

Science Group of the Anthroposophical Society in Great Britain

Newsletter – March 2008

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Article

Can we understand the relations between the different conscious beings of the universe? by Michael Friedjung

Different kinds of beings which surround us In my book *Putting Soul into Science*, of which an electronic version is available on the website of <http://www.SouthernCross.org> and which is also available in a print on demand version, published by iuniverse in the USA, the nature and development of modern science were examined. The most important conclusion was that conscious beings, whose natures are different, produce the various forms of unpredictability of phenomena found in 20th century science. Many of these beings have kinds of ability to act, knowledge about the results of an action and desires for something to happen. In particular they are present in the world of quantum physics, in the numerous events in physics of the large scale world whose future development is extremely sensitive to their conditions at a certain time and are therefore unpredictable (called situations of 'chaos'), in living organisms and even in the world of pure ideas such as those of mathematics. This way of thinking moreover helps us to understand what is the nature of time. We can indeed see that attempts to explain consciousness as being a result of blind unconscious processes in the brain which are both quite irrational and doomed to failure. This is still true, taking account of researches in recent decades, which relate the various activities of consciousness to different regions of the brain. In fact correlations of such activities with certain regions of the brain can break down; there is a recent case of a 44 year old man with only a thin layer of the cortex and the rest of the brain filled with fluid, following an illness when he was 6 months old, who recovered almost normal mental faculties in speech.

The aim of the present article is to look further and to invite and encourage others to look further into and meditate on the nature of some of the different beings, including particularly on what sorts of relations exist between them and what might be the inner significance of these relations.

When we look at the large scale physical world around us we find a 'dead' mineral world mainly only reacting in a predictable way by resisting outside influences, unless there is a situation of chaos, when something additional, which is unpredictable, occurs. Living organisms act on this world and change it. Human beings have developed industry which modifies the mineral world on a large scale. From the point of view of modern physics, as explained in the book, this resistance is partly explainable by the Heisenberg indeterminacy principle and through this principle by the non-predictability of the effects of phenomena in the quantum world on the large scale world.

The world of modern physics is itself however different than this large scale world of matter. We can, as stated in the book, understand it as a world of resisting beings, whose desires are confined or even 'imprisoned' inside a constant of physics. In addition it is a kind of 'virtual' world where different possibilities of events occurring and what would be impossibilities in the large scale world co-exist in a kind of 'frozen' state. According to the most accepted interpretation of this world, it is the interaction of this world with the large scale environment, which makes most of the possibilities die and so produces the properties of the world we live in.

When we look at what are called living organisms, the situation appears to be different than in the realms already described. Living organisms, in which chaotic phenomena, sensitive to minute perturbations, appear to play a major role, react or in a certain sense 'reply' to what comes from the outside world and its beings. This is especially developed in the higher plants, who react to sun and rain, but also occurs for much more primitive organisms, so as those one cell organisms, whose cell contains a nucleus (eukaryotes), the more primitive bacteria and the other class of one cell organisms without a nucleus called by biologists 'archaea'. Let us note that we need not suppose that the consciousness, which is present, is that of a single individual living organism. Those animals who possess a nervous system and brain are sensitive to events which happen in the outside world, without directly affecting them. For instance they can watch two other animals fighting each other. We can say that such animals are sensitive to the actions of other beings on each other, which do not directly affect them.

A human being can perceive his or her own being, not only suffering passions like animals, but by being also able to examine and perhaps to overcome them. He or she can think abstract thoughts; the idea of one's own separate being or self can become also an abstract thought. He or she can make a connection with the world of pure ideas. This eternal world of pure ideas, may as stated in *Putting soul into science*, be considered as belonging to a spiritual world, where conscious beings also exist. Self awareness is connected with the fact that a human being can recognize his or her image in a mirror; there has been a certain amount of discussion whether some animals can do the same. Chimpanzees and bonobos, who are very close to humans, can do so; experiments show that orang-outangs, dolphins, the type of whales called orcs and elephants also have the same ability. However it has been argued that such animals might be only aware of reflections as being a kind of continuation of their bodies, without being able to imagine themselves in space outside their bodies. In addition it is not clear to what extent such experiments really show a true recognition by animals of themselves or an ability of self examination. Moreover recognition of oneself in a mirror is only a beginning of abstract thought.

The existence of the various interactions between beings, appears to require the existence of separation and hence in at least some cases of some sort of space, with separation between places where different beings are able to act directly. Such a connection, including the relation with the geometry of space, clearly needs more study and elaboration than what seems to be possible at present. Let us note that for certain situations in quantum physics, what is called 'inseparability' occurs; 'objects' having 'particle' like properties, which are in

different places, may not have an independent behaviour. In addition also in the world of pure ideas, ideas are not at all separated by any sort of physical space.

Inner aspects What has been said can be directly related to spiritual teachings including especially those of anthroposophy. Such teachings lie at present far outside what is usually considered as real science, but that may change at some point in the future.

According to these teachings a human being, like other living organisms, has in addition to his physical body various 'subtle non-physical' parts, which might be understood from the point of view of science as acting on the physical body in situations of chaos, which are sensitive to extremely minute perturbations from the outside.

In particular these teachings state that a human being like all living organisms has an 'etheric' or 'life body', an 'astral body' like higher animals, while he or she has in addition also an 'I' or real Self, expressing his or her human nature. The different 'bodies' may be understandable as vehicles enabling the various types of interaction with the environment, already described, as well as also interacting with the physical body, including the different parts of the brain. If we are justified in understanding such teachings in that way, these 'bodies' cannot be thought of as unconscious 'things' like what is used in official scientific conceptions of physical events, which 'explain' consciousness as produced by blind unconscious processes. It is possible to consider such bodies as consisting of conscious beings, who can produce the mentioned interactions, without us being able at present to say exactly how this can occur.

Another aspect, which is even further away from what is considered scientific at the present time, is the relation of these interactions to the evolution of the world, as described by Rudolf Steiner. He describes stages, when the earth existed as 'old Saturn', 'old Sun', and later as old 'Moon', before becoming the present earth. In the first 'old Saturn' stage, what became human beings, had only the equivalent of a physical body (consisting of warmth); in the 'old Sun' the future human being became living with the addition of an 'etheric body', while in the 'old Moon' the human being acquired in addition an 'astral body' and in this way a nature which was 'animal'. It is possible to understand these stages, if what became human beings, was at first mainly acted on by other beings, including especially beings who were much more developed, then if later the ancestors of humans were also able to 'reply' to these actions, followed by a stage of an additional awareness of interactions between other beings they were not directly connected with. The following present stage is humans, aware of themselves.

It is in this way also possible to understand in that framework the actions of beings, named by Rudolf Steiner, whose action in the world according to him, hinder normal development. There is Ahriman, whose nature of 'imprisoning' beings inside a constant of physics in the quantum world, described in *Putting soul into science*, can be understood as opposing life. Lucifer, who is present in selfishness and beautiful illusions, can be understood as opposing awareness of interactions between other beings, who do not directly affect an individual. Rudolf Steiner also describes beings called 'Asuras' (an Indian expression) who attack the human I or Self. The beginning of the activity of each of these beings can then be related to the 'old Sun', 'old Moon' and the present stage of evolution. In this way we can be almost overwhelmed with amazement by the ways certain beings interact with the world and with us. However what is involved is not to 'gloat' over evil, but rather to see the marvellous functioning of the world.

Before concluding, I must also state some of the sources of this article, which did not arise out of 'thin air'. Rudolf Steiner is clearly the major source. However I was also impelled to reach these conceptions, by the teachings of the founder of another fairly dangerous movement. According to the procedures of 'Scientology' and 'Dianetics' questions are posed to a person about what others have done to him or her concerning a certain problem, what he or she has done to others concerning this problem, then what third persons did to other third persons concerning this problem and finally what he or she has done to himself or herself concerning it. While this is going on, the electrical resistance of the body is measured; this resistance changes when the person becomes aware of why he or she has that problem and is then freed from the problem. My use of this kind of idea, shows that we can also be helped sometimes by other conceptions, which might even be inspired by dangerous beings opposing the normal development of the world.

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Meetings/Conferences

Science Research Group in Cornwall

There will be a meeting for members of the Research Group on Saturday and Sunday 10-11 May 2008 at Trebullom, Peredur Trust, near Tintagel. Details from Henry Goulden, The Chapel, Treligga, Delabole, Cornwall, PL33 9EE. Tel: 01840 212728.

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.

Our next meeting is on 8 November 2008 at Elmfield School, Stourbridge, West Midlands.

If you are interested in attending, but do not normally receive notification of Section meetings, please contact Simon Charter, Juniper Cottage, Ludlow Green, Ruscombe, GL6 6DQ. Tel: 01453 755614.

Email: simon (at) ebbandflow.fslife.co.uk.

Internet (III): The Emergence of the Eighth Sphere

1-7 November 2008, Tobermory, Isle of Mull. Details from Anthro-Tech Association at 00 44 (0)1688 302532.

Reviews

The Schiller File, by Paul Eugen Schiller.

Published September 2007 by Henry Goulden Books, The Chapel, Treligga, Delabole, Cornwall, PL33 9EE. Price: £20. 188 pages, A4 ring-binder format. Also available from book-sellers.

This is a translation, with additional material, of Supplement 122 to the complete edition of Rudolf Steiner's works. Henry Goulden is to be congratulated for this achievement, which for the first time makes the Schiller File accessible to the English-speaking world.

The volume comprises the original 'Schiller File' with its 22 'folios', plus commentaries, supplementary reports and articles dating to very recent times.

The File was collected by Paul Eugen Schiller who, as a young man, worked as an assistant at the Research Institute in Stuttgart. This institute was founded in 1920 under the auspices of *Der Kommenden Tag*, to pursue the scientific indica-

tions given directly by Rudolf Steiner to various scientists. During the brief four years of its existence, Schiller collected and recorded conversations which Rudolf Steiner had with the scientists working there, also at the Goetheanum and elsewhere. Schiller continued to collect scientific indications and suggestions attributed to Steiner for many years, sourced from conversations, notes and letters. The File therefore has an anecdotal nature, and contains many uncertainties and possibly errors. For this reason, the material was confidential for many years, only being accessible to serious researchers on request. Modern-day researchers will find it a valuable resource, although it is probably not the easiest starting-point for scientists unfamiliar with Steiner's scientific impulse.

The information originates from such individuals as Rudolf Maier, Werner Rosenthal, Ehrenfried Pfeiffer, Gunther Wachsmuth, Henri Smits, Hans Theberath, Herman von Dechend, Walter Johannes Stein, Wilhelm Pelikan, Lilly Kolisko and many others.

The indications are far-ranging, and cover the ethers, electricity, magnetism, heat, spectroscopy, day/night effects, sensitive flames, chemistry, and more. The emphasis is mostly on practical experimental arrangements which, it was hoped, would reveal facts about the etheric realm, and lay the groundwork for a new etheric technology. Here we see Steiner the natural scientist in action, suggesting novel lines of investigation such as observing spectral lines at different temperatures; manipulating spectra with magnetic fields; and devising sensitive systems capable of responding to day/night influences. There are also specific chemical recipes given. For example, in Folio 13 we read of suggestions for the treatment of wood, but there is no record of this having been followed up.

Folio 7 is particularly interesting in that much subsequent work has been done, right through to commercial production at the present time. This relates to refining peat into fibres for clothes production. Steiner took a very close interest in this, saying that peat could protect us from the harmful effects of an increasingly electromagnetic environment. It is clear that some of Steiner's first suggestions (concoctions of plant extracts) were not effective; several times he changed his advice, until he found a formula which eventually produced the required strengthening of the fibres (a formula which was patented by Ita Wegman in 1930). This raises the interesting question of the limits of spiritual insight on the physical plane. In other Folios, Steiner indicates that the precise details will have to be established 'by experiment'.

Generally speaking, the section of 'Comments' on the Folios is well-constructed; indeed, it would hardly be worth publishing the Folios on their own. Here we see several detailed reports and diagrams of research post-1925, as in the studies of emission spectra in super-cooled conditions (although the quality of the pictures leaves much to be desired). There the modern researcher can find many helpful pointers for future directions.

Sadly, many of the indications given to the scientists at the Research Institute were not followed through to successful conclusions, and one has to evaluate the situation anew today. For example, Schiller himself did much research into sensitive flames, following a suggestion by Steiner that the newly-invented microphone did not convey important nuances of the voice, whereas a flame could be made to do this. Contrasting the dreadful quality of the early carbon-granule microphones, with today's instruments, the modern electrical engineer might well question the relevance of the sensitive-flame approach today. In contrast, the crystallisation work of Pfeiffer, and the capillary dynamolysis of Kolisko, lead us into a realm of for-

native forces for which orthodox science has nothing to offer, and these techniques continue to be used in research.

The aim of bending the electromagnetic spectrum with a strong electromagnet, bringing the two ends together to produce life-ether effects, is documented in Folio 2 and in the subsequent comments. Here one could wish for more details of what was actually achieved. The experiments carried out in 1923 in Stuttgart and a few months later in Einsingen 'partially showed the expected results'. Rudolf Steiner was said to be extremely pleased with this. However, bending of light by an electromagnetic field was not achieved until 1996 at Grenoble; in 1923 no such feat was possible. So what exactly was achieved which pleased Steiner?

In Folio 12 Steiner speaks of the rare (noble) gases as being hardened light. Pelikan comments that this can be understood by 'considering how the *heaviest* rare gas is produced from alpha-rays...'. And he goes on to mention helium – which of course is the *least-dense* rare gas. This point is not picked up in the subsequent commentary, and one is left wondering whether there is a misprint, a misunderstanding, or some deeper meaning. Those working with the *Schiller File* will have to work with many such questions.

Readers may be interested to note that Hauschka's work on the differences in heat from electrical, gas and other sources, was not confirmed by Schiller and others. In the true scientific spirit, all results must be carefully evaluated, and repeated independently, if they are to carry weight in the world at large.

The volume contains an appendix by Christoph Podak, evaluating the history and sociology of the Research Institute – a difficult task in view of the surprisingly poor documentation. Rudolf Steiner himself commented that progress was too slow. A number of factors led to lack of progress. The general membership of the society showed a lack of interest in such down-to-earth matters as scientific research, and there were rivalries and disagreements within the Institute itself. Kolisko and Maier were criticised by many, but Steiner commended them on the quality of their work. Paradoxically, another factor in the slow progress was that the researchers held Steiner in such awe that they sometimes failed to ask follow-up questions when they didn't understand him clearly.

In addition to the purely practical indications, there are many fascinating insights in *The Schiller File*, such as the revelation that there are *seven* ethers, only four of which we can investigate at present. There is mention of the Tibetan Mysteries, where machines were constructed which could, for example, make eurythmy-like gestures in response to speech.

There are many cross-references to lecture courses by Steiner (mainly but not exclusively the scientific lecture courses), and source-material is meticulously referenced, including internet sources where available. This is a tremendous help to the serious student. Nevertheless, it is worth mentioning that a footnote on page 70 states that parts of the 'Barr Document' have not been translated into English. In fact the whole document is to be found in 'Correspondence and Documents, 1901-1925' published in 1988 (Rudolf Steiner Press and Anthroposophic Press). In one section, Schiller has collected together many of Steiner's references to heat, and a section by Stephan Clerc on ether-research also collects together many helpful indications. The whole volume has an extensive subject index, and a name index complete with biographical notes. Any reader of this book will surely appreciate the vast amount of effort which has gone into its production, in order to facilitate further research and accessing of source material.

The Anthroposophical researcher will find much useful material in this volume, and although there are many tantalising ambiguities in the Folios, the many contributors have tried to

set these in context and suggest ways forward with some of them. The task of building an etheric technology – regarded by Steiner as essential – is largely unfulfilled, and it is to be hoped that *The Schiller File* will provide stimulus to those able to pursue the indications given specifically to scientists by Rudolf Steiner.

Howard Smith

The Hidden Qualities of Water, edited by Wolfram Schwenk, Floris Books, Edinburgh, 2007. ISBN 978-086315-610-6, 143 pp, £16.99.

This book is a collection of papers by researchers at the Institute of Flow Sciences in Herrischried, Germany, edited, introduced and summarised by Wolfram Schwenk and translated from the original German by several translators. It takes its point of departure from the fact that despite water being officially considered fit to drink if it is free of pathogens, poisons and foul odours and does not corrode pipes, many people feel that these criteria do not adequately define water that is refreshing and enlivening. Could the subtler qualities, especially water's mobility, be scientifically detected and described? Can a holistic, ethical, sustainable, life-serving way of managing water be developed? The Institute tackles these questions with a water-appropriate method of research that favours a perceptual and cognitive approach that is better suited to the movement, change, behaviour and processes of fluids than the science that was developed for solids. 'Water ethics' calls for first developing a mindset in empathy with water. This enables the scientist to study the formative, creative processes of a medium whose laws are like those of the living world, and possibly its very basis.

The first two papers on the nature of water are by Theodor Schwenk of *Sensitive Chaos* fame, and founder of the Institute. Without form, life, stability or rhythm of its own, water is nevertheless an essential part of these attributes of living nature. Its flow forms reappear in living forms. It is interesting to find a strong 'Earth as organism' theme in the first paper although it predates Lovelock's *Gaia* by at least a decade. To this is added water as mediator or transmitter of cosmic formative forces and, according to the author, our blocking of those forces through pollution. How can we rehabilitate it? Through acquiring 'water consciousness'.

Wolfram Schwenk describes the life-serving property of water in the next paper and illustrates it with many examples. The string of vortices created by drawing a stick through a viscous medium are reminiscent of embryological forms. Indeed, the author goes as far as saying that 'such flow movements conform to natural laws of organic formation'. A brief history of the evolution of water consciousness concludes with the question of how we can find a 'way of encountering the relationship between water and spiritual beings' in a modern form.

Michael Jacobi introduces the Institute's main investigative tool, the drop-picture method of Theodor Schwenk. Drops of distilled water fall in standardised conditions on a film of the water sample thickened with glycerine. The resulting, often very beautiful, flow pattern is photographed with schlieren optics and compared with controls. Good waters give richly differentiated shapes, both spatially and temporally, whereas this differentiation is lost in damaged waters.

The great challenge then is to let the 'images speak to us'. The next paper by Wilkens, Jacobi and Schwenk presents this 'speaking' at two levels: the lower being the diagnosis of the effects of treatments that the water has received and the higher being the dynamic morphology a careful observer can read in a series of samples from, for example, the course of a river. This

higher level is applied to the study of the healing quality of spa water.

Andreas Wilkens then gives an in depth analysis of what happens during drop-picture formation. What at first sight seems very simple, turns out to be an immensely complex phenomenon. His introduction to the zones of the drop-picture on page 70 would benefit from corresponding pointers on Figure 1. When studying the six pictures on page 79 I burst out laughing: the one for the River Rhine at Basel best resembled the one for 0.25% acetic acid. However, that was in the bad old days of 1972.

Christine Sutter-Picariello describes how unprejudiced reading of the drop-pictures is performed and the level of detail observable, which can extend to quantitative data for the number of vortices of a particular type. The results are difficult to express in language, but the pictures can in principle subsequently be re-studied by anyone at any time.

In the tenth chapter I finally found what I was looking for: practical advice on drinking water and how to care for it. Wolfram Schwenk advises running your tap into buckets until you have flushed out the pipes. Then you can drink. Ideally pipes should be stainless steel and not plastic – a shame that our water company did not think of this when they changed the asbestos cement main over to polypropylene! And bottled water should not be one's sole source for drinking – a pity, as I have long visited a spring 8 km away to draw the fortnight's drinking water because the chlorine from the tap even taints tea.

Given the emphasis on life in the book, I wondered if it would present a bioassay of various waters alongside the corresponding drop-pictures. I did not find this but something close to it, namely Schwenk and Sutter-Picariello's presentation of biodiversity in a mountain stream, above and at various points up to 8 km below a brewery discharge. The damage to and self-healing of the stream's biodiversity was obvious, and the accompanying set of drop-pictures vividly echoed this. Happily the brewery has since installed effluent treatment.

Before he summarises, Schwenk gives a short section on the role of substances in formative processes. They need to be brought into a condition where they can serve, in a state of chaos or instability, a higher level of order, for example the etheric, through the physical substance being dissolved in water.

Given that the product of the drop-picture method, a dynamic process, is a static image and the observer has to reassemble the dynamics in their mind through looking at a series of images, the question occurred to me: would the 'gestures' engendered by the test process be better revealed by high resolution video with slowed replay?

The debt to Rudolf Steiner for the indications that led to this line of research is acknowledged throughout. Four pages of references to many authors – surprisingly not Viktor Schaubberger, especially in view of Floris' two books about him – open doors for the reader to go deeper. The index makes the book a useful reference work.

I found a good deal of repetition, excusable perhaps as it was a collection of papers. Despite several accounts being given of the drop-picture method – an excellent diagram explaining it having been left to page 119! – there was no complete experimental description that would allow a scientist to set it up without further questions. Even so, the book was an engaging read and I see it as being of use not only to the lay reader who wants better to understand water, perhaps even to strengthen their case when lobbying for a more healthy, even reverent treatment of water, but also to those responsible for our water supplies, who could enhance their work by understanding its

subtler qualities beyond pH, biological oxygen demand, suspended coliforms, etc.

We are told by the media that water is going to become an increasingly contentious issue in the future, partly because of climate change and partly because of our unsustainable use of it. Wars have been and no doubt will be fought over it. People where I live are no strangers to this conflict. The flooding of a village on the river Tryweryn (Wales) in the 1960s by a reservoir for Liverpool (England) speaks for itself. The fading graffiti *Cofiwch Dryweryn!* (Remember Tryweryn!) on walls and bridges are periodically renewed to this day.

I hope that *The Hidden Qualities of Water* will contribute to raising awareness of this precious substance. *David Heaf*

Drawing Geometry: A Primer of Basic Forms for Artists, Designers and Architects, by Jon Allen. Floris Books, Edinburgh. p/b. ISBN 978-086315-608-3. 88pp. £9.99.

In the acknowledgements at the front of the book the author writes: 'There is little in this book that is original...'. This is certainly true, although the collection of drawings and constructions that follow is probably unique, even if the individual drawings can be found elsewhere. Several of the constructions are credited to other people.

The first, by far the longest part of the book, contains descriptions on the construction of regular polyhedra (from the triangle to a thirteen-sided figure): many figures have more than one construction. All are with compass and straight edge, and most are 100% accurate – the author states the accuracy where this is not the case. This first part is 'illustrated' with natural objects which contain the appropriate polyhedron, mostly blossoms. The Chartres labyrinth is also featured.

In the second part, the dividing of a line in (from two to seven) equal parts is described, and the well-known division into any number of divisions using a second line and a set-square (the only time a set-square is required). There follows a section on the golden mean, squaring the circle and an examination of the number of possible stars with a given number of points (e.g. two stars with seven points). The author concludes with progressions familiar to projective geometers.

In the detailed appendix the author 'proves' the constructions described in the first part of the book. Sadly he doesn't use a compass for the circles (or a straight-edge for the lines) making the sketches look very childish.

The author has produced a reference work for those wishing to construct regular polyhedra and an interesting collection of photographs of plants: 'a primer of basic forms', as he subtitled the work. *Bruce Jackson*

Time Stands Still: New Light on Megalithic Science, by Keith Critchlow. Photographs by Rod Bull. Floris Books, Edinburgh. ISBN 978-086315-587-1. p.b. 240pp. £20.00.

What has become of the kingly stream of Star Knowledge that guided the Three Magi from the East to the time and place where Christ was born? Their mastery in wisdom of the living radiance of cosmic light has evolved through astrology and astronomy into the mathematics and geometry underlying our mechanical or astrophysical views of the universe.¹

What has become of the revelations born of piety in simple shepherds' hearts? We are left with the revelations of external nature, and nature has been placed for our perception under microscopes and telescopes and subjected to molecular and atomic dissection. Yet in all that is sense perceptible, on the path of outward revelation, we find in ordinary science no trace of the human soul. Nature is to begin with utterly silent in the face of our yearning for self-knowledge.

Our relationship with nature, and our mathematical contemplations need revitalising if we are going to answer the deeper riddles of being human, and approach what was revealed to shepherds and foretold by kings: *The Divine is revealed in the heights of heaven and peace shall be among men upon earth who are of good will.*

Time Stands Still is a call for and example of the revitalising needed in several areas of science today. It is an example of how an envisioning of traditional prehistoric wisdom could be of use to us today in refinding a holistic science that could rescue us from environmental and social disaster.

As a work of archaeology, it tries to sympathetically comprehend the megalithic mind which was capable of great feats of cosmic architectural orientation without written words or numbers. It aims explicitly to understand the builders of the stone circles on their own terms and begins to explore what kind of knowledge they were using: instinctive, inspirational, intuitive or empirical.

How and why were the stone circles constructed? Why are so many not exactly circular, yet based on definite mathematically ordered shapes? What were the rituals or observations made in them? These are the classical questions confronting all megalithic archaeologists. The author of *Time Stands Still* hopes 'that some of our findings will help to stimulate a better and fuller perspective for the study of ancient monuments'.

It is however more than a book about stones: it strives to re-discover the wisdom stream that underlay the mathematical, geometric, and cosmic architecture embodied in the stone circles and sculpted into stone figures. While being specialist in that it focuses on stone circles, and these peculiar geometrically carved stone nodules from the North east of Scotland, it is a diverse and interdisciplinary study as it uses anthropology, psychology, mythology, architecture, linguistics, philosophy and numerology. This sets it apart from more ordinary research.

Already in Chapter One the positive agenda breaks through the bonds of specialism. Professor Critchlow sees more clearly than many practical environmentalists our need for the Mystery Wisdom of antiquity:

Potential global nuclear war and non renewable fossil-fuel consumption are in constant attendance, yet it may soon be realised that the greatest threat our modern industrial culture poses for mankind is the denial of its spiritual heritage or the value system to control these negative elements. What we call traditional or perennial wisdom is the foundation of all human communities throughout all recorded and non-recorded time. It not only sets out to relate the individual to the cosmic scheme of things, but predicates a relationship of health or 'wholeness' between the natural environment and fellow beings. It is only in this realm that the full dimensions of our dignity and humanity are to be found, as it is the very principle of unity.

Because mathematical knowledge is eternal, the call for the application of traditional wisdom is given deeper roots in this book. The truths of number and geometry, being supersensible were the same for us in our Neolithic incarnations as they will be in our future lives on earth. Plato is strongly invoked as the philosopher who most clearly called to awaken to the eternal reality of the world of Ideas:

To the person who pursues their studies in the proper way, all geometric constructions, all systems of numbers, all duly constituted melodic progressions, the single ordered scheme of all celestial revolutions, should disclose themselves...if pursued with the mind's eye on their single end. That person will receive the revelation of a single bond of natural interconnection between them all. (Plato: *Timaeus*)

As well as being a book about archaeology, *Time Stands Still* makes a stimulating and well illustrated synthesis of three of the four in the quartet just mentioned by Plato: mathematics

geometry, astronomy and music. Kepler did the same with unbounded enthusiasm in his major works, and reading *Time Stands Still* had something for me of the excitement that is communicated by Kepler. It is full of cross-cultural and interdisciplinary associations. For example there are descriptions of twentieth century stone-building rituals from the tribal areas of India. Ancient Hindu manuscripts containing ritual instructions are related concretely to geometrical temple constructions which are then identified in various stone circle ground plans, from survey work originally done by Professor Thom.²

Well-chosen philosophical and psychological quotations give robustness to this book's plea for our greater appreciation of the worn and weathered ancient sites, and for the people who built them. It is well illustrated with beautiful photographs by Rod Bull and all together it will encourage an experiential approach to prehistorical research. In one small part Critchlow describes his visit to Moel Ty Uchaf in North Wales during snow, and the impulse of his book can be heard through his response:

Is human wisdom only to be found in libraries, universities and technological wizardry? ...So many questions arise when one is put back into a natural perspective...One's humanity can be experienced as a natural ingredient of a whole phenomenon.

This personal response perhaps contains the key to a sort of Goethean archaeology. Living with the stone circles and having astronomical experiences alongside them will reveal to us the further secrets of their geometric mathematical and spiritual content.

In The Free University of Spiritual Science brought about through Rudolf Steiner we can hear the call to fulfil ourselves through the cosmic circling of the wandering stars. Living consciously with 'the rhythms of the worlds', while enhancing our observation-participation through meditation, can be the heart of the modern spiritual-scientific path. If megalithic stones and their spectacular and evocative settings can help us to make our inner connection with the universe, then we have linked up with an ancient mystery stream and become a part of its renewal. To carry this forward in the context of archaeological research adds another dimension to science.

An understanding of why seven and nine-fold symmetries were involved in the stone circle construction may arise only through our own active participation-observation and the spiritual fulfilment gained along the way.

An original suggestion in this book is the relation of the nine-pointed star to the great conjunctions and triangulations of Saturn and Jupiter over a sixty year period.

The so-called great conjunction of these slow-moving wandering stars happens every twenty years and successive conjunction points in the zodiac define a great equilateral triangle. Such positions, where from the earth's point of view there is a 120° angle, are called triangulations by astrologists. Critchlow points out that if the intervening positions are marked where Saturn and Jupiter are in triangulation with each other rather than in conjunction, then an elegant ninefold division of the zodiac arises. The rhythm of events is of about 7 years.

Earlier in the book the suggestion had been made that one of the more unusually shaped circles (Allan Water in Scotland) could have two nine-fold polygons underlying its construction. So here is a concrete example of how the impulse for geometrical construction could have come from astronomical observation participation.

The overlaying of classical geometry to the ground plans of stone circles sometimes seems to me fairly hypothetical. On the other hand Thom who is much acknowledged in this work gave considerable weight to geometrical analysis of megalithic

sites; and the fundamental idea of linking this with cosmic observation will surely be recognised as a sound one.

This is a good place to refer to the work by Anne Maculay³ who has similarly extended the work of Thom and made a thorough and elegant presentation of the geometry underlying stone circles, especially making suggestions regarding the mathematics of their construction.

My own observations of planetary triangulations this winter (Mars-Venus and Mars-Saturn) would confirm the striking open-armed gesture experienced when two planets are in this geometrical relationship. Rudolf Steiner, in his rare astrological comments, makes reference to the significance of quadrature (90° angle) in the zodiac and this is a second fundamental angle in geometric construction. (The natural fourfoldness of the moon's phases enhances our awareness of the right-angle in space.)

Really a whole field of pre-historical research-astroarchaeology or archaeo-astronomy! has opened up and been developed between Critchlow's first publication of this book and the second. We should not forget the wakeup that happened in Irish archaeological departments caused by the artist researcher Martin Brennan⁴ in 1980, who refused to accept the limited description of 'Burial Mound' for many Irish antiquities and set about showing at first hand how the Irish sites (chambered 'tombs' and dolmens) were aligned to Sun and Moon rises at various calendar dates in the year. The resistance to these ideas (which in previous generations seemed obvious) seems surprising in retrospect.

With the help of computer software, the prehistorical alignment of stone monuments to the resting as well as wandering stars can since the nineteen nineties easily be investigated. *Time Stands Still* contains very little of this research as it had its origin before this use of computers and concentrates on the purely geometric work pioneered by Thom. The numerology contained here came out of Thom's earlier and comprehensive surveys and is centred on the famous megalithic yard first suggested by him. A more recent work in astroarchaeology containing far more thorough astronomical correlation with stone alignments is Professor John North's epic piece of academic research entitled *Stonehenge*⁵, but covering a range of British circles and barrows. He makes an excellent case for the exact positioning of individual stones mainly based on the rising and setting positions of the brighter resting stars, as well as the more subtle of the lunar rhythms. Stonehenge is a more specialist and rigorous work remaining well within the framework of academic archaeology though nevertheless exciting in its imaginative investigations.

Its wide-ranging treatment of its subject sets *Time Stands Still* apart from formal archaeological treatises although it would be a useful stimulus in many universities. As a resource book for schools it has many useful and elegant constructions in geometry, artistic number work and relevant astronomy. Any stimulus for the teaching of geometry is to be welcomed because that subject is in danger of being whittled away to nothing in current mathematics curricular.

Time Stands Still could be a stimulus and introduction to scientists really wanting to take the research further in a scientific way as well as for those seeking a reconnection with the cosmos through an appreciation of ancient sites. Further work on stone positions as suggested by Critchlow following Thom needs to be done as illustrated by North. Cross-cultural research like this will be exciting for the interested amateur, and even the future spiritual scientist who might wish to read the cosmic environment once again with the support of ancient temple architecture.

The book contains a clear description of Imagination, again with a strong leaning towards Platonism. When Critchlow describes sacred temple construction having its origin in the spiritual world of archetypes, he says:

It is not the world that gives grounds or a basis for constructing a cosmological image (the framework of a temple) but the macro-cosmic itself, the archetype. This archetypal image is ultimately based on the same divine ground as the world, and so it becomes the dwelling place of the gods and thereby regenerates the world. In other words, the archetypal pattern is prior to and contains the regenerative properties that are necessary for the sustained 'becoming' of the world. Humankind both affirm their own grounds for being by their capability of conceiving this archetypal pattern, and sustain their world by recreating it in the world.

And in connection with contemporary psychological work Critchlow arrives at a view of Imaginative or Romantic science:

Following Henri Corbin we can use the word imaginal for the realm of the archetypal images:

This is a level of reality accessible intelligibly but not sensibly: in other words, interior 'visions' or the emergence of the archetype into the individual consciousness indicates that this imaginal realm is a psychological reality and is in no way dependent on the physical realm. In fact the traditional view is the reverse of the empirical, holding that the physical is dependent for its form and significance on the archetypal world.

Wolfgang Held the Dornach astronomer suggests that there are three ways of refinding our connection with the cosmos: observation, interdisciplinary research, and meditation.⁶

Time Stands Still is a good example of interdisciplinary research. With its fine photographs and strong Platonic insights it is also a good encouragement for further observation-participation and meditation at our ancient sites!

1. This introduction is based on suggestions by Rudolf Steiner in his lecture course entitled *The Search for the New Isis the Divine Sophia*. December 23rd-26th 1920.
2. Professor Thom. Many academic publications, for example *Megalithic Sites in Britain*. OUP 1967.
3. Anne Macaulay. *Megalithic Measures and Rhythms. Sacred Knowledge of the Ancient Britons*. Floris Books.
4. Martin Brennan. *The Stars and the Stones. Ancient Art and Astronomy in Ireland*.
5. Professor John North. *Stonehenge: Neolithic Man and the Cosmos*.
6. Wolfgang Held. Introduction to his book on Eclipses. Floris Books.

Alex Murrell

The Upright Ape: A New Origin of the Species, by Aaron Filler

The title 'Goethe's Poetry of the Spine' is taken from the second chapter of the recently published book *The Upright Ape: A New Origin of the Species*, by Aaron Filler Ph.D. M.D. (he is a spinal surgeon). The book has a foreword by David Pilbeam, Professor of Human Evolution at Harvard, and is dedicated to Ernst Mayr and Stephen Jay Gould, two famous Darwinists whom Filler studied under at Harvard. Two DVD's are also available that graphically demonstrate some of the work's major points: upright walking and arm swinging versus knuckle walking, and a set of 3D images of human evolution fossils (<http://www.uprightevolution.com>).

I cannot stress strongly enough the importance of this work for science-minded anthroposophists, or praise sufficiently the task that its author has undertaken, and has so remarkably well accomplished. In a short article I can barely begin to do justice to it, but I will attempt to give some indication of why I think it so very important for the future of human understanding.

The work strongly suggests that we stand at the onset of a scientific revolution that will make Darwinism essentially obsolete, and that J. W. von Goethe will be among the leaders of this new revolution. Among a wide range of very controversial

issues, he puts the question 'Did Apes evolve from humans?' and suggests that the modern Darwinian consensus, at least as it concerns human origins, is totally inadequate to the explanatory task required of it. Interestingly, the same essential point is made from a more philosophical perspective by the late David Stove, an Australian academic philosopher who specialized in the works of David Hume, and whose book *Darwinian Fairytales* was posthumously published by his wife in 1995. In it, and, I might add, with remarkable clarity of thought, he semi-humorously describes Darwinism as 'A ridiculous slander upon human beings'.

Clarity of thought seems to be Filler's strong point also. He is perhaps not quite as critical of Darwin as Stove is, but the issues he raises are by no means trivial, and it seems fair to suggest that in the years ahead this work among others will lead to a very strongly debated controversy that could lead eventually, as he suggests, to the development of a new science of origins. His treatment of Goethe's contribution to this problem is indeed admirable, and even includes a new translation of *The Italian Journey*. I will not quote directly from the book, but will leave that pleasure to others.

From an anthroposophical perspective this work is a fascinating development, because Rudolf Steiner himself, whom Filler does mention as the editor of Goethe's scientific works, allusively expressed deep concern in 1912 about the wisdom of connecting anthroposophy with natural science while the Darwinian controversy continued:

The objection might be raised here that any inclination toward present-day natural-scientific conceptions might put spiritual science into an awkward position for the simple reason that these conceptions themselves rest upon a completely uncertain foundation. It is true: there are scientists who consider certain fundamental principles of Darwinism as irrefutable, and there are others who even today speak of a 'crisis in Darwinism'. The former consider the concepts of 'the omnipotence of natural selection and 'the struggle for survival' to be a comprehensive explanation of the evolution of living creatures; the latter consider this 'struggle for survival' to be one of the infantile complaints of modern science and speak of the 'impotence of natural selection'. — If matters depended upon these specific, problematic questions, it were certainly better for the anthroposophist to pay no attention to them and to wait for a more propitious moment when an agreement with natural science might be achieved. (from his 1912 lecture series *Karma and Reincarnation*).

I do not think that by itself Dr. Filler's argument will meet the requirements for that 'propitious moment' to arrive, but rather that so insightful and well conceived a work can hardly fail to be the start of a major new scientific debate, one that might eventually have that effect, especially if the members of the Science Section make it central to their own future deliberations. Not only does Filler place a strong emphasis upon the works of Goethe, he also repeatedly uses the Platonic/Aristotelian dichotomy to illuminate aspects of the current evolutionary debate. What is important here, of course, is that Plato and Aristotle originally gave birth to spiritual worldviews, but that gradually over the centuries, and especially under the recent influence of Darwinism, they have both been drawn downwards into the broad framework of scientific materialism (the realm of human freedom); and that for the propitious moment to arrive of which Steiner speaks, they will need to have begun their return journey — but now as a unity, not a dichotomy. This will lead to a growing understanding that nothing of evolution is in fact accidental but is deeply rooted in an evolution of consciousness, both human and divine.

The 'journey', of course, is that which has led us across millennia from what Owen Barfield has termed 'original participation' (the old gnosis) on down through scientific materialism

to the present, and must continue in that we must now climb back upwards again, this time in freedom, towards 'final participation'. But it must first be understood that the return part of this journey – in which anthroposophy must play a central role – cannot even be commenced in earnest until it has been widely understood that scientific materialism (Darwinism) because it is grounded in chance, is scientific in 'appearance' only:

Chance, in fact, equals no hypothesis and to resort to it in the name of science means that the impressive vocabulary of technological investigation (associated with evolutionary biology) is actually being used to denote its [science's] breakdown; as though, because it is something that we can do with ourselves in water, drowning should be included as one of the ways of swimming. (Taken from *Saving the Appearances* by Owen Barfield).

Don Cruse

Publications

In Context, The Newsletter of the Nature Institute

No. 18, Fall 2007: Toward a participative science, *Arthur Zajonc*. The Earth as seen from the Moon, *Henrike Holdrege*. The poorly targeted gene, *Craig Holdrege*. Two Moons? *Martin Wagenschein*. Transformation of adult learning, *Craig Holdrege*.

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) natureinstitute.org. Web: <http://natureinstitute.org>.

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

Elemente der Naturwissenschaft

No. 87, 2007: Eine morphologische Charakterisierung des Weizens (*Triticum aestivum* L.), *Peer Schilperoord*. Entwicklungsbild der Sonnenblume, *Danica Jancaryova*. Benjamin Libets experimenteller Beitrag zur Freiheitsfrage, *Christoph Rehm*. Was wiegt das Kind auf der Schaukel, was wiegt der Stein im Wasser? *Hermann Bauer*. Über die Bedeutung von Lautsinn und Begriffssinn bei der Beurteilung von Kristallisationsbildern, *Beatrix Waldburger*. Plus 48 pages of short communications on picture-forming methods.

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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/elemindx.htm>.

Mathematisch-Physikalisch Korrespondenz

No. 230, Autumn 2007: Verbindung von Geist und Materie durch höherdimensionale Quantengravitation, *Hans Thiel*. Die Symmetrieparametrisierung des umstülpbaren Würfels, *Oliver Conrads*. Selected topics in three-dimensional synthetic projective geometry, Chapter 8: Linear complexes of lines in three-dimensional projective space, *Renatus Ziegler*.

No. 231, Winter 2007/8: DNA-Doppelhelix und der lineare Komplex I, *Ingrid Hartmann & Peter Gschwind*. The complex determined by a congruence and a line, *Lou de Boer*. Selected topics in three-dimensional synthetic projective geometry, Chapter 9: Linear congruences of lines in three-dimensional projective spaces, *Renatus Ziegler*.

Subscriptions are SFr 50/€30 per year.

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Wasserzeichen

Nr. 27 (2007): Sandrippel – Rhythmische Prozesse an der Grenze des Wassers zum Festen, *Michael Jacobi*; In addition to the article in this beautifully illustrated in-house magazine, its 51 pages have many shorter contributions including items on the Flow Research Institute's work, conferences, publications and funding. Price €3.00 per issue. Free to sponsors.

Editors, Georg Nitsche & Andreas Wilkens, Institut für Strömungswissenschaften, Stutzhofweg 11, D-79737 Herrischried, Germany, Tel: +49 (0)77 64 9333 0, Fax +49 (0)77 64 9333 22. Email: sekretariat (at) stroemungsinstitut.de. Internet: www.stroemungsinstitut.de.

Jupiter – Astronomy, Mathematics and Anthroposophy

Volume 2(2), November 2007: Die Venusphänomene im Tages- und Jahreslauf. Eine neue Sonnenastronomie, *Liesbeth Bisterbosch*. Eine 'Brücke' zwischen den Vorstellungen von der Evolution des Universums durch die moderne Wissenschaft und durch die Anthroposophie, *Thomas Schmidt*. Von Symmetralen, Kegelschnitten und den Dandelinischen Kugeln, *Heinz Fuhrer*. Soll auch der Mathematikunterricht nach Schluss, Urteil und Begriff gegliedert werden? *Stephan Sigler*. Wie man den Liebesgrundstein der Anthroposophischen Gesellschaft zeichnen kann, *Bernard Asselbergs*. Arnold Bernhard, *Elisabeth Bernhard-Müller*. Interested in the stars through the work at Weleda, Interview with *Finbarr Murphy*. Birth Chart Archetypes, *Finbarr Murphy*. My meetings with George Adams, *John Wilkes*. The 121 pages of this issue include book reviews, correspondence and a diary of events.

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Treasurer's Report

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Membership

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Next Issue

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