

# *Archetype*

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What is Goetheanism?

*Wolfgang Schad*

Some thoughts on the oxalic acid/formic acid processes

*Judyth Sassoon*

## Science Group of the Anthroposophical Society in Great Britain

The group exists to promote an understanding of scientific method and results, broadened and deepened by spiritual science; to maintain contacts among those with similar interests; to encourage collaboration and to publish and translate important contributions. The group publishes a newsletter twice a year which includes details of forthcoming meetings and courses, reports, book reviews, information on new publications and details of articles available from members. *Archetype* is for longer articles in science, mathematics and the history and philosophy of science as well as the social and environmental implications of its application. The journal's content, in English, will comprise research and other relevant articles, short communications and any correspondence these generate. For details regarding the submission of material for publication, please see inside the back cover. A regularly updated list of the contents of all back issues is available on the Science Group web site at the URL below.

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### *Editorial note*

In the last issue we published the first lecture in Rudolf Steiner's cycle on the Fourth Dimension and had intended to serialise it in subsequent issues. Despite our enquiries to the copyright owner before we embarked on that project as to whether there were other translations in existence or in progress, we discovered only after our translation of the first lecture was published that the entire cycle, apart, regrettably, from the copious endnotes by the editor of the German edition, had been published in English by Anthroposophic Press. We therefore abandoned our plan to publish translations of further lectures in the cycle in this journal. The book is reviewed by David Wood in the September 2002 issue of the newsletter of the Science Group.

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# The Fourth Dimension

Rudolf Steiner

Berlin 24<sup>th</sup> March 1905

Translator's note: this lecture by Rudolf Steiner is the first lecture from the volume: *Die Vierte Dimension. Mathematik und Wirklichkeit* (Rudolf Steiner Verlag, Dornach, Switzerland, 1995; GA 324a in the collected works in German). The volume was edited by Dr. Rhenatus Ziegler and Ulla Trapp. All the editor's additions are enclosed in square brackets [...]. The detailed end-notes below originate from Dr. Ziegler, and we are extremely grateful for his kind permission in both allowing us to make use of them, and his reading through of the present translation. *David Wood*.

Before you become disappointed with what you are about to hear, let me first of all say that today I will discuss very elementary things [about the fourth dimension]. Whoever desires to penetrate more deeply into this problem must be thoroughly acquainted with the higher concepts of mathematics. I would like to give you a few very elementary and general concepts. We must distinguish between the possibility of thinking in four-dimensional space and the reality itself. Whoever is capable of making observations there has to do with a reality extending far beyond what we know as sense-reality. One must undertake thought transformations when entering this domain. You must allow the things to play a little into the realm of mathematics, and acquaint yourself with the manner of thinking of a mathematician.

We have to realise that a mathematician does not undertake a single step without providing a justification for the results of his inferences. However, we must also become aware when occupying ourselves with mathematics that even the mathematician himself cannot press forward a single step [into reality], that he is unable to draw any inferences [extending out beyond what is possible in thought]. Initially we will be dealing with quite simple things that will soon become more complicated if we wish to arrive at the concept of the fourth dimension. We must become clear as to what we understand by dimensions. This is best done by analysing the various configurations of space according to their dimensionality. This leads to studies that were first tackled in the 19<sup>th</sup> century by great mathematicians such as Bolyai, Gauß and Riemann.<sup>1</sup>

The simplest magnitude of space is the point. It has no extension at all; it has to be thought. It is the fixing of an extension in space. It has no dimension. The first dimension is the line. The straight line has one dimension, length. If we move or rotate the line itself – which has no thickness – we pass out of one dimension and the line becomes a plane. This has two dimensions, length and breadth. If the plane is moved about we pass out of these two dimensions and get the solid. It has three dimensions: height, breadth, depth (Fig 1).

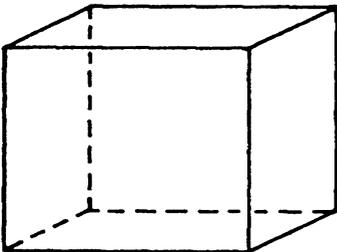
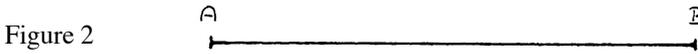
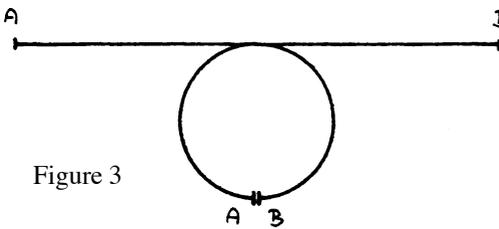


Figure 1

However, if you move the solid itself about, [for example] if you move a cube around in space, you will still only get a solid. You cannot move [three-dimensional] space anymore out of itself. We shall have to apply a few other concepts. If we look at a straight line, it has two boundaries, two endpoints *A* and *B* (figure 2).



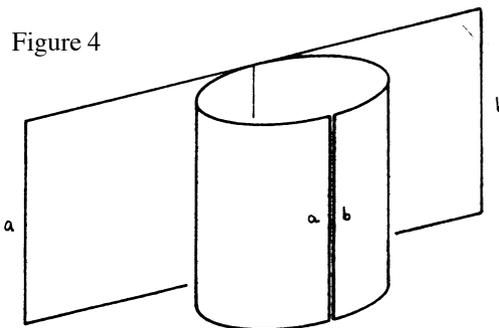
Now let us imagine that *A* and *B* have to come into contact with one another. If we want them to make contact we shall have to bend the straight line. What happens? It is impossible for you to remain in the [one-dimensional] straight line if you want *A* and *B* to coincide. To join the points *A* and *B* we have to pass out of the straight line, that is, we have to move out of the first dimension and pass into the second dimension, the plane. In this manner [a closed curve, i.e. in the simplest case] a circle arises from the straight line,



due to the fact we have made its endpoints coincide (figure 3).

Thus it is necessary to pass out of the first dimension, we cannot remain in it. The circle only arises in this manner. You can carry out the same operation with a [bounded rectangular] plane. This is only possible if we do not remain in

two dimensions. We must pass into the third dimension, thus obtaining a tube or a cylinder from out of the plane. This operation takes place in precisely the same way as before when we brought the two endpoints into coincidence, and thereby passed out of the first dimension. Here [with the plane], we have to move into the third dimension in order to bring the two ends of the plane together (figure 4).



Is it conceivable that a similar operation could be carried out with a spatial configuration already possessing three dimensions? If you have two congruent cubes, you can shift the one cube over into the other. [Now imagine two congruent cubes as the boundaries of a three-dimensional prismatic solid.] If you attempt to bring one of the cubes, which is coloured red on one side [and blue on the other opposite side], into coincidence with the other cube, which is in all other

respects [geometrically] the same – apart from the fact its blue and red colours are interchanged – then you cannot bring them into coincidence in any other way except by rotating the cube (figure 5).

‘There is a delicate empirism which identifies itself with the object in the most intimate way and thereby becomes actual theory.’ (MuR 565)

‘There is a reflection with enthusiasm which has its greatest value when we do not let ourselves get carried away.’ (MuR 329)

But in his estimation, the latter – letting oneself get carried away – happened too often with the romantics. And indeed the sympathy went increasingly in one direction, namely to Goethe. But he clearly distanced himself from them with harsh words of rejection:

‘Antiquity appears only as an idealised reality, a reality treated with grandeur (style) and taste; romanticism as unreal, impossible, given through phantasy only an appearance of reality.

Antiquity is plastic, true and real; romanticism is deceptive like the pictures of a magic lantern...’ (to Riemer, 28.8.1808)

‘A new expression has occurred to me that describes the relationship quite well: classicism I call healthy and romanticism unhealthy.’ (to Eckermann, 2.4.1829)

That went for not only romantic poets and literati but also the succeeding generation of scientists of the romantic movement. He had set his greatest hopes on them but he soon revealed his disappointment. Only a few of them found recognition with him such as Kiemeyer, Humboldt, Howard, Heinroth, Berzelius, Döbereiner, Voigt, Purkinje, Carus and Runge. For Goethe, the majority – with all their acknowledged talent – drifted into the numinous or as he put it into the dark side of life. When Schelling, whom he had himself summoned to the university at Jena in 1798, in 1815 wanted re-appointment, Goethe refused. He did not want ‘to see that old obsolete stuff reintroduced in a new mystical-pantheistic, abstrusely philosophical, though by no means despicable form.’ (to Chr. G. von Voigt, 27.2.1816). The botanist Schelver he called an ‘ultra’ (WA II, 6, 189). Even when Carus, whom he greatly estimated, sent him his study *Psyche*, which anticipates the modern psychology of the unconscious, Goethe noted in his diary (3.1.1832):

‘Deep reservations about Carus’ psychology of the dark side. Reaction to write one the same for the light side; immediately stated and carried out during a few sleepless hours at night.’

Although we might wonder about the rightness or wrongness of Goethe’s reservations, it is clear that we cannot equate his kind of mind with those of the scientists of the romantic movement. He even distanced himself from Oken, who was also appointed by him to Jena. On receiving a manuscript from Henrik Steffen he responded to him, ‘I picked it up hopeful and confident but I must admit that reading it put me in a bad humour.’ (letter draft, autumn 1806). In conversation with Sulpiz Boisserée and probably in connection with the work *Ahnungen einer allgemeinen Geschichte des Lebens* (Preliminary thoughts on a general history of life, 1806) he said the following about the physician Gotthilf Schubert, one of the later romantics who grew up in Weimar and studied under Herder at the Gymnasium high school there: ‘So G. H. von Schubert, the pitiful man, with his pretty talent, his pretty wit etc. is now playing with death; trying to find his health in decay.’ [...] (4.8.1815). Goethe probably did not even appreciate Novalis’ *Hymnen an die Nacht* precisely because the hymns referred to the night. And for his own part, Novalis, who had done a foundation training in science at the Freiberg Bergakademie, distanced himself

from Goethe. Between 1798 and 1800 his great admiration for the Meister novel – Goethe was to him ‘the true master of the poetic mind on the earth’ [Pollen, No. 106] – suddenly changed. Goethe was no longer romantic enough for him:

‘*The Apprenticeship of Wilhelm Meister* is in a sense totally prosaic – and modern. The romantic perishes – so too poetry of nature, beauty – he deals merely with everyday human things – nature and mysticism are completely forgotten. It is a poeticised bourgeois and domestic story. Any mystery in it is expressly treated as poetry and rapture. The book is in the spirit of artistic atheism.’ (Das philosophische Werk III, 638f.)

In September 1796 Goethe had met Novalis’ fiancée, Sophie von Kühn and later spoken of their ‘beautiful relationship’ (25.7.1816) which probably placated Novalis. But here we are not concerned with whether the two liked each other or not, but with whether the mission acknowledged and pursued by one was that of the other. Compared with Goethe, Novalis paved the way for anthroposophy in a much more direct way. Access to the supersensible was for Novalis at the centre of his life’s goals. Goethe took on the task of rendering experiencable an earthly world which is itself permeated by spirit.

All the romantics were somehow aware of this. For instance this is how Dorothea Schlegel wrote in sorrow to her sons (28.11.1817):

‘Goethe has revealed himself to a through passenger that in science and philosophy he’s an atheist, in art a heathen, and at heart a Christian.

Now we know quite openly from the man himself why he never gets to the truth.

The poor man! I feel very sorry for him.’

Even relative to the idealist Schiller, with whom he had formed a close friendship, Goethe described himself as an ‘out and out realist’ (27.4.1798) – not because he was one but because he wanted to contrast himself to mere exuberance, since he knew all too well from his own experience the problem of striking a balance. It was precisely the romantics, the literati as well as the philosophers of nature, who in his eyes had lost this balance. In his seventies he became kinder to them, for instance when he wrote to the botanist Nees von Esenbeck in Bonn (23.7.1820): ‘...I could venture a few steps towards that dark side when your faithful hand guided me.’ (WA IV, 33, 124)

Goethe explained the origin of the word ‘romantic’ thus: ‘The idea of classical and romantic poetry, which is now used all over the world and causes so much trouble and division, originated from Schiller and myself. In poetry I used the maxim of the objective method and I wanted to accept only this. But Schiller, who works entirely subjectively, thought his way was the right one and in order to protect himself from me he wrote his essay on naïve and sentimental poetry.’ Thus Schiller regarded Goethe’s work in the best sense as ‘naïve’, yet he nevertheless described his *Jungfrau von Orleans* (Maid of Orleans) as ‘a romantic tragedy’. Goethe continues: ‘The Schlegels took up the idea and sent it further on its way so that now it has spread the world over and now everyone talks of classicism and romanticism which nobody thought about fifty years ago.’ (to Eckermann, 21.3.1830)

When Goethe came to Weimar in 1775, a Johann Samuel Schröter (1735-1808) was the deacon at the city’s parish church of St Peter and St Paul (where Herder is known to have

## **Representatives of early Goetheanism and romantic science**

Abraham Gottlob Werner, mineralogist, 1750-1817  
Georg Christoph Tobler, geographer, 1757-1812  
Jeremias Benjamin Richter, chemist, 1762-1807  
Franz Xaver von Baader, philosopher and theosophist, 1765-1841  
Carl Friedrich Kielmeyer, versatile scientist, 1765-1844  
Alexander von Humboldt, versatile scientist, 1769-1859  
Friedrich von Hardenberg, geologist and poet, 1772-1801  
Joseph Wilhelm Eduard d'Alton, anatomist and archaeologist, 1772-1840  
Luke Howard, meteorologist, 1772-1864  
Henrik Steffens, philosopher of nature, 1773-1845  
Johann Christian August Heinroth, physician, 1773-1845  
Friedrich Wilhelm Joseph Schelling, philosopher of nature, 1775-1854  
Christian G.D. Nees von Esenbeck, botanist, 1776-1858  
Johann Wilhelm Ritter, physicist, 1776-1810  
Carl Friedrich Burdach, physician, 1776-1847  
Hans Christan Oersted, physicist, 1777-1851  
Franz Joseph Schelver, botanist, 1778-1832  
Johann Jakob Berzelius, chemist, 1779-1848  
Lorenz Oken, zoologist and philosopher of nature, 1779-1851  
Johann Wolfgang Döbereiner, chemist, 1780-1849  
Gotthilf Heinrich Schubert, physician, 1780-1860  
Ignatius Paul Vitalis Troxler, philosopher, 1780-1866  
Friedrich Siegmund Voigt, botanist, 1781-1850  
Joseph Ennemoser, physician, 1787-1854  
Johann Evangelista Purkinje, physician, physiologist, 1787-1869  
Carl Gustav Carus, physician, 1789-1869  
Carl Ernst von Baer, embryologist, 1792-1876  
Carl Friedrich Philipp von Martius, botanist, 1794-1868  
Friedrich Ferdinand Runge, chemist, 1795-1867  
Heinrich Wilhelm Ferdinand Wackenroder, chemist, 1798-1854  
Johannes Müller, zoologist, 1801-1858  
Gustav Theodor Fechner, physicist and psychologist, 1801-1887  
Justus von Liebig, chemist, 1803-1873  
Alexander Braun, botanist, 1805-1877  
Carl Fortlage, psychologist, 1806-1881  
Carl Snell, mathematician, 1806-1886  
Johann Jakob Balmer, mathematician, 1825-1898  
Ernst Haeckel, zoologist, 1834-1919  
Wilhelm Preuß, mathematician, 1843-1909

(see also the list of names by C. S. Picht, 1933)

been employed as superintendent in 1776) and at the same time the curator of the ducal natural history collection. From 1774 to 1784 he published a four volume work in which he meticulously catalogued in elaborate detail hundreds of rocks, minerals and fossils which he had seen or were mentioned in books, without even attempting a comparative overview or to present their mode of origin and evolution. He was a Linnean spirit of the third order whose name and ‘pea counting’ Goethe had never mentioned, although he certainly must have got to know him at the very same place. Only once after his death did Goethe mention him. It was in a letter to the Jena mineralogist Johann Georg Lenz (13.7.1814) where he asked about a rare fossil find of a limpet (*Patella*) near Weimar, which Schröter had catalogued and sketched and which Goethe had seen living on the shore at Venice. Schröter, Lenz and Herder were educated theologians but, of the three, Goethe found only Herder to be open to ideas about evolution in nature.

Yet the idea of evolution had no part to play amongst the scientists of the romantic movement except with C. G. Carus (1859), who, because of both this and his true empiricism, was more than just a romantic. Moreover, it was even tragic that both sides of the research enterprise, the outer thoroughness and the inner spiritualisation, were drifting apart before the eyes of the ageing Goethe. He and only a few others were able to combine the two. But whilst his romantic successors emphasised going the way of introversion, they provoked a reaction of pure extroversion on the part of the new generation. Almost all the materialists gaining influence around the middle of the 19<sup>th</sup> century had an idealistic-romantic period in their youth, which at some time or other they suddenly rejected because of their lack of inner substance and turned to the opposite. This was the case with Matthias Schleiden, co-originator of cell theory; Justus Liebig, inventor of mineral fertilisation; Charles Darwin who had at first half-heartedly attempted to study theology; Ernst Haeckel who likewise had a youthful pious period and Johannes Müller who was even a vitalist and yet co-founded mechanistic physiology. We can certainly put forward the biographical rule that verbal theism, spiritualism or idealism lead most fundamentally to a materialism that is no longer matched by inner experience. ‘Our most famous materialists were educated to be idealists, for instance Haeckel, Büchner, Moleschott’ (GA 93a, 72; see also GA 184, 175-6).

Steiner preferred wise materialists to stupid representatives of the spirit (GA 174, 217). For a verbal declaration of belief in the spirit can of course be very unspiritual. Thus Goethe had to do battle with both sides: the defenders of the faith and the rigid positivists. Goetheanism comprises the careful overcoming of this cultural divide. That is also a feature of anthroposophy. It does not want to be just anthropology or just theosophy, but to combine both as anthroposophy (GA 115, 23.10.1909). For this reason Steiner expressed his gratitude to nobody more than to Goethe. From the time of his Weimar studies of Goethe he reported:

“During the time that I was working at my interpretation of Goethe, I had Goethe always beside me as an admonisher who called inaudibly to me: ‘Whoever too rashly moves forward on the spiritual way may attain a narrowly restricted experience of the spirit, but he enters into a content of reality impoverished of all the richness of life’.” (GA 28, 124, see also GA 188, 128) [Tr: J. Collis]

And later in 1924:

‘Spirit perception, brought up in the loving perception of nature, brings to life the true riches of the soul. Spiritual dreaming, elaborated in contradiction to true knowledge of nature, can but impoverish the human heart.’ (GA 260a, 57) [Tr. G. Adams]

Steiner was much more able than Goethe to push the limit of experience further into the supersensible. But there is a Goethe the anthroposophist (see Schad 2000a) and a Steiner the Goetheanist (for instance in his practical knowledge of nature for discovering remedies in medicine and agriculture).

What then should be subsumed under Goetheanism on the one hand and anthroposophy on the other? To answer this we consider in the next section the indications of Steiner himself on Goetheanism.

### **Steiner’s characterisations of Goetheanism**

In Steiner’s published work there are over a hundred places where he used the word *Goetheanism*. The most important of them are summarised here.

**I)** Steiner was never tired of emphasising that by Goetheanism it was not so much the historic Goethe that was meant but what arose all the more from the spirit of Goethe immediately after his death (GA 181, 423; GA 200, 65; GA 272, 143). One should not swear by Goethe, or ape him; the Goethe cult typical at his time made a spectre out of him: ‘The most important thing about Goetheanism cannot be found in Goethe’ (GA 188, 128-144). Goetheanism is not old (GA 202, 260), because the spirit of Goethe lives on and is still unfolding (GA 333, 143) and is different year on year (GA 277, 132); he is the most modern person (GA 188, 103), indeed Goetheanism is the voice of the 20<sup>th</sup> century (GA 177, 213; GA 333, 143).

But his indications go far beyond that when he characterises Goetheanism as an element of the whole spiritual development of humanity (GA 277, 132); as one of the tremendous spiritual impulses of humanity (GA 192, 11) and indeed as the greatest spiritual pulsations beating in humanity (GA 190, 170). It is the keynote of the 5<sup>th</sup> post-Atlantean epoch (GA 296, 98). It will unfold only in the coming millennium (GA 181, 423). Indeed, Rudolf Steiner confirms Hermann Grimm’s words that Goethe will only be fully understood in a 1000 years time (GA 272, 138).

**II)** Yet Steiner also uses the term *Goetheanism* to refer to the historic effect of Goethe on his contemporaries (GA 220, 55; GA 258, 140; GA 330, 330) as the free spiritual life at the turn of the 18<sup>th</sup>/19<sup>th</sup> centuries (GA 338, 36). Herder, Lessing, Wieland, Schiller, Schelling, Hegel, Tiek, G.H. Schubert, Troxler, Carus and Novalis were mentioned in a variety of lectures linked with Goetheanism. They ranged from Leibniz (GA 196, 237) to Haeckel (GA 196, 135). Indeed, in these people Goetheanism, which had continued from the Knights Templar and Walther von der Vogelweide in the Middle-Ages until Goethe, ended in middle-class culture (GA 171, 116; GA 190, 173-188). This Goetheanism lived primarily in the arts and thus in an apolitical manifestation and produced no implications for society to deal with (GA 186, 111; GA 190, 173).

**III)** Goetheanism Steiner sharply contrasted with and set opposite to several other ‘isms’: Catholicism (GA 181, 423) just as much as Lutheranism (GA 185, 151); the Galilean world view as well as Jesuitism (GA 77b, 109); Frederick the Great’s Prussian nationalism which resurrects only the primitive wildness of the Niebelungen (GA 190, 162) and Americanism (GA 181, 423) especially in its Wilsonian form (GA 185, 151; GA 186, 236). Even Comte, Bentham, Marx and his socialism were identified as opposites to Goetheanism (GA 184, 31; GA 186, 212; GA 185, 215). And in the sciences in the universities there was too much jurisprudence to allow them to be Goetheanism (GA 195, 9; GA 185, 170-173). The circle round the pessimistic Viennese poetess delle Grazie was explicitly described as anti-Goetheanism. What was common to them all? It was the danger of abandoning the human.

**IV)** Steiner spoke most significantly on Goetheanism when referring to the Goethean approach to nature. It comprises the pure, virgin and primal phenomenon (GA 180, 57) and the incredible intimacy of experience of outer realms (GA 333, 143). Goetheanism means the reciprocal exchange between inner and outer (GA 322, 7) and thus uniting the moral and physical world (GA 201, 236); with the virtue being neither too spiritual nor too material (GA 334, 273). Thus, in that Goetheanism holds the rhythmic centre between the ‘metabolic forces of oriental culture’ and the ‘modern nerve-sensorial culture’ can it always succinctly discover the whole in all the parts (GA 334, 290; GA 200, 9). Goetheanism never views non-human nature without its connection to the human being (GA 196, 135; GA 201, 69) and thus arises the ordering in the fullness of the appearances of the sense world (GA 78, 153; GA 81, 159). Steiner frequently emphasised Goetheanism as phenomenism. And Goetheanism demanded concreteness especially in *physics* (GA 320, 61).

**V)** But there is too the contrary indication that Goetheanism is more than phenomenism in that it does not remain only with sensorial observation (GA 322, 7). Rather than a theory of facts it is a theory of transformation, a study of metamorphosis (GA 181, 59). Thus Goetheanism becomes a spiritual morphology (GA 187, 42-92) and lays the basis of understanding the evolution of all living beings up to man (GA 277, 132). Through this Goetheanism lends ‘boldness’ to Darwinism (GA 61, 448). But whereas the latter focused on only the different approaches at the time to a theory of evolution, Goetheanism is open to innovation (GA 177, 198). Yet in the very same lecture, Rudolf Steiner contrasts Goetheanism even more strongly with Darwinism, particularly where the latter bears within it the inhuman elements of selection theory (GA 177, 208).

An essential feature of evolutionary Goetheanism is that it makes the transition to a theory of evolution of the spirit (GA 177, 198, 210). It is not a finished spirit that simply unfolds in time, but it develops itself on earth. Thus the Goetheanistic theory of metamorphosis leads directly to the idea of reincarnation (GA 171, 116). In his conversation with Johannes Daniel Falk on 25 January 1813 at Wieland’s funeral, Goethe spoke about it more openly than he ever had done, referring to his ‘observations over many years which I have made on the constitution of our own being and all the beings in nature. [...] It is always the same metamorphosis or the capacity of nature for change that calls forth from

the leaf a flower, a rose; from an egg a caterpillar and from the caterpillar a butterfly. [...] I'm certain as I stand before you now of having been here a thousand times and I hope to come back many thousand times more'.

Thus scientific Goetheanism, if taken far enough, leads the researcher to becoming 'at least an idealist, or more probably a spiritualist' (GA 191, 124). For, 'spiritless science is there precisely to educate human beings to the spirit. That is what is paradoxical about it' (GA 191, 187). Just as mysticism leads to the material, so also does scientific Goetheanism lead to spiritualism (GA 197, 95). It can become cosmic, become a mystery wisdom (GA 197, 147), penetrate to the spirit of the cosmos (GA 71, 107). Goetheanism can work in this way as a transformer of science (GA 333, 143).

**VI)** Steiner thus came to recognise a further aspect of Goetheanism, namely that it was of course the precondition for the coming into existence of anthroposophy and still is. The latter arose from a continuation of Goetheanism (GA 84, 7) and indeed owed its origin directly to Goethe. For this reason, the building on Dornach hill in Switzerland is named the 'Goetheanum' as a place of homage to Goethe (GA 259, 113). And to this day the surest entry to anthroposophy is via Goetheanism (GA 185, 170). It is the straightest road directly to anthroposophy (GA 201, 178; GA 211, 78; GA 218, 308). Thomism combined with Goetheanism gives anthroposophy (GA 74, 73); the Cistercian Wilhelm Neumann drew Steiner's attention to this connection in 1888 (GA 74, 93-4)

**VII)** In lectures to both public and invited audiences Steiner went even further. Goetheanism is not just the ante-room, the atrium to anthroposophy but anthroposophy wants to be Goetheanism, in that it develops comprehensive Goetheanism, indeed it is the manifestation of Goetheanism today (GA 333, 143). In at least ten lectures Steiner identified anthroposophy directly with Goetheanism (GA 65, 51; GA 72, 13,64,107,150,187; GA 177, 198; GA 178, 9; GA 259, 437 etc).

'Therefore [...] I like to call the world view which I represent as anthroposophically oriented spiritual science the *fully developed Goethean world view*' (GA 73, 133).

'And I was aware that my lectures were basically never anything other than Goetheanism when I spoke of spiritual science in the way it is possible in our time.' (GA 65, 86)

'I would like to name this world view which has arisen scientifically in the way I have described – if I am not to be misunderstood, I would like to name it so every time – out of the sources whence it came to me; I would most of all like to name this world view *Goetheanism*, just as I [...] would most like to name the building dedicated to this world view there in Dornach the *Goetheanum*' (GA 72, 50; also GA 72, 105, 147, 227)

Rudolf Steiner gave the reason why he did not always call anthroposophy Goetheanism as being that it would be too easily misunderstood. It is clear where the misunderstanding can occur: confusing anthroposophy with historical Goetheanism, when Goetheanism of the present is meant.

**VIII)** But in a lecture on 12 March 1922 in The Hague Rudolf Steiner took word for word a totally opposite position: Goethe's phenomenalism is devoid of any knowledge, like the

pragmatism of William James (1842-1910) the American philosopher. In precisely this sense phenomenism lands up in agnosticism if we do not involve ourselves with investigation of the supersensible aspect of life, anthroposophy (GA 82, 207ff.). One can hardly imagine a greater contrast to the characterisations presented in sections V, VI and VII above.

Speaking about this time, Hermann Poppelbaum said that from one day to the next Steiner himself stopped a series of publications which he had instigated, namely the republication of the buried literature of the early Goetheanists. At that time he himself had undertaken to prepare for reprinting Carus' *Zwölf Briefe über des Erdleben* (Twelve letters on life of the earth) of 1841, but then later abandoned the task. Only in 1986 did it reappear, published by Ekkehard Meffert (Verlag Freies Geistesleben, Stuttgart).

**IX)** We also encounter a reversal of the characterisation in section VI. We do not reach anthroposophy via Goetheanism, but we only understand Goethe through anthroposophy (GA 171, 116). Goetheanism is realised only when anthroposophically oriented spiritual science throws light on the results of modern science (GA 74, 73). Goetheanism can develop only through spiritual science (GA 289, 7). Here the indications are clear, as arises from the context itself, as to when historical Goetheanism of the 18<sup>th</sup>/19<sup>th</sup> centuries is under consideration and when current/future Goetheanism. Thus Steiner characterises old Goetheanism as apolitical and socially weak (II), but present day Goetheanism as just the opposite. This leads to the discovery of the threefold nature of the human being and not just in his spatial-bodily organisation, but precisely as a being in time. Through this a renewal of embryology was possible (GA 192, 237). It revealed the powerful dimension of time in the so oppositely constituted head and limb members (GA 184, 174). Furthermore, the discovery and development of social threefolding was only possible this way (GA 196, 151). What is portrayed in *Kernpunkten zur sozialen Frage* (Towards Social Renewal – Basic Issues of the Social Question, GA 23) as spiritual, rights and economic life is also present as the three kings in Goethe's fairytale (GA 197, 189). During the early twenties, the threefolding movement set up a co-ordination centre at the Goetheanum called the *Verein Goetheanismus* (Goetheanism Association). Steiner was not completely happy with the name *Waldorfschule* and once suggested *Goetheanismus-Schule* so that it would not be taken as an appendage of a cigarette factory (GA 300 I, 185).

Already we can see such a rich variety of the content of Steiner's vocabulary of *Goetheanism* that the reader must be yearning for a clear consensus for the term's linguistic usage, for a clear definition. But here too the reader is faced with a linguistic problem which anyone encounters who embarks on studying (not just reading) anthroposophy. They have to deal with the same tension that Steiner reported from his own workplace (GA 280, 134). Living thinking, becoming free of the body, no longer depends on the prop of language and must create a new relationship to it. Real understanding is not communicable in words, as nominalists and verbalists think, but through the context in which the words are used. This of course is what gives rise to the excitement in the kettle game (*Teekessel-Spiel* – a children's guessing-game based on puns *Tr.*).

In the modern age more than any other, word wear continually increases. The single word alone no longer conveys the real meaning but is just a pointer to comprehension that

words cannot express (GA 199, 253). Highly formalised sciences exist through conventions of linguistic definitions, living science in a linguistic guessing game. And we will look further at the multi-facetedness of the term *Goetheanism* in the following sections.

**X)** Rudolf Steiner's indications on Goetheanism as an expression of German-ness are also strikingly contradictory. Even in his first usage of the word Goetheanism as a student he used it to denote the specific German mind set that holds idealism to be true. To the Austrian student, who had got to know about Siebenbürgen German-ness through a fellow student he had befriended, this was especially obvious. During World War I too German idealism was referred to as Goetheanism (GA 65, 51; GA 185a, 88; GA 185, 151; GA 190, 173; GA 192, 275) and German Goetheanism mentioned (GA 184, 31).

In a similar lecture Steiner emphasised that Goetheanism had nothing German or national about it (GA 185, 173). Indeed, Goethe once spoke of how the three minds who had had the greatest influence on him were the Englishman Shakespeare, the Dutch Jew Spinoza and the Swedish botanist Linnaeus (WA II, 6: 390; IV, 27: 219). Goetheanism is an attack *against* mere nationalism. A contradiction? Or not?

In the Spring of 1920 Steiner once reminisced ironically that in the first half of the 19<sup>th</sup> century it was a crime to speak too publicly in the country of his German-ness (Jahn, the father of gymnastics, was at times imprisoned for this). But it was just through Goetheanism that a unified, lively *intellectual* culture existed in Germany which *governmentally* was a patchwork (GA 196, 228).

Middle-Europe always experienced high points in its culture when the linguistic region was not a governmental region. Thus it was in the time of Meister Eckhart, Walther von der Vogelweide and Wolfram von Eschenbach, or during the flowering of the central European renaissance and, after the devastating Thirty Years War, once again in the time of German classicism. When in the romantic movement German academic youth saw the French king as their arch enemy, Goethe withdrew spiritually into Islamic culture and studied Arabic so as to shift, in *Westöstlicher Diwan*, from national literature to *world literature*. Everyone feels that when it comes to nationalism, no people is more at risk of behaving inhumanely than the Germans. Reader of souls Goethe clearly knew this:

German national character

Any hope of forming yourselves into a nation, Germans, is in vain;

Develop yourselves rather – you can do it – more freely as human beings! (Xenien)

And in analysing the human being, Steiner concludes that the character of the peoples of central Europe consists not in having strong ethnic bonds like individuals of peoples elsewhere, but in developing its higher 'I' nature, its individuality (GA 157, 265-6). One could say that the Germans are an 'I-people', even if this designation is self-contradictory. For we are either 'people' or 'I'. The real paradox is that the Germans are only a normal people like others when the single person manifests not so much as a people but as individuality itself. Most sadly, whoever does not manage this just imitates others (the west Germans were until 1989 the most faithfully linked to the West, the east Germans to the East), or he opens up neo-nationalism and gives an even more pitiable, even dangerous, impression. The higher 'I' of each person consists of their being able to be open to entire otherness. Only thus can we understand Steiner's wholesome advice: 'One is a

central European only when one takes an interest in other peoples’.

And that solves the apparent contradiction above. Goetheanism arises in central Europe from those forces which recognise the humanity, even the universally human, in each person such that the dignity of each individuality comes before anything to do with their belonging to a people. This was most clearly apparent in the time of the chaos after the First World War, as Steiner made clear in one of his lectures on the social question on 30 December 1919:

‘And how at the moment when the prospect of victory began to turn to our disfavour, the Goetheanum was erected in front of the whole international world of nations as a witness to the international spiritual life, without shying away from the fact that what is today the development of Goetheanism originates from the roots of German spiritual life. Thus anthroposophically oriented spiritual science will struggle for its recognition as a world content which has become a conviction against all obstacles.’ (GA 333, 163-164)

**XI)** Many otherwise strikingly contradictory comments by Steiner on Goetheanism are resolved, if we are careful to note whether the time dependent aspect of historical Goetheanism and its associated cultivation of tradition in Weimar is meant, or whether it is that which has developed further in the 20<sup>th</sup> century as its spiritually powerful, increasingly brilliant, inner aspect. But there is a much more future-oriented characterisation of Goetheanism by Rudolf Steiner which culminated in the lecture cycle *Der Goetheanismus, ein Menschenumwandlungsimpuls und Auferstehungsgedanke* (Goetheanism as an impulse for man’s transforming impulse and idea of resurrection, GA 188). In this 1919 lecture, Steiner said that not only in the 19<sup>th</sup> century did people stand before the closed grave of true Goetheanism (GA 204, 110), but also even in our time this Goetheanism is still buried (GA 188, 134). But it will undergo a resurrection and be the Christianity of the future. Still, Goetheanism is in its infancy and will develop metamorphically (GA 273, 262-3). And the Christ impulse already lives in it (GA 169, 104; GA 185, 173-198), for it is a science that has remained connected with the sphere of religion (GA 185, 201). Now there is a mood of expectation, the expectation of a new understanding of the Mystery of Golgotha (GA 188, 103). But it will find its future resurrection through its present death and the rejuvenation resulting from that (GA 188, 128-142; GA 177, 210). Healing the split between the spiritual and the sense-bound aspects of the world, between the divine and everything earthly, the divine ‘Yes’ to man and the mission of the earth, is Christ’s work in life and in death. The mystery of Golgotha is the execution of this cosmic healing.

To live the reconnection of these two worlds was the lifeblood of the historic Goethe too. When the young Goethe’s friend Johann Kaspar Lavater became a bigoted moral fanatic, Goethe could only write to him:

‘I am indeed no anti-Christian, no un-Christian, but a decided non-Christian...’  
(29.7.1782)

But when he was very old he let go the following in conversation with his friend of that time Friedrich von Müller:

‘You know what I think about Christianity – or perhaps you do not know – who

today is a Christian as Christ would have it? I alone perhaps, though you all regard me as a heathen.’ (7.4.1830)

In this respect Goethe was an exceptional person in the sense that in him the split between ‘I’ and world, between subjectivity and objectivity, did exist far less than is normally the case with people. For this split is the gift of Lucifer and its healing the deed of Christ. This is Rudolf Steiner’s diagnosis of what underlies the particular spiritual constitution of Goethe as a person:

‘Now look, if thinking was not so luciferic as in most people on earth, those who do not think luciferically, would think like the kind of person who thought least luciferically, namely Goethe.’ (GA 191, 271)

**XII)** Thus Steiner sees it as the future task of anthroposophy to find its way to Goethe. It is a preparation for the future Goetheanism and the Christianity that is to come. Then Goetheanism will be no longer the preparation for anthroposophy – that was Goetheanism hitherto – but the goal of anthroposophy. Anthroposophy is the most substantial wisdom stream of the present time, i.e. human wisdom in spiritual science taken literally. Its future concern is for cosmic wisdom to become cosmic love (GA 13, 414f.). In that knowledge transforms to love, present anthroposophy in Rudolf Steiner’s sense will in future become re-enlivened Goetheanism which is as yet buried.

The worst wars are religious wars. Both sides believe that God is on their side and prosecute them first mentally then physically with throat-cutting or aircraft terrorism as on 11 September 2001. But what is God supposed to do with all these party followers who revere him so variously? One of Goethe’s most esoteric poems is *Die Geheimnisse* (The Secrets), which he wrote in middle age. It remained a fragment. It was an attempt to combine in twelve representatives all the religions of humanity around the figure of *Humanus*. He gave up the attempt. For this task Herder and Frau von Stein had been his confidants. But the finished product would have been implausible. We are not so far. Goetheanism is still a mood of expectation.

### **Goetheanism after Rudolf Steiner**

The terms Goetheanism and Goetheanistic have remained uncommon in the field of non-anthroposophical science. People probably wanted to avoid turning Goethe’s achievement into an ‘ism’. It is true that it was the historic achievement of the young Steiner for the first time to have made the methodological approach of Goethe the scientist visible in wider circles, a deed that is recognised today amongst all those interested in Goethe (Mandelkov 1980, 190, 191; 1989, 39; 1998, 238). This was unquestionably the result of his first book published by Kürschner which comments on Goethe’s scientific writings (1884-1897), then of his *Grundlinien* (Theory of knowledge implicit in Goethe’s world conception, GA 2, 1886) and the book with which he concluded his Weimar period: *Goethes Weltanschauung* (Goethe’s world view, GA 6, 1897). And during the whole 20<sup>th</sup> century there was a succession of scientists with a direct and close connection with Goethe, scientists who cultivated an understanding of nature which reached beyond positivism without their calling it Goetheanism. Wilhelm Troll, Lothar Wolf, Rupprecht Matthaiei,

Wolfgang Bargmann, Martin Loesche, Eberhard Buchwald, Bernhard Peyer, Otto Schindewolf, Adolf Portmann, and Bernhard Hassenstein are some names that come to mind, and on closer examination Werner Heisenberg too. Troll's and Schindewolf's use of the idea of the type as an effective reality; Portmann's concept of inwardness (*Innerlichkeit*) and self expression in the animal kingdom and all recognition of the irreducibility of life to atomic mechanisms stem from Goethe. Today he is increasingly recognised in the ecological public debate (Meyer-Abich 1998). And in psychology too, Erich Fromm contrasts Goethe as the great biophile with the necrophilic technologists (see Jungk 1974).

There is of course too a succession of detractors. Goethe's approach is rejected as amateur science, colour theology and naïve diletantism. This usually requires the detractor to read selectively and/or project their own conception of nature onto Goethe, which then does not fit. This happens as much with clerics (Lackmann 1984) as with their opponents (Schöne 1987; Kreutzer 1980).

*Goetheanism* and particularly the adjective *Goetheanistic* are terms in general usage when people are discussing anthroposophy. Moreover, on closer examination or on listening more carefully we can identify the following wide variety of usage contexts:

- a) As an example of everything without exception that is scientific work in an anthroposophical connection.
- b) In a less sweeping sense all that deals with the Subject/Object dichotomy and is oriented at overcoming methodologically this dualism in research on the primal phenomenon, the type and the understanding of metamorphosis.
- c) The experimental verification of many of Steiner's indications using the methods of university science.
- d) Any poetically, aesthetically experienced dealings with nature without any claim to being scientific.
- e) Anthroposophically oriented study of culture in art, art history, history, linguistics and literature.
- f) Arts arising from anthroposophy such as eurythmy and the organic style in architecture, the latter directly in connection with the buildings of the first and second Goetheanum, including interior and furnishing design and jewellery. The term 'Goetheanistic' is not used for any poetry, speech formation, music, painting and plastic arts or sculpture which has been stimulated by anthroposophy.
- g) On the other hand the view has become established that Goetheanism is a preliminary stage of anthroposophy but has hesitated at the decisive threshold to it. As we have shown, this would indicate that people understand neither Goethe nor Steiner.

The first two of the above contexts were the concern of those scientists who had encountered Rudolf Steiner when still students and had, in his sense, tried to connect with Goethe, namely Wilhelm Schnepf (1880-1954), Hermann Poppelbaum (1891-1979), Wilhelm Pelikan (1893-1981), Ernst Lehrs (1894-1997), Iwer Thor Lorenzen (1895-1976), Rudolf Reißmann (1895-1982), Werner Schüpbach (1896-1982), Gerbert Grohmann (1897-1957), Hans Heinze (1899-1997), Walter Cloos (1900-1985), Frits Julius (1902-1970), Friedrich Kipp (1903-1997). Lili Kolisko (1889-1976), Rudolf Hauschka (1891-1969),

Hans Krüger (1898-1988), Ehrenfried Pfeiffer (1899-1961), Paul Eugen Schiller (1900-1992), Joachim Schultz (1902-1953), Alla Selawry (1913-1992) etc. pursued an experimental approach. Hans Wohlbold (1877-1949), Otto Julius Hartmann (1895-1989) were university academic writers. Günther Wachsmuth (1893-1963), the first leader of the Science Section of the Goetheanum, Dornach, Switzerland was originally qualified in law and business management and his work was more a systematic compilation than the pursuit of independent research.

The 1930s and 1940s were marked by a major breakdown, partly because of internal social crises resulting from circumstances in Dornach and partly because of both the banning of the Anthroposophical Society and persecution in Nazi Germany and, above all, because of the Second World War. Despite this, many continued to work quietly and alone.

As a result, immediately after the war ended, anthroposophical cultural activities blossomed again, especially in the social professions. Its practical application to urgent work for people in need was and still is a priority. Here the anthroposophical picture of the human being daily proved its worth. But a science furthered by it developed only slowly. Those coming forward from the younger generation were particularly interested in finally bridging the gap between the university and the anthroposophically oriented scientific approaches.

Here it is amazing the extent to which the general scientific agenda depends on which way the political wind is blowing. At least in the Adenauer era people still cultivated the remains of the German renaissance and classicism. But that happened far too academically to enable people to deal with the spiritual crisis of the 20<sup>th</sup> century after Auschwitz and Hiroshima. The displeasure of the rising generation vis à vis the prevailing political and cultural conservatism grew imperceptibly at first, then increased and suddenly changed into what was their alternative, namely Marxism. This disturbance in the late 1960s did away with a lot of antiquated customs; people knew what they were justifiably protesting against. But they replaced organised religion and academic education with another relic, a belief in atheist dogma. Thus historically the Rudi Dutschke generation was one of successful iconoclasts but it did not plant any seeds for constructing something better. Instead of cultural bread it once again offered the stones of dialectical materialism. This spontaneous student revolution thus had from its outset the fate of an intermezzo. The same thing happened as so often happens: if talk of culture and values is hollow, i.e. subjective or personal, far too personal, then the resulting response is plain materialism. Ahriman follows on the heels of the luciferic subject. Putting Christian into the name of a political party and letting the state continue collecting the church tax goes to show how the resulting outer materialism is an automatic consequence of the inner. 1949 was the year of the 200<sup>th</sup> anniversary Goethe's birth. The event occasioned celebratory lectures to be given and articles to be written, largely non-anthroposophical, about the Goethe who had lived from 1749 to 1832. After 1966, with the sudden change to a leftist trend, there was a switch to anti-Goetheanism. Brecht's epithet *Fürstendiener* (servility to the aristocracy) was doing the rounds. It was 'politically incorrect', as we would now put it, to refer to Goethe.

However, the widespread uncertainty of the younger generation led many individuals, though of course not in large numbers, increasingly to seek and accept anthroposophical culture. In the 1970s and 1980s the Waldorf school movement grew as never before, as did other anthroposophical professions including ethically motivated banks. Certainly this brought with it the risk of self-ghettoisation or an unreflecting modernism. In rejecting one, people easily slipped into the other. In those taking up positions there was the desire to avoid everything that hindered recognition from outside. They either fought Goetheanism internally as a childish naïvety, a false idyll (*'Gartenlaube'*), or they openly stated that they were not familiar with Goethe. Frequently they emphasised only the few expressions of distance from Goetheanism out of the rich pallet of Steiner's usages of the term. Thus they rejected Goetheanism to make it clear to all comers that they did not belong to the past. Certainly old-fashioned plaits were cut off. But people still owed an answer to the question as to what good scientific as well as anthroposophical research comprises. Instead they mostly only gave expressions of intent. It is true that successful outward results appeared which also pass muster as up to date.

However the inward effects did not stop either. Too many responsible people not only opposed historical Goetheanism but also avoided the connection to the present and the future Goetheanism. The leading public anthroposophical monthly *Die Drei* which appeared for the first time in 1921 with the subtitle *Monatsschrift für Anthroposophie und Dreigliederung* (Anthroposophy and Threefolding Monthly) was subtitled from July 1922 to March 1931 and from February 1948 to January 1949 *Monatsschrift für Anthroposophie, Dreigliederung und Goetheanismus* (see Diemann 1987, 81). Then people felt embarrassed. In passing, we should mention the opportunism of at one moment being against Goetheanism while it is perceived publicly as a metaphor for scientific backwardness and then suddenly in the next moment being for it, as in 1989 when the Iron Curtain collapsed and Rudolf Steiner's remark went around that the east could only accept anthroposophy via Goetheanism. Thus in people's understanding of Goetheanism, only its role of being a historical, perhaps also even biographical, forerunner of anthroposophy was accepted. The view remained that 'Goetheanistic' is something to do with the former Goethe.

Looking back at the life history of Goetheanism it is probably appropriate at the moment not to equate it with anthroposophy itself, even if Steiner occasionally did so (see section VII above). But this is currently advised not only to avoid misunderstandings but also because today the majority of people think of Goetheanism and Goetheanistic as being a holistic form of natural science.

Yet for the time being these two reasonable grounds for not equating Goetheanism with anthroposophy are – because they are too pragmatically oriented – not sufficient. Not using them simply as synonyms requires attention to the respective founders themselves (Schad 1975). Goethe was a person who enjoyed life with all the senses and who was bursting with imagination even as a four year old when his grandmother gave him a puppet theatre and soon after the fairy story of Doctor Faustus was performed. On the other hand the seven year old Steiner had his key experience in a supersensible encounter with a dead person related to his mother. From then on the child distinguished "things and beings 'that one can see' and those 'that one cannot see'" (GA 28, 22). Steiner himself

showed that up to the age of 35, supersensible experience was more accessible to him than that of the senses. With Goethe the reverse was true. But in middle age his struggle with and access to the supersensible increased more and more. His route was from a particularly intensively experienced ‘loving joy in all things sensorial’ to the supersensible. Rudolf Steiner’s biography began with supersensible experience and in the last seven years of his life became completely practical. Their biographies are diametrically opposite (Schad 2000a).

Because of this Steiner’s use of both the term ‘Goetheanism’ and ‘anthroposophy’ metamorphosed. As a student he encountered the word from his high school teacher Robert Zimmermann in the form of a combination of anthropology and philosophy to become ‘anthropo-sophy’. It was a kind of philosophical anthropology in the form of a system of ideas according to Herbart’s method, which in no way reached up to the young Steiner’s level of supersensible experience. Only in Berlin after 1900 in meetings in theosophical circles was he able to speak for the first time of the supersensible to those interested. And thus he called his first book on the subject *Theosophy*, wholly in the sense of a science of the supersensible. In 1909/1910 ‘anthroposophy’ was still not understood to be, like ‘theosophy’, a science of the spirit, but as the connecting realm between anthropology and theosophy (GA 45, 15; GA 115, 4; GA 124, 31). Only after the separation from the Theosophical Society in 1913 and weighing up anew (see Ziegler 1999, 55) was *anthroposophy* referred to in exactly the same sense as *theosophy* as a science of the spiritual world.

‘Where outer senses knowledge ends  
There and there only is the gateway  
That leads the soul being of man  
To the realities of life...’ (Whitsun 1915)

Anthropology and anthroposophy were contrasted in this sense in the first chapter of Steiner’s fundamental methodological book *Von Seelenrätseln* (Riddles of the soul, 1917). Anthroposophy was no longer the foothill between valley and peak, as was still the picture in 1909/1910, but the complete spiritual realm itself. Accessing it required casting off from the outset the bond to the senses, as is made clear in Steiner’s texts for the first class of the Goetheanum Free University of Spiritual Science. Only through first thoroughly separating the two realms could they later be reconnected in a much more fruitful way. In this sense it is good for once strictly to differentiate between Goetheanism and anthroposophy. Whoever does not do this remains with the pre-1913 usage of the terms.

In essence anthroposophy is always a spiritual science based on spiritual experience developed by thinking. Natural science always takes sensorial experience before reflection. So an ‘anthroposophical natural science’ taken literally is self-contradictory, but ‘Goetheanistic science’ is not. Goethe himself regarded his scientific work, for instance his colour theory, as far more significant than his entire poetic work (to Eckermann 19.2.1829) even if almost all Goethe experts then and now see it differently.

Of course much has declared itself to be Goetheanism, but there was more declaration than substance in it. Thus, as Friedrich Kipp suggested many years ago, it is a virtue more than ever ‘to talk as little as possible about Goetheanism but to do it as much as possible’.

Not that we should avoid referring to it by name but it could not endure on the one hand incomprehension and on the other hand the devaluation of words.

When Goetheanism is science, the question immediately arises as to how it distinguishes itself from established science. On this matter too many people were over-hasty in their agreement: the latter is the analytic-atomistic way of observing nature and the former the synthetic-holistic. Goethe was untiringly singled out as a holist without people noticing that life is not a holon but always also part of a larger context, for instance of its habitat. Of course nobody denies that Goethe had such an ecological viewpoint. And so far as established sciences are concerned, their methods are also more complex, especially in the life sciences. They are rich in synthetic synopsis of innumerable investigative details in comprehensive ideas, whether they know it or not. One only need think of the magnificent achievement of the taxonomists, untiringly rearranging in a more natural system of relationships the Linnean artificial classification of organisms. All systematic categories, whether species, genus, family, class, phylum etc. are higher synthetic achievements which all biologists depend on; yet it is not just taxonomy but also homology research in morphology or evolutionary biology. Whoever needs Steiner's authority on this hangs onto his comment: 'Natural science is full of good spirits, but they're not always the scientists'.

And good Goetheanism, besides all love of ideas, has never arisen without analysis. Goethe himself never despised it. Instead he used it carefully with 'loving joy in all things sensorial'. For instance reading verbatim his *Metamorphose der Pflanze* (Metamorphosis of plants) or his *Entwurf eines allgemeinen Typus des Säugetierskelettes* (Sketch of a general type of the mammalian skeleton) or his report on his dissection of butterfly chrysalises, we can see that where his research was fruitful he was not concerned with the polarisation of analysis and synthesis, but with the regular exchange from one to the other (we avoid the inappropriate word 'balance').

'But I adhered to my firm intention and course and unhesitatingly wanted to use all the advantages that through separating and distinguishing were readily and willingly offered and immeasurably helpful, provided that we did not overdo it and knew the right moment to combine.' (WA II, 8, 128)

And that equally applies to productive research methods in established science (I am disregarding unnecessary freewheeling in the creation of data banks or mere knowledge for power). Science as a concept is indivisible because it rests on the fruitful connection of experience *and* understanding in both supersensible and sensorial research (GA 9, 17; GA 13, 36, 37, 143). If Goetheanism is fruitful science then any fruitful science is Goetheanism, whether or not people realise this or make it explicit. This excludes anything to do with personal ambition and motives such as reward by title, career status, over concern for one's reputation or desire for profit. On closer examination these things range from reducing quality to being unfruitful in scientific matters.

Goethe's enjoyment of the senses, enthusiasm for the world and depth of interest were held in such paradigmatic balance with all his remaining human faculties that during and after his time he not only openly or secretly motivated countless scientists in their work but also his example can continue to do so in the future. For this the subject matter of his

enduring contribution lies more in the life sciences than in physics, geology or meteorology.

It is well known that in geology – occasioned by his travels in the Harz mountains – he cultivated a particular connection with granite. Like the neptunist Abraham Gottlob Werner of the Freiberg Mining Academy, Goethe also regarded granite as the *oldest* rock because it was always *below* the sedimentary rocks. Not until nearly 40 years later (1818) did he realise that it could have arisen also at later geological times: ‘Thus it is very possible that granite has appeared several times’ (WA II, 10, 89). Indeed his own collection of samples of granite/contact-hornfels from the Harz show that hornfels (a Lower Carboniferous sediment) must have hardened earlier than granite (an Upper Carboniferous formation) (see Schad 1983, 117). And his long rejection of vulcanism weakened in his later years under the influence of Berzelius and Alexander von Humboldt and he regarded his neptunism more as determined by his temperament (to Boisserée, 2.8.1815)

Meteorology was for Goethe an especially fundamental schooling of observation because it was practised by him daily. His water barometer was hanging right next to his bed. Apart from the larger scale of highs and lows, he noticed a finer modulation of pressure caused by the daily double air pressure wave (WA II 12, 61, 100, 103, 109). But he explained them wrongly as a purely ‘telluric effect’ caused by rhythmic oscillations in the earth’s gravitation. Wachsmuth’s defense of this interpretation has no support (Wachsmuth 1952, 112ff). What is the evidence? It is that the maxima appear on average at 10 and 22 hours local time and the minima at 4 and 16 hours. The differences are 2-4 mb in the tropics but less at middle latitudes, namely 0.5-1 mb. The basic daily cycle is caused by insolation and the resulting intrinsic oscillation of the whole atmosphere as a semi-diurnal quasi-octaving overtone. So it is a matter of an integral interaction of solar (through heating), atmospheric (through air mantle density) and telluric (through the size of the globe) influences. The tidal influence of the moon on the earth – as Goethe already surmised – is too weak to give rise to an observable effect (Liljequist 1994). A rhythmic alteration of the force of gravity, which Goethe suspected as the main cause, is not evident.

In the physics of gases he himself had realised that warmed air acquires a lower density and thus becomes specifically lighter and rises. When the Weimar pharmacist Wilhelm Heinrich Sebastian Buchholz (1734-1798), ‘one of the first Montgolfierists, made [a hot air balloon] rise from our terraces, to the delight of the informed, while the crowd could hardly contain itself for amazement’ (WA, 6, 103), Goethe noted with concern, ‘the hot air balloon was discovered. How close I came to this discovery. My own frustration in not having discovered it myself. Quick comfort’ (WA II, 11, 301).

Goethe’s optics and colour theory has always remained controversial for the objectivist physicists because Goethe’s approach was basically not about stopping merely at the objective consciousness of outer things. His rejection of Newton’s corpuscular model of light is understandable. The wave theory of light could already get by without it. Yet saying that light is not a mixture of colours but that they are formed only through passage through a prism is also not sufficient. If we place a second identical prism after the first so that at the same angle the fanning out colour spectrum is collected then we get emerging

from it normal, apparently colourless light once again. In inorganic science, temporal and spatial reversibility is very often the case; even if this almost always involves entropic energy losses through heat production. Goethe's organic thinking was in contrast to this in that it reckoned with a real transformation. Pure monochromatic light is unchanged as such even after passing through prisms. And if this does not hold, then it is clearly not pure monochromatic light (see the controversy between Hetzel & Proskauer (1987), Maier (1987) and Mikelskis (1987)). The solution in Goethe's conceptual approach of not regarding light as composed of parts probably lies not in diametrically opposing the macrophysical apparently homogenous field of light with the microphysical particulate model but in recognising its 'middle', rhythmic qualities and paying attention to the wave nature of light (see Schad 1976). Any vibration of an air column in an organ pipe or any violin string vibrates at a fundamental note at the same time as the multiple overlays of all its overtones so that no unison and no mixture occurs, but rather a whole exists that is in itself richly structured. Unity and structuring are not mutually exclusive. Only the frequency analyser separates the individual frequencies out of the whole, just as does the prism. Before the prism the colours must be present unseparated as an undulating whole. We need only to explain the wave medium of the light, just as for sound it is the string and the air. Of course that is not some physical ether but the structure of space itself. Indeed since Faraday and Einstein space is not thought of as a geometric construct (as Kant pictured it) but the carrier of all energy fields, i.e. including electromagnetic, and thus is of physical relevance (Westphal 1953, 60). Today Goethe would probably agree with this because a mere 'atomism' of light cannot exist. Even the main accusation against Goethe from the classical physicists that he regarded the dark field, darkness, as itself physically active falls away with the recognition of the accessibility of empty space to physical-empirical research by modern physics. Albrecht Schöne's ridicule of Goethean 'colour theology' is on shaky ground and would make psychoanalysts suspect a case of childhood theological indigestion.

Goethe did not do much in chemistry though here he also had some good, indeed sustainable, presentiments. In his *Colour Theory* and *Elective Affinities* the acid-base polarity had an influential role to play. He was an encouragement to Döbereiner, the chemist employed by him at Jena University, in his discovery of his triad law which led to the discovery of the periodic system of the elements (van Spronsen 1969, 1). He was greatly interested in Runge's discovery of atropine and caffeine. In mineralogy he staunchly claimed for chemical actualism (WA II, 10, 88). He had high hopes for a chemistry of plants from the chemist Heinrich Wackenroder (1798-1854) finally dealing with leaf metamorphosis as an effect of 'an organic chemical function of life' (to Wackenroder, 21.1.1832).

Goethe's indisputable and lasting achievement was in the life sciences themselves. It has proved its worth and thus been fully taken up by modern biology: the certainty about the common type of the human organism and all mammals (rediscovery of the premaxilla); the common identity of all leaf organs of seed plants (morphology); temporal development of leaf organs in a threefold expansion and contraction process (chronobiology); his whole concept of metamorphosis as a precondition for evolutionary thought as well as

his supposition about the segmental head and the trunk formation according to his ‘vertebral theory of the skull’, which of course does not apply to the bony skull itself (this arises mostly from the unsegmented neural crest), but to its forerun in the somites and their gene expression (Rose-Engelberth 1999). Admittedly there were errors here too, for instance his homologising the premaxilla of all the *Sauropsida* with that of the *Mammalia* (WA II, 8, 130; see also Schad 1998, 356), but on the whole Goethe had a much better ‘view’ of biology than physics. Indeed he is the ‘Copernicus and Kepler of the organic world’ (Steiner 1883, GA 1, 76), not of the inorganic.

Only from an anthroposophical perspective does Goethe’s approach to physics become more understandable. For all that is dead originates from what was once upon a time alive. And the echo of the laws of life in geology, meteorology and colour theory he regarded as primary: the gradual formation of rocks for the most part without violent eruptions (he did not know that there was also a weaker vulcanism of dilatation, see Schmutz 1986, 16); the harmonious threefolding of granite where all three components ‘have no *continens* and *continentum*, but rather are all within each other, a complete trinity of parts’ is ‘his distinguishing concept’ (WA II, 10, 79); the supposition from meteorological phenomena that the earth is a living organism; colours as an enhanced mediator between light and darkness; above all ‘the two great driving wheels of nature’: the law of polarity and enhancement and with it the trinitarian-ness in the natural world. The world of dead things has become a world created (‘*Werkwelt*’) and in the meantime is no longer a world creating (‘*Wirkwelt*’), but just a *picture* of the latter (Steiner GA 26, 96, 99). To note this copy-character was what Goethe considered more important than all his poetry. His work in the arts was not the most important thing to him but rather his humanisation of thinking, most especially in the sciences.

It is through ignorance that Goethe the scientist is still today mostly judged from the viewpoint of the earlier classical physics. But his universality is the hidden force at the source of modern physics. Balmer saw in his own mathematical formulation of the periodicity of the hydrogen spectrum a Pythagoreanism that likewise had delighted Goethe, as in the octave law analogous to music and the ‘octet tendency’ in the periodic system of the elements and bonding theory (see Schad 2000b, 197). Bohr’s principle of corpuscle and wave duality appears on closer examination to be a triad principle in that almost every elementary particle also possesses a homogenous field of charge (Schad 2000b, 197). Bohr, Heisenberg, Pauli and other co-founders of quantum physics together rehearsed Goethe’s *Faust* (Huber 2000). When the 23 year old Heisenberg was staying on Helgoland because of hay-fever and there discovered the mathematical basis of quantum physics, Goethe was beside him: ‘I have hardly slept a wink at all. I’ve allocated a third of the day to quantum mechanics, for a third I have been clambering over the rocks here and for another third I have learned by heart the poems from the *West-Östlicher Divan*’ (Hermann 1976, 32). In his later years in his speech of 1967 to the Weimar Goethe Society, Heisenberg drew the biographical conclusion that his generation of physicists had, despite everything, not paid enough attention to Goethe’s approach to nature:

‘At the same time the dangers have become as threatening as Goethe himself foresaw. We have in mind for instance the disensoulment or the de-personalisation of

work or the absurdity of modern weapons or the flight into madness that has taken on the form of a political movement. The devil is a powerful master. But the light realm, which was once talked about in connection with romantic music and which Goethe was able to discern throughout nature, has also become visible in modern physics where it tells us about the grand unified order of the cosmos. We will also be able to learn from Goethe nowadays that for the benefit of one organ, namely rational analysis, we must not exclude all others; that it is much more a case of grasping reality with all the organs given to us and trusting that this reality is also the one that matters, one that reflects the ‘One, the Good and the True’.

We hope that the future manages to do this better than our time, my generation, has done.’

In the meantime, Goetheanistic work has continued quietly in the field of anthroposophically oriented science. It is still too early to draw historical conclusions about recent decades. On the one hand it has involved fundamental research work especially in the field of biology. On the other hand it involves transferring scientific Goetheanism to practical application as is now the approach in ecology, pharmacology and medicine, though hitherto not innovatively enough in agriculture. Moreover this work is accompanied by two areas of danger. Either people get stuck in the statistical mentality of imposed causal-analytic data (against which there is nothing to be said, if it is used as an accompanying procedure), or one distils the expected results *a priori* out of a system of ideas, without really observing how ‘tyrannically’ (MuR No. 541) the idea can behave towards the world (which is not saying anything against a faculty for richly inspired ideation when it is balanced in relation to the world). Mere rationalism is as useless in Goetheanism as mere ideal superficiality. Goethe justifiably had difficulties with this when Schiller versified about Columbus:

‘Ever, ever westwards! There must the coast appear,

Clear and shimmering she appears in your mind

Trust in the guidance of God and cross the silent ocean!

If the coast would not yet exist there, now from the waters it would rise.’

(‘Columbus’)

Columbus certainly did not discover India but a completely new and unexpected continent. And the mistake of having had dealings with ‘Indians’ is perpetuated in language to this day.

Once a student visited the great Hegel and ventured his own reservation that the experiential aspect of the world does not always agree with the ideal constructs of philosophy. ‘So much the worse for experience’ retorted Hegel. That would certainly not have been Goethe’s answer. In contrast the latter once sent (on 13.4.1821) to Hegel a physical object, a polished Bohemian glass on which the glassblower had put a quite translucent curled up serpent to demonstrate the origin of colour. With it Goethe included his written dedication with the following words, which are not without an intentional difference:

The primal phenomenon  
recommends itself  
most beautifully

to the Absolute  
for friendly acceptance.

This hint with a glass was a broad one. Here we are not advocating in mere sympathy for Goethe but making clear what very different planets even the great geniuses come from, and in doing so indicating what is characteristic of the individuality, Goethe.

The contrast between both persons is also revealed in the extraordinarily different usages of the words ‘phenomenon’, phenomenology, and ‘phenomenological’. With Goethe *phenomenon* was literally *what appears* in the sense of perception in the technically unenhanced sense. Thus according to his concept of phenomenon what is given both sensorially and supersensibly is one – a special gift that is more than Naïve Realism:

‘I cannot divide life  
Neither inner nor outer...’ (Zahme Zenien)  
‘Only let one not seek for something behind the phenomena,  
The phenomena themselves are the theory.’ (MuR)

But even in Goethe’s time, for Hegel phenomenology was not the content of already existing nature but that of the individual consciousness, that of the spirit grasped by the subject. That is why his fundamental work the *Phenomenologie des Geistes* (Phenomenology of spirit) is written with such a dearth of imagery. Even for Franz Brentano, the Aristotelian held in such high estimation by Steiner, phenomenology is certainly not what is given by the senses but solely what arises in the soul, i.e. descriptive psychology (Brentano 1874, Gilson 1955). Edmund Husserl’s philosophical phenomenology with its purely *a priori*, unempirical, cognitive domain became established and very influential in the 20<sup>th</sup> century. If in anthroposophical circles we cultivate unprejudiced Naïve Realism and then present it as a phenomenological method then it has become seriously misunderstood. If we are not carefully identifying what we mean then more restraint in the use of this term is called for. Gernot Böhme commented justifiably on this linguistically important difficulty of understanding when he wrote (Böhme 2000, 34):

‘The designation of a type of knowledge as ‘phenomenology of nature’ must result in a double delimitation. It is forced to position itself opposite natural science as a phenomenology and make it clear with respect to phenomenology that it is dealing with nature.’

The latter was Goethe’s particular aim in his distancing himself from Hegel when he referred to the primal phenomenon. For Goethe, nature had intrinsic dignity and participating mentally in her productions man could become worthy of taking part in nature (WA II, 11, 55). Otherwise we subsume the richness of nature in ‘deadly generalisation’ (WA II, 6, 390) and fall under the commandments of the idea (Steiner 1894).

We are all still suffering from the awakening of the intellectual soul in the pre-Socratic Eleatics, Parmenides and Zenon, who placed the unchangeable laws, even the laws in thought, higher than the stream of transformation in the world, which of course is supposed to be merely the less valuable transience. This reductionism prevailed for two millennia. But since the radical change into the modern age people have begun to discover everything germinating and becoming, everything processing and metamorphosing and adding up to the dynamic impetus of this age. (GA 287, 98). The great men Nikolaus

Cusanus and Giordano Bruno were the first to be fully aware of this. Adolf Meyer-Abich has illustrated this fittingly with a quote from the writings of Galileo Galilei (1632):

‘I can only with the greatest reluctance hear that the properties of the unchangeable and unchanging are of superior quality and complete and, on the other hand, that transitoriness is something incomplete. I regard the Earth as being of the highest quality precisely because of the changes that take place on it, and the same goes for the Moon, Jupiter and other planets.’ (Meyer-Abich 1935)

And Meyer-Abich (1935, 15) added:

‘This dethroned the static world picture of antiquity and the dynamic thinking of the modern age finally took its place. ‘True reality’ was henceforth no longer symbolised by a world in a state of eternally accomplished rest, but purely by a world of eternal unrest and movement. Henceforth no longer was the state real but only the process.’

And Goethe himself also renounced the Eleatic constraint and thus became a campaigner for the development of the consciousness soul:

‘I feel sorry for people who make a lot of fuss about the transience of things and loose themselves in contemplation of earthly nothingness. Indeed, aren’t we here precisely to make the transitory intransitory; that can only happen if we appreciate both.’ (MuR 155)

‘The intransitory develops only from the transitory.’ (Goethe, MuR 643; Schieren 1998, 154)

Summarising in retrospect we can say that it is not just every single statement of Goethe’s scientific work that has epochal and supra-European proportions but his far reaching way of applying himself to understanding the world, for it contains the concept of evolution, i.e. that everything is in a state of becoming. It was one of the great spiritual deeds of Rudolf Steiner that he also pursued the evolutionary process into the spiritual world and even spoke of the evolution of the hierarchies (GA 13, chapter on evolution). Indications of this occur in the resurrection scene in Faust where Goethe speaks about the younger and the more mature angels.

## **Prospect**

What is Goetheanism then? As we have seen it has become something very variously understood and expressed, not only in Rudolf Steiner’s work but also after him in the field of anthroposophically oriented science. And it will be equally so in the future. When we point out Steiner’s contrasting positions, the discrepancy is mostly resolved if we keep in mind what audience Steiner had before him at a particular time. In public lectures he was never tired of speaking about the living spirit of Goethe in modern Goetheanism and even of equating it with the core of the anthroposophical movement. Before internal meetings of Anthroposophical Society members, who often had a past connection with theosophy, he frequently made a point of stressing the value of scientific Goetheanism. On the other hand, at the beginning of the 1920s as people with academic training and ambitions began to work in the anthroposophical movement and wanted to make the new spiritual science more vivid with the methods of the sensorially based scientific disci-

plines, Steiner emphatically recommended that they should not rely too much on Goethe's approaches, but finally take seriously the supersensible approaches of anthroposophy (GA 82, 207ff.). Steiner always proceeded according to educational methods appropriate for a particular people and culture. He was not concerned with a 'truth in itself' (GA 94, 217) but with what for the given constellation of people was at the actual time true. Steiner never wanted to set up a ready-made system – as is often thought with good or bad intention by all too many people who do not know him – but to help strengthen people so that they could be more fruitful. Therefore it is possible for what is right today to be wrong tomorrow. Ethical individualism is situation ethics. In 1958 Ernst Lehrs once recounted verbally how in front of the students at that time, three weeks after the publication of his *Kernpunkte der sozialen Frage* (Basic issues of the social question), Steiner said that it was already out of date.

So this essay – probably much to the disappointment of many readers – was not intended finally to establish what for example Goetheanism is now and for all time. Yet out of what has been covered, an attempt has been made to present the attributes of what it is *today*. We should like to see it apparent in *all its sensorially based cultural manifestations* as are all arts and sensorially based sciences. On the other hand, autochthonously anthroposophy means supersensible research and is understood literally as *spiritual science* in the sense of a science of the spirit. Goetheanism comprises all sensorially based research, even if with respect to its cognitive output it is spiritual work. Anthroposophy is all sense-free research, even in its empirical basis, nevertheless it is purely spiritual and in the end it always becomes practical for the earthly reality of life.

Therefore, a large part of research that is referred to today as anthroposophical is certainly not anthroposophy, but rather – provided that it is fruitfully productive – Goetheanism. What mostly takes place in the activities of the sections of the *Freien Hochschule für Geisteswissenschaft am Goetheanum* (Free University of Spiritual Science at the Goetheanum) are sensorially based projects and in this very sense is Goetheanism undertaken by anthroposophists. The research fund or research commission of the Anthroposophical Society in Germany founded twelve years ago has shown itself to be concerned primarily with research projects involving sensorial mediation, i.e., in the good cases, Goetheanism, even when they are motivated by the study of anthroposophy. For understandable reasons to do with its highly personal relevance, communication that is in the best sense scientific about the realm of supersensible experience, which of course on closer examination any person has whether anthroposophist or not, is far rarer and at the same time involves more self deception than does sensorially based research (GA 17, 41). But of course individual and group scientific work in the supersensible is certainly possible, today as always.

Therefore, for the time being, the two research orientations should not just be indiscriminately mixed together but necessarily practised according to methods which are independent of one another. This is especially so in order better to control error on both sides. It is precisely here that Rudolf Steiner's approach to science comes to our aid. Thus at the conference of philosophers in Bologna on 8 April 1911 he recommended the following (GA 35, 140-142):

*‘...but one would have to see that the ordinary empirical content of consciousness is related to that which is truly experienced in the inner life of man’s essential being as the mirror image is related to the real being of the person who is viewing himself in the mirror.*

*Through such a manner of conceiving in relation to epistemology, conflict could be decisively eliminated between science, with its inclination towards materialism, and a spiritual research, which presupposes the spiritual. For a right of way would be established for scientific research, in that it could investigate the laws of the corporeal organisation uninfluenced by interference from the spiritual way of thinking. [...] Within natural scientific research one will always rightly oppose the interference of purely spiritual points of view. [...], whereas the hypotheses of a direct control of organic processes by psychic influences are scientifically untenable. But the idea previously given, fundamental from the point of view of epistemology, can see in the whole range of what can be established by science only arrangements which serve to reflect the real essence of man’s being. This essential being, however, is not to be located in the interior of the physical organisation, but in the transcendental. Spiritual research would then be conceived as the way by which one attains knowledge of the real nature of that which is reflected. [...]*

*It may thus be asserted that epistemologically unbiased considerations open the way for rightly understood anthroposophy. For these lead to the conclusion that it is a theoretically understandable possibility that the essence of man’s being may have an existence free of the physical organisation.’*

Anyone working in both realms recognises the subtle difference whether sensorially based and supersensible results reciprocally help or hinder. Desires can all too quickly father thoughts, but a ‘truth is true even when all personal feelings rebel against it’ (GA 9, 35). We need to guard ourselves to some extent from over hasty associations and analogies between the two realms. Schiller introduced this methodological separation in the following aphorism in Xenien:

*Natural Scientists and Transcendental Philosophers*

*Let there be hostility between you! Alliance still comes too early:*

*Only if you keep separate in your seeking will you recognise the truth.*

In 1910 Steiner had already tried to elaborate the difference when at one time he tried to write a book with the title *Anthroposophy*. However he is known never to have brought it to publication readiness and it thus remained a fragment (GA 45). This has the advantage that still today we can have a glimpse into his inner workplace. In the draft for the second chapter he tried to present as complete as possible a theory of the senses with the general aim of determining as best he could that perceptions which do not belong to the twelve bodily-based senses can all the more certainly be accepted as supersensible experiences. He was concerned here with a methodologically sound differentiation.

In 1917 Steiner once again clearly distinguished sensorially based and supersensible research, which he summarily called on the one hand ‘anthropology’ and on the other ‘anthroposophy’. Either are properly pursued independently of each other. But when both honestly keep to their respective methods then a definite moment comes when, like posi-

tive and negative they complement each other:

*'If the two ways, anthroposophical and anthropological, are followed in the appropriate way, then they will arrive at the same point.'* (GA 21, 32)

Indeed he once used the picture that both research methods were tunnelling into the mountain of reality from opposite sides so as to meet in the middle (GA 72, 130). In this way science need not sneak a look at spiritual confirmation and the content of spiritual science needs no evidence from science. Instead they will later be all the more supplementary to each other – not reciprocal proofs – when both sincerely go their own ways. To talk of Goetheanistic anthroposophical science is at most a self-handicapping chimaera because it can become an excuse not to enter into purely spiritual work. Then the manifold danger and habit arises of carrying out sensorial based research as a substitute in order to avoid the difficult demands of cultivating supersensible experience. Many people will gladly do the former because it gives them the security of bodily-mediated sensorial experience. But the latter requires the most personal involvement in letting go of all one's masks. But letting go also includes all brain-bound ideas and bases for knowledge, or rather entering 'knowing ignorance' (Meffert 2001), i.e. dissolving established patterns of thought. When thoughts become spiritual they take on life. It makes one's mind whirl ('*Drehkater*') (GA 177, 139), shocks and frightens even, as if one is groping in a dark cupboard and unexpectedly finds a mouse in one's hand (GA 164, 18.9.1915). So perseverance is necessary and the drama of one's own soul begins (GA 72, 197); one experiences a catharsis which required the initial shock. If this does not happen one can carry out intellectually stimulating sensorially based research but it is not anthroposophy. At the end of the first scene of Rudolf Steiner's first Mystery Drama, Helena tells of the spiritual bliss that flows from the fount of truth, yet Johannes clearly sees it as madness.

Goethe knew this intimate sphere of spiritual encounter and put it into the poetic account of the pain in the eyes on looking at the sun in Faust's monologue in the Ariel scene:

'The blend of joy and sorrow that confounds us  
Sends us to earth: to veil our troubled state,  
For benefice of Spring we supplicate.  
And so I turn, the sun upon my shoulders,  
To watch the waterfall, with heart elate,  
The cataract pouring, crashing from the boulders,'

(Faust II, 1i: *Trans. Philip Wayne*)

And immediately after this comes some pure Goetheanism in the description of the 'rainbow rising from this rage', i.e. earthly life as a colourful reflection. Everything becomes a parable, a symbol – but now indeed in purely sensorial form.

So it makes sense always carefully to differentiate at the outset between the methods of Goetheanism as science and anthroposophy as spiritual science. Whoever has long enough experience of both knows that both – especially when they do not lend themselves to mutual corroboration – when mature enough will meet and confirm each other. Then Goetheanism will be anthroposophy and anthroposophy will achieve its goal in Goetheanism as the Christianity of the future.

If anthroposophy as real research in the supersensible has for long enough distinguished

itself from Goetheanism as all sensorial research that is also intimately connected with reality, and both ways have over and over again been pursued mutually in alternation, then something strange happens. The longer one is actively involved with anthroposophy, the more it leads to the irresistible urge to make it fruitfully practical for the here and now, in one's job and social interaction. It makes people want to be active in life. The longer doing good Goetheanistic science goes on, the more it notices its experiences of the boundary to the supersensible and seeks the sources of pure spirit. On closer examination, both aspects are not divided between different people. As already mentioned, there is Steiner the Goetheanist and Goethe the anthroposophist. Both streams can exist in any person even if different orientations are also involved. And in this manner Goethe and Steiner nevertheless saw their most characteristic concerns very differently. Goethe's mission was to imbue culture once again with sensorial contemplation which is open to the spirit. Steiner's was to enable any person to enter the supersensible free of the body and guided by thinking. It was not his Goethe research – that really should have been the task of Karl Julius Schröer – which was his life's task, but pure spiritual research (see Stein 1922). Goethe on the other hand managed to conceal the esoteric aspect of his supersensible experiences so much that even today they are not detected by mainstream research on Goethe (Schad 2000a).

Both can indeed exist in any person. It is a biographical inhalation and exhalation. As Goetheanists we can inhale the world, we take it in and learn how to spiritualise it. In however small a way at first, an anthroposophist lives by the spirit and may devote himself actively to the earth. This extends the circumscribed concepts of Goetheanism and anthroposophy presented above and they now become capable of growing. If we said at first that anthroposophy is life in the supersensible and Goetheanism the most human form of involvement in the bodily-bound world of the senses, then now Goetheanism becomes the transformation of 'loving joy in all things sensorial' to awareness of the spirit, and anthroposophy becomes being familiar with the spirit so as to be practical in the best sense in earthly life. To the question 'how does one recognise an initiate?' Steiner is once said to have answered, 'In that he is the most practical person.'

Now in the whole sphere of life, biographical inhalation and exhalation are completely inseparable from one another, even if as complementary currents they always remain polar opposites. And it matters not whether we call the two combined, anthroposophy or Goetheanism. But at any moment we are aware which relationship we have to the world and how much we have to thank the other for any complementation. For the two are not only present in a single individual but still more so in the reciprocal complementation that occurs between people. Thus Goetheanism is indispensable to anthroposophy. And Goetheanism will not be able to develop for the next millennium without the efficient involvement of anthroposophy.

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## Abbreviations

Goethe references

MuR – Maximen und Reflexionen

WA II – Weimarer Ausgabe : Goethes Werke. (H. Bühlan) Weimar 1887-1919

Steiner References

GA – *Gesamtausgabe* - Rudolf Steiner’s collected works, numbering used by Rudolf Steiner Verlag, Dornach

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## Some thoughts on the oxalic acid/formic acid processes

*Judyth Sassoon*

As a researcher in biochemistry, I am painfully aware of the way in which the sciences have been de-humanized in recent years. It is a very sad and common complaint from my colleagues that the wonder and excitement they felt at University and in their early days of laboratory research becomes stifled by the necessity for competition, the desperate need for publications and by an insidious paranoia that creates panic if a colleague gets too close to Joe Scientist's personal research niche. The fear that someone else might "get there first" haunts Joe and causes unnecessary misunderstandings and battles between otherwise reasonably friendly human beings. I do not believe that I am alone in observing that scientists consider their work to be more important than the people who do it. We are so busy galloping forwards that our own subjective experiences, and certainly those of others, are considered irrelevant and unimportant. The frenzied pace at which we work, the long hours and the ultimate frustration of knowing that financial support might be terminated if results are not forthcoming is not conducive to developing a calm and serene relationship with the natural phenomena that we study. Today we do not have time to gaze in astonishment when nature reveals her miracles to us, nor are we able to slow down for long enough to ponder the real implications of what we do. We are governed by financial interests, the desire for personal gain and the most terrible feeling of insecurity. Natural phenomena are no longer a source of joy in themselves, merely a means of getting an intellectual "kick" when some experiment has worked. Then, of course, we feel pleased with ourselves and claim rather arrogantly that "I made it work". In this pitiful way we study the Life Sciences – the subject that I have always considered to be the most sacred, most wondrous and most divinely inspired of all the sciences.

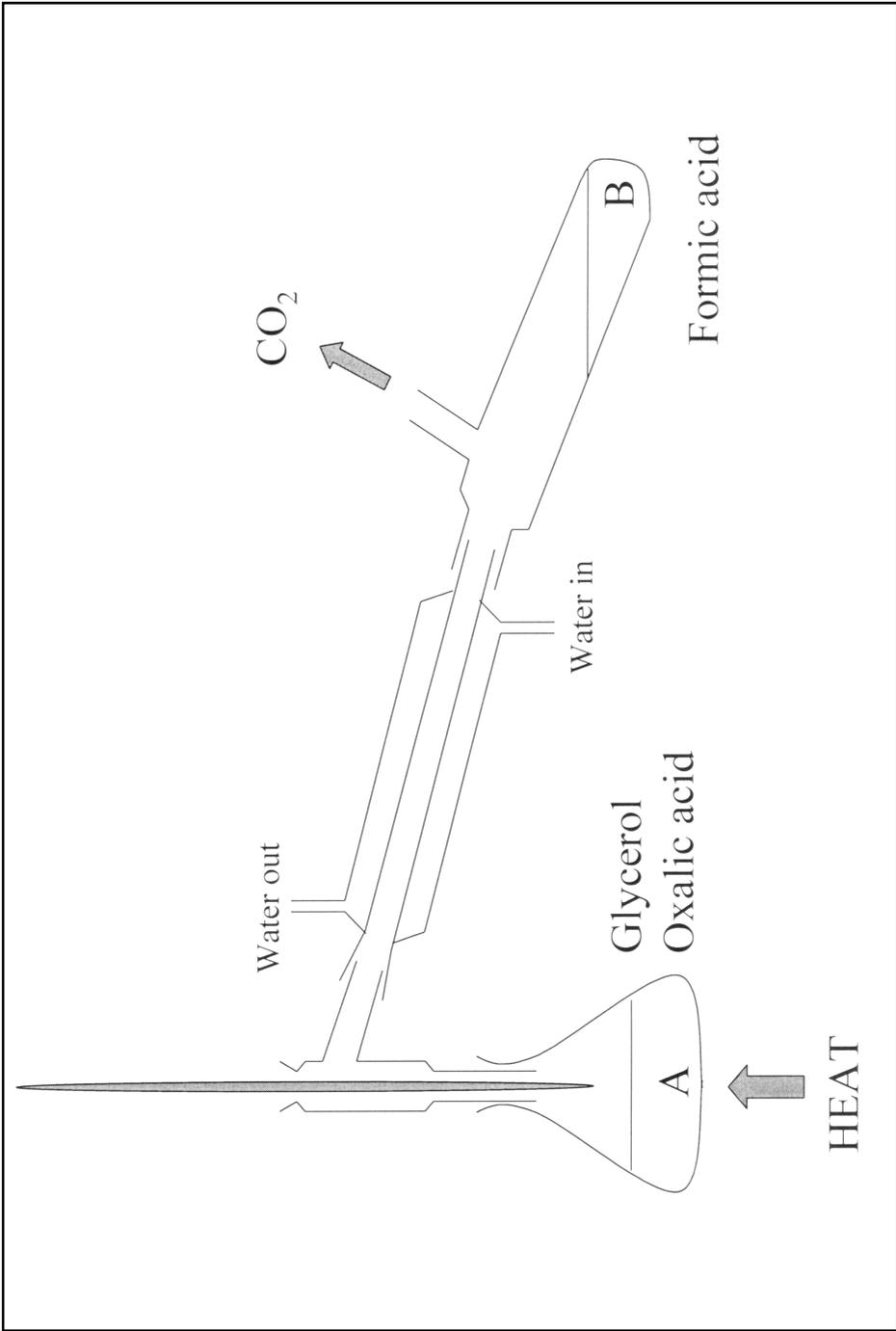
I have spent much of my time wondering how to re-discover the beauty and the divinity within my work. How can I re-connect it with what is true and meaningful and ultimately holy? The need to make time to wonder at the phenomena that I work with is absolutely essential. Nature answers our questions through the experimental procedures we devise and she always answers truthfully. When we give ourselves time to see that truth we come closer to the experience of the divine within nature. But even when time is somehow made available it is still hard to know where to begin. How can a modern scientist reconnect with the reality of the natural phenomena he or she works with?

I was delighted to come across several lectures in Rudolf Steiner's *Mysteriengestaltungen*<sup>1</sup> that seemed to hold some answers. In the 13<sup>th</sup> Lecture, Steiner refers to a chemical reaction that was quite well known in his time and uses it to illustrate how the Rosicrucian alchemists, those for whom nature was unquestionably a reflection of divinity, performed their research. The experiment chosen by Steiner is a simple process by which oxalic acid is converted to formic acid. I will discuss this procedure in some detail because in our time the human capacity to understand physical processes in nature can be used as a first step to understanding the divinity that exists within it. Today we do science by studying

physical process so that must be our starting point, but from there it is possible to progress further to encompass a more spiritual view of the phenomena. An in-depth knowledge of the physical side of a natural phenomenon can be used as a means of re-awakening the wonder and the sense of divinity, but only as long as we do not let it obsess us to the exclusion of all that lies beyond the physical world. To perform the experiment that Steiner described, equal quantities of oxalic acid and glycerol are placed into a flask ('A') with a distillation tube attached to it as shown in the diagram. The mixture is heated slowly up to but not beyond about 108°C, and the distillation product is collected at B. The products are carbon dioxide gas and pure formic acid.

This reaction was quite well known during the early part of the 20th Century, having been first demonstrated by the eminent French Chemist Pierre-Marcelin Berthelot in the 1850s.<sup>2,3</sup> Berthelot is probably best remembered for his work on thermodynamics, but another of his achievements was in characterising some of the properties of the viscous, syrupy alcohol, known as glycerol (glycerin or 1,2,3-propantriol), which he studied in relation to its use in the manufacture of explosives and dyestuffs. His expert knowledge of the characteristics of this substance enabled him to devise an alternative procedure for producing formic acid, which was needed for certain industrial processes. The standard methods of producing formic acid at that time created large quantities of crude product and required extra time-consuming purification steps before the pure product was finally generated.<sup>2</sup> Berthelot found that his method produced good quantities of pure formic acid, especially if the distillation procedure was repeated. Although successful in theory and practice, this method was apparently not adopted on an industrial scale and today the experiment is not very well known. The memory of Berthelot's procedure has, however, been kept alive within the anthroposophical community because of Rudolf Steiner's references to it<sup>1,4</sup> while in University Chemistry departments and in schools, it is mostly forgotten.

In Berthelot's publications there are no details of the analyses he performed to confirm the purity of the products or the mechanism of reaction. Of course there were a number of well-known chemical methods that could have been used for this purpose at that time. Berthelot claimed<sup>2</sup> that the glycerol remained unchanged during the reaction. This was also reiterated by Steiner.<sup>1,4</sup> Usually, when an acid and an alcohol are present together they react and form very stable chemical compounds known as esters. I was therefore slightly puzzled that the glycerol did not appear to participate in the reaction and wondered about its function. I therefore set out to confirm that the reaction indeed took place as claimed. I used the modern and accurate technique of proton <sup>1</sup>H NMR which is able to detect and identify small quantities of organic compounds in mixtures. The results from this analysis were quite clear. The product distilling over was a solution of pure formic acid in water and the gas was carbon dioxide (the latter was easily confirmed by the standard lime-water test). In the residue remaining behind in flask A, the analysis showed the following: there was no more oxalic acid present, showing that the reaction had gone to completion, but it was still possible to detect formic acid which had not distilled over (hence Berthelot's suggestion to redistil the residue for maximum yield). The NMR spectrum also showed that most of the glycerol remained unchanged, but that there was a very



small amount of a glycerol mono-ester present – the result of the reaction of oxalic acid with the glycerol. For anyone wishing to repeat this experiment, it is necessary to realize that the heating must be slow and gentle and that the final temperature must not rise above 110°C. If the heating of the reactants is performed more vigorously, larger amounts of glycerol react with the acid and the ester also distils over into the product flask. It is also good to note that at higher temperatures, the oxalic acid breaks up into CO, CO<sub>2</sub> and H<sub>2</sub>O. Thus for this procedure to work the heating must be slow and the temperature maintained below 110°C. Under these conditions the glycerol acts as an un-reactive carrier, bringing a slow and even distribution of heat to the reaction and allowing the oxalic acid to dissolve.

Rudolf Steiner referred to Berthelot's experiment when he spoke of the way in which the Medieval Rosicrucian alchemists looked upon processes in the laboratory as reflections of processes in nature and images of the spiritual world. For them, the objectivity that science has cultivated for the last 300 years did not exist. A laboratory procedure was significant firstly at the level that it reflected processes in the human body and secondly as a picture of processes in nature. The experiment, the experimenter and the surrounding world were regarded together as different expressions of the work of God. Experiments were used as means to answer questions about nature and man, both held as sacred, through the mediation of divine spiritual beings working within. The experiment was thus a means of communication between Man and God. Today, such devotion at the lab bench has been lost in favour of intellectual objectivity and detachment. Steiner emphasises that it must now be re-discovered as Mankind develops into the future.

Steiner gives rather a detailed description of how the processes illustrated by Berthelot's experiment have parallels in the human body. He bases his comments on clairvoyant perception and says that formic acid is continuously present and necessary for the human body<sup>4,5</sup> and that whatever human beings eat is ultimately transformed into formic acid. He also says that people who are sick do not generate enough formic acid and that insufficient amounts give rise particularly to the symptoms of gout or rheumatism. Taking Berthelot's experiment as a model of human metabolic processes, Steiner says that oxalic acid (or similar substances) are introduced into the human body through the stomach. The body itself provides substances equivalent to the glycerol acting as biochemical vessels or carriers for the reaction. Metabolism in the body provides the heat, which is added to the experiment by means of a Bunsen flame, and carbon dioxide gas is given off as a product of metabolism in the human being and as a product of the reaction in the experiment.

It is important to emphasize that when Rudolf Steiner spoke of oxalic acid and formic acid in this context, he was speaking from his own clairvoyant experiences and to our modern understanding it may be easier to comprehend his description of biochemical events as references to processes i.e. "oxalic acid/formic acid processes" and not necessarily to the physical compounds stringently defined by science. In a similar way in alchemy we speak of the "salt" or "sulphur" processes without necessarily meaning NaCl or the element S.<sup>6,7,8</sup> So far, there are no hard biochemical data to support Steiner's claims about the chemical substances oxalic acid and formic acid in the human organism, al-

though it is clear that acidic substances have a particular stimulating effect on the human being (consider the reviving effects of taking vitamin C or eating an orange). However, the processes that can be seen in Berthelot's experiment closely resemble and encompass the spiritual events in the human body that Steiner was able to understand through clairvoyant perception.

Steiner then describes how Berthelot's experiment can be related to processes in nature. He says that formic acid is something that is needed throughout nature and that it originated in the cosmos at the Old Moon period of Earth evolution, along with other insect toxins, such as the components of bee and wasp stings.<sup>4</sup> During pollination, insects deposit some of their toxins into plants to revive them and heal them from a natural tendency to succumb to degenerative processes. Also the forest floor, which is full of dead and decaying material is revived by formic acid given off by ants and has curative powers to stave off death processes (in this case Steiner is clearly speaking of the substance that science agrees is the true formic acid). Thus insects are the great healers of the world, keeping natural death processes in sufficient balance with life processes for nature to continue. The ants consume plant substances (equivalent to oxalic acid) which lie on the forest floor and, after metabolic conversion, give off formic acid and carbon dioxide. Here we see Berthelot's experiment represented in nature.

I was so fascinated by Steiner's comments on these matters that I began to wonder if there was any evidence from scientific literature for the presence of atmospheric formic acid from ant sources. I managed to find a relatively recent reference confirming that formicine ants may account for as much as half of the formic acid in the atmosphere (about  $2 \times 10^{13}$  grams of formic acid per year).<sup>9</sup> The formic acid released by the ants apparently rises into the atmosphere and then falls back to earth in rain-drops. This is for me a most beautiful natural parallel to the Berthelot experiment. Ants eat dead leaves (oxalic acid) and convert it to formic acid as Steiner says and this is equivalent to the reaction that takes place in flask A (see diagram). But then the formic acid rises up into the distillation apparatus (in the experiment) and into the atmosphere in nature. In the apparatus it cools and drops down into the collecting flask B; in nature, it drops back to earth when it rains to revive the earth.

Berthelot's experiment is a lovely example of a laboratory procedure that can help us to learn how to change our approach to science. With the help of Rudolf Steiner's insights, I was able to enter into its phenomenology in some depths. I also must add a word of caution. On the afternoon that I initially performed the experiment, I was working in a fume hood and was therefore not too concerned about the amount of formic acid that I was producing and inhaling. Consequently, that evening, I suffered the very worst headache of my entire life. It should be noted that formic acid is toxic even in fairly small quantities. It is the metabolic product of methanol and is the reason why any alcoholic beverage containing small quantities of methanol can produce dreadful hangovers. My hangover was a direct experience of what happens when an excess of a "vitalising" substance, like formic acid, is taken into the body: it revives the body so much that it brings about an excessive consciousness, that leads to pain!

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