

Science Group of the Anthroposophical Society in Great Britain

Newsletter – March 2011

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Subscriptions

As most members now pay their subscriptions by direct payments from their bank to the Science Group's account, from now on, in order to save administration time, no subscription reminders will be sent out. If by 31 January no subscription has been received in the previous twelve months it will be assumed that the person concerned no longer wishes to receive the print version of the newsletter. They would still have access to it when it is eventually archived on the Science Group's website.

Conference Funds

Part of the original reason for establishing subscription payments for membership of the Science Group, is to have a small reserve for underwriting members' conference initiatives. It was envisaged that this reserve would be used for room hire and/or guest speaker expenses. This note is to remind members that the reserve exists and to notify them that, as the Group's funds are in a healthy state, the reserve is currently set at £1,000.

News

The identity of Professor Capesius

In August 2010, while researching the philosophy of Karl Julius Schröer, David Wood came across a passage in Schröer's writings in which he refers to a certain Professor Capesius from Hermannstadt. Schröer's remark immediately recalls the existence of another Professor Capesius: that of the like-named character in Rudolf Steiner's Mystery Dramas. In September 1924 Rudolf Steiner had indicated a connection between Schröer and the figure of Capesius. This gives rise to a question: what is the precise relationship between this Professor Capesius in Hermannstadt, Karl Julius Schröer, and the character of Professor Capesius in the Mystery Dramas? David Wood's 11-page essay in *New View* is a contribution towards answering this question.

Wood, D. (2010) Rudolf Steiner and Professor (Josef) Capesius on the Centenary of the First Mystery Drama in Munich (1910-2010) *New View* 58, Winter 2010/11, pp. 53-62.

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Dr. F. Capesius

Article

The rate of decay of radioactivity constant or not?

*'What we're suggesting is that something that doesn't really interact with anything is changing something that cannot be changed'*¹

The dogma² that the decay rates of radioactive nucleotides are constant and cannot be influenced, i.e. changed by external effects, may be on the verge of being abolished, if the results of experiments recently published hold out.

In August last year I received an email with a link to news³ from Stanford University, USA. The title of the article: *The strange case of solar flares and radioactive elements*. We read that when going through published data on specific isotopes, researchers found discrepancies in the rates of decay. Assuming everything went according to the book, the data suggested that a constant wasn't constant. Further, going through data collected over a period of time (between 1982 - 1986) at the Brookhaven National Laboratory (USA) and a 15-year record of results from the Federal Physical and Technical Institute (PTB, DE), researchers found that radioactive decay constants varied with the seasons: in winter slightly faster than in summer (for the northern hemisphere). This applied to silicon-32 and radium-226. Checking of the instruments showed it was highly unlikely that the observed phenomena were caused by environmental effects. Malfunctioning of these instruments was also ruled out (see 4). So, until any indication to the contrary, this is a phenomenon which we have to recognise as such, notwithstanding that it eludes our present day understanding.

The known effects of solar flares on earth, such as changes in the earth's magnetic field, power surges in the electrical grid, communications problems, fit nicely within the context of other known phenomena. This new effect, which has been observed for 15 years at the PTB (1983 - 1998; see note 4), contradicts, until then, a well established 'law' of radioactive

decay. The variation in the rate of decay was found to be between 0.1 and 0.3%.

A clue to the mystery was supplied by the observation that the decrease in the rate of radioactivity of manganese-54, started more than a day before a solar flare sent a stream of particles to the earth.⁴ A couple of things to note: 1) the change started before the detection of the flare;⁵ 2) the mass of the earth was between the sun and the locality of the detection system; 3) a different nucleotide was involved; 4) it also suggests a possible influencing agent: neutrinos. It was known that the intensity of the stream of neutrinos varies as the sun rotates; Jenkins and Fischbach found a 33-day recurring pattern in the Brookhaven data, instead of the expected cycle of about 28 days. This gives rise to further speculation.

That the detectors used to count radioactive decay reacted before the flare was detected, is not only a mystery for now, but also offers a way of warning astronauts, and earthlings, of a flare erupting, and maybe earning money for further research. Neutrinos travel at nearly the speed of light and move through matter as if it were 'thin air', however they don't react with much. That is the problem if they are to be the cause of the decreasing rate of decay: by what means could this happen, in other words what's the mechanism? In a second article, Jenkins and Fischbach speculate that neutrinos are responsible for the change in the rate of decay.⁶

The dates derived from radio-carbon dating will not change the established dates significantly.

Norman Grant published two articles in the *Newsletter Articles Supplement of the Science Group of the Anthroposophical Society in GB*.⁷ In the first article, Grant discusses radioactivity and carbon dating as currently practised in geology. At the end of his article he writes: 'From this discussion, it can be seen that the validity of radioactive ages depends only on two assumptions. The first assumption underlies the mathematical treatment of radioactive decay, namely, that the rate of decay of a radioactive parent nuclide is proportional to the number of atoms present. The second is the assumption that the decay constants have remained fixed throughout the time-span of the history of the Earth. Both assumptions are part of a wider set of assumptions about the uniformity of processes in time and space that have progressively developed in science over the last three hundred years'.

I would like to look at the second assumption. The experiments briefly discussed above seem to put a question mark to that assumption or even, if the results stand up to further scrutiny, invalidate that assumption. Leaving that aside for the time being, there is another assumption, namely that the mineral earth is the 'dead basis' for the living organisms we find on earth, ourselves included. Dead is meant here in the sense of not-living, for example a stone, which, to most of us, is the example of a dead object. In adult humans we find objects, bones, which don't show much evidence of what we generally understand by life; but, they are an essential part of our body and we know from growing up that bones do grow (remember the growing pains in your legs when you were crossing the boundary between childhood and teenager?). We also know that a lot goes on in and around bones. The skeleton may seem dead at old age, but changes throughout life, and dramatically during childhood.⁸ In later life changes do also occur, but only very gradually. The rate of change in the human body decreases with age.

If the equivalent of Maxwell's demon, living on the bone tissue of an old human being, calculated the length of time needed for the bone to reach that length, the age of the human would be far beyond ages currently recorded. Of course, the demon could also use the growth rate of the very young child

and then calculate at what age the bone would reach old age length, the outcome might surprise.

If we regard the mineral earth as an organism, with vestiges of life processes, the physical laws we (the West in particular) have been studying seriously since Galileo and Newton (to name two very prominent scientists), may reflect the state of the earth in the last 500 to 1000 years.⁹ Rates of change can change over time, so extrapolating current rates of change back into the past, may not reflect what really happened.

The wider set of assumptions Grant mentions in the quote above, is also debatable, in particular those about the 'uniformity of processes in time and space', if we assume the mineral earth to be part of a living organism. That may be true for a restricted period of time (a millennium or a million years say) but not necessarily for the whole life span or the whole earth evolution.

The finding that the rate of radioactive decay can change (if confirmed) may bring about a rethink of some of the assumptions scientists hold. That may well narrow the gap between the outlook of mainstream science and that based on anthroposophy.

Notes

1. See: <http://news.stanford.edu/news/2010/august/sun-082310.html>, page 2.
2. A dogma is an article of faith.
3. See 1.
4. Cartwright, J. The mystery of varying nuclear decay, <http://physicsworld.com/cws/article/news/36108>.
5. Jenkins J. H. & Fischbach, E. Perturbations of nuclear decay rates during the solar flare of 13-12-06, arXiv:0808.3156v1.
6. Jenkins J. H. & Fischbach, E. arXiv:0808.3283.
7. Grant, N. (1996) Radioactivity in the history of the Earth. *Newsletter Articles Supplement* (forerunner to *Archetype*) 2, 12-30.
Grant, N. (1996) Steiner's description of the Earth's history. *Newsletter Articles Supplement* (forerunner to *Archetype*) 2, 31-39.
8. Marieb E. B. (1992) *Human anatomy and physiology*. 2nd edition. p. 218. The Benjamin/Cummings Publishing Co.
9. Or perhaps even further back.

Diederik Ruarus

Comment

Everyone knows that Rudolf Steiner valued science tremendously and saw the scientific approach to life as a kind of doorway through which spiritual activity becomes accessible to us; in other words a door to our own self.

Yet it is perhaps not always clear as to what this means, when it is so evident that science has apparently involved our person, society and culture in so many anti-spiritual situations and activities.

So many factors block the doorway.

Firstly, it is sometimes easy to feel that a scientific attitude is *not* a doorway to the essential questions of the spirit and life, and to wish to keep the doorway to spiritual questions *separate* from that of science per se.

Isn't that attitude a common one?

It is possible isn't it, to have *two* islands of knowledge. One for mathematics or physics where I feel, 'I know this item incontrovertibly out of my insight', and another for 'spiritual matters' where 'I know this because my community, my scrip-

ture, my belief system, my well-being and way of life depend on my assent to it'.

In the first case: 'Objects fall to the ground with an acceleration due to gravity of x '.

In the second: 'Jesus Christ is present in the sacrament. 'The Koran is infallible truth'; 'Rudolf Steiner's statements are not to be doubted'.

How do we know what we say we know?

But secondly I think there is another more general question connected to this. Probably most of us laugh at the objections which were brought (and are still brought) against Galileo or Darwin by religious spokesmen.

But what was the real point? The modern 'view' presented by most writers is that Galileo observed the facts with his telescope and that he drew obvious conclusions; and that an obscurantist Church opposed this, clinging to the status quo for religio-political reasons.

Not at all! The Catholic hierarchy undoubtedly included those who knew very well that neither heliocentricity nor geocentricity were necessarily 'true' in every respect, but are only different ways of explaining things; but that this was not suitable to be said in a public way. The Catholic fold would absolutely not cope with Galileo's formulation, which additionally seemed to include the feeling that the geocentric view was *stupid, and that the earth and everyone on it was rushing through space!*

In other words, what is stated by authorities to be 'true' is not a question independent of other (social and personal) considerations outside of science per se.

Is it different today?

Much the same goes for Darwin's ideas. At first they were felt like an outrage. Yet we feel as absurd today the opposing explanations; of a God, as a *Deus ex machina* , 'plonking ' the various animal species on the earth once and for all in 4004 BC.

But such an idea might have been very concordant with European cultures ruled by kings and nobles who controlled their fiefdoms (from castles high on hills) by Divine Right.

Whereas our idea, of species competing and adapting, is much more in tune with a world of economic reality and financial survival and struggle. One firm preys on another and each compete to survive.

So where does that leave the question, 'Which view is *true*'?

Is truth (and therefore the gate to our self) ever unobstructed at all?

But there is something else as well. If these different scientific ideas do *not* originate in some kind of absolute way, where *do* they come from?

Some spiritually minded people maintain that science as we know it today is essentially a product of something actually *British*, (not in the obvious sense as part of the British nation's history but more subtly).

According to this view, British empiricism, the views promulgated by Hume, Hobbes, Locke etc. and put into practice by the Royal Society, are part of a kind of 'imperialism of the mind'. They see in all this activity an effort to spread over the globe a kind of Baconian-Newtonian dream of the world, supported by Economic and Political motives. A dream vigorously pursued by men like Benjamin Franklin and almost built in to the founding of the USA.

There is plenty of support for this view in Rudolf Steiner up to a point. This view considers the source of this science to be 'lodges' of one sort or another, intent on suppressing the more spiritual view of mankind associated with Central European thinking; in particular Goethe etc. If this is to be taken seriously don't we have to ask 'in what sense then can we claim

Goetheanism or Darwinism to be *true*?' *Do we even make this claim?*

I would like to ask for example, 'Is Darwinism or Newtonianism in any sense at all English?' 'Is Goetheanism or Leibnizian thought in any sense German'?

I am not pretending that there is an easy answer to these riddles. But could one say 'The atom bomb is characteristically American' or 'DNA is an English idea'?

Well, the Nazis considered relativity to be characteristically Jewish, so do we feel that Nazism is characteristically German? If so in what way? The question is fundamentally, 'Is TRUTH subject to anything at all outside itself'?

There is just one other point.

Nietzsche, for example, believed that science emerged from a certain psychological *attitude*; from an *inner* attitude alien to life; from asceticism and self-loathing; from weakness of the spirit that chose to reduce the warm full blood of life to thin anaemic observation and measuring, something cold and thin and spectral.

(Like a camp commandant attitude perhaps...or the invention of the latest aeroplane for war.)

And on the other hand of course we see the enslavement of science to big business and government, so that *what* questions are asked and 'elucidated ' are already tied at their inception to money and power.

How are we to rescue something, which perhaps we feel as anthroposophical scientists, is so essential to our culture's spiritual development, from the enormous powers which encircle it and threaten its autonomy?

I would be so interested to know how others see this.

In an Internet world where information, disinformation and misinformation have completely run riot, aren't we faced on a daily basis with the problem of trying to discover what TRUTH ACTUALLY IS?

Sandra Moore

Review

A Modern Quest for the Spirit Ehrenfried Pfeiffer (1899-1961)

Pfeiffer's autobiographical memoirs on etheric research and nutrition, the etherization of the blood, the function of the heart, letters and memoirs from his estate. With contributions by Lexie Ahrens and Paul Scharff, MD.

Compiled with an introduction by Thomas Meyer. Originally Published by Thomas Meyer 1999. Perseus Verlag Basel.

English translation from the German by Henry Goulden. Mercury Press 2010. ISBN: 978-1-935136-02-6

As we approach 100 years since the inception of much of Rudolf Steiner's initiatives, there have been many publications about the history of the anthroposophical movement and the biographies of its leading personalities. Here is another work which can fill out our impressions of a distinguished friend and pupil of Rudolf Steiner and his subsequent scientific and esoteric striving through the first 60 years of the last century.

Historical-biographical books contribute to our awareness of Anthroposophia as a living organism and also stimulate the renewed interest in the pioneering impulses and striving of those who lived in close proximity to Rudolf Steiner. May they also connect us with those evolving individualities!

This compilation of memoirs, letters and essays by Ehrenfried Pfeiffer is a further contribution to this biographical-historical field.

There exists a biographical memoir of Pfeiffer by his close German colleague Alla Selawry – brought out in 1987, trans-

lated and published also by Mercury Press in 1992. This earlier work is a fine tribute to Pfeiffer's life and work and is to a large extent about the working together of two co-workers on the crystallisation methods which they pioneered. It also shows the esoteric striving of Pfeiffer in a particularly warm and personal way.

This new work compiled by Thomas Meyer and translated by Henry Goulden from a 1999 publication is a much-needed addition to the earlier work. Apart from the introduction and a couple of supplements, the work is entirely in Pfeiffer's own words comprising an autobiographical memoir, several essays and some letters.

The compilation is broader in scope and gives insights into the development of the scientific impulse in anthroposophy from the perspective of a coworker looking back after 35 years of work on the nature of substance and the transmutation of substance. It also gives an interesting view of Pfeiffer's connection with the non-anthroposophical Rosicrucian organisation in America. It contains many profound instances of Pfeiffer's greatness and is clearly a good source and stimulus for karma research.

No one can dispute that Ehrenfried Pfeiffer was 'one of the most significant members of the anthroposophical movement'. Rudolf Steiner's first words to him were: 'We have already known one another a long time'.

His life's work was continually involved with both medical and agricultural applications. With Wachsmuth and Steiner he conducted the first experiment with a cow horn manure preparation. He was consulted on the chemical and biochemical parts of *Fundamentals of Therapy* by Wegman and Steiner. In a real sense then he was one of the founders of anthroposophical medicine and biodynamic agriculture. It was he who first posed the questions about the etheric formative forces and their technological and therapeutic applications. This was the genesis of the *Forschungsinstitut am Goetheanum*, the seed of the future Natural Science Section. Wachsmuth wrote his book on the etheric formative forces and Pfeiffer began to experiment.

According to Rudolf Steiner the social conditions were not right for a successful outcome of their first experiments. To some extent Pfeiffer then carried the unfulfilled research ambitions with him for the rest of his life, and across the threshold, trusting in his own will and the will of the spiritual world. This sense of failure is balanced by the success in the pioneering of crystallisation as a method for developing faculties of perception in the etheric world, and years of work around the world in agriculture, and medicine. Similarly the sense of the aloneness of his striving is balanced by the obviously close and enduring connections he found with many people. His letters give profound indications of his esoteric life shared with his closest friends.

A combination of his aloneness and his scientific bearing also gave him an independent view of the challenges within the Anthroposophical Society after Steiner's death.

So in 1960 shortly before his own death he wrote:

I can see all of these connections clearly, very clearly (...) but fundamentally I have been given a thankless task: neither did I succeed in reconciling Wegman and Frau Steiner, neither could I either reconcile or endure their followers [Stein, Kolisko including Zbinden, Englert] nor could I bring Clymer [a leading Rosicrucian friend of Pfeiffer] with Rudolf Steiner, since Clymer in spite of his greatness was caught up in traditions. In all this lies the struggle of the awakening of the consciousness soul.

Yet balance this sense of disappointment and failure with his description of his laboratory work:

a place of peace and productive work, and still is today after almost thirty five years. No 'Society' problem ever interfered with any laboratory or other enterprise for which I was responsible. All my co-workers at all times felt this responsibility that the *work* stands above personal opinion and interest.

Today you can experience the same kind of helpful objectivity, untroubled by controversies, in anthroposophical work when it is scientifically orientated.

Pfeiffer's comments on his scientific method are relevant in our circles today.

Regarding his crystallisation work, he says explicitly that he had no interest in using the method to prove or test anything. It was solely about developing a faculty of perception for the etheric world, which means developing Imagination. I think we sometimes observe the strong wish to prove things in anthroposophical science, and this can then lead to an unscientific attitude.

More fundamentally, Pfeiffer criticises those who make even phenomenology into a hypothesis, or a theory of knowledge:

I felt they make a hypothesis out of phenomenism instead of simply collecting data, information, to let facts speak, question and answer. Anthroposophical speculation then develops which in no way is better than any other materialist hypothesis. [...] my mind operates differently: I can be quite happy by seeing, observing, and maybe at first even not understanding. I can feel at ease having a question not answered. But I would feel the impulse to enlarge my field of vision, of phenomena, eventually creating such experimental arrangements that more phenomena can be had and observed.

Following Rudolf Steiner's suggestions, Pfeiffer would keep a notebook on one side of which he would write down spiritual-scientific observations and on the other everything he could find out about a topic through more conventional sources. A comprehensive knowledge source was then built up over years:

Not to speculate or build theories or hypotheses, but to let the facts speak as phenomena. To collect as many data and facts as possible and to have not narrow, but wide-spread interests. [...]

My mind was always active, eager to learn, to collect information, always open to accept more. No theory or hypothesis was allowed to block the view or to shut up a possible channel of investigation.

The mind does not get tired, nor does it need rest – this in distinction with the body. In the active, observing (NB. Not speculative) mind we have a source of eternal youth.

To observe, and to put the mosaic of visible, i.e. observable, phenomena together and wait until gradually out of the pieces of this picture puzzle a pattern develops, creates a productive tension. This kind of waiting is by no means a passive property of the soul, but is stimulating. The tension is the motor to continue searching: in fact, one will discover that there is no end. It leads from the space-and-time limited to the endless, to eternity. [...]

Explanations are always bound to time, space, our present status or level of knowledge. It needs courage to live and dwell in a world that can be experienced but not explained. As soon as the fragments of our knowledge fall into a pattern, we *know*. Higher beings, it is said, live in the adoration, *Anschauung* (contemplation) of God. They do not think or speculate about God, but they know God as they see Him. So we can live in the *Anschauung* (con-

templation) of nature, but do not need to speculate about nature.

I have quoted this at length because maintaining the difference between reading the world of experience and 'explaining' it seems to me to be a fundamental Anthroposophical challenge. Restraining the impulse for explanation however must not become a limiting of the observations of either our minds or our senses. Hunger for knowledge in the face of world mysteries, and the deepening sense for reality are also vital ingredients in the scientific project alongside the 'active, observing mind'.

The above quotation was taken from the sixth of seven sections of Pfeiffer's 'Biographical Fragment' It gives a good indication of the quality of the writing to be found in this compilation. I am grateful to Henry Goulden for making this work available to English Speakers, and whole-heartedly recommend it to scientific colleagues and people whose interest in Anthroposophy is as broad as it is deep.

A deeper cooperation between our own Science Group work and the Biodynamic and Medical streams of research may also be stimulated by reading this book. That would surely be a consequence wholly in tune with Pfeiffer's life task and his continuous striving.

Alex Murrell

Meetings

Projective Geometry

A small group meets weekly in Brighton, currently on Mondays, to explore the laws of the space of physical and living forces.

Please contact Paul Courtney on 01273 557080 or 07903 961390 or at PaulRC (at) btinternet.com for further details.

UK Group of the Science Section

The Science Section for members of the School of Spiritual Science who are taking responsibility for the scientific work has been meeting twice a year in autumn and spring.

The next meeting will be at Elmfield School, Stourbridge, Worcestershire on Saturday 12th November 2011.

As well as the contribution from Judyth Sassoon on convergent evolution, Sandra Moore has reminded us of the suggestion from the previous meeting to look at the uncertainty principle and non-locality experiments relating to nuclear physics.

If you are interested in attending, but do not normally receive notification of Section meetings, please contact Alex Murrell, Wychwood, Wynstone's Drive, Brookthorpe, Glos. GL4 0UN. Tel: 01452 812094. Email: alexandermurrell (at) hotmail.com.

Research Group

The next meeting of the Research Group is on Saturday October 1st 2011, at the Christian Community in Buckfastleigh, Devon.

Contributions are invited to cover costs of catering. The Science Group will cover hire of meeting rooms and facilities. Accommodation is available for £12 to £15 for a guest room (limited availability; please book in advance) or £5 per person for a mattress and duvet. Bedding and towels provided.

RSVP stating if you need accommodation to PaulRC (at) btinternet.com or: Paul Courtney, Ground floor flat, 1 Surrenden Road, Brighton, UK BN1 6PA; or: +44 (0)1273 557080.

Directions and location maps available. The nearest railway station is Totnes which is a 35-40 minute (7 mile) bus ride from Buckfastleigh. Newton Abbot has more trains but is fur-

ther away. Please phone Gordon Woolard on 01364 644241 after 16 August, or at gordon.geometry (at) gmail.com for further information on trains.

Course

Regarding Landscapes

Regarding Landscapes is an initiative started in 2008 by Adriaan Luijk, who has been working and living for the most part of his life in England.

After many years of biodynamic farming in between following the Science Course for Upper School Teachers and a few years teaching, he moved to France in 2004 where his deep impression of the landscape led to an attitude of questioning what exactly is our relationship to landscape.

After reviving and continuing his interest in Goethean science by following a post-graduate course in Goethean Science and environmental ethics with among others Isis Brook (Lancaster University) in 2008, he discovered the work of Jan Diek van Mansvelt, his ex-biology teacher at the biodynamic agricultural college Warmonderhof in the Netherlands, who together with his colleague Bas Pedroli has done lots of work on and for the European Landscape Convention.

Adriaan appreciates the idea that the way to approach the landscape is multi-disciplinary but that this at the same time needs to be based on actual experience and phenomena.

His courses/workshops are based on sharing with participants their experiences of the landscape from different points of view, such as Goethean science and landscape phenomenology, but also aesthetics, history, ethics, etc.

The main themes of the workshops are: The plant world in relation to its environment; sense-perception and interpretation (environmental aesthetics); nature and culture within the landscape; evolution of consciousness and our changing perception of landscape.

The courses/workshops are one-week long and consist, apart from short studies, of practical and outdoor observational activities, with sharing of experiences at the end of the day.

Adriaan is seeking ways of collaborating and working together with others both in England and the Netherlands.

This year Karina Hendriks, Ben Stolk and Simon Blaxland de Lange will each be co-leading a workshop with Adriaan. Contact: Regarding-Landscapes, Adriaan Luijk, Le Fort, 09300 Lieurac, France. Email: adriaan (at) regarding-landscapes.com. Tel: 0033 (0)561052760

Publications

Metamorphosen im Pflanzenreich Peer Schilperoord

ISBN-10:3-7725-2391-9; EAN:9783772523915

Verlag: Freies Geistesleben GmbH; 183 pp, profusely illustrated.

Notes from the publisher's flyer:

- a renewal of the theory of metamorphosis
- covers progress in morphology since Goethe as well as molecular genetics of the last 20 years
- aimed at botanists, geneticists & philosophers
- classical plant metamorphosis theory is one of leaf metamorphosis
- as plants develop cyclically, metamorphosis theory should cover the entire cycle
- instead of classical fundamental organ theory that divides the plant into root, leaf and shoot axis, the approach starts

with double membership based on Goethe's 'organic division'

- stamen and carpel result from the interaction of vegetative and generative fundamental organs
- the concept of *type* unites the two concepts model and key. The key sets the model in motion resulting in the diversity of forms.
- Goethe's concept of *anschauende Urteilskraft* is examined
- Contents: plasticity of leaf formation; diversity of leaf forms; liverworts to angiosperms; vegetative and generative fundamental organs; overcoming the fundamental organ theory; sex separation; several kinds of metamorphosis: variability of proportions, organic division, polarity; the flower as an interplay of several metamorphoses; characterisation of wheat; *anschauende Urteilskraft*; experiencing the living world.

Enquiries to: Peer Schilperoord, Hauptstrasse 16, CH 7492 Alvaneu Dorf, Switzerland. 0041 81 404 22 29. schilperoord (at) bluewin.ch.

Peer Schilperoord's research web page is at:

http://anthrobotanik.de/anthro/Forschung/Forschung_PS_Meta-morphosen_Pflanzenreich.html

In Context, The Newsletter of the Nature Institute

No. 24, Autumn 2010: Main articles: Milkweed and its myriad companions, *Craig Holdrege*. An unexpected, submicroscopic journey, *Steve Talbott*.

Editor: Steve Talbott. Single copies of *In Context* are available free of charge while the supply lasts. Contact details: The Nature Institute, 20 May Hill Road, Ghent, NY 12075. Tel: +1 518 672-0116. Fax: +1 518 672 4270. Email: info (at) nature-institute.org. Web: <http://natureinstitute.org>.

The Nature Institute's online *NetFuture* newsletter is available at <http://netfuture.org>.

Elemente der Naturwissenschaft

No. 93, 2010: Was ist ein Teilchen? *Peter Gschwind*. Zur Frage nach der Nebenadervverzweigung in Dikotyledonenblättern *Manfred Weckenmann*. Investigation of olive oil quality using the sensitive crystallisation method, *Gerard Hotho and Beatrix Waldburger*. Konstellationsforschung im Spiegel des Wassers: Betrachtungen zu Mars, *Christine Picariello, Wolfgang Schwenk*.

Editorial board: Johannes Wirz (editor-in-chief), Birgit Althaler (editorial assistant), Ruth Richter, Johannes Kühl, Barbara Schmocker.

Subscription enquiries to: Wochenschrift 'Das Goetheanum', Abo-Service, Postfach, CH-4143 Dornach 1, Switzerland. Email: abo (at) goetheanum.ch. Fax: +41 61 706 4465.

Editorial enquiries to: Naturwissenschaftliche Sektion am Goetheanum, Elemente der Naturwissenschaft, Postfach, CH-4143 Dornach 1, Switzerland. Tel. +41 61 706 4210. Fax +41 61 706 4215. E-mail: science (at) goetheanum.ch.

Cost: Annual subscription (2 issues, including postage): €20.- / CHF 32.-. Single issues: €12.- / CHF 18.- ISSN 0422-9630.

A list of the contents of back issues is available at <http://www.science.anth.org.uk/eleminde.htm>.

Mathematisch-Physikalisch Korrespondenz

No. 243, Winter 2010: Der ätherische Charakter des Photonen-Welle I, Erweiterung der Quantentheorie durch Bohm, *Karl-Heinz Niklowitz*. Zur Klärung des Ehrenfestparadoxons, *Hermann Bauer*. Elemental phylogenesis, *Paul C. Marx*. The spiral evolution of the elements, *Paul C. Marx*. A new universal principle, *Paul C. Marx*

Subscriptions are SFr 50/€30 per year.

Edited by Prof. Dr. Peter Gschwind, Mathematisch-Physicalisches Institut, Benedikt Hugiweg 18, CH-4143 Dornach, Switzerland. Tel: +41 61 701 5968. Email: p.p.gschwind (at) intergga.ch.

Jupiter – Astronomy, Mathematics and Anthroposophy

Volume 5(1), September 2010: Main articles: Die Lemniskate als Beziehungsbahn, *Hermann Bauer*. An approach to the lemniscate path of the sun and earth, *Nick Thomas*. Das Lemniskatenbahnsystem, *Roland Schrapp*. Plus an interview with Bengt Ulin, details of publications and a forum.

Volume 5(2), December 2010: Path curves, *Nick Thomas*. Imaginäre und komplexe Zahlen, *Hansjörg Bögle*. Strahlentoptik und projektive Geometrie, *Gerard Hermans*. Rudolf Steiner zur Technik – Ein Recherche, *Leinus Feiten*.

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Wasserzeichen

Nr. 33 (2010): Main items: Das Besondere der Quellen, *Christine Picariello*. Das Neubauprojekt Pumpspeicherwerk Atdorf, *Manfred Schleyer*. Trinkwasser-Gewinnung in Notsituationen, *Maarten Gast*. Bewegungsforschung, *Michael Jacobi*. Tinte zeigt Reinheit der Wasseroberfläche, *Andreas Wilkens*.

Plus shorter items of news, and on the Flow Research Institute's work, conferences, publications and funding.

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