between human beings and machines. Rudolf Steiner indicated that such a "welding together" would be an issue for the rest of human evolution. For this "welding," we seek guidance from spiritual science. We understand the need for inner development whereby we can act with a moral purpose. To approach such goals as selflessness, we know that we must gradually build a base with other human beings seeking the same goal.

The name MysTech combines Mysteries and Technology. At the center of our logo is the Tao sign. In the *Temple Legend*, Rudolf Steiner mentions the Tao several times. "In the future, machines will be driven ... by spiritual force, by spiritual morality. This power is symbolized by the Tao sign."

Computers have evolved from chilled mainframes to personal computers to cloud computing. These 'out-of-sight' cloud computers have enabled a new generation of 'apps' for smart phones and portable computers. Many apps use artificial intelligence available in these cloud computers. Movies have alerted the general public of dangers here. We've learned that some companies have intended to build a clientele who spend considerable time using their software – perhaps even knowing that it was addictive. To address such concerns and to overcome related fears is also a goal of MysTech. We ask: can an organization such as MysTech influence an industry to construct machines that can filter and operate only upon moral impulses?

### Initiatives

- **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 and a full-time school curriculum into the matter of moral technology for the future. To become a member, go to: <http://rudolfsteinerbookstore.com/membership/mystech/>
- **Research:** once MysTech has a solid foundation, then significant research can begin. Currently, some research is being done by unfunded volunteers.
- **MysTech Journal:** is published twice a year to support research. To purchase the MysTech Journal or a Subscription, go to: <http://rudolfsteinerbookstore.com/membership/mystech/>
- **School/Study Groups:** a syllabus is available for ongoing, online Zoom study groups 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 [at] yahoo.com.
- **Conferences:** We hope to hold our first MysTech Conference in 2019.
- **Organization:** MysTech is based in Seattle, WA but its members are geographically dispersed. It is a part of the Center for Anthroposophical Endeavors (CFAE) where it holds its 501c3 status. MysTech operates the website <https://mystech.co> as a repository for its research and lecture slides. Coming soon will be <https://mystech.org> which will be the public facing website. MysTech volunteers administer the Facebook group [Anthroposophy and Mechanical Occultism](#).

We'd love to hear from you. Questions and suggestions may be sent to cfae [at] outlook dot com.

*CFAE supports MysTech and Rudolf Steiner Bookstore, which is handling pre-orders of the Wilson book below, and is building a new endeavor called Local Commons, built on a Threefolding foundation.*

[Ed. Check out the wonderful selection of children's wooden toys through the [Bookstore](#).]

## Book Announcements

### ***What is Colour? The Collected Works***

Michael H. Wilson

Edited by Laura Liska & Troy Vine

Foreword by Prof. Jonathan Westphal

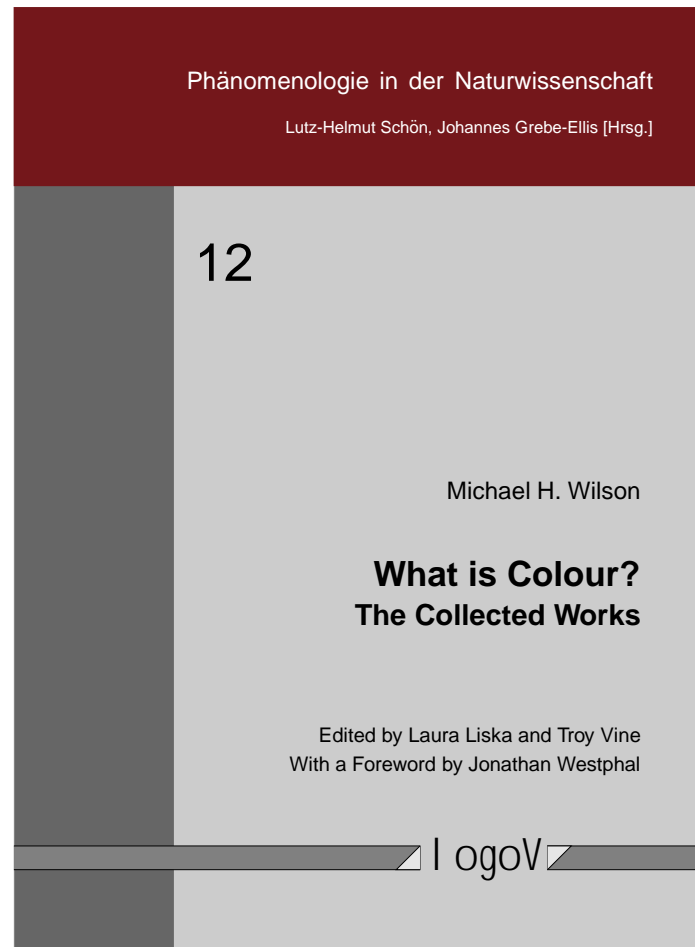
[Michael Henry Wilson](#) was a man of many interests and talents who felt the main theme of his life was in the understanding of light and colour. He expanded Goethe's theory of colour with his own experiments in coloured surface reflection, coloured shadows and after-images. Wilson did not merely repeat 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.

[What is Colour? The Collected Works](#) is edited by Laura Liska and Troy Vine, with a forward by Jonathan Westphal. Professor Westphal has a long career in colour science and philosophy. The book will be launched on the 28<sup>th</sup> of August at the Glasshouse Arts Centre, Stourbridge, UK, and forms part of the opening celebrations of the exhibition [experienceCOLOUR](#). This exhibition is held in cooperation with the Natural Science Section in Dornach (see page 10).

*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).*

**Pre-orders** of the book may be made [here](#). Use coupon code: **colour**



# ***Understanding Mammals: Threefoldness and Diversity***

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

by Wolfgang Schad

[Adonis Press](#), December 2018

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.

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



# Calendar of Events

## 2018

- August 28-October 14: *experienceCOLOUR* (Glasshouse Arts Center, Stourbridge, UK)  
<https://www.rmlt.org.uk/Pages/Site/experiencecolour/Category/experiencecolour>
- September 6: *Finding Medicine with Meaning*; A seven-session webinar series offered by the Physicians' Association for Anthroposophic Medicine (PAAM) (online)  
<https://paam.wildapricot.org/event-3012679>
- September 21-22: *20 Year Anniversary Talk and Workshop* (The Nature Institute; Ghent, NY)  
<http://www.natureinstitute.org/calendar>
- 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/](http://www.forschungsinstitut.ch/en/)

*Mathematics-Astronomy Section*

[mas.goetheanum.org/en/mas/](http://mas.goetheanum.org/en/mas/)

*School for Spiritual Science*

*Anthroposophical Society in America*

[www.naturalsciencesection.org](http://www.naturalsciencesection.org)

[anthroposophy.org](http://anthroposophy.org)

*Correspondence*

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