

CORRESPONDENCE

OF THE NATURAL SCIENCE SECTION OF THE
ANTHROPOSOPHICAL SOCIETY IN AMERICA

NOVEMBER 2018

VOLUME 1 ISSUE 3

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

By Wolfgang Schad

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**25% OFF until January 15th
See page 8**

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Editor's Note

This “November” issue was all but ready to come out in early November, just before our Section conference in Spring Valley with Prof. Dr. Peter Heusser of Witten/Herdecke University, Germany. However, the editor has been fumbling to format the many photos of the 2016 Geology Group meeting report, which would have been included. That report will rather appear in the true December issue, which itself will come out in a few days.

Meanwhile, now that Wolfgang Schad's [Understanding Mammals](#) has become available (see p.8), it is incumbent upon us to get this issue out right away. Until January 15th, Schad's new two-volume, expanded edition of his *Man and Mammals* can now be ordered at a 25% discount! Natural Science Section, AWSNA, and academic conferences are in the works, for which this new edition will set the theme.

In this issue we also announce the availability of a video archive of each evening's lecture for those who could not attend the “Bridging” conference with Prof. Dr. Heusser (see p.3). Two book reviews related to this conference theme are also included.

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

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

Blessings for these Holy Days and Holy Nights,

Barry Lia, Ph.D.
Correspondence Editor

Please Support Our Work

We call upon our readers to participate in the Correspondence by sending us notes and commentary on what you are encountering in relation to science and technology. Feel free to contact the editor [here](#).

We also ask that you 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.

Furthering the epistemological foundation of anthroposophy is not only a matter of scientific method. 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 is important for *all* of us working with anthroposophy to further our culture today, be we teachers, farmers, doctors, therapists, artists, entrepreneurs, or anyone seeking to heal the contemporary worldview.

The video archive of Dr. Heusser's public lectures presenting this theme will be a great aid to organize workshops across the country, reaching the broader audience that should take interest in these matters.

With these videos, together with the inauguration of the *Correspondence*, we have made a substantial advance in our outreach capability. We ask you to consider furthering this work financially.

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

(It is possible to set up recurring monthly donations.)

To donate, click [here](#).

Or mail check payable to “Natural Science Section” in care of our Treasurer, Barry Lia at:
Anthroposophical Society in America, 1923 Geddes Ave, Ann Arbor, MI 48104

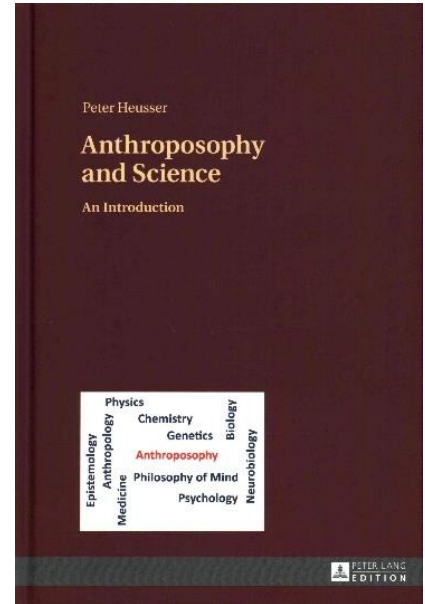
Thank you kindly for your consideration.

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

Video archive of Prof. Dr. Peter Heusser's Public Lectures



BRIDGING NATURAL SCIENCE AND SPIRITUAL SCIENCE



We wish that more of you readers could have joined us for the “Bridging Natural Science and Spiritual Science” conference in Spring Valley in early November.

However, you can now view Prof. Dr. Heusser’s Public Lectures archived on our website.

These four lectures stand as a summary of his book and will hopefully serve as the basis of regional workshops continuing this work to promote an understanding of Rudolf Steiner’s epistemology on a modern, scientific basis.

Lecture 1: ***Is there a place for the spirit in physics and chemistry?***
– ***On the importance of epistemology for natural science.***

Lecture 2: ***Is there a chemical or genetic explanation of life?***
– ***A closer look on causality and agency in modern biology.***

Lecture 3: ***Does the brain cause consciousness?***
– ***A way out of neurobiology’s current doctrine.***

Lecture 4: ***From natural science to spiritual science.***
– ***Rudolf Steiner’s contribution to the evolution of science.***

Click [here](#) to register for video access.

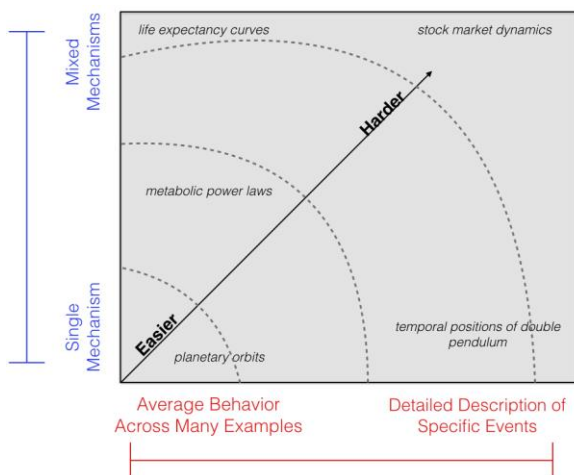
Notes and Commentary

Note:

“Who is responsible if a prosthetic limb malfunctions and strikes someone in a crowd—the patient or the device?” Ethicists and philosophers working in the Center for Neurotechnology at the University of Washington have been funded to address such issues in prosthetic and other brain-computer interfaces currently under clinical study in the States, the Netherlands, and Germany.¹ What are the perspectives of both researchers and participants about brain-computer interfaces? Can patients be better informed before consent? Can devices be designed to better suit users’ values? Will patients using these devices feel in charge of their own actions? —Barry Lia

Note:

A graph in a recent *Aeon* article² caught my eye.



The point of the graph was to portray a polarity from “easier” questions in science, such as a planet’s orbit, to the “harder” questions, where we aim to explain more complex and specific events with mixed contributing factors, such as stock market dynamics.

The abscissa brought to mind another gradient, that between the abstracting generalizations of experimental science and the attentive concern and “gentle empiricism” of phenomenological science.

¹ www.washington.edu/news/2018/11/28/cnt-neuroethics-grant/

² aeon.co/ideas/when-science-hits-a-limit-learn-to-ask-different-questions

The discovery of natural laws from examining “average behavior across many examples” in simplified situations struggles to explain specific events. A form of “detailed description of specific events” can lead—through exploration of the specific phenomena and their interactions—to the Urphenomenon.

Of greater interest was the citation of an article in *Science* from nearly half a century ago by P.W. Anderson, “More is Different.”³ Anderson shows how the constructivist converse of reductionism breaks down in the face of symmetry breaking in physics. For example, the ammonia molecule, NH_3 , inverts its pyramidal shape symmetrically at a frequency of about 3×10^{10} Hz. PH_3 , about twice as heavy, inverts at about a tenth the frequency. Much heavier PF_3 is not observed to invert at a measurable rate, though theoretically it could. A sugar molecule of 40 atoms will never invert. “At this point we must forget about the possibility of inversion and ignore the parity symmetry: the symmetry laws have been, not repealed, but broken.” We may relate this to the supervenience of higher conditions upon lower laws of which Heusser writes.

In accord with this theme in Heusser’s book *Anthroposophy and Science*, Anderson finally writes, “We expect to encounter fascinating and, I believe, very fundamental questions at each stage [up the hierarchy of the sciences] in fitting together less complicated pieces into the more complicated system and understanding the basically new types of behavior which can result.” From whence appears such new behavior? Below? Above? Before? After?

In reference to living beings, Anderson had introduced temporal regularity as another type of symmetry, broken now in the [etheric, Ed.] processes of growth and development.

After concluding that “...each level can require a whole new conceptual structure,” Anderson ends with a quip on how qualitative differences can come from quantitative ones in a 1920’s dialog in Paris:

FITZGERALD: The rich are different from us.

HEMINGWAY: Yes, they have more money.

—Barry Lia

³ Anderson, P.W. (1972) More is Different: Broken symmetry and the nature of the hierarchical structure of science, *Science* 177:393-6

Book Notice:

In the Shadow of the Machine: The Prehistory of the Computer and the Evolution of Consciousness by Jeremy Naydler (Temple Lodge, 2018)

A new book by Jeremy Naydler, anthroposophist, philosopher, and cultural historian in Oxford, England, *In the Shadow of the Machine: The Prehistory of the Computer and the Evolution of Consciousness* (Temple Lodge), suggests that current disquiet about AI is primarily a result of our having become confused about what actually constitutes intelligence, due to a drastic narrowing of our understanding the true nature of human thinking.

He draws attention to the fundamental difference between:

- 1) “discursive thinking” (which could also be called “machine thinking” or AI), which “runs along” (L>dis-currere) from one already formed thought or logical inference to another (“analyzing data”) until it arrives at a conclusion or goal; and
- 2) “contemplative thinking,” which stays still, meditatively focused, orienting itself to the originating source and inherent meaning of the living thoughts that it thus creatively and freely brings into being.

The book also traces the evolutionary history of these concepts. AI’s assumption that human intelligence is simply the product of physical processes in the brain contradicts the direct experience of every human being who has engaged in real thinking. Rather than being the causal effect of physical, mechanically conceived brain processes, the intrinsic dynamism and energy of the act of thinking is in reality their cause (as increasing evidence in neuroscience is supporting).

Naydler includes various quotations from Rudolf Steiner supporting this picture, such as “One will never arrive at something which is the cause of thinking if one steps outside the realm of thinking itself” (The Philosophy of Spiritual Activity) and “In a true experience of thinking . . . one no longer feels

oneself outside the divine, but within it. To lay hold on thinking in oneself is to lay hold of the divine there.” (Mystery Knowledge and Mystery Centers, Lecture 1).

Naydler also has a summary article, “The Spiritual Challenge of Artificial Intelligence,” in the Autumn 2018 issue of the British anthroposophical magazine, *New View* [subscribe [here](#)]

—David Adams

Book Notice:

Emerson and Science: Goethe, Monism, and the Search for Unity by Peter A. Obuchowski (Lindisfarne, 2005)

The origin to this book reaches back to 1969 when Peter Obuchowski was a PhD student at the University of Michigan. He decided to base his PhD thesis on an inspiration he realized from Professor Floyd Stovall’s 1963 article *Eight American Authors: A Review of Research and Criticism* (Norton, 1963). Stovall had made a point about Emerson’s strong relationship to science that most critics of the Transcendentalist had overlooked.

Obuchowski’s book should be included in those pertinent to our 2018’s conference theme, “Bridging Natural Science and Spiritual Science.” For despite, nay, for in addition to his philosophy and theology, Emerson sought to “put science and the soul, long estranged from each other, at one again.”⁴

Emerson’s science “teacher” was Goethe. Emerson resonated with the fact that Goethe “was both scientist and idealist” who “sought to show the material, empirical view of the universe not incompatible with a spiritual, supersensible view.”⁵ Before being introduced to Goethe, Emerson had struggled between the competing ideals of Plato on one hand and Locke on the other. The classification work of Swedish botanist Carl Linnaeus had become accepted as fact, but Emerson could not accept this. Goethe’s *Metamorphosis of Plants* opened his eyes to a new view of reality, while it also revealed the necessary change in the scientific method. “Emerson, thus, through Goethe’s science, came to see imagination as a ‘reader of forms’, the mode of cognition most capable of perceiving reality.”⁶ Emerson tells us “Science does not know its debt to imagination. Goethe did not

⁴ *The Complete Works of Ralph Waldo Emerson*, ed. Edward Waldo Emerson, volume 4, 1903-04, p.111-2

⁵ Peter Obuchowski, *Emerson and Science*, Lindisfarne Books, 2005, p.25

⁶ Peter Obuchowski, *Emerson and Science*, Lindisfarne Books, 2005, p.30

believe that a great naturalist could exist without this faculty.”⁷

Emerson never fought against science, only against paths that could not lead to a bridge to spiritual science. As Obuchowski states, “even for Emerson, his Transcendentalism was a spiritual path, not a finished philosophy.”⁸

The similarities of Emerson’s Transcendentalism and Steiner’s Anthroposophy, in regard to science, are striking. Where Emerson spoke of the scientist experiencing phenomena as a poet would, Steiner asks the scientists of the future to experience phenomena through the eyes of an artist. Emerson states, “Natural Science, without philosophy, ... was unsouled.”⁹ Obuchowski adds that Emerson felt that Art, Science, and Religion needed to be reunited. “Once science became oriented to Goethean strictures, it and philosophy could proceed meaningfully together in a mutual pursuit of truth.”¹⁰ Emerson did not fear science as did many of his contemporaries. No, he continually sought to balance his mysticism (as some have called it) with his scientific interests, believing one without the other would lead away from truth.

Both Steiner and Emerson admitted to being monists. “Emerson firmly believed that spirit and matter would ultimately be shown to be one.”¹¹ And like Steiner, Emerson chastised science for limiting itself to the inorganic. Then science incorrectly applies the laws learned from the inorganic to the organic without seeing any higher laws. Heisenberg agrees, “We cannot assume such simple proportions as: biology relates to chemistry, as chemistry to physics. It would probably be more correct to say that a completely new level of perception and understanding had to be achieved in the transition from an aspect of reality already ‘understood’ to one still new.”¹² Obuchowski describes the influence Emerson had on the forthcoming generation of scientists in addition to Heisenberg, including Hoyle and Whitehead.

Obuchowski concludes with these words that are so fitting to our current struggle to build that bridge, “An understanding of the role of science in Emerson’s thought can let us see more clearly not only the coherent outline of his total vision but, equally, the keen awareness on Emerson’s part of what was needed to make that vision whole.”¹³

—Andrew Linnell

From *Riddles of the Soul* (Mercury Press) p.103-4

“The question could easily arise: Then why does the soul seek to form natural-scientific pictures, if precisely through them it is creating for itself a content that cuts it off from its spiritual foundation? From the standpoint of the beliefs that see the natural-scientific outlook to have been formed in accordance with the way the world does in fact manifest to us, there is no way to find an answer to this question. But an answer is definitely forthcoming if one looks toward the needs of the soul itself. With mental pictures, such as only could have been formed by a pre-natural-scientific age, our soul experience could never have arrived at a full consciousness of itself. In its ideas of nature, which also continued a spiritual element, it would indeed have felt an indefinite connection with the spirit, but it would not have been able to experience the spirit in its own full, independent, and particular nature. Therefore, in the course of mankind’s development, our soul element strives to set forth the kinds of ideas that do not contain this soul element itself, in order, through them, to know *itself* as independent of natural existence. The connection with the spirit, however, must then be sought in knowledge not through these ideas of nature but through spiritual vision. The development of modern natural science is a necessary stage in the course of mankind’s soul evolution. One understands the basis of this development when one sees how the soul needs it in order to find itself. On the other hand, one recognizes the epistemological implications of this development when one sees how precisely *it* makes spiritual vision a necessity.” —Rudolf Steiner

⁷ *The Complete Works of Ralph Waldo Emerson*, ed. Edward Waldo Emerson, volume 8, 1903-04, p.10

⁸ Peter Obuchowski, *Emerson and Science*, Lindisfarne Books, 2005, p.30

⁹ *The Journals of Ralph Waldo Emerson*, ed. Edward Waldo Emerson & Waldo Emerson Forbes, volume 10, 1909-14, p.463

¹⁰ Peter Obuchowski, *Emerson and Science*, Lindisfarne Books, 2005, p.66

¹¹ *Ibid.*

¹² Werner Heisenberg, *Philosophic Problems of Nuclear Science*, London: Faber and Faber, Ltd., 1952, p. 93

¹³ Peter Obuchowski, *Emerson and Science*, Lindisfarne Books, 2005, p.113

Announcements

From
The Nature Institute
natureinstitute.org



Dear friends,

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

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

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



You can find out more about the course on our [website](#). Apply by February 15, 2019.

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

Thanks so much!

Seth Jordan
Program Coordinator

Book Announcement

Understanding Mammals: Threefoldness and Diversity

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

by Wolfgang Schad

[Adonis Press](#), NOW AVAILABLE

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

\$125 **LESS 25% through January 15th**. ORDER [HERE](#).



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.

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

Calendar of Events

2019

January 14: **MysTech Beginners' Study Group**, 10 Classes on Zoom, Mondays 8:30-9:30 ET.

[Email](mailto:jandrewlinnell@gmail.com) Andrew Linnell at jandrewlinnell at gmail dot com

February 17-21, 2019: **Winter Course on "The Nature of Animals and Developing Dynamic Thinking"** with Craig and Henrike Holdrege (Nature Institute, Ghent, NY)

<http://natureinstitute.org/calendar/index.htm>

March 29-31, 2019: **Mathematics Alive! Negative Numbers and Linear Equations** with Henrike Holdrege and Marisha Plotnik (Nature Institute, Ghent, NY)

<http://natureinstitute.org/calendar/index.htm>

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

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

June 2019-July 2020: **Encountering Nature and the Nature of Things: Foundation Course in Goethean Science**, a year-long, low-residency program (Nature Institute, Ghent, NY)

<http://natureinstitute.org/calendar/index.htm>



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