

# Science Group of the Anthroposophical Society in Great Britain

## Newsletter - September 2002

### Contents

News.....	1
Meetings.....	1
Courses.....	2
Review.....	2
Review Article.....	3
Publications.....	5
Next Issue.....	6

### News

#### New Kolisko Steigbild Experiments

In the last issue I reported briefly on a new section of the Science Group's web site which republishes the work of Lili Kolisko and her successors with capillary dynamolysis (CD) experiments conducted during planetary events. A new page has now been added to report on the experiments carried out this year by Guy Desbiolles, Switzerland. They cover the Mars-Saturn Conjunction of 4 May 2002, the Mars-Venus Conjunction of 10 May 2002 and the Jupiter-Mars conjunction of 3 July 2002.

I thank Nicholas Kollerstrom for bringing this work to my attention. All the CD work republished on the Science Group web site, beginning with Kolisko's Saturn-Sun experiment of 1926, remains without any form of peer review. Indeed, it is not easy to envisage how it would be peer reviewed if the need arose. The corroboration lies in the fact that different workers in different places over the years have apparently obtained similar results. Readers are invited to comment on the relevance of peer review in this work and the implications of publishing it without such reassurance.

The index page for all the work including the new experiments of Desbiolles is:

[http://www.anth.org.uk/Science/Metal-Planet\\_Relationships\\_Index.htm](http://www.anth.org.uk/Science/Metal-Planet_Relationships_Index.htm)

*David Heaf*

#### SES Newsletter ceases publication

With the issue of its Newsletter reported in the publications section below, The Society for the Evolution of Science (SES) will cease to exist primarily for philosophical reasons. The lack of dues-paying participation in recent years has meant an ever-falling balance in our bank account to the point where we can just cover expenses for this last issue. However, rather than attempt to rally the readers to send in their dues and continue with this format, we have decided that we would rather establish a new basis for this work.

While the SES has been in continuous publication since its founding and has held meetings on a regular basis (every three years), it has required a significant effort on the part of its editors to keep it up and running. At this point, we, the present editors, would rather put our energies into issuing a newsletter that has its basis in the work of the American Natural Science & Mathematics / Astronomy Section of the Anthroposophical Society ("the Science Section"). Most of our readers are members of the Science Section, an organization that was founded several years after the founding of the SES.

We are ready to offer our services as editors and submit the following proposal: We will create a new vehicle for articles and letters of scientific interest that can be shared with a gen-

eral audience. We will promote the original goal of the SES, which at its core states that we "work for the advancement of science based on the insights and methods first described by Rudolf Steiner, the founder of Spiritual Science." Articles will be authored by anyone following this standard. The Science Section will elect the editorship of the new newsletter. We will offer the publication to anyone for a reasonable fee and continue also to have meetings that are open to the general public on a regular basis.

We feel that the impulse for this work is coming out the Natural Science & Mathematics / Astronomy Section and would like to explicitly state this by producing a newsletter that is based on the striving of this group.

We would like to take this opportunity to thank all of you that have supported the SES and hope that you will choose to support our new efforts.

*Jim Kotz*

#### Steigbild dishes

Glass dishes for doing capillary dynamolysis experiments are now available to order at 8.50 Swiss francs each. An instruction book is also available which details how to prepare the reagents and biological extracts.

For further information please contact Dr Heidi Flückiger, Verein für Krebsforschung, Institut Hiscia, Kirschweg, CH-4144 Arlesheim, Switzerland. Tel: 0041 61 705 7111 Fax: 00 41 61 706 7200. This information was sent by Janet Barker of Ita Wegman Klinik, Arlesheim. She can be contacted by email at [hml@wegmanklinik.ch](mailto:hml@wegmanklinik.ch).

#### Astronomy software

Philip Kilner reports that freely downloadable astronomy software based on positional data and NASA images is available at <http://ennui.shatters.net/celestia/>

### Meetings

#### Genetic Engineering and the Intrinsic Value and Integrity of Animals and Plants

*Ifgene* – International Forum for Genetic Engineering Workshop 2002. 18-21 September 2002. Royal Botanic Garden, Edinburgh, UK

14 invited speakers from the following fields: bioethics; molecular genetics; biodynamic farming; sociology; law; environmental philosophy; public perception of technology; plant & animal breeding; transgenesis and Goethean phenomenology. Plus guided practical observation sessions; breakout workshops; public panel discussion; and contributions by representatives of Roslin Institute (home of Dolly the cloned sheep) and other institutes round Europe and USA.

Places are still available. Please book as soon as possible. Deadline for meals bookings, 11 September. The event has already attracted over 60 participants coming from as far afield as New Zealand, Tasmania, Mexico, Hawaii, Colorado & Canada. It has been made financially possible by more than a dozen sponsoring organisations as well as individual donors.

For full details please see the workshop web site at <http://www.anth.org/ifgene/2002.htm> or contact Ifgene UK coordinator: David Heaf, Hafan, Cae Llwyd, Llanystumdwy,

### **Spirituality, Science and Religious Experience**

10-22 September 2002, University of Wales, Lampeter  
Conference chairs: Prof. Paul Badham, David Lorimer & Dr Wendy Dossett.

Details from: Dept. Theology & Religious Studies, University of Wales, Lampeter, Ceredigion, SA48 7ED. Tel: 01570 424708 Fax: 01570 423641 Email: m.ablett@lamp.ac.uk. www.lamp.ac.uk.

### **Conference to launch research into living forms**

Friday 4<sup>th</sup> to Tuesday 8<sup>th</sup> October 2002, Seaview Grazings Strontian, Argyll, Scotland

Geometrical drawing, counterspace, path curves (shell profiles, water vortices and leaf forms) with Graham Calderwood, Stuart Brown, Nick Thomas and Ron Jarman.

Anyone seriously interested in taking forward this research work should contact Ron Jarman, The Hollies, Butterow West, Stroud, Glos, GL5 3UE. Tel: 01453 750477. A research fund is available to cover all costs.

### **Erkenntniswege in der technisierten Welt – Urphänomene der Elektrizität und die Frage nach der Unter-Natur**

Autumn conference of the Science Section of the Goetheanum, Dornach, Switzerland, 9-13 October 2002

Organised by Johannes Kühn, Georg Maier and Florian Theilmann.

For more information please contact: Naturwissenschaftliche Sektion am Goetheanum, Postfach, CH-4143 Dornach 1, Switzerland. Tel: 0041 61 706 4210 Fax: 0041 61 706 4215 Email: science@goetheanum.ch www.goetheanum.ch/sektion/nws/home.html

### **UK group of the Science Section**

There will be a meeting of the UK group of the Science Section on Saturday 9<sup>th</sup> November 2002 for members of the School of Spiritual Science who are taking responsibility for the scientific work. For further details please contact: Richard Swann, Orchard Leigh Camphill Community, Bath Road, Eastington, Stonehouse, Gloucestershire GL10 3AY. Tel: 01453 825617; Fax 01453 823811. E-mail: raswann@lineone.net.

## **Courses**

### **Animal magic: science beyond the microscope.**

Jane Goodall, Rupert Sheldrake, Françoise Wemelsfelder & Colin Tudge. February 9-28, 2003

### **New cosmology: insights from science, art and ecology.**

Brian Swimme, Charlene Spretnak, Stephan Harding & Jordi Pigem. May 11-30, 2003

For further details of Schumacher College and its courses, please contact: Administrator, Schumacher College, The Old Postern, Dartington, Totnes, Devon TQ9 6EA, UK Tel: 0044 (0)1803 865934; Fax: (0)1803 866899.

Email: admin@schumachercollege.org.uk

Web: <http://www.schumachercollege.org.uk>

### **The Fourth Dimension. Sacred Geometry, Alchemy, and Mathematics,** by Rudolf Steiner. (Trans. Catherine E. Creeger, Anthroposophic Press, 2001). Reviewed by David Wood.

For English-speaking students of Spiritual Science with a mathematical bent it is certainly a welcome sign that this important collection of lectures and answers to questions has appeared so relatively soon after its German counterpart (GA 324a, *Die Vierte Dimension*, ed. by Renatus Ziegler, Dornach: 1995). All the more so since works of this kind tend to have a limited circulation, even if they are by Rudolf Steiner himself (which perhaps explains the jazzed-up subtitle of this English version “Sacred Geometry, Alchemy and Mathematics” as opposed to the more sober “Mathematics and Reality” of the German original). The book in question consists of 8 lectures given by Rudolf Steiner in Berlin between 1905 and 1908 on the topic of multi-dimensional spaces, as well as over 20 answers to questions from 1904-1922 treating of similar geometrical and mathematical themes. Primarily due to the emergence of spiritualistic phenomena at the end of the nineteenth and the beginning of the 20<sup>th</sup> century, the subject of the fourth dimension had exerted a fascination and deep interest on the scientific community and general public alike. For example, respected scientists and mathematicians such as William Crookes (1832-1919), Friedrich Zöllner (1834-1882) and Oskar Simony (1852-1915) (the latter personally known to Steiner), attempted to validate spiritualistic results using scientific methods. Central to their endeavours was the investigation of the nature and dimensionality of space itself, with many considering the explanation and key to spiritualism to lie in the existence of an extra or added dimension, i.e. a fourth dimension. This conviction was also the starting point for Charles H. Hinton (1853-1907), a view outlined in works which became extremely popular within theosophical and spiritualistic circles of the time, such as *A New Era of Thought* (1900), *The Fourth Dimension* (1904), and *An Episode of Flatland* (1907). This fact should not prejudice our view of these “thorough and insightful books”, as Steiner calls them, for along with Edwin Abbott’s 1884 book, *Flatland: A Romance of Many Dimensions*, they are still prized today by conventional mathematicians for their ability to stimulate and develop geometrical imagination. Such was the broad cultural climate and background of the audience to whom these early lectures of Rudolf Steiner were directed, explaining why, for example, the coloured cube (tesseract) method and step-by-step imaginative approach of Hinton hold such a prominent place.

Yet in addition to surveying the different mathematical methods and exercises for visualising and experiencing the fourth dimension for oneself, they also present the initial results of Steiner’s own research into the relation between higher dimensions and the human being. Essentially, Steiner outlines how the 4<sup>th</sup> dimension is primarily the domain of the living, whose outward manifestation in the three dimensions of physical space is movement, development (growth) or time. The 5<sup>th</sup> dimension is connected with the world of feeling (empathy) and sensation; it results when two four-dimensional beings encounter or recognise the soul aspect of the other. Moreover, what we designate or experience as self-consciousness in the human being, is fundamentally the result of the projection of the sixth dimension into our three-dimensional physical world.

The second part of the volume contains Rudolf Steiner’s at times lengthy and detailed answers to a wide range of

technical questions concerning physics, mechanics and higher mathematics, many of which were posed by trained scientists and mathematicians. Fundamental themes treated include: reflections on Copernicus's third law, the status of imaginary or complex and hyper-complex numbers, inherent problems with Einstein's theory of relativity, colour perspectives and Goethe's theory of colour, and the rise and significance of non-Euclidean geometry. These answers truly provide a veritable wealth or treasure-trove of research possibilities and indications for the scientifically inclined anthroposophist, or just for anyone with a general interest in science. In fact, they particularly serve to highlight a theme running through Steiner's entire life's work: The relationship between mathematics (especially synthetic/projective geometry) and everyday (sense) reality on the one hand, and the role of mathematical thinking as the first stage of true objective spiritual cognition on the other.

It is unfortunate to end on a somewhat negative note, however, the following surely needs to be rectified by the Anthroposophic Press in any future edition of this volume: How did it transpire, that the current German editor could compose virtually a third of the book (over 75 pages), including the highly original and exhaustive end-notes, the comprehensive bibliography, the fine geometrical diagrams and figures (the only time he is granted a cursory mention), as well as supplying reconstructions for the numerous lacunae in the text, all of which were rendered wholesale into English, yet not only without mentioning his crucial and substantial contribution, but without even his knowledge?

## Review Article

*At the Ifgene workshop in May 2001 at the Goetheanum, in Switzerland, titled 'The Intrinsic Value and Integrity of Plants in the Context of Genetic Engineering' Jeremy Narby gave a paper on his experiences of Peruvian shamanic knowledge of plants. This raised the question of different cognitive approaches or 'different knowledges' as one philosophy professor amongst the participants put it. However, there was a mood of scepticism amongst some present. Since that event, Florianne Koechlin, another participant, has conversed with Narby and has written the article which follows.*

### **Jeremy Narby and Florianne Koechlin: Is Western science and shamanic knowledge compatible?**

*by Florianne Koechlin (First published in Wochenzeitung WOZ, 14.3.2002)*

**How shamans know** Jeremy Narby, an anthropologist living in Switzerland, maintains in his book *The Cosmic Serpent* an astonishing correspondence between shamanic knowledge and molecular biology. Narby and the author of this article argued over this hypothesis for two days.

Narby spent two years with Ashaninca Indians in the Peruvian Amazon. He was amazed by their almost encyclopedic knowledge of plants and animals. Their language included more plant names than known to nomenclature, and their knowledge of medicinal plants, in particular, was enormous. He says: "I began to ask my guides how they know what they know. They always gave the same answer: knowledge from the plants comes from plants themselves. They explained that ayahuasqueros, or shamans, drink a hallucinogenic brew called ayahuasca and communicate in their visions with spirits found in all forms of life, which are sources of information. The

Ashaninca people consider that nature is intelligent and speaks with people in visions and dreams. For them, the spirits were real, but for me they were at best metaphors. I did not really believe in their existence." The word 'shaman' is originally Siberian. It was adopted by European languages in the eighteenth century for lack of a corresponding concept. It referred to people who beat drums or take hallucinogens, enter into trance and cure people. Shamans can be found in all five continents. For a long time they were considered neurotic, schizophrenic or hysterical. That understanding changed in the middle of the twentieth century, but controversy remains. Academic analyses of shamanism are always rational studies of the irrational. "In other words a cul-de-sac", says Narby. "One cannot consider that what they say is real, because, in reality as 'we' know it, plants do not communicate." During his stay in the forests of Peru, Jeremy Narby was introduced to ayahuasca by an ayahuasquero named Ruperto Gomez. Ayahuasca is the hallucinogen used by the indigenous peoples of Western Amazon. He witnessed several remarkable cures, caused by shamans. When Gomez visits sick people, he drinks ayahuasca and waits for the spirits to help him diagnose the illness and determine the right plant remedy. "Ayahuasca is the television of the forest," explained Ruperto Gomez, "You can see images and learn things." Narby describes his own experience with ayahuasca (under Gomez's direction) as follows: "The ayahuasca brew tasted extremely bitter and made me feel so nauseous that I had to vomit more than once during the session. While Gomez sang a beautiful melody, I began to see kaleidoscopic images with enormous fluorescent snakes and other animals. I followed the music, started to fly and began hallucinating. Gradually, the images faded, leaving me completely exhausted and wanting to sleep." Amazonian shamans have been preparing ayahuasca for hundreds, perhaps thousands of years. The brew is a combination of two plants, which must be cooked together for hours. The first plant is the *Psychotria viridis* bush, which contains the hallucinogenic substance dimethyltryptamine. The hallucinogen has no effect when swallowed, because it is blocked by a stomach enzyme called monoamine oxidase. The second plant, however, the *Banisteriopsis caapi* vine, contains three monoamine oxidase inhibitors, which allows the hallucinogen to reach the brain nevertheless.

Shamanic knowledge, so Narby explains, is based on emotions, internal images and intuitions. It cannot be reproduced. Visions cannot be repeated.

But the results are reproducible; a salve, for instance, works a second and a hundredth time. "There is a fundamental difference in the way they acquire their knowledge. We Westerners look into a microscope and see a fragmented, seemingly objective reality. Shamans see inside themselves by looking into an internal microscope."

**Defocalizing** Narby grew up in a suburb of Montreal and studied at Stanford University.

"I went to the Amazon without knowing a thing. Of course I liked animals and plants, but bees were more like flying toasters, small objects without a mind, soul or intelligence, and easily defined by conventional science. Here I encountered a radically different understanding." Shamans insist on the existence of animate essences or spirits. Shamanic knowledge is, above all, knowledge of these entities. It is through the idea of an animate essence that the fundamental sameness of the human and the non-human takes shape. For shamans, the Western notion of man here and nature there does not exist. An important element in their quest for knowledge is identification with nature. When they say that a shaman becomes a jag-

uar, when his heart becomes a jaguar heart, it is not a metaphor, it is a reality .

"If you want", says Narby, "shamanic knowledge means learning to use one's inner microscope." For this there are various defocalizing techniques: controlled dreams, prolonged fasting, isolation in wilderness, repetitive music, consumption of hallucinogenic plants, or a combination of the above.

There are also descriptions of defocalizing experiences in Western culture.

Many crucial scientific discoveries originated from a flash of genius that exceeds the bounds of rationality. René Descartes dreamed of an angel who explained the principles of materialist rationalism to him; August Kekulé discovered the cyclical structure of benzene after falling asleep in front of the fire and dreaming of a snake dancing in front of his eyes while biting his tail. Albert Einstein was daydreaming in a tram approaching another, and came up with the theory of relativity. James Watson scribbled on a newspaper in a train and reached the conclusion that DNA had the form of a double helix on a bicycle ride afterwards. In his book, Narby writes: "Scientific discovery often originates from a combination of focalized and defocalized consciousness. Typically, a researcher spends months in the lab working on a problem, considering the data to the point of saturation, then attains illumination while jogging, daydreaming, lying in bed making mental pictures [...], in brief, while thinking about something else and defocalizing." Shamans have always sought knowledge by way of defocalization. During their hard apprenticeship which can last up to thirty years, Western Amazonian shamans learn to defocalize and master their hallucinations in order to come into contact with the spirits or souls of other living beings, beyond the conventional boundaries of space and time.

There is, however, a critical difference between our idea of intuition or "defocalized knowledge" and shamanic knowledge: intuition or defocalized knowledge comes from within the human brain, from the "subconscious".

Shamans say they get their information from the outside, from the spirits of plants and the souls of animals. Plants communicate actively with them.

**Plants are their teachers** As a biologist and a chemist with training in natural sciences, I find it difficult to understand such concepts. Narby says: "Try to turn back the clock. The microscope was discovered in the early seventeenth century. If somebody had told you then that humans and plants are full of cells, a gigantic cell community, and that they share many of the same proteins, of course you would not have believed it. We are still beginning to understand the workings of molecular biology. The shamans might just be ahead of us in their understanding." Narby adds that we must consider the fact that in the second half of the 1960s, hallucinogens became illegal. Shortly thereafter, scientific studies of these substances came to a halt. "It's as if one had to understand music after years of Taliban rule and music prohibition. We just do not have the right concepts." The neurological pathways of hallucinogens are better understood than their mechanisms. In 1979, scientists discovered that the human brain seems to secrete dimethyltryptamine, which is also one of the active ingredients of ayahuasca. How ayahuasca works, what processes it elicits, has still to be investigated. "At this point it is impossible to determine whether information comes from inside the brain, as the scientific point of view would have it, or from the outside world of plants, as the shamans claim", says Narby. It could mean that the information is coming from the inside as well as the outside.

Claude Lévi-Strauss, "a master of dialectics in anthropology" according to Narby, was one of the first to put shamanism on the same intellectual footing as Western science. Instead of opposing them, Lévi-Strauss argued it would be more appropriate to treat them as parallel methods in acquiring knowledge. There are two different strategies in making nature accessible to scientific investigation. One strategy is based on subjective perception and the power of imagination, the other is not. Or according to Lévi-Strauss, the necessary connections that any science needs to make, can be achieved in two different ways; one way is close to perceptible intuition, the other is not.

**Songs** Back to the initial question: how do shamans get information from plants and their spirits in their visions? Through songs, says Narby . "Once you have calmed down in your visions, you learn to talk to the individual plant spirits. You hear their melodies and you sing back." Narby knows that such statements provoke at best a smile in the Western world and are not taken seriously.

But why has the influence of sounds in biology not yet been investigated? The rare instances of scientific investigation in this field are astonishing: French scientist Joël Sternheimer for example played precise melodies to tomato plants three times a day during their growth period. The plants were significantly more vital, had bigger tomatoes and seemed to support dry periods more successfully than the control plants that had not benefited from music. Sternheimer's thesis is that the frequency of the music stimulates the synthesis of certain proteins (so called TAS14 proteins) which are important for the plant's resistance capacity.

Ethnological studies have shown that shamans of the entire world communicate with spirits through music. During Narby's ayahuasca session, it was Ruperto Gomez's singing that guided him through his hallucinations and opened up the way to his visions. Visual music, or three-dimensional images that coalesce into sound are projected by spirits in front of the shaman's eyes. The shaman then imitates these sound patterns by emitting corresponding melodies. Shamanism could be described as the knowledge of songs that allow the shaman to connect with the spirits of plants, from whom they receive information in the form of sound, which they then use for cures.

But what do these songs communicate? How does an ayahuasca hallucination help a shaman determine the illness of patient X as well as the plant Y needed for his or her cure? "If I tried to answer this question directly, it would prove that I do not really understand it", says Narby. Plants communicate information indirectly, through signs. In order to interpret these signs, one needs a special language. He cites the British anthropologist Graham Townsley who maintains that everything within the realm of spirits or animate essences is by nature extremely ambiguous, paradoxical and ambivalent. These things are associated with darkness, elusive visions and dreams. Spirits are autonomous entities with their own agenda and their own intelligence. They are "real beings who are both like and not like" the things they animate. Because of this ambiguity, there is only one way to interpret their signs: the "twisted language". The "twisted language" is never direct. It uses metaphors, images, stories, myths. This language is incomprehensible to those who are not shamans, even from the same community. Shamanic knowledge consists of singing in this twisted language, intoning strong rhythms, and then carefully weaving together the verbal images. The songs are elaborate, metaphorical encirclements that open up the spirit world. "With my songs I want to see – singing, I carefully ex-

amine things – twisted language brings me close but not too close – with normal words I would crash into things – with twisted ones I circle around them – I can see them clearly," says a Yaminahua shaman from the Peruvian Amazon.

In almost all shamanic cultures, the path leading to the spirits is guarded by serpents and dragons, often jaguars. "Serpents", says Narby, "are a remarkably consistent symbol, a symbol of life." The Israeli psychiatrist Benny Shanon did an inquiry with people who had taken ayahuasca. The majority saw serpents, dragons, birds, jaguars, palaces and strange beings or flowers. Serpents are omnipresent in visionary paintings, as a connection between heaven and earth, as a symbol for the mystery of life.

"Serpents are masters of change, they are powerful, they are pure muscle and sheer potentiality. The Ashanincas were constantly telling me about the invisible spirits of plants and their serpentine forms, about their serpent-like world. Serpentness: this is what makes life tick."

**Double helix** Narby then went a big step further. He says: "My big question was: do shamanic and Western systems of knowledge have anything in common? I stumbled over DNA. DNA has the shape of a serpent, the double helix ladder.

DNA is the vital essence of all living beings, it is what we have in common with plants, animals and bacteria. Could DNA have anything to do with the serpentness with which shamans come into contact in their visions?" Narby sought an answer by looking at both perspectives simultaneously, with one eye on molecular biology and the other on shamanism. According to his thesis, the serpent seemed to be the symbol that binds together molecular biology with shamanism, and serpentine DNA seemed to be a scientific explanation as to how shamans communicate with the spirits of plants.

**A risky thesis** Jeremy Narby went looking for proof in molecular biology and successfully defended his thesis in several disputes with geneticists.

In 1953 Francis Crick and James Watson made the first drawings of DNA as a double helix. Since then DNA has climbed an impressive way up from these first cautious, insecure sketches to the sturdy public model or even sacred icon.

The double helix became a cultural symbol, presented in drawings often very similar to those of shamans, such as the ladder between earth and heaven, surrounded by the insignia of salvation and promise, or the spiral staircase for progress towards a better future. The exaggerated symbolic value of the double helix corresponded to its meaning in molecular biology.

The gene became the "book of life" (James Watson), the determining factor responsible for good looks, diseases, behaviour and character. But in the last few years, this deterministic gene-dogma has encountered more and more doubts and contradictions. Today it is clear that genes are not context independent determinants, but change their functions and expression patterns depending their environment and neighbourhood. It is also known that information not only goes from genes to proteins, but also vice versa: proteins influence genes, change them and inform them. The 'language' with which proteins communicate is not understood very well, but it is a language which is different from DNA's. Thus the 'book of life' is not written in DNA, but in dynamic networks, where DNA sequences constantly converse with each other and with the surrounding proteins. Many scientists have started to look at the whole cell once again. Research on self-adapting systems is growing. And the cell is once again starting to look like a complex and adaptive system, rather than a factory hall with robot-like DNA-machines.

Against this background Narby's equation of the shamanic serpent knowledge with the DNA-double helix seems rather forced and overdetermined. Narby responds: "OK, the dominant dogma at that time was 'DNA is king'. I was a young anthropologist and said: Look, what you scientists say and what shamans say, fits together. It was also the possibility I could use to make shamanic knowledge fit for Western society." Nevertheless, Narby does not think the analogy is wrong, and still finds the universality of DNA fascinating. And, he adds, if you look at DNA from a shamanic point of view, it is clear that DNA could not be an inert molecule but rather a form of text you only can understand in a wider context.

**Intelligence of nature** Perhaps. But perhaps the mutualities of the two systems of knowledge are to be found in more open concepts. Jeremy Narby is now working on a new book, entitled *The Intelligence of Nature*. The word intelligence comes from the Latin 'inter legere' 'to choose between'; consequently, its original meaning is the ability to make decisions. Narby starts off his book by describing a fascinating experiment: Japanese researchers studied the single cell slime mould *Physarum polycephalum*. They constructed a maze on an agar plate with four possible routes, but no exits. They put a slime mould in the middle of it. The slime mould extended into the whole maze. Then the scientists put oatmeal at the start and end point of the maze. To everybody's surprise after a few hours the mould withdrew from the dead ends and then shrunk to the minimum length between the two food sources. "This remarkable process of cellular computation implies that cellular materials can show a primitive intelligence," the scientists conclude.

Narby writes: "A common view is that intelligence requires a brain. And brains are made of cells. But in this case, a single cell behaves as if it had a brain." And also cells in multicellular organisms like humans have to make decisions all the time. "All cells must continually sense their surrounding environment and make decisions on the basis of this information. They must make decisions about division, specialisation, death or metabolic control," writes scientist Julian Downward. So do even our body cells have something like an intelligence? "The more I look into the latest scientific investigations, the more I understand the Ashanincas' point of view. I am beginning to see what they mean when they talk about an intelligence in nature," says Jeremy Narby.

#### **Literature**

'The Cosmic Serpent', Jeremy Narby, 1998, Tarcher Putnam 'Shamans Through Time. 500 Years on the Path to Knowledge', 2001, ed. Jeremy Narby and Francis Huxley, Thames & Hudson, London 2001

More about epigenetics: [www.blueridge-institute.ch](http://www.blueridge-institute.ch)

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<http://www.blauen-institut.ch>. <http://www.blueridge-institute.ch>

## **Publications**

### **Archetype**

Publication of *Archetype* 2002, which would normally take place in September, will be postponed for a limited period with the expectation of including in it a translation of Wolfgang Schad's monograph *What is Goetheanism?* The 2002 issue will also contain a paper by Judyth Sassoon entitled *Some thoughts on the oxalic acid/formic acid processes*. Pub-

lication will be announced in due course, and at the latest in the next issue of this newsletter.

### **Elemente der Naturwissenschaft**

**No. 76 (1) 2002** Zur Entstehung der Farben. Die Erkenntniswege des "Goetheanismus" und der "modernen Physik", *Thomas Schmidt*. Die Grundversuchsanordnungen für die Lichtbeugung an Kanten, *Hanspeter Seipp*. Bewegung in ihrem Bezug zu den Elementen. Anregung aus dem Zweiten Naturwissenschaftlichen Kurs zur Mechanik, *Wilfried Sommer*. Colloquia: Zum Typus des Blattes, *Per Schilperoord*. Eine kleine Anmerkung zu Kalk und Kiesel, *Nikolai Fuchs*. Subscription enquiries to: Wochenschrift "Das Goetheanum", Aboverwaltung, Postfach, CH-4143 Dornach 1, [abo@goetheanum.ch](mailto:abo@goetheanum.ch)

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Cost: Annual subscription (2 issues): €15.- / CHF 22.-  
Single issues: €8.- / CHF 12.- ISSN 0422-9630

### **Mathematisch-Physikalisch Korrespondenz**

**No. 208, Easter 2002** Rudolf Steiner und die Quantenstatistik, *Friederich Wilhelm Dustmann*. Kurvenmetamorphosen, *Sebastian Kühn*. Wie kann die Menschheit lernen, die Computerwelt zu bestehen? Part 2, *Horst F. Wedde*.

**No. 209, St John's 2002** Koordinatenbildung, *H.-J. Stoss*. Die Relativitätstheorie als Resultat eines absoluten Empirismus, *Hermann Bauer*. Was können wir von Zenons Widerspruch in seinem Beispiel von Achilles und der Schildkröte lernen? *Kurt Pfister*

Subscriptions are Sfr45/€ 25 per year. Edited by Dr. Peter Gschwind, Mathematisch-Physikalisches Institut, Benedikt Hugiweg 18, CH-4143 Dornach, Switzerland.

### **In Context – The Newsletter of the Nature Institute**

**No. 7, Spring 2002:** As well as short items of news, reviews and comment the publication carries the following two main articles: The dynamic heart and circulation *Craig Holdrege*; The lure of complexity (Part 2), *Steve Talbott*.

Contact details: The Nature Institute, 169 Route 21C, Ghent, NY 12075. Tel: 518 672-0116. Fax: 518 672 4270. Email: [info@natureinstitute.org](mailto:info@natureinstitute.org). Web: [www.natureinstitute.org](http://www.natureinstitute.org).

### **Waldorf Science Newsletter**

**Volume 8, #16** Partial contents – Waldorf High School Research Papers; Inside the Gulf of Maine; How Do Atomistic Models Act on the Understanding of Nature in the Young Person?; The House of Arithmetic; Origami Mathematics; Sixth Grade Acoustics; Sixth Grade Kaleidoscopes; Tricks with Mirrors; The Flour Mill and the Industrial Revolution; Web Gems; Understanding Parabolic Reflectors; The Capacitor; Oscillation and Waves; Crystal Radio; Qualifications for High School Mathematics Teaching.

Because of cost cutbacks the newsletter is now being sent electronically in Adobe pdf format.

Edited by David Mitchell and John Petering, \$5.00 each. Contacts: Judy Grumstrup-Scott, Association of Waldorf Schools in North America (AWSNA) Publications, Email: [jgscott@awsna.org](mailto:jgscott@awsna.org). Web site: [www.awsna.org](http://www.awsna.org). David Mitchell, 1158 Quince Avenue, Boulder, CO 80304, USA. Fax 303/ 541-9244. Email: [davidm@awsna.org](mailto:davidm@awsna.org).

### **Newsletter of the Society for the Evolution of Science**

**Vol. 18 (1) Spring 2002:** Main articles: Michael Polanyi's Personal Knowledge, *John Barnes*. Human Experience, Technology and the Environment, *Michael D'Aleo*.

Editor/Treasurer: Jim Kotz, 3698 Dwight Davis Drive, Tallahassee, FL 32312, USA. Email: [jimk\\_99\\_11@yahoo.com](mailto:jimk_99_11@yahoo.com).

### **The Fourth Dimension – Sacred Geometry, Alchemy and Mathematics by Rudolf Steiner.**

8 lectures, Berlin, 24 March 1905 to 22 October 1908. GA324a. First English Translation. 90 diagrams 256 pages paperback. \$18, ISBN 0-88010-472-4. Anthroposophic Press, PO Box 799, Great Barrington, MA 01230, USA, Tel: 413-528-8233 x202. Fax: 413-528-8826.

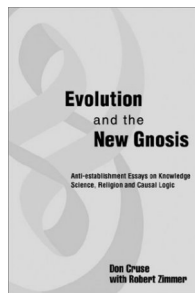
Email [pcohen@anthropress.org](mailto:pcohen@anthropress.org). [www.anthropress.org](http://www.anthropress.org).

### **Holistic Research**

Over the past year Bruce Kirchoff has been engaged in research funded, in part, by the Future Value Fund of the Rudolf Steiner Foundation. This research has had several results, one of which has just posted to the web. Last November he gave an invited talk at the annual Forum of Sigma Xi, the scientific research society that publishes the journal *American Scientist* (<http://www.sigmaxi.org/>). This talk is now available as an audio Powerpoint presentation at:

<http://www.uncg.edu/~kirchoff/> or by following this URL [http://www.uncg.edu/~kirchoff/Parts%20and%20Wholes\\_files/frame.htm](http://www.uncg.edu/~kirchoff/Parts%20and%20Wholes_files/frame.htm) which links directly to the presentation. Compatible with Internet Explorer v5.0 and higher. Size 10meg.

For more information contact Bruce K. Kirchoff, Department of Biology, University of North Carolina, P.O. Box 26170, Greensboro, NC 27402-1670, USA. Tel: 336-334-4953 Email: [kirchoff@uncg.edu](mailto:kirchoff@uncg.edu) <http://www.uncg.edu/~kirchoff/>



### **Evolution and the New Gnosis: Anti-establishment Essays on Knowledge, Science, Religion and Causal Logic by Don Cruse and Robert Zimmer.**

ISBN 0-595-22445-8. Price \$24.95. Now available in either paper back or e-book from the bookshop of the publisher, [www.iUniverse.com](http://www.iUniverse.com) or Amazon.com, B&N etc. It contains 22 essays and 7 appendices, among the latter are contributions by Owen Barfield, Paul Carline, Valdemar Setzer, Edward Reaugh Smith and Daniel Smitherman. The authors regret the rather high price of the PB version. This they are told is normal in POD publishing and they have had no say in the matter, they wish that it were free. The e-book version is much less expensive, but for best results one must possess an e-book reader.

### **Next Issue**

Copy for the next issue should reach the editor at the address below by 20<sup>th</sup> February 2003.

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